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# Tax Reform in OECD Countries: Economic Rationale and Consequences

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# WORKING PAPERS

No. 40: TAX REFORM IN OECD COUNTRIES:

ECONOMIC RATIONALE AND CONSEQUENCES

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Monetary and Fiscal Policy Division

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This paper examines the question of tax reform in OECD countries. First, the reasons for tax reform are reviewed. These include economic efficiency arguments as well as concerns about equity which are often a major consideration. Next, the paper considers the many factors which constrain governments in their effort to reform the tax system (such as inherent conflicts between efficiency and equity, and the non-revenue objectives of taxation), and how those constraints might be reduced. Finally, the paper reviews the extent of tax reform in OECD countries, noting some of the remaining problems.

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Cette étude traite de la réforme fiscale dans les pays membres de l'OCDE. En premier lieu, elle rappelle les raisons de cette réforme. Parmi celles-ci figurent des considérations d'efficience économique, mais aussi (et parfois de façon primordiale) le manque d'équité du système en vigueur. Ensuite, sont examinés les multiples contraintes auxquelles les autorités sont confrontées quand elles tentent de réformer la fiscalité (les conflits inévitables entre efficience économique et équité, la poursuite d'objectifs autres que la seule perception de recettes, etc.), et les moyens dont elles peuvent disposer pour les atténuer. En définitive, l'étude présente les modifications réalisées à ce jour dans la fiscalité des pays membres, sans omettre les problèmes en suspens.

# TAX REFORM IN OECD COUNTRIES: ECONOMIC RATIONALE AND CONSEQUENCES

by

Robert P. Hagemann, Brian R. Jones and R. Bruce Montador*

Monetary and Fiscal Policy Division

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## I. INTRODUCTION

Tax reform has recently attracted a great deal of attention in several OECD countries (1). Major changes to existing tax systems have been enacted by a number of governments, notably those of the United States, the United Kingdom, Australia and New Zealand; many others have proposed significant reform of taxation or have implemented some changes while studying further reform proposals. Such broad interest in reform reflects concern that the existing tax structure not only imposes large costs on society by distorting economic decisions (2), but also that it is unfair, unnecessarily complex and too subject to avoidance and evasion. The sense of unfairness is twofold: individuals in similar circumstances are treated differently, while there is a strong belief that, despite the appearances of progressivity (as illustrated by rising marginal personal tax rates), very little redistribution actually occurs. These concerns have been heightened by the increase in tax revenues relative to output since 1970, as shown in Table 1 (3). Moreover, a combination of already large tax revenues and highly distorting tax systems has made it difficult to increase taxes where necessary to face budgetary problems. Finally, part of the reason for the timing of the renewed interest in taxation is the belief that it may have helped increase the structural rigidities in the economy (4).

The purpose of this paper is to investigate these issues in the light of the literature on the subject and the experience of OECD economies. Three sets of questions are addressed:

i) What are the reasons for tax reform? How important are the concerns about tax-induced distortions? What are the consequences of the tax system's increasing complexity? How valid are concerns about inequities in tax systems? Should short-term budgetary problems influence tax reform decisions? What are the desirable features of a tax system?

ii) What are the constraints on tax reform? How does the use of the tax system for purposes other than raising revenues conflict with the desire for an efficient simple and equitable tax system? What are the political and practical considerations that influence any initiatives for reform? In particular how do macroeconomic and international circumstances limit the options facing governments?

iii) How has tax reform proceeded in the OECD countries? Which types of reforms have been considered or undertaken? What remains to be done?

Sections II, III and IV of the paper deal successively with these questions. Tentative conclusions are provided in Part V.

## II. THE RATIONALE FOR TAX REFORM

The traditional public finance principles underlying tax reform proposals include efficiency, simplicity and equity (i.e. fairness), although

the relative importance of each varies across countries considering reform. This section looks in some detail at the extent to which existing tax systems have missed these goals, with an emphasis on the efficiency losses from tax-induced distortions. It then examines briefly some considerations in the design of a desirable tax system.

## A. Efficiency losses from tax-induced distortions

### i) Sources of distortions

A tax distortion occurs whenever economic agents respond to changes in relative prices induced by taxation. Taxes create "wedges" between the before- and after-tax prices of goods, services, factors of production or activities, and when these wedges are of different sizes, relative prices change (see Annex A). Some of these "distortions" may be desirable -- as when polluting activities are taxed to ensure that users pay the full social costs (see the discussion of tax expenditures in Section III). However, most of them are not: taxation of factor income will affect the supply of and demand for the factors; differential taxation of factors according to how and where they are used can lead to inefficient production methods and lower output; and differential tax rates on final goods and services will affect consumption patterns, generally reducing welfare.

Several types of tax distortion are particularly important as a source of welfare costs. First, taxation of labour income discourages labour supply relative to what it otherwise would be, because the after-tax return to the worker is less than the cost to the employer as measured by the marginal value product. This "tax wedge" exists whether wages are taxed directly or via an indirect tax on the consumption of goods and services (which lowers the real after-tax wage), and is greater the higher the total marginal tax rate on labour income (including employee and employer contributions to social security). Chart A provides an illustration of how marginal tax rates on single workers vary with wages in major OECD countries (including the old and new rates in the United States), taking account of both income taxes and social security contributions (but not indirect taxes). They show a broadly similar pattern of rising marginal rates (except for the United States after the recent reform), generally reaching levels well above 50 per cent. At lower incomes the pattern is often erratic, a situation that is made worse when the transfer system is taken into account (for instance the phase-out of benefits as incomes rise creates a "poverty trap" where marginal tax rates exceed 100 per cent over some income ranges). Table 2 shows how the marginal tax rates on labour, including indirect taxes, have evolved in recent years (5). They are typically very high and have even shown a tendency to rise.

General income taxes impose a second distortion by driving a wedge between before and after-tax returns on capital. Such taxation of capital income discourages saving by discriminating against future relative to current consumption. This in itself will reduce welfare by leading to a sub-optimal level of intertemporal resource transfers. It may also tend to reduce investment and thus the domestically-owned capital stock, and may potentially lower productivity growth. While technological change and the increase in labour supply determine the rate of economic growth in the long run, many believe it possible, by reducing the rates of capital taxation, to induce

faster growth for a time through an increase in investment (6). The investment incentives that exist in many countries have been designed in part for this reason. Indeed they are sometimes seen as an ad hoc offset to the double taxation of savings (and the overstatement of income under inflation). However, in some countries there is concern that these have gone too far, with capital being unduly favoured at the expense of labour so that investment has become labour replacing.

The third distortion frequently cited in the tax reform debate is associated with the wide dispersion in the effective marginal rates of taxation of capital income. The different characteristics of personal and business tax systems produce widely varying effective tax rates on capital use. This has been well documented by a number of recent studies. The results of a recent Secretariat study, based on tax systems in effect in 1983, are reported in Table 3. They show considerable variation in tax rates across types of financing, sectors, industries, and countries. In particular, corporate tax systems in many countries tend to favour short-lived over long-lived capital goods, financed by borrowing rather than new share issues or retained earnings. The dispersion of tax rates reflects the interaction of explicit investment incentives (such as selectively applied investment tax credits and accelerated depreciation), changes in expected inflation, and differences in financing patterns. Since the real after-tax rates of return to investment in alternative assets will tend to converge, a tax-induced misallocation of resources occurs and the capital stock is less productive than it would be under uniform taxation of all capital income.

Inflation has compounded many of these problems. It pushes taxpayers into higher tax brackets (in unindexed income tax systems with rising marginal tax rates), more often than not increases the cost of capital to firms, as illustrated in Table 3, by inappropriate treatment of inventories and depreciation (using historic instead of replacement costs, with long-lived assets being the most affected), promotes consumption over saving (where nominal interest income is taxed and/or interest costs are deductible) and generally increases distortions in the economy.

ii) Factors influencing the size of distortions

The importance of the distortions will depend on the tax rates as well as on the elasticities of supply of and demand for goods and factors of production and the elasticities of substitution in production between factors. In fact, much of the debate about the choice of a tax base is in essence a discussion about the size of two specific elasticities: the elasticity of labour supply with respect to after-tax wages and the elasticity of savings with respect to the after-tax rate of return.

An increase in after-tax wage income will have both a substitution effect that raises labour supply (at the expense of now more expensive leisure) and an income effect that lowers it (since the same income can be earned more quickly). The net effect is indeterminate a priori and must therefore be assessed empirically. While early empirical studies tended to find the wage-sensitivity of labour supply was either small or non-existent, more recent research has found larger labour supply elasticities for males and particularly for married women (see Annex A).

Economists' views about the elasticity of saving with respect to the after-tax rate of return have followed a similar, although much less robust trend. For many years it was generally believed that the compensated elasticity of demand for future consumption (or, equivalently, of supply of current savings) with respect to the interest rate was very low. In part this conclusion was based on the great stability of the savings rate over a long period. Relatively few earlier estimates of this elasticity were made, however, and they often neglected the role of taxes. Recent estimates are higher, although they are very sensitive to several variables, notably the interest rate chosen, the definition of savings and the inflation expectations process assumed. It is important to note that the relative merits of alternative tax systems can depend critically on this parameter (see Annex A).

iii) Costs of distortions

Distortionary taxes result in welfare costs (often described as "excess burdens" or "deadweight losses") because they reduce income over and above the transfer of resources to the government (7). This aggregate loss is due to the fact that consumers and producers, responding to changes in relative prices, demand and supply goods and factors in different proportions than they would in the absence of taxes and, therefore, output and income are lower. The greater the responsiveness of consumers and producers to the tax-induced changes in relative prices, the greater the "deadweight" loss to the economy.

The increasing concern about the costs of tax distortions has itself several sources. Recent empirical work suggests that the welfare losses associated with tax distortions are larger than previously thought, in part because of increased estimates of both the elasticity of labour supply with respect to the after-tax wage and the sensitivity of savings to the after-tax return. Moreover, recent applications of applied general equilibrium models have reinforced the belief that wide dispersion in the taxation of capital income reduces output significantly. These changes in view reflect the substantial improvement in the quality of estimates of the welfare costs of taxation over the past decade. The increased refinement of the models has enabled investigators to account for more of the variation in tax treatment across individuals and businesses (see Annex A). Moreover, some recent models have also been able to include dynamic elements, and hence to assess long-run effects of alternative tax structures (i.e. allowing for induced changes in saving, investment and the capital stock).

Table 4 reports some estimates of the possible gains obtained from changes to the existing system. They vary substantially (0.16 per cent of GNP or less, to 9 per cent), reflecting differences in methodologies, data, countries, assumed parameters, etc. Nevertheless, several observations can be made. First, whereas earlier estimates of welfare costs assumed the unacceptable alternative of lump-sum taxes, more recent studies consider the gains to be achieved by more realistic changes, such as integration of personal and corporate taxes or a switch to a consumption tax. Second, and in part because they take account of virtually all existing taxes, some recent estimates of static costs are generally higher than previously obtained (despite the assumption of realistic, and therefore also distorting, replacement taxes). Lastly, allowance for the dynamic effects of taxes substantially increases the welfare gains to be achieved from reform when moves towards consumption taxation or, equivalently, to reduce tax on capital income, interact with positive savings elasticities.

While it is important to quantify the total welfare costs of raising a given amount of tax revenue, the marginal welfare cost (MWC) of additional revenues may be more relevant, given the difficulties faced in reducing the size of government. The MWC is the incremental excess burden of an additional unit of revenue for a given tax structure. It includes the extra tax collected and the marginal loss in welfare from the behavioural responses to it. Such estimates are useful indicators of the costs imposed by current tax systems and, in particular, of how expensive it may be to try to solve budget deficit problems or to undertake new spending programmes via an increase in existing taxes. The results of recent work are shown in Table 5 for tax systems as a whole and for some individual types of taxes. What emerges from the table is how often and by how much marginal welfare costs exceed the marginal revenue. For example, one estimate for the United States is that incremental outlays of one dollar would require incremental social benefits of from $1.07 to $1.46 in order to offset the costs of raising the additional dollar via taxation, depending upon assumptions about the elasticities of labour and saving supply and the tax to be raised. In the case of Sweden, where marginal tax rates are particularly high, the MWC of an additional unit of revenue can be even greater.

Because the welfare loss from taxes is sensitive to their level and dispersion, as well as to the responsiveness of economic agents, it is obvious that the effect of a tax increase will be different depending on the tax that is changed. One of the studies reported in Table 5 gives estimates of the marginal welfare cost for alternative tax sources. As can be seen, additional revenue from consumers' sales taxes results in relatively lower MWC reflecting the fact that in the United States they are generally imposed at low rates. On the other hand, MWC from capital taxes (calculated at the industry level) are relatively large, owing to the high and variable rates of capital taxation then prevailing in the United States.

The general equilibrium model results discussed in this section are, of course, subject to several limitations. They depend on the choice of structure and parameter values of individual models. They compare equilibrium solutions, ignoring the consequences of initial disequilibrium. This presumes, as indeed does much of the case for tax reform, that long-run considerations are sufficently important to outweigh any short-run aspects. Notwithstanding these caveats, the welfare losses appear to be potentially large, even on favourable assumptions about model structure and parameter values.

## B. Other reasons for tax reform

### i) Complexity of existing tax systems

The existing tax systems in most economies are very complex. This has two main sources: the need to define clearly (and in legal terms) distinctions that make economic sense, and the use of the tax system for non-revenue raising purposes. In particular, the treatment of capital income poses two specific problems. First, complicated rules are needed to determine taxable income, which can make it profitable to devote resources to finding ways to reduce tax, given the existence of a rising marginal rate structure. Second, complexity generates uncertainty about the tax consequences of alternative actions, which can adversely affect economic behaviour.

Popular concern about complexity often relates to the personal income tax, with the complicated calculations of revenues, exemptions, deductions and tax credits. It is sometimes erroneously suggested that the existence of multiple tax brackets is itself a factor in the complexity of the tax system. In fact, tax tables usually make the calculation of tax owed the simplest part of a tax return. However, rising tax rate structures do provide a strong incentive to smooth income between years and between individuals (tax arbitraging). This obliges tax authorities to establish rules governing income averaging and income shifting (particularly capital income from parent to child and between spouses), increasing the complexity of personal taxation.

Business income and indirect taxes can also be exceedingly complicated. The complexity of the corporate tax system (due in part to the growing complexity of business finance, and to tax avoidance practices) is reflected in a dispersion of effective tax rates on accounting profits. In the case of indirect taxation, complexity is linked directly to differences in rates and variations in coverage, often aimed at increasing the progressivity of the tax system. The administrative complications arise from the need for regulations and rulings that allocate particular goods or services or stages of production to one or another tax rate category (8).

Complexity creates costs in several ways. The direct costs are, in the first instance, the real resources devoted to compliance and tax collection. As personal and business income taxes have become subject to a host of preferences, exclusions, deductions and credits, record-keeping and tax preparation have in turn become, at least in some countries, particularly costly activities. In many cases (about 40 per cent of taxpayers in both the United States and Canada) individuals have to pay for assistance (9). Although any comprehensive tax requires a complete set of consistent definitions and rules, which themselves impose complications, compliance costs of current systems appear unnecessarily high. It has been estimated, for instance, that direct costs of complying with the existing U.S. income tax, including expenditures associated with the Internal Revenue Service, could be as high as $30 billion (nearly 1 per cent of GNP) (10).

Complexity of the tax system also produces indirect costs because of the effort devoted to artificially rearranging one's affairs in such a way as to reduce a current tax liability. The time and money spent researching options and the use of consulting services result in a considerable diversion of resources into tax-related applications and away from more valuable endeavours.

ii) Inequities

In many countries, pressure for tax reform has arisen from the growing conviction that present tax systems are unfair. The concept of "equity", which relates to the distribution of the burden of taxation, has perhaps been the predominant consideration in recent reform proposals. It is important to distinguish between two different aspects of equity: horizontal equity, which is concerned with the fairness of a tax system (taxpayers in similar circumstances should be treated the same way), and vertical equity, which requires that taxpayers who are better off contribute relatively more to the operations of government than those less well off. Horizontal equity is an

absolute (although not necessarily easy to achieve in practice); in principle, everyone would favour equal treatment of similar economic agents, although they may differ on the definition of equality. On the other hand, vertical equity is a relative concept; except for extreme egalitarians, the desirable extent of redistribution is a matter of debate.

Concerns about both types of equity are sometimes directly related to those about the complexity and distortions discussed above. A lack of horizontal equity often reflects the use of the tax system for non-revenue raising purposes (see Section III below). However, some of the differences in tax treatment may be ex post (and thus not necessarily inequitable) rather than ex ante : taxpayers make choices (about work, investment or consumption) despite the higher tax burden generated by their particular decision. Horizontal inequity arises only where the ability to choose tax-preferred income or consumption is restricted. One particularly important example is the different capacity of wage earners and the self-employed to make use of tax-reducing schemes. Another occurs when individuals face different time profiles of income, since tax systems make at best a grudging allowance for income averaging, falling far short of ensuring the same treatment of those with similar lifetime command over resources.

Vertical equity requires that average tax rates rise with the ability to pay. Such a progressive tax structure has long been a social goal in many countries, which typically use (often steeply) rising marginal income tax rates, although a flat-rate tax combined with a basic exemption or a refundable tax credit can also produce rising average tax rates (11). While steeply rising marginal tax rates are often cited as evidence that "too much" redistribution is being sought, most studies of tax incidence conclude that actual tax systems in fact redistribute very little. The effects of indirect and payroll taxes, flat rates and ceilings for social security contributions, as well as the extensive use of tax expenditures, result in a far more even distribution of the tax burden than suggested by statutory tax rates (12). The problem is not one of too much progressivity per se. It is, first, that a given amount of redistribution requires a steeper income tax function than it would if the income tax were the only source of revenue, and, second, that the resulting high tax rates themselves lead to pressures for additional deductions and exemptions and to avoidance. Others argue, on the basis of these observations, that tax reform can provide an opportunity to "restore" progressivity to taxation as a whole, without excessive distortions.

Where tax systems are not achieving their stated redistributional objectives, it may be possible to reduce distortions, complexity and horizontal inequity with no loss of vertical equity overall -- i.e. tax reform can potentially be "distributionally neutral" (13). Moreover, as noted earlier, income redistribution cannot be assessed by looking at the tax system in isolation from transfers and direct public spending.

iii) Macroeconomic considerations

The need for tax reform can also be related to budgetary considerations. Since distortions will remain important as long as the overall level of taxes is high, a cut in the size of government may be necessary to reduce welfare losses significantly. However, given the apparent difficulty of further public expenditure cuts, there is concern about the

government's ability to raise any necessary additional revenues efficiently (see Table 5). Although all taxes distort to some degree, most existing systems are sufficiently imperfect to make reform appear a necessary precondition to any efforts to raise tax revenues.

For instance, in Japan the 1986 tax reform proposal, although substantially motivated by concerns about equity (14), appears to have the additional purpose of helping to reduce international imbalances. In Canada the government proposes to reform the structure of indirect taxation, which would be a prerequisite to any shift towards indirect taxation (either to finance proposed lower personal tax rates or to help reduce the deficit). In countries with large self-employed and agricultural sectors (such as Italy, Spain, Portugal and Greece) governments have found that funding the current levels of public service via direct taxation requires high effective tax rates on wages (particularly via employers' contributions to social security) because of collection problems for other incomes. The case for reform has also been reinforced when tax expenditures are used extensively as tax shelters and thus generate greater than expected revenue losses. Examples include film industry incentives in Australia (now somewhat less generous) and the Canadian scientific research tax credit.

iv) Social considerations

Finally, a focus for reform in some countries is the choice of tax-paying unit (15). Should taxation be based on the family or on individuals? The possible choices suggest a conflict between equity considerations and the need to accommodate the changing role of women in modern society. The various solutions may also create additional distortions. Tax authorities generally have at least four options: separate taxation of each individual, complete integration of family income, integration of unearned income and separate taxation of individuals with a married person's allowance that disappears as the spouse's income grows. Systems that assess tax on a family basis might appear more equitable, since total family income would determine tax liabilities. However, such systems may discourage women from playing a greater role in the economy, or even discourage marriage, since the earnings of married women are subject to a high marginal tax rate. Similarly, if taxation is on an individual basis with a married person's allowance geared to the spouse's income, women are discouraged from reentering the labour force since the first income earned is implicitly taxed at the husband's marginal rate. The disincentive effect on labour supply disappears, however, once a wife's earnings are sufficient to eliminate her husband's married person's allowance. Many of the issues involved in this area of tax reform are essentially non-economic in nature but they are an important focus of the current tax reform debate in some countries, notably the United Kingdom.

C. Redesigning tax systems

Although much has been written on the subject of optimal taxation, the economic literature does not provide any clear lessons for tax reform (16). Most authors have generally recognized that a perfect tax system -- satisfying simultaneously the principles of efficiency, simplicity and equity -- is not possible, so that any feasible taxes will necessarily distort economic choices. The design of the optimal tax structure is, therefore, a problem of second best in terms of efficiency. The socially optimal trade-off between

efficiency and equity will depend crucially on the extent to which the government wishes to use the tax system to pursue social welfare objectives (such as income redistribution). However, it is important to remember that such goals should be pursued with the most appropriate instruments of government; for example taxes, transfers, direct expenditures and regulations all influence income distribution.

The major conceptual problem confronting tax design is the choice of tax base. In practice, it is generally held that this should reflect the "ability to pay", of which there are in principle two alternative measures, "comprehensive income" (consumption plus the change in wealth over a given accounting period) (17) and consumption by itself. The literature has also considered the more general concept of "individual welfare" (which is impracticable) and the "benefits principle", where each pays according to the benefits received (which ignores vertical equity). A more mundane question concerns the relevant accounting period. Although the income tax is usually based upon the annual cash flow, this procedure does not deal satisfactorily with fluctuating incomes, or the distinction between realized and accrued income. If one could calculate a measure of the taxpayer's lifetime resources, these problems would be eliminated. Indeed, some proponents of a consumption tax base argue that consumption is a better proxy for lifetime income than is current income.

The principal difference between comprehensive income and consumption as tax bases is the treatment of savings (or, equivalently, deferred consumption). With an income base, savings are subject to double taxation, whereas with a consumption base they are taxed only once, when consumed (providing bequests and gifts are treated as consumption). Both comprehensive income and consumption taxes discourage labour supply by leaving leisure untaxed. An income tax implies a smaller labour-leisure distortion than a consumption tax to the extent that the broader base permits lower rates, but introduces a saving-consumption distortion. It is therefore necessary to evaluate the welfare costs of the two types of distortions, and in particular to know to what extent the double taxation of capital income inhibits saving, investment and economic growth. Concerns about the adverse effect on capital formation of taxing capital income and its horizontal inequities (those with low time preference rates will pay more taxes, because they save more, than others in similar circumstances) lead many to prefer a tax on consumption to an income tax.

There are three possible ways that consumption can be taxed: differential commodity taxation, a broad-based, flat rate indirect tax; or a direct (possibly progressive) expenditure tax. The theoretical case for differential commodity taxation reflects three different arguments: i) welfare losses can be minimised (under appropriate simplifying assumptions) if tax rates are inversely proportional to the corresponding elasticity of demand; ii) commodity taxes can be made progressive by taxing necessities lightly and luxuries heavily; and iii) leisure could be taxed indirectly via goods that are its complement. In practice, these arguments tend to be mutually exclusive. Moreover, in the absence of robust estimates of the relevant price elasticities, and given the administrative complications of multiple-rate systems, uniform taxation, preferably in the form of a broad-based consumption tax such as a value-added tax (VAT), is usually recommended as a practical approach (18).

Expenditure taxation is often thought to imply indirect taxation. However, it is possible to design a direct expenditure tax, which would exempt saving. Moreover, such a tax can be made progressive (19). The basic structure would be similar to a conventional income tax. However, deposits to approved savings accounts would be exempt from taxation, while withdrawals from them (for consumption, gifts or bequests) would be taxed. Income earned on other savings (made out of after-tax income) would not be taxed. Rudimentary forms of such a structure exist for retirement savings in several countries (e.g. the United States, the United Kingdom). The Canadian system, once its ongoing extension is phased in, is perhaps the most generous. Such an approach to taxation may lead to tax avoidance through misuse of the registered accounts mechanism (20), requiring an enforcement mechanism. More general problems with consumption taxation include its perceived regressiveness, the treatment of bequests (in particular, to the extent that individuals take their heirs' welfare into account, inheritance taxes will also distort behaviour) and the transition from an income tax (discussed in Section III).

Although the literature on optimal taxation is ambiguous on the choice of a tax base, a generally recognized requirement of a well-designed tax system, albeit seldom satisfied, is the need for simplicity. An uncomplicated tax system has lower compliance costs, is less subject to tax avoidance and should, therefore, be more acceptable to the public. On the other hand, a complex system may be politically attractive because of a lack of transparency if particular groups wish the extent of government assistance they receive to be disguised. It is also desirable that the tax system not create problems for macroeconomic stability and that it not conflict with accepted social values.

One general prescription from the optimal tax literature does hold, however. Since efficiency losses increase more than proportionately with the tax rate, a given amount of revenue should, other things being equal, best be raised by broadly-based taxes in order to ensure that the corresponding rates are as low as possible.

## III. THE CONSTRAINTS ON TAX REFORM

Although the need for tax reform is recognized in many OECD Member countries, actual reform to date has often been quite limited. Even where major changes have been approved (e.g. the United States, the United Kingdom, Canada, Australia, Denmark, New Zealand), or are being actively considered (e.g. Japan), some of the important problems generally remain. This reflects several constraints, notably: the difficulties sometimes faced by governments in formulating a clear strategy, given conflicting prescriptions for reform and the use of the tax system for non-revenue purposes; the political and practical constraints on the changes that can be undertaken; and the macroeconomic environment (including international considerations) in which tax reform must take place. This section discusses how these factors constrain action to improve tax systems in OECD countries.

## A. Competing goals

The desire for tax reform generally reflects the view that, despite uncertainty about what constitutes an optimal tax system, substantial efficiency and horizontal equity gains are possible relative to the existing tax system. Although opinions differ about the appropriateness of using taxation (as opposed to direct expenditure and transfers) for income redistribution, tax reform may also make it possible to increase the progressivity of the tax system relative to the current situation. However, in the limit there is a clear trade-off between the competing goals of increased efficiency and greater vertical equity. Moreover, equity or efficiency goals often conflict with the need for simplicity in a tax system.

The nature of these trade-offs varies for different taxes. With an income tax (or a progressive consumption tax), a revenue-neutral increase in progressivity implies greater deadweight losses than under the existing tax structure. If the disincentive effect from higher rates is strong enough, the maximum feasible degree of income redistribution may be reached more quickly than anticipated. With differential commodity taxes, on the other hand, the deadweight losses are minimised by taxing most heavily those commodities with the lowest price elasticities of demand (i.e. high taxes on necessities and low taxes on luxuries). Efficient commodity taxes thus tend to be highly regressive, while those that attempt to be progressive tend to be inefficient. In either case the dispersion of tax rates violates the goal of simplicity.

Use of the tax system for economic and social policy goals other than income redistribution also gives rise to trade-offs between efficiency and these objectives. Provisions for a favourable tax treatment of particular types of activities or groups of taxpayers, as a substitute for direct government expenditures, are frequently referred to as "tax expenditures" (21). Their importance has been sufficiently recognized for several OECD countries to publish accounts of such tax expenditures. They are often strongly criticised on the grounds that if the tax system is asked to do too much, it will do nothing well. An assessment of such arguments nevertheless needs to address two questions: when is government intervention justified? and are tax expenditures the best way to intervene?

The identification of circumstances where government intervention can be justified has been a traditional theme in public finance theory. Intervention is generally rationalised on one of three grounds: the market fails to allocate resources efficiently; the market outcome leads to an unacceptable income distribution; or the existence of merit goods (where individuals do not act in their own or their childrens' best interests). The most important sources of market failures are: the breakdown of competition; the existence of public goods and externalities; imperfect information; incomplete markets; and disequilibrium in labour markets.

Government intervention to rectify a market failure need not imply a trade-off with efficiency, since the objective is to eliminate the cause of inefficiency. However, if it results in higher expenditure or lower revenues, it will generate efficiency costs elsewhere in the economy from the increased taxes needed to make up the budgetary shortfall, which will offset some of the gains from eliminating the original source of inefficiency. For many types of market failure, therefore, as well as for merit goods and income

redistribution, the desirability of government intervention depends on there being a practicable policy that in fact improves on the market outcome. The efficiency and distributional consequences of alternative policies (including those caused by the tax increases that may be needed to leave the budget balance unchanged) must be established, as well as their likely success at achieving their objective. In that regard, it should be noted that the officially stated objective of policy may not fully reflect the true goal: beneficiaries generally prefer anonymous support, as via tax expenditures, which avoids visible government handouts.

As the tax collection apparatus already exists, it may at times provide the most efficient means of government intervention, particularly for measures intended to have an economy-wide effect, since the marginal administrative costs involved may be low. In addition, taxes (or subsidies) can be used to "correct" an externality by "internalizing" the costs (or benefits). Tax expenditures can also be more effective than direct spending for some specific purposes (for example, replacing direct benefits to low income groups, where the take-up rate is sometimes substantially less than 100 per cent). In general, the choice between tax expenditures and direct spending will depend importantly on which more accurately targets the source of the problem.

However, tax expenditures are often poorly designed and targetted, and tend to be an "ends justifies the means" response to popular policy objectives. There is often less scrutiny of the implications and cost effectiveness of a new tax expenditure (which may entail only a minor amendment to existing tax legislation) than would be given to legislation to introduce a new expenditure programme with the same aims. As a result, tax expenditures can sometimes be extremely ill-suited to their stated objective, indiscriminate, inequitable and cost ineffective. Last, and importantly, the future revenue costs of tax expenditure proposals are difficult to estimate and may turn out to be volatile because of changing taxpayer circumstances and behaviour. Although well-designed "corrective taxes" can potentially improve overall economic efficiency, in practice tax expenditures often simply undermine the tax base without substantial benefits (22).

Although tax expenditures' lack of transparency sometimes provides a political rationale for their use, it is also a major argument against them. Their true costs exceed the direct revenue losses, which themselves are still not widely publicised. Moreover, such measures are seldom reviewed regularly. Tax expenditures also complicate the tax code (because of the need to define the limits of eligibility), thereby increasing scope for tax avoidance.

While the trade-offs between competing policy goals are a legitimate constraint on tax reform, much of the debate appears to arise from insufficient public appreciation of the highly adverse consequences of some tax expenditures. Efforts to clarify public understanding of the true implications of existing tax policy might facilitate the path of reform. The sheer number of current tax expenditures also creates problems in preparing tax reform proposals. Thus, global tax reform sometimes starts from the premise that all existing tax expenditures be abolished, even if some are worthwhile, since examining them individually may delay the process of tax reform.

## B. Political and practical constraints

Tax reform proposals in practice are seldom as far reaching as might appear desirable. This limitation reflects both the nature of the political decision-making process and the practical difficulties of implementing major changes to existing regimes, including transition problems.

### i) Political constraints

Many proposals for tax reform are dismissed as not being politically feasible even if they are economically desirable. However, what is politically possible is in large part what is acceptable to the current government, which in turn reflects what is acceptable to the public (23). The development of existing tax systems and the scope for changes to them should be seen in this light. There are four important issues in this respect: the political factors that explain present tax provisions; the treatment of those who lose from tax reform; the importance of "selling" reform, in part by encouraging informed debate; and the relative merits of "comprehensive" versus "piecemeal" reform.

Political factors explain much of the evolution of tax systems over the years: changes to a tax system are often a response to political pressures or to policy ends viewed as important at the time. As new concessions are added, while existing ones remain, a "ratchet effect" results, increasing the complexity and other problems of the tax system. (In many cases, of course, the effects of the new tax provisions may offset earlier measures.) Moreover, concessions tend to be regarded as rights to be staunchly defended, and governments fear the electoral consequences of repeal. Indeed, since tax privileges will typically be capitalised in asset prices, their removal can raise important horizontal equity considerations (24).

Perhaps the single most important impediment to (revenue neutral) tax reform is that there will inevitably be "losers" in the resultant income redistribution. Losses normally tend to be concentrated on relatively few individuals or businesses, who therefore have great incentive to oppose changes, whereas the gains are distributed thinly over many taxpayers. The objections can be particularly effective if the tax relief being abolished was originally presented as helping a worthy cause. The proposed change can then be pilloried as hostile to investment (abolition of the investment tax credit), to old people (removing exemptions for pension income), to education (removing deductions for tuition costs), etc. Losses also tend to be immediate, whereas some indirect benefits may accrue over time, so they are less certain and less visible. If a reform improves economic efficiency, overall gains will by definition exceed losses, although for people affected by specific changes lower tax rates may provide insufficient offset. Appropriate compensation and transition provisions can thus be particularly important in minimising political obstacles to tax reform (25).

The actual presentation of tax reform proposals can also crucially affect its political costs and benefits, given the importance of their perception by the public. The implications of tax reform are usually complex, far reaching, and not well or easily understood, so careful explanation and "selling" of a reform proposal may be necessary (26). It is important to educate the public about the subtleties of taxes, and about the true and often

perverse effects of tax expenditures in particular. For example, it is not widely recognized that the deductibility of mortgage interest tends to increase the demand for and hence price of owner-occupied housing, so that the assistance to first-time home-buyers is at best much less than suggested by the tax saving.

Moreover, public attitudes reduce the ability to change indirect tax systems, despite the widespread scepticism about the progressiveness achieved by differential tax rates (because of the increasing similarity in the broad consumption patterns across income classes) (27). Similarly, any shift towards greater reliance on a consumption tax base is seen as regressive. Given the relatively limited extent of inheritance taxation, this perception is essentially correct, although overstated since a direct expenditure tax could be made progressive, and because discussion tends to focus on the single year incidence rather than the effect over the entire life cycle.

Finally, perception of reforms that shift the tax burden from labour to capital (or vice versa) may also exaggerate the income distribution effects, if based on the presumption that taxes on capital are paid by the rich while those on labour are borne by the poor. Leaving aside the technical problems of determining whether the corporate income tax is "borne" by the owners of capital or shifted to consumers via higher output prices, much capital is in fact owned by pension funds or mutual insurance companies, whose ultimate beneficiaries are not all wealthy. Moreover, if capital formation is adversely affected, wage incomes and the demand for labour may be as well.

For several reasons a single comprehensive tax reform package may be more politically feasible than piecemeal reform spread over some years. The major tactical advantage of comprehensive reform is that it permits a greater simultaneous reduction in general tax rates, making the gains more evident to beneficiaries. Moreover, the lower the rates after the reform, the less important will appear the cancelled and remaining tax preferences. Both these factors may have been important in the case of the United States where, for instance, the real estate industry was openly concerned about the reform adopted, even though mortgage interest deductibility was retained, because the lower tax rates reduce the value of the deduction. The alternative, removing concessions piecemeal, may maximise the political costs, by spreading the adverse economic consequences (e.g. from uncertainty) over a much longer time, with a risk that the "political goodwill" for reform will be exhausted before much progress is achieved.

A second important advantage of comprehensive reform is that it appears more equitable if all groups simultaneously give up their preferential treatment. Conversely, the fairness of partial reform will be less clear, and hence there is greater scope for general distrust. A comprehensive reform is easier to defend if it produces a very simple tax system with no concessions. This gives special interests the least chance, since once one concession is allowed it would be more difficult to reject other claims for special treatment. The choice of a simple system would also lessen the risk of inaction as a result of detailed discussion of the merits of each of the individual measures proposed. Even a simple system entails an enormous amount of detailed legislation. Finally, a comprehensive reform should allow greater subsequent stability of the tax system, thereby reducing uncertainty for those making long-run plans.

A comprehensive tax reform has, on the other hand, the disadvantage that, with so many changes occurring at once, it is virtually impossible to predict its full economic consequences. This promotes fears about the effects on income distribution, particular sectors and activity in general. However, existing tax systems are often so complicated and distorting that their impact on income distribution is essentially arbitrary, so a new system may be no worse. There is a risk that sweeping tax reform may pay insufficient attention to the detailed measures taken, given its focus on the medium to longer-term efficiency gains. While overlooked problems and anomalies can be sorted out as they arise, successful reform must avoid too many ex post corrections, which would not only reflect poorly on the value of the original proposals but could also set in motion a process of ad hoc measures leading back to a complicated tax system (for example in the United States the Technical Amendments bill of 1987 is 500 pages long).

Marginal reforms of the tax system may often be worthwhile if the public is unwilling to accept major changes (for instance, the United Kingdom has implemented a substantial programme of tax reform on a fairly gradualist basis). Even so, a step-by-step approach within a systematic overall plan is preferable to ad hoc piecemeal reform. For instance, if the ultimate aim were to move to a consumption base for taxation, widening the income base to include previously exempted capital income would be a step in the wrong direction.

The nature of the political system also influences the ease of implementing tax reform proposals (28). A strong executive branch of government may facilitate reform, while if power is shared more evenly between the executive and legislative branches of government or in a multi-party coalition, it may be more difficult to secure the necessary agreement. (In the United States, two years of intensive debate were required for agreement between the President and both Houses of Congress on a compromise tax reform bill.) A comprehensive reform may be the best option in the latter case, since the effort required to get agreement for each piece of legislation would make piecemeal proposals even more difficult.

ii) Practical constraints

A major problem in tax reform is that distinctions that make clear economic sense may be hard to translate into the tax code because the relevant variables are not easy to measure. This has generally prevented coming to grips with such problems as the definition of business income in the presence of inflation, the taxation of unrealised capital gains and the measurement of the imputed income from owner-occupied housing. Even when economic concepts can be defined in legal terms, lack of skilled administrative and legislative resources can place additional constraints on tax reform. Precise descriptions of the provisions of any tax code tend to require complicated legal drafting, which can take time. Moreover, even if the new system is simpler than the old, it will be necessary to establish precise transition rules.

In some Member countries constitutional arrangements can be an important factor limiting the speed and extent of tax reform. In some federations (Canada, Switzerland, United States) a significant proportion of

total taxes is collected by regional (state or provincial) governments, while in some unitary states (e.g. Denmark, Finland, Japan, Sweden) local governments collect a large amount of tax. Moreover, in a number of countries there are tax-sharing agreements between the central and state or local governments (e.g. Japan, Germany, Australia). The scope for tax reform will be less if it is restricted to the central government. Tax reform will generally affect the tax systems of lower levels of governments, and co-ordination is necessary. This is particularly true where the different levels of government share the same tax instruments or where tax paid at other levels is deductible.

The potential gains from tax reform are also limited by what might be called arithmetic reality, in particular the size of the total tax burden. As Table 1 shows, total tax receipts in many Member countries exceed 40 per cent of GDP. Unless total taxation is reduced, significant distortions will remain; they can be shifted but not eliminated. As an example, Table 6 shows the implied tax rates that would be required if all revenues were raised by a single proportional tax on income. While these appear very high relative to the average rates of personal income tax (also shown in Table 6), they are not when compared with the total tax wedge (including social security contributions and indirect taxes) on labour income shown in Table 2.

The idea of reforming taxation by sharing the burden across tax bases has limitations. The use of several tax bases lowers the tax rate on each base, but it does not generally reduce the total welfare losses relative to placing all the burden on a single base. That is, there is no "free lunch". A comprehensive proportional income tax is equivalent to a flat rate tax on total expenditure (including investment). Subject to some qualifications, a tax on wages (and inheritances) can be seen as roughly equivalent to a tax on consumer spending (and bequests) (29). Thus, for example, a 20 per cent proportional labour income tax and a 20 per cent VAT-type consumption tax is no less distorting than a proportional labour income tax that generates the same revenue (approximately a 40 per cent rate). Because the income tax generally falls on at least some capital as well as labour income, and the VAT often exempts investment, shifts to indirect tax may, however, improve efficiency by moving the tax system partially towards a consumption base. Moreover, most such changes have also been used to reduce the progressivity of the income tax rate structure (and thus the labour-leisure distortions) and to lessen tax evasion by reducing the gains from evading any single tax (30).

It is difficult to see how significant reductions in the tax wedge on labour can be achieved without moving to punitive capital taxation because the capital income tax base is much smaller. Indeed, the scope for this is quite limited because of the international mobility of capital (see below). However, the question of the appropriate shares of taxation on labour and capital is an open one, depending in part on the relative elasticity of labour supply and saving (see the discussion of the choice of tax base in Section II above) and on the incidence of capital taxation. In fact, in the long run, it may not even be possible to tax income from labour and capital differently (31). However, increases in social security contributions (particularly in Europe) have been seen as raising the cost of labour relative to capital and thus as a partial explanation for the rise in unemployment.

The extent to which capital should be taxed is related to the broad

question of investment incentives. Observers in many countries have argued for the maintenance of present favourable treatment (such as the investment tax credit) or the introduction of new measures, because of concern that investment is or may become cyclically or secularly depressed. Many studies have found the timing of capital spending to be quite sensitive to temporary, tax-induced changes in the cost of capital (32), but it is not clear that the level of the capital stock is permanently affected. There may be a perceived need for a permanent investment incentive (although this would require offsetting tax increases elsewhere), but in practice most measures of this kind tend to be biased in favour of specific types of capital. Pressure for permanent incentives for capital spending often reflects concern that saving and investment in income-based tax systems may be inadequate. The unpopularity of moves towards a consumption tax base makes some form of tax stimulus to investment appear attractive. Similarly, partisans of consumption taxation tend to resist the abolition of existing tax incentives. The appropriate answer clearly depends on circumstances, but if such measures are to be adopted or retained, it would be desirable for them to be far more neutral than in the past.

iii) Transition problems

Although tax reform is largely motivated by longer-term efficiency gains, major changes in the tax system have substantial and sudden effects on income and wealth distribution, which cannot be ignored. Thus transition rules have a role to play in minimizing unfair losses, or undeserved windfalls, to individuals whose investment decisions were influenced by the provisions of the existing tax code. Such rules can be important for the successful implementation of tax reform, but are difficult to design. Tax reform may also need to be accompanied by policies to offset adverse short-run macroeconomic effects (as discussed below).

Equity problems justifying transition rules arise from changes in the timing of a tax liability ("carryover" problems) and from changes in asset prices. Carryover problems occur where changes in the tax code affect the taxation of income earned in the past but not yet taxed (for example, capital gains are usually taxed only when realised), or income already taxed in the past, which may be subject to taxation a second time. These problems are especially severe for a change to a consumption tax because of the different saving behaviour of individuals at different stages of their lives. In particular, to the extent that the assets of the elderly have been accumulated out of after-tax income under the old system, they would be taxed again when used for consumption. (Obviously this does not apply to those who took advantage of existing tax-favoured saving provisions). However, the introduction of a progressive expenditure tax might even lower the tax paid by poorer retirees. Clearly, compensation raises difficult problems: establishing the facts about who is truly worse off; making value judgements about whether compensation is justified; and designing efficient instruments to provide it.

Since the effect of tax systems on expected future after-tax income is normally capitalised in asset prices, changes in relative asset prices occur when tax changes affect relative returns on different assets rather than affecting all assets equally. In particular, the abolition of the special concessions offered to some industries (real estate) or types of assets could

lead to substantial falls in asset prices. In general, the price changes are likely to be greater for long-term fixed claims than for equities; greater for assets which cannot be easily shifted between industries and for which asset supplies adjust slowly; and greater in the short run than in the long run after all economic adjustments have worked through.

Such windfall losses to asset holders may justify compensation if the previous system explicitly encouraged investment in those assets. However, a counter argument is that all changes in government policies affect incomes to some extent, so that it is not normal to provide compensation. The risk that a special concession will be withdrawn should be reflected in the rate of return on the relevant assets and, if so, further compensation is not warranted. Finally, even where compensation is theoretically justified it will be difficult to calculate the appropriate amount (observed changes in asset prices may reflect other factors). This suggests that transition rules should aim to limit the losses on individuals who responded in good faith to government incentives rather than to provide full compensation.

The most appropriate transition rule for "carryover" equity problems is to tax, to the maximum extent possible, income earned before the changeover date under the old system, and income accruing after that date under the new system. However, the necessary regulations increase the complexity of the tax code, raise compliance costs (because two sets of accounts must be maintained) and lead to the possibility of tax evasion (by mis-stating the value of assets at the change-over date). Two possible solutions to equity problems relating to windfall changes in asset prices are: "grandfathering" (existing assets are exempt from the new law as long as they are held by the current owner), and phasing in the new rules. The aim should be to minimize the possibility of windfall gains to existing asset holders and to avoid introducing new distortions.

To sum up, given that there are overall gains from tax reform, it should be possible to compensate losers to some extent. However, there are equity arguments both for and against compensation, and hence the merits of each individual case need to be considered. The general arguments for compensation being strictly limited are that it: i) reduces the revenue available for tax rate cuts (at least in the short run); ii) increases the complexity of the tax code; iii) opens the door for other claims for special treatment; and iv) may well create new anomalies because of an inability to target the compensation accurately. It is difficult to design appropriate transition rules, but the problems are not insurmountable.

## C. Macroeconomic and international considerations

The possibility of unwanted short-run macroeconomic side-effects (recession, inflation and balance of payments problems) from tax reform is often an important concern. Assessing the full economic consequences of a reform is difficult, requiring general equilibrium analysis and a detailed understanding of the time pattern of its effects. Moreover, policymakers are often confronted with conflicting empirical estimates.

### i) Concern about aggregate activity

Traditional macroeconomic considerations have influenced the tax reform debate in at least three ways. The first, as noted in Section II above, is

that in several countries budget imbalances suggest that revenue-increasing rather than revenue-neutral tax reform could be required (which may reinforce the case for improving the tax system). Non-revenue neutral reform would be expected to have macroeconomic effects, at least in the short run, but that is not the focus here.

A second concern sometimes expressed is that changes to a tax system may affect its automatic stabilising properties (33). (The Carter Commission in Canada was concerned that tax reform not reduce these, while in Switzerland it has been suggested that shorter tax collection lags would lessen destabilising influences). For example, indexation of personal income tax rate scales reduces the "fiscal drag" that causes tax revenues to rise faster than income (for progressive tax scales). On the other hand, if social security contributions are "capped", the indexation of the ceilings increases overall fiscal drag. Similarly, reductions in the progressivity of the personal income tax or shifts to indirect taxation can reduce the size of the automatic stabilisers. Although it might be useful for the tax system to dampen the effects of shocks to activity, in practice it is not clear whether fiscal drag is stabilising or destabilising, given lags in tax collection and in the response of private spending to tax payments. The risk that tax reform will reduce the effectiveness of automatic stabilisers is therefore generally not considered to be a major problem.

The most notable macroeconomic concern in recent tax reform discussion has been the effects on aggregate activity of shifts in the burden of taxation under a revenue-neutral change to the system. Even if it is revenue neutral in every time period, there can still be a short-run impact on aggregate demand because of asymmetric responses of winners and losers. There would be a negative impact, for example, if groups losing tax concessions react more quickly (by reducing expenditure) than those benefiting from tax cuts. Such asymmetry need not necessarily hold, since major expenditure components may in fact react sluggishly in either direction.

The macroeconomic effects of revenue-neutral tax reforms that shift the relative burden between corporations and households are of particular concern. Since investment is generally more volatile than consumption, it might be expected to react more quickly to tax reforms that increase the cost of capital to the corporate sector than would consumption to the offsetting increase in disposable incomes. In the United States tax reform has shifted the burden to corporations, leading to fears that the macroeconomic impact will be unfavourable, with an increase in consumption lagging a fall in investment. Furthermore, there is concern that the higher cost of capital will permanently lower investment, and hence longer-term growth prospects. However, the negative effect on investment over the short term, and thus the risk of macroeconomic destabilisation, may not be as strong as some expect. There are three main reasons for this. First, a matter of timing: the abolition of the investment tax credit, which increased the cost of capital for equipment, was retroactive to January 1986. Expectations of such a provision (common to all of the major tax reform proposals) may explain part of the weakness in business equipment investment in 1986. Second, the tax reform's effect on the cost of capital varies across types of capital good. For structures, the changes in depreciation schedules and the lower corporate tax rates are roughly offsetting. On the other hand, reform does significantly reduce the rate of return on commercial real estate and rental

housing, sectors that are already very weak in many parts of the United States as a result of overbuilding (reflecting the earlier, excessively generous tax treatment), and where capital spending was anyway expected to decline. Third, the outlook for investment in the United States has in any event been substantially improved by the decline in interest rates (34).

It is by no means clear that current macro-econometric models, which typically apply the average changes in the cost of capital to aggregate investment equations, can capture complicated reforms in the structure of capital taxation and the incentives to save and invest (at both the personal and corporate levels) (35). Nevertheless, these models are being used to evaluate the United States tax reform, and they often suggest that it will depress both investment and overall activity. For example, DRI has estimated that it will lower non-residential business fixed capital spending by 3.0 per cent in 1987 and 5.8 per cent in 1988 (36). However, this assumes that the negative effects on equipment investment only begin in 1987, despite widespread recognition in 1986 of the imminent disappearance of the investment tax credit. It seems likely, therefore, that these figures over-estimate the consequences of the tax reforms for capital spending over the next two years. The OECD forecast for U.S. business investment, which makes some allowance for these factors, shows slow growth over the two years, as opposed to the decline forecast by DRI.

A tax reform designed to be revenue neutral on average over a particular horizon, say 5 years, as in the United States, will not in general be so in each individual year. Furthermore, as revenue neutrality over such a time horizon depends on particular assumptions about the responses to tax reform, the outturn could be very different. The pattern of fiscal stimulus and contraction resulting from tax changes may conflict with the macro-stabilisation policy objectives of the government. For instance a reform that initially moved the budget towards surplus might increase the risk of recession if the economy were already expected to slow. (Although if future increases or decreases in tax liabilities are imminent and well publicised, they should be at least partly offset by movements in private saving.) In theory, varying the implementation dates of tax changes could influence the time profile for the budget deficit and economic activity. However, given the imperfect knowledge of the dynamics of the economy, such fine-tuning might be difficult to administer. More generally, the impact of a tax reform depends on the extent to which the long-run effects are recognized, and on the consequences of such changes in expectations for short-run behaviour. If necessary, the gradual implementation of its provisions should ensure that any short-term influences do not offset the gains expected in the long run.

ii) Inflation and indirect taxes

The possible inflationary effects of tax reform have been of concern, particularly in the case of a shift from direct to indirect tax (see Section IV) and, conversely, tax changes have often been used to influence wage bargaining in the context of incomes policies. An increase in indirect tax results in a one-off rise in the price level, with subsequent increases if wages are indexed or if inflationary expectations are raised. A revenue-neutral change to indirect tax rates could also raise the price level if tax increases are passed through more fully than tax decreases. As usual, a complete analysis needs to take into account general equilibrium effects. To

the extent that wage bargaining is based on after-tax incomes, higher prices from an increase in indirect tax will be partially offset by lower direct taxes and consequent lower wage settlements, although the initial effect may be higher inflation. However, tax reform, which shifts burdens and alters relative prices (preferably moving them closer to a neutral tax system), should in principle have no long-run inflationary consequences.

In practice, the effect on inflation will depend importantly on monetary and competition policies (and, where relevant, incomes policies). If the tax reform takes place with no change in monetary policy, output losses may occur, especially if the increase in the price level affects inflation expectations. In the United Kingdom, for example, the move towards indirect taxation in 1979 coincided with monetary tightening. In addition, there was some confusion of price level changes with inflation, resulting in significant output costs, despite the government's efforts to promote a retail tax and price index that reflected the offsetting income tax rate cuts. In New Zealand, the recent introduction of the Goods and Services Tax was accompanied by efforts to ensure that the following wage round took both indirect tax increases and direct tax cuts into consideration, thereby avoiding secondary wage and price increases; however, the evidence is not yet in. One situation in which increases in indirect taxation may improve rather than worsen inflation expectations is the case (rare but of current relevance) of a downward supply shock to prices. A shift to indirect taxes could actually smooth out the movement in observed and thus in expected prices if it prevented the measured rate of inflation from falling below the underlying rate.

iii) International considerations

International linkages may limit the ability of the authorities in one country to change their own tax system or force them to react to reforms elsewhere. Economic and political factors, as well as international tax treaty obligations, affect the extent to which a country's tax system can differ from that of its neighbours. The recent changes in the United States, for example, have clearly influenced the Japanese and Canadian perceptions of tax reform (37). Economic pressures can develop when the differences in tax systems affect international trade in goods and services and the flow of capital for investment purposes.

Such effects can arise via divergences in any of the major types of taxation. Marked differences in indirect tax rates for a commodity within or across countries provide an incentive to purchase where tax rates are lowest. This distorts expenditure patterns while encouraging tax evasion. The frontier controls necessary to ensure compliance are costly, both administratively and in terms of economic efficiency (they inhibit the free flow of goods and the development of broad markets). The EEC has recognized the importance of harmonisation of indirect tax rates to its goal of removing all internal frontiers by 1993 (38). The 1985 Irish Budget brought indirect tax rates more into line with those in the United Kingdom in order to lessen tax avoidance. The design of indirect taxes can also influence the international competitive position of the economy. As noted earlier, the Canadian government's proposed reform of indirect taxes is motivated in part by the fact that the present system favours imports and discourages exports (39). Different tax rates on goods and services can affect, for

example, the position of the tourist industry (in particular a VAT usually covers services as well as goods) in neighbouring countries like Canada and the United States, Denmark and Germany or Ireland and the United Kingdom.

International differences in personal taxation can also cause problems, even though international labour mobility is less than that of capital. Marked differences in marginal tax rates can induce highly skilled individuals to emigrate to low tax countries (a "brain drain"). This is particularly important in high technology industries, such as information technology and financial services, which can relocate readily. The potential effects on innovation and productivity growth can be substantial. The top marginal tax rate varies widely across OECD countries (see Table 7), from 88 per cent in Japan to the new 38 per cent rate that will apply in the United States from 1988 (including an assumed average state marginal tax rate of 5 per cent). However, international comparisons of personal taxation need to consider not only top marginal rates, but tax systems more generally. Although the top marginal rates usually only apply at very high incomes, and to a very small number of taxpayers (who often have access to tax shelters), the tax wedge on labour income is nevertheless substantial at somewhat lower levels in several countries because of social security contributions. Inter-country differences can be important even if they reflect differing social programmes (such as medical benefits), since the benefits to those at high incomes will (normally) be much less than the taxes or contributions paid (40).

Similarly, existing company tax structures vary widely across Member countries reflecting in part different treatment of depreciation, the existence of investment tax credits, etc. In part, this reflects competition efforts by some countries to attract industry through a favourable tax climate. Differences in the after-tax cost of capital across OECD countries (before-tax real interest rates tend to be equalised across countries) may in fact help to explain prevailing levels of investment and capital intensity (41). However, countries providing large investment incentives can eventually face an erosion of their balance of payments position if the marginal product of (tax-induced) investments cannot cover the before-tax cost of funds -- as may have been the case in Ireland (42).

The practical consequences of company tax changes will be limited by international tax agreements, which prevent double taxation of corporate profits by providing offsets to domestic business tax liabilities based on company tax paid abroad. For small countries this places a constraint on the usefulness of reductions in its corporate tax as an incentive. To the extent that revenues lost by the host government accrue to foreign treasuries, the effective after-tax cost of capital to industry will be unaffected. On the other hand, a reduction in tax rates abroad may force a similar move at home if, as a result, foreign investors are unable to claim all their tax paid as a credit against the taxes of the parent company, or if the country does not tax the foreign earnings of domestic companies (as is the case in France and the Netherlands).

The consequences of a tax reform for the balance of payments will obviously reflect the changes to the savings-investment balance within the country. If the net effect is to encourage savings or to discourage investment, there will be less net capital inflows and the current account balance will improve. Conversely, a tax reform that encourages investment on

balance will reduce national saving or increase dissaving, leading to a capital inflow.

The implications of the recent United States tax reform for capital flows have to be examined in this light. Although the changes may imply a short-run reduction in net national dissaving in the United States if investment declines precede increases in consumption, it is the longer-run effects that are of most concern. The consensus view appears to be that lower marginal tax rates, particularly for high incomes, will stimulate savings, and capital spending will be smaller (albeit more efficently allocated) (43). This should, ceteris paribus, improve the current account deficit and reduce capital flows into the United States. However, in several countries there is a fear that the lower corporate income tax rate threatens to shift investment towards the United States. This reflects a failure to distinguish between direct and indirect investment. The new corporate tax rate itself can influence decisions about direct investment in two ways. First, it may limit the ability of multinationals based in the United States to claim credits on taxes paid abroad at higher rates than those prevailing at home. This could reduce the willingness of such companies to operate overseas. Secondly, there may be some incentive for "footloose" multinational corporations to relocate their base of operations (head office) in the United States (44), which would at a mimimum lower tax revenues in their previous home base. Although there may be changes in the composition of capital flows and a reduction in direct investment by U.S. firms in the rest of the world, the preliminary view of the United States Treasury is that there would be a small tilt towards capital outflows (45).

Other problems in the taxation of international capital flows include the unitary tax system in some states in the United States (46), which has generated strong protests from other countries. In 1984 the United States, Germany and France abolished withholding tax on government bonds held by foreigners, reducing the supply of foreign capital (or raising its cost) to countries which maintained this type of tax. The integration of corporate and personal tax (discussed in Section IV) which provides tax credits to domestic residents for tax already paid on company dividends disadvantages foreign equity holders. In each case, international considerations need to be taken into account when considering tax reform proposals. This may involve difficult technical problems and may conflict with the objective of abolishing as many tax reliefs as possible.

## IV. TAX REFORM IN PRACTICE

This section reviews the tax reform measures currently implemented or envisaged in OECD countries (more details can be found in Annex B). Tax reform has usually been approached on a piecemeal basis, considering individual parts of the tax system and particular problems sequentially, and even in isolation from changes that might be forthcoming in other areas. Recently, however, several governments (such as the United States, Japan, Canada and Australia) have taken a more comprehensive approach to tax reform, with base broadening and rate reduction as a major theme. Some countries (the United Kingdom in 1979, New Zealand more recently) have also considered more fundamental changes, such as shifting (at least in part) their tax base towards consumption (Chart B shows the relative importance of the different

types of tax revenues in OECD countries). While tax reform has focussed on other specific problems, in most countries there are major areas that have gone without scrutiny.

## A. Reform of direct taxation

Reform of direct taxation includes broadening the base of both personal and company tax, with a reduction in the level and dispersion of tax rates, and a "flattening of rate scales" for personal taxes. In some cases it also addresses the integration of personal and corporate income taxation. These objectives are all inter-related, but their relative importance varies across countries according to circumstance. The United States, the United Kingdom, Australia, New Zealand and Denmark have already enacted significant changes to their income taxes, while several other countries (including Japan and Canada) are currently considering reform proposals.

### i) Personal income tax

A comprehensive income base, including all increases in purchasing power during an accounting period, whether realized or not, is useful for analysis but has serious practical problems. Moreover, a departure from such a base may be justified if there are tax concessions that achieve policy objectives cost effectively. Nevertheless, leakages from the tax base under existing personal income tax systems are extensive, and substantial opportunities for base broadening exist, either by reducing the amount of exempt income or by eliminating deductions from income in calculating taxable income. Tax reform is often aimed at eliminating such leakages from both labour and capital income.

#### Reducing exemptions

Fringe benefits, which are often fully or partly exempt from taxation, are increasingly used as a form of compensation in many countries, in part as a response to higher marginal tax rates on cash income. Many countries could enlarge the tax base by including a larger proportion of such benefits in taxable income (47). In 1981, for example, the Canadian government moved to include most exempt benefits in taxable income as a means of financing part of the significant cuts in marginal tax rates on high incomes, and similar moves have been made in Finland. However, such changes are often difficult to achieve, as shown by the recent United States experience, where political pressures prevented the incorporation in taxable income of a substantial portion of fringe benefits (e.g. employer-paid medical and life insurance, and employer contributions to retirement programmes) as proposed by the Treasury Department. An alternative approach of taxing fringe benefits, at the corporate level, and at the corporate tax rate, has been in force in New Zealand since 1984 and in Australia since 1986.

Exemptions from capital income are more prevalent than those from labour income, in part reflecting measurement difficulties. In addition, preferential treatment for capital income is sometimes viewed as a partial move towards a consumption tax (offsetting the double taxation of savings). However, in practice, the resulting pattern of taxation varies substantially and arbitrarily across types of capital. The consequent efficiency losses may well offset any efficiency gains from a partial move towards a consumption

tax. Examples of fully or partly excluded capital income include the imputed income or capital gains from owner-occupied housing (see below) and other capital gains. Moreover, in some countries (e.g. Japan), a large portion of capital income is exempt from taxation, or at least taxed at a lower rate than ordinary income. However, the recently proposed changes to the Japanese tax system would tax most interest income at 20 per cent, close to the marginal rate of the average taxpayer.

A comprehensive income tax should include the accrued real increases or decreases in the value of a taxpayer's capital assets in the tax base. In practice, however, only realized capital gains are taxed since it is difficult to determine changes in the value of unsold assets and because unrealized gains do not provide a cash flow from which tax could be paid. In many countries even realized gains are either partially or fully exempt. This is usually rationalized on three grounds: the fact that nominal capital gains have a large inflationary component, the lumpiness of realized gains and the need to encourage risk taking. The need to adjust for inflation can be tackled directly by explicitly indexing the price of an asset for inflation-related increases in value (see below). The problem posed by the lumpiness of realized gains will remain as long as the tax structure is progressive but can be reduced if income averaging is allowed. The distortions and avenues for possible tax avoidance created by exempting capital gains but not other forms of capital income may be more important than the increase in risk-taking (48) that might occur as a result of such a partial move to exempt capital income.

Capital gains taxation has been prominent in tax reform debates. In Australia the real capital gains on assets held longer than 12 months are now taxed as income, with averaging over five years. (Nominal gains for shorter holding periods were and are taxed without adjustment for inflation.) In the United States the Administration's original reform proposal called for broadening the capital income tax base, while retaining the preferential (lower) tax rate for capital gains. However, the Tax Reform Act of 1986 raises tax rates on capital gains treats all gains as ordinary income and fails to provide for any indexation of capital income for inflation.

Other important leakages from the income base in a number of countries are unemployment compensation, pensions and other transfer payments, as well as income in kind provided by governments. Even though many individual government benefits are subject to means-testing, the total value of benefits received may push beneficiaries above the threshhold at which income becomes taxable. Where reasonably easy methods can be found for determining their value, they should be included in the income tax base. Thus the United States reform will, for the first time in that country, subject unemployment benefits to taxation.

Eliminating deductions

Much of the leakage from actual to taxable personal income arises from the existence of deductions based on specific tax-preferred uses of income. Base-broadening income tax reform requires the elimination of many of them if rates are to be reduced significantly, and virtually all countries undertaking reforms have scrutinized existing tax deductions and credits.

Most income tax systems allow some deductions for the costs of earning income. Although the exclusion of such costs from the tax base is justifiable (on equity grounds and on any reasonable definition of income), it is difficult to distinguish between necessary and discretionary outlays. Moreover in some countries, such as France, the ability of certain professions to make substantial employment expense deductions (without substantiation) has a significant revenue cost. Several recent income tax reforms have placed explicit limitations on what is allowable. For example, the United States reform allows miscellaneous work-related expenses only above a specified floor (2 per cent of adjusted gross income). Australia now requires substantiation of employment-related expenditures, particularly automobile and travel costs. Many countries are also seeking to limit entertainment expenditures, which are open to much abuse. However, the ability of the self-employed to inflate their expenses and reduce their taxes remains a problem in most countries.

Interest deductions represent a particular dilemma for governments, both for the erosion of the base which they cause and the distortions they create. Interest payments on loans may be a valid tax-deductible expense when the funds are used to generate taxable income. However, most countries provide some offset, either as a deduction or a tax credit, for interest costs incurred in the purchase of an owner-occupied dwelling, even though the associated income earned is taxed only partially or not at all. (The tax treatment of housing is discussed at greater length below.) When interest deductibility is allowed for consumer purchases, there is clearly a distortion in favour of current consumption, which compounds the problem created by taxing capital income. Moreover, when allowed without restriction, it can result in what is known as "tax arbitrage" (where tax-exempt bonds, real estate or other personal assets are acquired by incurring debt, with the cost partly or wholly offset by the tax savings). Concern about the long-run effects of interest deductibility on savings, interest rates and capital formation has led some governments to reform the tax system's treatment of non-mortgage interest. The United States reform calls for a phasing-out of all consumer interest and limiting other deductible (non-mortgage) interest to net investment interest. Ireland recently placed limitations on non-business interest other than for purchase and improvement on a principal residence. Denmark has also moved to reduce the incentives to borrow by taxing interest on loans for consumption purposes.

There are many other existing tax provisions that reduce the income tax base as a result of incentives for specific uses of income including, for example, medical, education and energy-conservation expenditure (49). An important deduction in some countries is the exclusion of a portion of income set aside for retirement in the form of contributions to pension programmes or individual retirement programmes, combined with a favourable treatment of the income earned on these funds. In some countries (e.g. Japan, Germany) the base-narrowing effect is compounded by significant exemptions of the eventual pension income. The recent limitation on the deductibility of individual retirement accounts in the United States reflects concerns about the associated base erosion. On the other hand, France recently proposed the creation of tax-preferred individual retirement accounts as an explicit means of promoting saving, and Canada has significantly expanded its retirement saving tax shelter.

Finally, it should be noted that lower marginal tax rates are an important complement to any base broadening reform, since they greatly reduce the value of any remaining income leakage or tax deduction. In many countries the efforts to reduce marginal rates have concentrated on the highest rates, that is, flattening the rate schedule (see Table 7). In the United States, for example, the recent reduction in federal rates from a high of 50 per cent to 33 per cent (which followed on the reduction from 70 per cent in 1981) made it easier to gain acceptance for the measures broadening the personal income tax base. The United Kingdom lowered the maximum rate from 83 to 60 per cent in 1979, while in France and Ireland the highest rate has been reduced from 65 to 58 per cent. Australia succeeded in lowering its top rate on personal income from 60 to 49 per cent, New Zealand's was reduced from 66 to 48 per cent. The 1981 Canadian reform reduced upper bracket rates (at the federal level) from 43 per cent to 34 per cent and the government now proposes to reduce this to 29 per cent. Turkey has lowered its top rate from 65 to 50 per cent from 1987. The proposed Japanese reform would lower the highest income tax rate (including local tax) from 88 per cent to 65 per cent (although the rates on labour income are slightly lower because of an income-related deduction), but is notable in that it aims to reduce marginal rates across most of the income range by roughly the same amount.

An interesting feature of these reforms, however, is that in many cases only part of the rate reduction was achieved via base broadening. The total personal income tax burden was reduced in the United States via the shift to corporate taxation, in Australia and New Zealand via reduced total tax bills (and partial shifts to indirect taxation), in Canada because of the abandonment of some of the base broadening measures that were the original offset to the 1981 reduction in marginal rates, and in the United Kingdom and (as proposed) Japan because of a shift to indirect taxation. This suggests that a pure revenue-neutral base-broadening rate-reducing reform of personal income tax may not be easy to achieve.

ii) Corporate income tax

As noted earlier, many existing corporate income tax systems produce very large dispersions in effective marginal tax rates on income from new investments (see Table 3). These rate dispersions reflect, to a great extent, the treatment of depreciation as well as specific incentives for certain activitires, sectors or regions. It is difficult to define capital consumption in a way that appropriately matches real depreciation with the associated real income produced. However, many of the deficiencies of existing systems result from ad hoc procedures for dealing with the effects of inflation on depreciation allowances.

In many countries, base broadening for the corporate tax implies changes to the treatment of capital costs. The United States and Canada (to a large extent) have eliminated their investment tax credits, and have changed their depreciation schedules to accord more with estimates of real economic depreciation rates. The United Kingdom also modified its corporate tax system in 1984, phasing out 100 per cent first-year allowances for machinery and 75 per cent ones for buildings. Japan's proposal for reform of its tax system calls for periodic review of the useful lives of depreciable assets. France abolished its accelerated depreciation allowances in 1982 and Australia abolished its investment allowance (but retained accelerated depreciation) in

1985. However, about half of OECD countries still have investment tax credits or allowances.

These base-broadening measures have enabled reductions in corporate tax rates to be made in some countries. Thus, the corporate tax rate in the United Kingdom has been lowered from 52 per cent to 35 per cent, while the United States reform provides for a reduction in the statutory rate from 46 per cent to a flat rate of 34 per cent. In Canada the government has already implemented part of a phased reduction in the federal tax rate from 36 to 29 per cent for large businesses, and from 15 to 11 per cent for smaller ones. In France, the corporate tax rate has been reduced from 50 to 45 per cent, and it is proposed to lower the company rate progressively to 42 per cent by 1988, while the Netherlands lowered its rate from 48 to 43 per cent (although not as a result of base broadening). The long-term effect of these measures is difficult to estimate but there is general agreement that in the United States and the United Kingdom, the two countries which have made the biggest changes, the marginal effective tax rates are now much more uniform across capital assets, even though the average rate of tax is higher.

iii) Integration of personal and corporate taxes

Integration of personal and corporate income taxes is in some countries an important element of tax reform, because of concern to reduce very high effective tax rates on capital. Moreover, the tax collected should in principle not differ between realized and unrealized income, and not according to whether income is received as dividends or as capital gains (via profits retained by corporations). Complete integration would eliminate any tax-induced bias against the corporate form of business organization, against equity financing, and in favour of profit retention. This could be achieved by abolishing the corporate income tax, with all corporate-source increases to wealth being taxed at the individual level (including a taxpayer's share of retained earnings when realized as a capital gain). However, this could be politically unpopular and would open new avenues for tax avoidance. In practice, no country has considered this option, which would imply a revenue loss because of the delay in taxing undistributed profits. An alternative is for firms to pay tax at the corporate rate on all income, with a full tax credit to shareholders. This method would tax income from profits as they accrue, and any additional income from capital gains on realisation, with imputation credits available as an offset. (A simpler although less precise method is not to tax capital gains on equities.)

The methods used, and the extent of integration of corporate and personal taxes vary widely across countries. Only a few countries, including Germany and possibly Australia, come close to full integration for both distributed and undistributed income, although the Carter Commission in Canada in 1967 and the U.S. Treasury Department in 1977 both proposed it. Concern about administrative problems, the revenue cost and the international implications (company tax may be an important means by which the host country obtains benefits from the presence of foreign capital) are the major factors explaining governments' reluctance. However, many countries relieve, or are proposing to, at least part of the double taxation of dividends either at the company level (using a split-rate system that applies a lower tax rate to distributed income) or by providing a tax credit to shareholders receiving dividends for taxes already paid at the corporate level. Nevertheless,

existing measures can tax undistributed profits relatively heavily (if capital gains are taxed as well), exempt dividends paid to foreign shareholders, and leave tax-exempt domestic individuals or institutions with some tax liability (50). Only Japan exempts all capital gains on equities. Several countries (including Germany and Italy) exempt long-term capital gains on equities, while a number of countries exempt capital gains on shares held by employees of the company.

The existing extent of integration in OECD countries is summarized in Table 8. At present France and the United Kingdom use the tax credit method, and relieve taxpayers of approximately 61 per cent and 75 per cent, respectively, of the second tax that would otherwise be imposed on dividends. (A Canadian system relieves about 40 per cent but is not based on the tax actually paid at the corporate level -- it is a tax incentive for residents to invest in domestic companies.) Japan and Germany use a mix of both methods to relieve 38 per cent and 100 per cent, respectively, of the double tax. In Italy there is alleviation of around half of the double taxation of dividends, and no double taxation of undistributed profits because of the exemption of capital gains. Although the initial proposals recommended partial integration, the U.S. Tax Reform Act of 1986 does not provide any relief. Austria, Greece and Turkey have full alleviation of double taxation on dividends. From 1987-88, Australia will have a "qualifying dividends" imputation system (imputation credits are available only on dividends paid out of income on which company tax has been paid) which will come close to full integration since retained profits used to make share issues will be treated as a distribution. New Zealand proposes a full imputation system for dividends from 1988-89. On the other hand, Japan proposes to reduce integration by eliminating the lower tax rate on distributed corporate profits. This measure is in part in line with the move to tax interest, and represents a shift from a consumption to an income tax base.

## B. Reform of indirect taxation

Reform of indirect taxation has usually involved either changes in the mix of indirect taxes (particularly moves to broad-based consumption taxes such as VAT) or base broadening and rationalisation of rate structures to reduce distortions. In addition, a number of countries have moved to increase the relative importance of indirect taxes, following a decline in their share of total taxation through to the early 1980s. Indirect taxes had, however, remained broadly constant relative to GDP since the late 1960s (51).

### i) The different types of indirect taxes

In considering the design of indirect tax systems, it is useful to note a few basic distinctions. Such taxes can be relatively general or restricted to specific commodities (e.g. excise taxes on alcoholic drinks, tobacco and motor fuel) (52). Within general consumption taxes there are single-stage taxes [distinguished by the stage at which they are levied, such as the manufacturing sales tax (MST), wholesale sales tax (WST), or retail sales tax (RST)] and multi-stage taxes (mainly VAT in its various forms). The actual mix of indirect taxes varies significantly across countries and over time. For instance, in some countries (France, Italy, Germany, the Netherlands, Belgium and Austria) general consumption taxes make up a large proportion of

total taxes on goods and services, while in others (Japan, United Kingdom, Australia and Ireland) taxes on specific commodities are much more important. However, the latter have become less significant in all countries over the last 20 years, as have custom duties.

Apart from special reasons for taxing specific products separately, indirect taxation should preferably take the form of a broad-based consumption tax (BBCT) (53). Indeed, failure to tax a particular item favours consumers with a strong preference for that item, and distorts the consumption patterns of all consumers. However, in practice, even so called broad-based taxes may have a relatively narrow base. For instance, in the United Kingdom VAT covers just over half of final consumption, mainly because of exclusions related to distributional objectives (especially food and fuel), but also because of practical difficulties (in particular financial services, and owner-occupied housing and construction) (54). In the United States, RST in most states exempts services and food consumed at home.

The choice between single and multi-stage taxes as the preferred form of BBCT has been the subject of some debate (55). There is general agreement that a single-stage tax should preferably be levied on retail sales, which, by including services and retailers' value added, is the widest base and thus allows the lowest rate (56). In fact, a VAT and a RST are very similar in their economic consequences since each is a tax on domestic consumption. Their total revenue and incidence should be identical given the same coverage and rates, and differences should only arise from the different methods of collection. The main arguments in favour of VAT are, first, that it can more easily exclude business inputs and exports from tax (thus avoiding distortions of production decisions and ensuring neutrality with respect to international trade flows) and, second, that it is less vulnerable to evasion. For the same tax collected the amounts due at each stage are smaller under VAT than RST, and so is the incentive for evasion. There is also an element of self-policing because buyers and sellers at intermediate stages have opposite interests, and the administration of VAT creates a chain of invoices, which facilitates control (57). Although a RST with the same coverage as a VAT, and with the same tax base could treat business inputs and exports in the same way, RST systems in practice often exempt more consumer expenditure than VAT and do not effectively exclude capital equipment and other business purchases.

The main arguments against VAT are its greater administration and compliance costs (at least in smaller firms). Administration costs are comparatively high (58) because firms at all stages of production, not just the final one, are involved (59) and because of the need to verify claims for credits and to monitor invoices. The substantial fixed component of these costs suggests that VAT should not be set at a low rate, or used intermittently. Compliance costs can be substantial, especially for small firms, and so VAT systems generally exempt small firms (60). In choosing between VAT and RST administrative considerations can be important. For example, in the United States and Australia, start-up costs and lead-time argued against the introduction of VAT, while in Europe, the need to repair existing multi-stage tax systems (61) and the advantages of tax harmonisation within the EEC worked in favour of it.

VAT is usually incorporated in the final sales price, so that the amount of tax is relatively invisible, while a RST is generally added to the

sales price. This difference is not inherent to the two systems, however. Whether transparency or a lack thereof is an advantage depends upon non-economic criteria. The Treasury Department's rejection in 1984 of a VAT for the United States reflected concern that its "invisibility" would make it too easy to raise taxes and thus government spending.

All OECD countries except Japan (where a recent proposal for a VAT has been referred to a parliamentary commission because of extensive public opposition) and Australia (which was unable to obtain public acceptance for a RST and so settled for some broadening of its wholesale sales tax) now have some form of BBCT, although in the United States and Canada it is levied at the state or provincial level. In recent years, Turkey, Portugal, Spain, New Zealand and Greece have all introduced a VAT. Portugal and Greece were already heavily reliant on tax on goods and services, while in New Zealand it replaced a WST.

ii) Base broadening and the rationalisation of rate scales

In practice there is a strong presumption in favour of uniform indirect tax rates, despite the theoretically possible use of differential commodity taxation for income redistribution purposes (see Section II above). Nevertheless, systems of indirect taxation typically have multiple rates and extensive exemptions. Table 9 shows the standard rate of taxation on general commodities, the range of rates for specified commodities and major exemptions, for OECD countries. The standard rate of VAT ranges from 10 to 23.5 per cent, while countries with RST generally have somewhat lower rates. Most countries have a luxury rate (in excess of 30 per cent) and/or a range of preferential rates.

Distributional objectives are the most important reasons for this dispersion, with low rates on "essentials", items consumed disproportionately by the poor, and high rates on "luxuries", items consumed more by the rich. Differential tax rates can sometimes be justified for other reasons, such as correcting externalities as noted in Section III. Some exclusions from the indirect tax base also arise because of technical problems (such as difficulties of taxing financial and housing services) and hence are more intractable, although in some cases there are alternatives which could achieve a broadly appropriate tax treatment.

Given the importance of redistribution objectives in explaining tax rate dispersion, what is the evidence on the regressiveness or otherwise of indirect tax systems? A proportional tax on consumption (for example a uniform rate VAT) is considered regressive because consumption is a declining proportion of income (although this is less important in a life-cycle context). However, it is possible to make consumption taxes less regressive using differential rates and exemptions. Indeed, on the evidence available, the VAT in the United Kingdom appears to be slightly progressive (because of the extensive use of zero rating) as does the VAT in Italy (using highly varied rates), while VAT in Germany appears to be proportional at least for lower incomes (because of the exemption of rent and reduced rate on food) (62). It may thus be possible to make indirect taxes progressive or at least proportional, but it is at the cost of a substantial increase in complexity, non-neutrality and administrative costs.

There has been little progress in rationalizing indirect tax rate structures. Only New Zealand, Denmark, Finland and Norway have a single VAT rate (although Norway has minor exceptions, and the Finnish VAT is fairly narrowly based). Half of the countries with VAT have 3 or more rates (not counting minor exceptions); France and Italy have 4 and Belgium 6. Most countries have made numerous changes to their indirect tax system over the years although mainly increasing VAT rates and reallocating goods and services between rate classes. In part, the latter changes are an inevitable administrative cost of a multi-rate system, although they are sometimes presented as removing anomalies to improve equity.

iii) Increased reliance on indirect taxation

Lower personal income tax rates, which are widely seen as desirable, can be achieved by shifting taxation towards consumption as well as by broadening the income tax base. The increased reliance on indirect taxes in some countries (United Kingdom, Australia, New Zealand and as under consideration in Japan and Canada) also reflects a number of other considerations: the inability to find politically feasible ways of broadening the income tax base, a desire to reduce tax evasion and avoidance (high marginal tax rates encourage such activity so a system with several taxes, each at a low rate, should be less vulnerable) (63); and, finally, the fact that indirect taxes tend to be less visible and thus politically attractive. For countries joining the EEC, the requirement to introduce VAT has also been relevant.

The effects on income distribution (especially for low income families) have also been important in considerations of a shift towards indirect tax and in proposals to move from a multiple-rate structure (with rates designed to protect the poor) to a single tax rate. As a result, substantial changes to the indirect tax system have often been accompanied by an explicit package of compensation measures to offset unacceptable effects on poorer families (as in Australia, Canada and New Zealand). Such packages can include changes to the income tax or the transfer system (64), but are difficult to design appropriately because of the size and diversity of the population of low income earners. Untargetted compensation (e.g. a universal refundable tax credit to offset the price increases for a given level of consumption) is too costly, while narrower measures (e.g. a refundable tax credit phased-out for higher incomes) increase the complexity of the tax system and the effective marginal tax rates over the phase-out range.

Several concerns have, on the other hand, limited the move towards indirect taxes in some cases. The United States Treasury argued that reform of the income tax was preferable to the introduction of a federal sales tax. The latter was considered too costly to replace only part of the income tax and too regressive to totally replace the income tax system. There was also fear that an indirect tax might be too efficient at raising revenue and hence facilitate growth of the public sector, and wariness about federal intrusion into what is for many states a primary source of revenue. The effects on inflation (see Section III) and on income distribution have also been of concern.

## C. Specific reforms and unresolved problems

In addition to basic changes to income tax or indirect taxation, tax reform in some countries has addressed more specific questions, notably social security contributions and the problem of family versus individual taxation. On the other hand, certain particularly sensitive or difficult aspects of taxation have been left untouched, even though they may be the source of very significant distortions. The most notable examples are the tax treatment of housing and the non-indexation of taxation, which is particularly important for capital income. This sub-section examines these issues.

### i) Social security contributions

In many countries social security systems, and particularly the retirement pension component, face major problems in the coming years as a result of ageing populations if present benefit entitlements are to be maintained (65). The need for eventual increases in contribution rates on this account, which would inevitably amplify labour supply distortions, is itself a strong reason for improving the tax system as soon as possible. To the extent that high levels of social security spending are reflected in high current contribution rates, they already pose problems for tax systems (from 1970 to 1985 social security contributions rose from 5.9 to 9.2 per cent of GDP in the OECD area as a whole). As they become more and more significant parts of the revenue-collecting system, social security contributions pose three particular problems. First, and foremost, the high contribution rates increase the tax wedge on labour with the efficiency consequences discussed earlier. Second, ceilings on the income subject to such taxes have created anomalies in the marginal tax rate structures in many countries (as can be seen in Chart A). Third, the growing share of employers' contributions has increasingly meant that the cost of social security programmes has been hidden from those benefitting from them, and from those who pay for them (on the assumption that such taxes are eventually borne by workers).

These problems have drawn the attention of some governments. In the Netherlands the Oort Commission has proposed that social security contributions be fully integrated with personal wage and income taxes, which implies an extension of the base for these contributions from wages to all income and substantial simplification. The United Kingdom government considered a similar proposal in the recent Green Paper on taxation, but concluded that the benefits were unlikely to exceed the costs. It did, however, remove the ceiling on employers' contributions in 1985. The problem of the lack of transparency has also been tackled by the Oort Commission. They recommend an end to employers' contributions as such and a just-offsetting increase in wages and in employees' contributions. Such a change would not affect the financial situation of any corporation or individual but it would make the true costs of social programmes fully visible (66).

### ii) Family versus individual taxation

As noted earlier, the choice of tax unit, although it can have significant economic consequences (because of the labour supply responses of spouses), is often motivated by social concerns that are not directly related to problems of resource allocation. About half the OECD Member countries have

individual taxation and half have joint taxation, but the distinction is not always clear-cut because of taxpayer options. Since the early 1970s, seven countries have moved to individual taxation and two others allowed an option. More recently, in the United Kingdom the Green Paper on taxation proposed the creation of a system of transferable allowances designed to treat men and women equally, and to remove a possible tax penalty on marriage (where a married couple pays more tax than it would as an unmarried couple living together with the same joint income). It is sometimes suggested that this proposal would act as a significant deterrent to married women's participation in the labour force (67). Although concern about marriage penalties has also been expressed in the United States, the recent tax reform repealed the two-earner deduction, a change justified by its poor design and by the reduction in the tax on marriage from a flatter rate structure (68). In Japan the proposed tax reform would modify the spousal allowance to replace an effective lump-sum penalty on the participation of married women by a graduated tax.

iii) The tax treatment of housing

Most OECD countries have tax policies that are ostensibly aimed at favouring home-ownership (or at offsetting any disincentives arising from local government rates or property taxes). There is an apparently strong belief that the non-economic benefits from having a large proportion of home-owners outweigh the costs of distortions that arise from encouraging taxpayers to invest in ways which they might not otherwise choose. However, there is reason to think that those policies that are implemented via the tax system have been inadequately reassessed in much of the tax reform effort to date. In many cases their impact on home-ownership is doubtful at best and possibly perverse. Moreover, they can substantially reduce the progressivity of the tax system.

Only Canada, Australia (from 1988), New Zealand and Turkey, among OECD countries, have neither tax deductions nor tax credits for mortgage interest paid on owner-occupied housing. In 10 countries (the United States, Spain, Switzerland, Portugal, Austria, Denmark, the Netherlands, Greece, Norway and Sweden) the tax deductions are unlimited, while in some others (the United Kingdom, Italy and Finland) they are subject to relatively high ceilings (69). The favourable treatment of housing also takes the form of either partial deductibility (Belgium, Luxembourg) or tax credits (Japan, France and, effectively, Ireland). Deductions for the cost of purchasing an asset would be legitimate if the income earned on the asset (including any real capital gains) were taxed. However, in some countries this is not the case even when the interest costs are fully deductible (e.g. in the United States and Austria) or deductible up to a high limit (e.g. the United Kingdom). Even when imputed income from owner-occupied housing is taxed, the method of calculation is usually such that the level of income subject to tax is well below market rates (70) which, when combined with mortgage interest deductibility, provides a strong incentive to invest in housing.

To the extent that tax advantages increase the demand for housing, house prices will rise. As a consequence, it is not obvious that the more broadly-based measures will benefit the first-time home-buyer. Instead, mortgage interest deductibility may simply be capitalised in existing house (and land) prices. In addition, it is regressive: a given deduction is worth

more to those with high marginal tax rates, and especially if there is no upper limit on the amounts allowed. The regressiveness can be limited by imposing a ceiling on the deductions (as Ireland did in 1985 when it also limited their value to that at the basic rate of tax) or by moving to a tax credit system (as France did from 1984). However, the general problem of the distortion in favour of housing consumption remains. Indeed, in the United States none of the several proposals that led to the recent tax reform tackled the question at all except for proposing to limit mortgage interest deductibility to the taxpayer's principal residence. The final bill maintains it for the secondary home as well, testimony to the political sensitivity of the subject. Indeed, the tax revenue costs are so large that a significant further reduction in marginal and average rates might have been possible if this form of tax expenditure had been eliminated. For instance, the United States government estimates that the deductibility of mortgage interest for owner-occupied housing, equivalent to approximately $31 billion in 1986, will still be around $20 billion in 1988 when the lower tax rates are fully phased in.

From a consumption tax base viewpoint the correct treatment of housing is to tax the flow of housing services. Measurement here is no simpler than the calculation of the imputed net rental income. To some extent, where property taxes are imposed on housing, they can be viewed as imposed on the implicit income of the capital asset. However, an alternative treatment is to tax the investment -- either implicitly, by providing no income tax relief, so that housing is financed out of after-tax income, or explicitly by not exempting residential construction from indirect tax. The former is the solution adopted in Canada, New Zealand, Australia and Turkey and to a large extent in Japan (where tax incentives for housing are very small). In most European countries new residential construction is subject to value-added tax. The introduction of such a VAT, by increasing prices for new houses, can also create windfall gains for the owners of existing houses.

iv) Inflation and indexation

Many of the distortions found in present tax systems developed because of the interaction of the high rates of inflation over the last 15 years and the taxation of nominal measures of income or expenditure. Recent declines in inflation appear to have reduced the concern about this problem. Moreover, some authorities fear that efforts to insulate the economy from such immediately damaging consequences of inflation may reduce the general resistance to inflation. As a result, the problems of the interaction between taxation and inflation have to a considerable extent been left out of most major tax reforms.

The first and most straightforward aspect of this interaction is the fiscal drag due to "bracket creep" and the reduced real value of tax allowances. This occurs when inflation pushes taxpayers with unchanged real incomes further up a progressive income tax structure defined in nominal terms. This process generally increases total tax revenues and (up to a point) the progressivity of the tax system. Many observers have argued that this fiscal drag, by increasing taxes "invisibly" (i.e. without announced rises in rates), provided part of the means and motivation for the growth of the public sector during the 1970s. Indexing the personal tax is thus viewed as necessary to prevent further growth.

Many countries had moved towards this goal starting with Luxembourg (1968), France (1969) and Denmark (1970) and, most recently, Switzerland and the United States (1981 with effect from 1985). Indexation provisions are, however, not always complete and in recent years revenue needs have led some countries to abandon indexation wholly or in part (Australia in 1982, Denmark in 1983, Canada in 1983 and then from 1985). Moreover, the adjustments actually made were usually imperfect and even countries without indexation made regular ad hoc changes to offset at least part of the fiscal drag. Despite the budget deficit problems that prevail in several countries, the need to limit the size of the public sector and the contradiction between invisible tax increases and the arguments for increased accountability of government suggest that the lack of a general commitment to index is a significant failing of many tax systems.

A related problem (a form of negative fiscal drag) has affected social security contributions when the income ceiling is fixed in nominal terms, and some indirect taxes, which are defined in specific rather than ad valorem terms. Most countries have taken steps to reduce these effects by indexing (officially or on an ad hoc basis) the contribution limits in the case of social security and, in more recent years, by increasing the specific taxes on gasoline, tobacco and alcohol or by switching to ad valorem tax rates instead.

The second, more complicated and potentially more economically damaging consequence of inflation for the tax system concerns the measurement of capital income, at both firm and personal levels. The basic problem in this respect is the need to distinguish between the real and inflation related portions of interest, dividends, capital consumption and capital gains in arriving at a measure of economic income.

Business income taxes are levied in almost all countries on accounting profits defined without taking account of inflation. Rising prices distort measured profits, so that the effective tax rate may be very different from the statutory one. The three main reasons for this are the treatment of inventories, the use of historic cost in the calculation of capital consumption allowances and full deductibility of interest costs. (It is worth noting that, for the most part, the definition of profits used by companies to report to shareholders also neglects these problems.)

Inflation-induced inventory profits are not an appropriate part of the tax base. When prices are rising, the use of the historic (acquisition) cost of capital in calculating the depreciation that can be subtracted from the operating surplus underestimates the cost of replacing capital and overestimates profits. These two factors tend to raise the effective tax rate above the statutory one. The third factor can reduce it. In periods of rising prices, interest rates contain an expected inflation component. As a result, debtors repay not only the scheduled amortization of their loans, but that part of the principal eroded by inflation. Full deductibility of interest costs is thus equivalent, for an indebted firm during inflationary periods, to a more rapid rate of depreciation and, therefore, to a lower effective rate of taxation.

Some countries (for example the United States, Japan, Italy and the Netherlands) allow inventories to be valued on a "last-in first-out" basis

(LIFO), avoiding the distortion created by inflation-induced false profits, but many other countries specifically exclude this possibility. With respect to the other problems mentioned above, Iceland and Denmark do index the depreciation base for inflation, but do not, however, reduce the deductible amount of interest expenses by the inflation component. Neither question has been tackled in any of the major tax reforms, however. For example, the Canadian proposal for corporate tax reform specifically rejected indexation of capital costs or debt on the grounds that it was too complex, would introduce significant compliance costs, and was not really necessary since the interest and depreciation cost factors tend to offset each other, albeit crudely. It therefore concluded that only inventories are truly burdened by extra inflation, a problem that it felt could be remedied without indexation (71). The original proposal for United States tax reform did recommend the indexation of depreciation allowances, indebtedness and inventories (72) but this was not retained in the legislation adopted in late 1986.

Many of the specific tax provisions that generate a dispersion in effective tax rates were justified, when introduced, as compensating for the effects of inflation. However they have been retained, even with low inflation and were, in any event, largely arbitrary. Indexation of capital costs using aggregate price indices is obviously an imperfect solution, since price movements vary across capital goods. Nevertheless, it would presumably be less imprecise to assume that all capital costs increased at the same rate as the national accounts deflator for business fixed investment (with similar provisions for inventories and borrowing costs) than to assume a zero rate of increase. However, this would require that the personal tax system be indexed with respect to capital income, which is typically not the case. (Sweden and Iceland provide full indexation for capital gains but not for interest receipts, as do Australia and Ireland for capital gains on assets held longer than one year). Indexation would make the tax system somewhat more complicated, although the use of aggregate indices and of adjustment tables provided by the authorities could presumably reduce the compliance cost for individual taxpayers. But it would also make it significantly fairer and more efficient.

There may be transition problems in introducing full inflation adjustment for capital income. For example, asset owners can suffer substantial capital losses if their original purchases were based on the possibility of rapid expensing offered by high inflation and non-indexation, while any exemption would create opportunities for tax shelters with significant revenue costs to governments. However, as an argument against indexation, this is equivalent to arguing against reducing inflation. In addition, it is sometimes argued that at low inflation rates it would be sufficient to make occasional ad hoc adjustments to the tax system. However, this would conflict with the desire for a relatively stable tax system. Moreover, the introduction of indexation in a period of low inflation would limit the problems of windfall gains and losses in asset prices.

## V. CONCLUSIONS

The need for tax reform in many OECD countries reflects the inability of existing taxation systems to satisfy the three main goals of efficiency, equity and simplicity traditionally assigned to them -- goals which often

conflict. Major concerns have been the distortions created by the wide dispersion of the effective marginal tax rates for different types of labour, capital or goods, and the adverse impact of high taxation of wage and capital income on labour supply and saving. Estimates of the size of such distortions and the associated welfare costs have increased in recent years, in part because labour and saving responses appear stronger than previously thought. Other problems with present tax systems are tax avoidance and complexity (which are costly and undermine public acceptance), and their lack of fairness. The latter has two facets: horizontal inequities (arbitrary differences in the tax treatment of individuals), and the concern about vertical equity, since in most OECD tax systems the amount of redistribution achieved by taxation alone appears much less than suggested by the structure of personal marginal tax rates.

Some of these problems, which have been heightened by increases in the total tax burden, could be reduced or eliminated by tax reform. In particular, significant improvements appear possible from reduced dispersion of tax rates. It is also probable that a shift of the tax base from income to consumption would yield additional efficiency gains, but the magnitude depends importantly on the sensitivity of savings to after-tax returns. Substantial welfare losses are, however, inevitable as long as total tax collections remain high, although, if taxation is broadly based, tax rates and the ensuing distortions can be lessened. On the other hand, it is not clear to what extent the effective progressivity of the tax system can be increased without incurring substantial efficiency costs.

This conflict between efficiency and distributional objectives is not the only constraint on tax reform. Much of the complexity of the system and most of the dispersion in effective tax rates can be attributed to tax expenditures, which reflect efforts to use the tax system for non-revenue purposes. Although some of these initiatives may be useful, there is reason to believe that many simply undermine the tax base without significant benefits.

Other constraints on tax reform (and particularly on the removal of tax expenditures) arise because losses tend to be concentrated, so that losers are usually better organised and more vocal than those who benefit from lower tax rates. The problem is compounded because of inaccurate public perceptions of taxation (e.g. about the effects of tax changes on progressivity, or about the true effects of tax expenditures). For these reasons the presentation of reform proposals can be crucial in creating political support for change. It is often easier to undertake a more comprehensive reform, since the elimination of most tax preferences will allow larger reductions in tax rates and is more likely to be seen as fair. The relatively limited ability to shift sizeable portions of taxes permanently from one base (labour or capital) to another is also a difficulty. Transition problems are particularly important in this context, because of the windfall gains and losses when asset prices adjust to changes in future tax liabilities. Care is needed, however, to ensure that the necessary transition rules, which can never be perfect, do not excessively complicate the tax system or create opportunities for tax avoidance.

International linkages can also be an important influence on tax reform. Large differences in tax rates between countries can have various

adverse consequences (such as emigration of skilled labour) and can generate both political and economic pressures for lower taxes in high-rate countries. In particular, substantial differences in personal and company taxation can distort the international allocation of investment.

The concerns sometimes expressed about the effect of revenue-neutral tax reform on aggregate activity, inflation and the balance of payments appear relatively less important, although care needs to be taken that any shift to indirect taxation does not create a price-wage spiral or aggravate an existing one. The fears about the adverse effects on future investment in the United States as a result of the shift to corporate taxation may also be overstated, partly because of early reactions by investors, who had anticipated some of the changes, as well as of the sharp decline in interest rates.

Despite these problems, several countries have already undertaken fairly comprehensive reform of their tax systems, while others have proposed or initiated a number of individual changes. In the area of personal direct taxation, base broadening by reducing tax preferences and cuts in marginal rates, particularly for the upper tax brackets, have been the main features. It is notable however that these reforms have usually resulted in declines in personal taxation, either as a result of shifts to business or indirect taxation, or because taxes were cut overall. Corporate tax reform has followed the same basic route, with reduced investment incentives and more realistic depreciation schedules allowing lower tax rates.

Reform of indirect taxation has mainly concentrated on the introduction of VAT-type taxes, though a few countries have sought to correct anomalies in the structure of their existing consumption taxes by reducing the dispersion of tax rates across products. There have been relatively few moves to simplify rate structures within VATs, even though there is little evidence that multiple-rate systems significantly improve progressivity, and then at a substantial administrative and efficiency cost. There have also been moves in several countries to increase the relative weight of indirect tax, although these have raised concerns about vertical equity. In some cases they have been accompanied by measures to offset the regressive effects, at least for those on very low incomes.

Notwithstanding the substantial progress made in some countries, much remains to be done on broadening tax bases and reducing the dispersion of rates. Moreover, countries have generally not yet tackled the very important problem posed by the future increases in public pension payments, and thus in social security contribution rates, as populations age and retirement schemes mature. Other aspects of the tax system that appear in need of reform in most countries are the tax treatment of housing, the interaction of inflation and capital income and the integration of personal and corporate taxation. This last poses problems in part because of the increasing internationalization of capital markets and of individual investment portfolios. The harmonization of taxation across countries would be a further step towards international economic integration.

The reform of taxation can best be undertaken within the context of a clear strategy. Key choices that need to be made include: the extent to which governments wish to continue using the tax system for non-revenue purposes, the amount of progressivity they wish to have in the tax system as a

whole and the appropriate mix of income and consumption taxation. This last may depend on the adequacy of national savings, as well as on judgements about the extent to which savings are sensitive to the rate of return. Once the decision to proceed with reform has been made, the presentation of the proposals becomes vital. In this respect, as indicated above, a comprehensive reform package may be easier to "sell" than a piecemeal approach and offers a greater chance of future stability of the tax system, which is obviously very important for private sector planning.

## NOTES

1. See, for instance, OECD (1986b), OECD (1987c).

2. The emphasis on the role of taxes in influencing aggregate demand in Keynesian macroeconomic models may have led to a failure to anticipate the costs of high and variable marginal tax rates on macroeconomic performance.

3. This paper considers personal and corporate income taxes, social security contributions and indirect taxes on goods and services. The measures reported in Table 1 are based on national accounts data, for which taxes on capital, property and payroll are included in indirect taxes. These taxes are not considered in most of what follows although they can also create economic problems. For more discussion see OECD (1979). The OECD also produces detailed taxation statistics, which cover more member countries and which separate property and payroll taxes from taxes on goods and services [see OECD (1986a)]. They are used to describe the breakdown of tax revenues by type in Chart B and Annex B. However, it should be noted that they can differ from National Accounts definitions. In particular, they suggest a significantly lower tax burden in some countries (e.g. Germany) as certain social security contributions are deemed voluntary and excluded.

4. On this subject see OECD (1987a), Chapter 10, "Financing the Public Sector".

5. For details and discussion of this and the following table see McKee, Visser and Saunders (1986).

6. What is at issue is the economic growth accruing to domestic residents. In open economies the level of investment and of GDP growth may be sustained by capital inflows but the subsequent servicing costs will limit the growth in GNP.

7. The deadweight losses of distortionary taxes are the utility lost because relative prices change (this applies whether the prices are of different goods, or of all goods on the one hand and leisure on the other). A lump-sum tax transfers resources from the taxpayer to the government, reducing utility as a result of the lost income, but a distortionary tax that yields equivalent revenue lowers utility more because behaviour changes. The difference between the new levels of utility under the lump-sum and distortionary taxes is the latter's deadweight loss. See Boadway (1979), Chapter 12.

8. For example, in Canada there have been 22,000 administrative rulings defining the coverage of the manufacturers' sales tax, and only 60,000 taxpaying companies.

9. This may also make the tax system appear unfair. The rich, being able to buy more and higher quality advice, may benefit more from the opportunities for tax avoidance created by the complexity.

10. See Slemrod and Soram (1984), p. 4.

11. Some economists, however, appear to feel that this type of tax structure cannot "redistribute enough", at least with tax credits of politically acceptable size. See A. Blinder's discussion in Federal Reserve Bank of Boston (1986), pp. 92ff.

12. See the survey of national studies in Saunders and Klau (1985), Section VII.

13. See, for example, D. Bradford's discussion in Federal Reserve Bank of Boston (1986), pp. 99ff.

14. The exemptions for interest income allow many to pay much less tax than others similarly situated. The reform did not, however, address the horizontal equity problems posed by the large exemptions of pension income or the very low tax rate on farm income (a problem for the tax systems of most member countries see, for example OECD (1987b), para. 39).

15. See, for example, Aaron and Boskin (1980), Part Four.

16. There is a vast literature on optimal taxation. Useful surveys include: Stiglitz (1986) Chapter 19, Stern (1984) and Sandmo (1976). It is worth noting that optimal tax design examines points on the "efficiency frontier" where there is a trade-off between equity and efficiency, whereas existing tax systems lie inside the efficiency frontier and hence it may be possible to improve both equity and efficiency. The optimal tax system depends explicitly on the government's social welfare function.

17. Comprehensive income as a tax base is often referred to as the "Haig-Simon" concept of income, following work on this subject by Haig (1921) and Simons (1938).

18. Commodity taxes that redistribute bear most heavily on luxuries, which tend to have high price elasticities of demand, so such taxation would maximize welfare losses of individuals. In fact, under some circumstances, it is optimal to tax wages alone and avoid commodity taxation. See Atkinson and Stiglitz (1976), pp. 55-75. For support for the use of uniform rates, see United States (1984), Australia (1985) and New Zealand (1985a).

19. Even a flat-rate consumption tax does not need to be regressive, if bequests are treated as consumption, since rich and poor each "consume" all their income over their lifetime.

20. The direct expenditure tax was considered in United States (1977). It was recommended in Ireland (1982) as was, more recently, a somewhat similar lifetime income tax by the Economic Council of Canada (1987), an advisory body. See also, Aaron and Galper (1985), Bradford (1986), Beach, Boadway and Bruce (1986).

21. Tax expenditures can take a number of forms. Exemptions of some types of income; deductions from gross income depending on the characteristics or behaviour of the taxpayer, tax credits and special rate reliefs. They may either reduce tax payable or defer tax. See OECD (1984).

22. Despite the apparent popularity of individual tax expenditures, public dislike of high rates and a narrow base suggests that it implicitly does not view tax expenditures as being, on balance, cost effective.

23. The determinants of the behaviour of governments has been described in the literature known as public choice theory.

24. See in this respect Feldstein (1976), pp. 77-104, and United States (1977).

25. Tax changes may be potentially "Pareto optimal" if the gains exceed the losses. However, they will almost never be so in practice if they are revenue neutral, as there will be practical limits to the amount of compensation.

26. The Australian Tax Summit in 1985 is an example in such an effort, but it is also an illustration of the difficulties involved.

27. See the contributions in Aaron (1981).

28. Milton Friedman, among others, has suggested that the influence of politics on spending and taxation needs to be constrained by constitutional limitations.

29. See Stiglitz (1986), pp. 361-363.

30. Some support for the notion that lowering tax rates will raise tax revenues, at least when the rate was very high initially, was provided by the experience in the United States after 1981. See, for example, Lindsay (1985).

31. The argument, based on work by Samuelson (1961), is that in the absence of other factors of production, increases in the price of labour as a result of payroll taxes, for example, will eventually be passed on to the price of capital, leaving relative factor prices unchanged.

32. See, for example, Chirinko and Eisner (1983) and Sinai and Eckstein (1983).

33. The tendency for the budget deficit to rise during a recession provides an endogenous offset to the severity of the recession; conversely, the deficit declines when there is strong nominal growth, thus lessening inflationary pressures.

34. The investment equations in the Federal Reserve's MPS model, for example, suggest that this more than offsets the tax reform-induced increase in the cost of capital for equipment, partly offsets the reform's negative implications for commercial real estate and provides

a significant net stimulus for other structures, although the net effect on structures is negative. However, both the tax reform and the lower interest rates are substantially favourable to inventory accumulation. Finally, note that, although the decline in interest rates is unlikely to be related to tax reform, lower personal tax rates should, in principle, reduce market interest rates and thus offset part of the rise in the costs of capital.

35. A detailed discussion of this issue is found in Gravelle (1985).

36. See Wyss and Caton (1986).

37. See for example, Canada (1986), p. 7.

38. Levels of indirect tax are broadly similar within the EEC at about 10 per cent of GDP (except in Ireland and Denmark where the ratio exceeds 16 per cent). However, the mix of indirect taxes varies greatly. In the United Kingdom and Ireland VAT covers only about 40 per cent of consumer expenditure compared with 90 per cent in most other countries, while taxes on alcohol, tobacco and petrol are more important.

39. Export values have an average sales tax content of about one per cent while imports are taxed roughly one third less than comparable domestic goods (reflecting the fact that domestic manufacturers' prices tend to be gross of some functions such as wholesaling and advertising that are not included in the import prices of foreign goods on which the manufacturers' sales tax is levied). See Canada (1986) p. 8.

40. For some benefits such as pensions, however, this is not true. For example in Japan high income earners are in fact able to obtain high benefits in return for their pension contributions.

41. The efficient international allocation of capital in itself is not usually a major focus of tax policy. However, the cross-country differences in company taxation can distort the international allocation of capital and thereby lower total OECD output. See M. Fukao and M. Hanazaki (1986).

42. See OECD (1985), p. 47. Ireland has a tax rate of 10 per cent for manufacturing company profits and depreciation allowances that eliminate the tax liability of many companies.

43. However, the effect on savings may be offset, at least in part, by the increased taxation of capital gains.

44. An extreme example is the consideration of this by the Honda car company (which now sells more cars in the United States than in Japan).

45. Letter from U.S. Treasury to the OECD, quoted in "Inside U.S. Tax Policy" (1986), p 10.

46. A state income tax levied on world profits of a corporation according to a formula based on the percentage of the corporation's world

activity conducted in the state. This either lowers tax receipts in the home country of corporations through double tax agreements or increases the tax burden on companies, and creates a substantial compliance burden for companies involved.

47. For example, in some countries subsidized mortgages or reduced prices for goods and services produced by the employer are still not taxed.

48. See Ando, Blum and Friend (1985), Chapter 3.

49. See the discussion in OECD (1984).

50. For a more complete discussion of the different methods of integrating personal and corporate taxation, including questions of the pass-through of tax preferences and the treatment of tax-exempt institutions and foreign shareholders, see United States (1984) and Australia (1985).

51. See OECD (1986c) Chapter 1 for a discussion of trends in indirect taxes since the 1960s.

52. There are several other types of indirect taxes on goods and services. The profit derived from fiscal monopolies (where the government produces or distributes a commodity rather than levying an excise), and revenue from licenses are often similar in nature to, and are classified as, indirect tax. As for custom duties, they differ from other taxes on goods and services in that they are levied only on imports and because their primary purpose is usually protection of domestic industry rather than revenue raising. The importance of such duties has diminished greatly (due largely to GATT negotiations, EEC harmonisation and increased use of non-tariff barriers to trade) and they will not be discussed here.

53. Several countries with VAT choose to tax some business inputs, largely for revenue reasons. Norway and Finland tax investment goods; Sweden taxes energy goods; Finland also taxes purchases of fuel and certain other business inputs; and Turkey has a phased deduction for capital goods.

54. Davis and Kay (1985). However, even the comprehensive VAT considered but rejected in the United States covered only 77 per cent of personal consumption expenditures, excluding housing, financial services, medical care, educational expenses, religious and welfare expenses and urban transit services. If food consumed at home were also excluded, the coverage drops to about 65 per cent.

55. A discussion of the relative merits of VAT and RST can be found in OECD (1986c), Chapter 5; United States (1984), Vol. 1, pp. 225-226 and Vol. III; and Australia (1985). Aaron (1981) also provides an assessment of VAT based on experience in Europe. Governments in the United States, New Zealand, Japan and Switzerland have considered VAT to be superior (although two referenda to replace RST by VAT have failed in Switzerland and the United States did not impose an indirect tax at the national level), while Australia argued in favour of a RST.

56. Taxation at the manufacturers' or wholesale level creates major problems of dispersion in effective tax rates and of tax avoidance or revenue losses as costs are shifted forward in the production distribution chain.

57. The Australian authorities were not convinced that VAT was markedly superior to a RST from a tax evasion viewpoint. They cited evasion and avoidance under European VAT systems, and noted that the lower administrative costs of RST could allow more resources to be devoted to combatting evasion. Moreover, both systems face similar problems in distinguishing between business and private use of goods and services such as fuel, electricity and telephone.

58. Administration costs for VAT in the United Kingdom in 1984-85 were estimated at about 1 per cent of VAT revenue. This is high because of the extensive use of zero-rating and exemptions. The running costs for the VAT proposed for the United States were estimated at about 0.4 per cent of revenue (at a 10 per cent VAT rate). There is a sizeable fixed component of administration costs for a VAT, and hence it is usually argued that VAT should not be levied at rates much less than 10 per cent. However the proposed VAT in Japan would be levied at a 5 per cent rate.

59. However, experience with VAT suggests that the larger number of firms involved is not a significant problem (for developed countries at least). Indeed, in the United Kingdom, it was estimated that in 1979 RST would have involved 72 per cent of traders registered for VAT, and 90 per cent for the RST and VAT systems considered in United States (1984).

60. However, as pointed out in New Zealand (1985b), p. 17, the record-keeping required is probably no more than prudent management practice in any event.

61. Many European countries had turnover taxes, a form of multi-stage tax with substantial disadvantages (tax cumulated because there were no credits for tax paid on business purchases).

62. See Aaron (1981) for further details.

63. This appears to be the main argument for a more balanced tax system, as advocated in the United States (1984), p.219; Japan (1986); Canada (1986), p. 10; Australia (1985), p. 116.

64. If transfer payments were made to all families below the poverty line and none to families above that level, then such transfers could be increased to exactly compensate low income families for the sales tax increase. Some shading out would be required above the poverty line.

65. See, for example, the discussion in Chouraqui, Jones and Montador (1986).

66. See Netherlands (1986) and United Kingdom (1986).

67. See for example Symons and Walker (1986).

68. As explained in United States (1985).

69. The ceilings were raised in the United Kingdom to the interest on £30,000 in 1983 and in Finland to 25,000 markka (in interest) in 1986. For a general discussion of the favourable tax treatment of housing and of recent measures to limit it see OECD (1986b), pp. 54-55.

70. For example, in Denmark the imputed annual income is 2 1/2 per cent, and in Sweden 2 per cent, of an assessed value itself from 35 per cent (Denmark) to 50 per cent below market values.

71. See Canada (1985), p. 33.

72. See United States (1984).

# TABLES AND CHARTS

TABLE 1

TOTAL TAX REVENUE AS PERCENTAGE OF GDP

| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNITED STATES | 30.4 | 29.9 | 31.1 | 31.2 | 31.8 | 30.3 | 31.1 | 31.3 | 31.3 | 31.0 | 31.8 | 32.5 | 32.1 | 31.6 | 31.6 | 32.1 |
| JAPAN | 19.8 | 20.6 | 20.5 | 21.3 | 23.2 | 22.7 | 22.2 | 23.2 | 22.9 | 24.0 | 25.6 | 26.9 | 27.2 | 27.4 | 27.9 | 28.1 |
| GERMANY | 37.2 | 35.3 | 38.8 | 41.2 | 41.8 | 41.6 | 43.1 | 44.2 | 43.7 | 43.4 | 43.7 | 43.6 | 43.5 | 43.3 | 43.0 | 43.0 |
| FRANCE | 36.0 | 37.2 | 37.3 | 37.6 | 38.3 | 39.2 | 41.5 | 41.3 | 41.3 | 42.8 | 44.5 | 45.0 | 45.8 | 46.3 | 47.3 | 47.3 |
| UNITED KINGDOM | 34.3 | 34.0 | 32.4 | 31.6 | 34.8 | 35.6 | 34.7 | 34.3 | 33.2 | 33.9 | 35.4 | 37.3 | 38.2 | 37.7 | 38.1 | 37.9 |
| ITALY | 29.4 | 30.0 | 29.8 | 29.4 | 29.5 | 30.4 | 32.3 | 33.5 | 35.2 | 34.7 | 36.8 | 38.3 | 41.0 | 44.1 | 43.4 | 43.2 |
| CANADA | 31.7 | 31.9 | 32.1 | 31.6 | 33.6 | 32.1 | 31.7 | 31.0 | 30.6 | 30.1 | 30.5 | 32.6 | 33.1 | 32.5 | 32.6 | 32.0 |
| TOTAL MAJOR SEVEN | 30.2 | 30.1 | 30.6 | 31.0 | 32.0 | 31.3 | 32.0 | 32.4 | 32.2 | 32.8 | 33.4 | 34.3 | 34.4 | 34.4 | 34.6 | 34.8 |
| AUSTRALIA | 23.5 | 23.6 | 23.2 | 21.8 | 25.8 | 26.0 | 25.0 | 28.0 | 26.9 | 26.9 | 27.6 | 28.8 | 30.5 | 26.0 | 29.0 | 30.4 |
| AUSTRIA | 38.4 | 39.2 | 40.1 | 40.9 | 41.4 | 41.5 | 41.0 | 42.5 | 44.8 | 44.3 | 44.0 | 45.6 | 44.8 | 44.5 | 45.4 | 45.9 |
| BELGIUM | 34.3 | 35.1 | 35.3 | 36.3 | 37.4 | 40.1 | 40.1 | 41.6 | 42.5 | 43.0 | 42.2 | 42.8 | 44.1 | 43.9 | 44.9 | 45.2 |
| DENMARK | 43.8 | 44.5 | 43.9 | 44.7 | 46.4 | 43.5 | 43.9 | 44.7 | 46.5 | 47.5 | 48.1 | 47.9 | 47.1 | 49.1 | 50.9 | 51.9 |
| FINLAND | 32.6 | 34.4 | 34.3 | 35.1 | 34.9 | 36.9 | 40.2 | 39.0 | 37.3 | 34.9 | 34.8 | 36.5 | 36.1 | 36.1 | 37.7 | 39.0 |
| GREECE | 24.6 | 24.7 | 24.5 | 23.3 | 24.0 | 24.7 | 27.1 | 27.0 | 28.3 | 28.0 | 28.1 | 27.2 | 30.9 | 32.1 | 32.8 | 32.7 |
| IRELAND | 33.6 | 34.5 | 33.0 | 32.9 | 33.5 | 32.9 | 36.1 | 34.4 | 33.3 | 33.5 | 36.3 | 37.1 | 38.6 | 40.5 | 41.0 | 40.5 |
| NETHERLANDS | 39.5 | 42.1 | 43.1 | 45.0 | 45.2 | 46.6 | 46.3 | 45.7 | 46.4 | 45.1 | 46.1 | 45.5 | 45.7 | 47.1 | 45.5 | 45.2 |
| NORWAY | 41.2 | 44.7 | 46.3 | 47.4 | 46.1 | 47.2 | 48.3 | 48.4 | 48.7 | 50.3 | 50.7 | 48.8 | 48.5 | 48.1 | 48.4 | 50.0 |
| SPAIN | 20.9 | 21.5 | 22.0 | 22.5 | 21.5 | 23.0 | 24.0 | 25.2 | 26.0 | 27.3 | 28.5 | 29.8 | 29.7 | 31.8 | 31.8 | 32.7 |
| SWEDEN | 44.4 | 46.9 | 47.0 | 44.8 | 46.0 | 47.4 | 51.9 | 54.5 | 53.9 | 51.0 | 51.4 | 52.6 | 52.7 | 53.3 | 53.3 | 53.3 |
| TOTAL SMALL COUNTRIES | 32.4 | 33.7 | 34.0 | 34.1 | 34.9 | 36.0 | 36.7 | 38.0 | 38.1 | 38.0 | 38.5 | 39.1 | 39.6 | 39.9 | 40.3 | 40.9 |
| TOTAL COUNTRIES (WEIGHTED) | 30.5 | 30.6 | 31.0 | 31.4 | 32.4 | 31.9 | 32.6 | 33.1 | 33.0 | 33.4 | 34.1 | 34.9 | 35.1 | 35.1 | 35.3 | 35.6 |
| TOTAL COUNTRIES (UNWEIGHTED) | 33.2 | 34.1 | 34.2 | 34.4 | 35.3 | 35.7 | 36.7 | 37.3 | 37.4 | 37.5 | 38.2 | 38.8 | 39.4 | 39.9 | 40.3 | 40.6 |

SOURCE: OECD, NATIONAL ACCOUNTS

Table 2

TOTAL MARGINAL TAX RATES ON LABOUR USE (a)

| With two children | Single worker | | | Single-earner Married couple | | |
|---|---|---|---|---|---|---|
| | 1979 | 1981 | 1983 | 1979 | 1981 | 1983 |
| Australia | 44.4 | 43.5 | 42.3 | 44.4 | 43.5 | 42.3 |
| Austria | 60.6 | 64.1 | 64.0 | 60.6 | 64.1 | 64.0 |
| Belgium | 64.6 | 66.0 | 66.9 | 62.2 | 62.1 | 61.7 |
| Canada | 43.3 | 45.1 | 42.7 | 41.1 | 43.0 | 42.7 |
| Denmark | 68.5 | 69.0 | 71.2 | 68.5 | 69.0 | 71.2 |
| Finland | 63.1 | 63.1 | 62.5 | 63.1 | 63.1 | 62.5 |
| France | 66.9 | 66.7 | 68.8 | 57.5 | 57.2 | 59.7 |
| Germany | 61.1 | 60.5 | 60.9 | 56.8 | 56.4 | 57.0 |
| Ireland | 55.5 | 57.8 | 70.2 | 55.5 | 57.8 | 63.8 |
| Italy | 56.3 | 59.5 | 62.7 | 56.3 | 59.5 | 62.7 |
| Japan | 40.5 | 43.9 | 43.7 | 35.9 | 39.4 | 39.9 |
| Luxembourg | 62.4 | 63.2 | 67.2 | 47.6 | 48.7 | 50.6 |
| Netherlands | 66.8 | 69.0 | 73.5 | 66.8 | 69.0 | 73.5 |
| New Zealand | 43.9 | 54.3 | 40.3 | 43.9 | 54.3 | 55.5 |
| Norway | 72.5 | 70.5 | 69.5 | 65.9 | 67.0 | 63.0 |
| Portugal | 44.0 | 46.8 | 46.9 | 40.1 | 43.3 | 44.3 |
| Spain | 43.9 | 45.4 | 46.7 | 43.9 | 45.4 | 46.7 |
| Sweden | 74.4 | 73.5 | 73.0 | 74.4 | 73.5 | 73.0 |
| Switzerland | 44.4 | 44.2 | 42.2 | 40.5 | 42.2 | 40.2 |
| United Kingdom | 51.5 | 53.4 | 54.5 | 51.5 | 53.4 | 54.5 |
| United States | 47.1 | 52.9 | 48.6 | 40.2 | 45.2 | 42.6 |
| Average (Unweighted) | | | | | | |
| OECD Europe | 59.8 | 60.8 | 62.5 | 57.0 | 58.2 | 59.3 |
| OECD Non-Europe | 43.8 | 47.9 | 43.5 | 41.1 | 45.1 | 44.6 |
| Total OECD | 56.0 | 57.7 | 58.0 | 53.2 | 55.1 | 55.8 |

Source: McKee, Visser and Saunders (1986).

a) Calculated as a percent of total compensation, including payroll taxes, for an average production worker. Recent tax reforms are unlikely to have changed the figures significantly, even for the United States.

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Table 3

ESTIMATED TOTAL MARGINAL TAX RATES ON CAPITAL (a)
Per cent of pre-tax rate of return

| | Equipment | | | | | | Structures | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Zero inflation | | | 10 per cent inflation | | | Zero inflation | | | 10 per cent inflation | | |
| Financed by: | Debt | New share issues | Retained earnings | Debt | New share issues | Retained earnings | Debt | New share issues | Retained earnings | Debt | New share issues | Retained earnings |
| Australia | -18.1 | 36.3 | 4.8 | -14.9 | 83.9 | 26.6 | 38.2 | 66.6 | 50.1 | 30.5 | 108.5 | 63.2 |
| Austria | -18.6 | 23.2 | 16.9 | -10.4 | 52.5 | 40.4 | 20.8 | 49.0 | 44.8 | 15.4 | 70.8 | 60.2 |
| Belgium | -12.2 | -13.7 | -10.2 | -0.5 | -3.2 | 3.1 | 20.0 | 19.0 | 21.5 | 32.2 | 29.9 | 35.3 |
| Canada | 6.4 | 24.5 | 34.8 | 3.3 | 41.4 | 58.7 | 21.4 | 36.7 | 45.6 | 5.8 | 43.5 | 60.6 |
| Denmark | 49.5 | 59.6 | 24.9 | 91.2 | 111.6 | 37.8 | 54.4 | 63.5 | 32.0 | 92.0 | 112.2 | 38.9 |
| Finland | 49.3 | 25.6 | 24.5 | 78.6 | 40.1 | 42.7 | 53.5 | 30.8 | 29.5 | 81.7 | 45.0 | 45.9 |
| France | 14.7 | 38.9 | 40.9 | 4.8 | 56.8 | 61.3 | 25.6 | 47.0 | 48.8 | 9.7 | 60.5 | 64.9 |
| Germany | 5.1 | 18.4 | 52.8 | -31.1 | 0.1 | 80.9 | 36.8 | 45.9 | 69.5 | -27.3 | 3.4 | 82.9 |
| Ireland | -90.1 | -108.7 | -178.1 | -51.2 | -75.8 | -176.5 | -56.4 | -71.8 | -124.4 | -17.6 | -38.9 | -122.3 |
| Italy | -6.8 | 27.5 | 34.6 | -37.5 | 38.8 | 54.5 | 9.9 | 38.9 | 44.8 | -32.2 | 42.4 | 57.8 |
| Japan | 7.7 | 52.7 | 43.5 | -11.5 | 91.5 | 70.5 | 25.3 | 61.7 | 54.2 | -12.7 | 90.9 | 69.7 |
| Netherlands | 36.0 | 65.8 | 16.3 | 77.9 | 135.6 | 42.4 | 57.7 | 77.1 | 44.0 | 89.7 | 141.7 | 57.4 |
| New Zealand | 24.0 | 58.2 | 39.2 | 28.8 | 105.9 | 63.1 | 35.3 | 64.4 | 48.2 | 22.3 | 102.2 | 57.8 |
| Norway | 29.9 | 59.9 | 45.6 | 30.6 | 99.8 | 66.8 | 41.0 | 66.6 | 54.4 | 34.3 | 102.1 | 69.8 |
| Spain | -42.7 | -0.3 | -11.1 | -44.5 | 27.7 | 8.5 | -14.0 | 20.0 | 11.5 | -27.4 | 39.8 | 22.0 |
| Sweden | 41.3 | 24.3 | 39.0 | 79.6 | 48.7 | 60.5 | 55.0 | 39.7 | 53.7 | 89.5 | 63.2 | 71.7 |
| Switzerland | 21.3 | 35.2 | 27.5 | 32.7 | 62.1 | 38.2 | 24.8 | 38.1 | 31.0 | 34.3 | 63.4 | 39.8 |
| United Kingdom | -45.8 | 0.0 | 16.3 | -91.7 | -0.1 | 21.6 | -21.1 | 16.9 | 31.8 | -59.9 | 21.7 | 42.5 |
| United States | -27.6 | 35.6 | 10.1 | -32.2 | 82.7 | 32.8 | 18.2 | 58.7 | 43.3 | 10.3 | 104.2 | 64.4 |

Source: McKee, Visser and Saunders (1986).

a) 1983 data. The total marginal tax rate which would apply to a hypothetical investment in the manufacturing sector which yielded a pre-tax real return of 10 per cent. The investment is assumed to be made directly out of personal savings -- the effective tax rate would be lower if the investment were channelled via a tax-exempt financial institution. The estimates take account of both the corporate and personal tax systems (assuming that the investor has other income equal to the annual wage of an average production worker).

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Table 4

ESTIMATES OF WELFARE GAINS FROM CHANGES TO EXISTING TAX SYSTEMS

| Investigators | Country | Policy changes | Type of estimate | Welfare gains (% of GNP) |
|---|---|---|---|---|
| Harberger (a) (1966) | United States | Lump-sum tax | Static | 0.3-0.6 |
| Shoven-Whalley (b) (1972) | United States | Lump-sum tax | Static | 0.4-0.7 |
| Whalley (1975) | United Kingdom | Various plans including: | Static | Negligible |
| | | Abolition of purchase tax | | |
| | | Elimination of selective employment tax | | |
| | | Introduction of a VAT | | |
| | | Changes to corporate taxes | | |
| | | Introduction of a unified income tax | | |
| Keller (1980) | Netherlands | Changes in marginal rates | Static | Negligible |
| Piggott (1980) | Australia | Abolition of sectoral specific tax expenditures and subsidies | Static | 3.50 |
| Slemrod (1983) | United States | Indexation | Static | 0.48 |
| Ballard et al. (c) (1985) | United States | Full integration | Static | 0.16-0.71 |
| | | Full integration | Dynamic | 0.63-1.42 |
| | | Progressive consumption tax | Dynamic | 1.58-1.81 |
| | | Consumption tax w/integration | Dynamic | 2.40-2.92 |
| Piggott and Whalley 1985) | United Kingdom | Various plans | Dynamic | 6.00-9.00 |
| Daly et al. (1985) | Canada | Elimination of dispersion of capital tax rates | Dynamic | 2.0 |
| Fullerton and Henderson (1986) | United States | 1984 Treasury Proposal | Dynamic | -0.1-1.2 |
| | | President's Proposal | Dynamic | 0.2-1.2 |

Source: Shoven and Whalley (1984), and individual studies.

a) Assumes a compensated labour supply elasticity of 0.125.
b) Assumes a compensated labour supply elasticity of 0.125.
c) Assumes a compensated labour supply elasticity of 0.15, and savings elasticity to 0.4.

Table 5

MARGINAL COST OF PUBLIC FUNDS

| Study | Country | Marginal cost of public funds | Compensated elasticity of: Labour supply | Compensated elasticity of: Saving | Source(s) of MWC |
|---|---|---|---|---|---|
| Browning (1976) | United States | $1.09-$1.16 | 0.20 | - | Federal personal income taxes<br>State and local personal income taxes<br>Social Security contributions<br>Excise taxes |
| Stuart (1984) | United States | $1.21-$1.33 | 0.20-0.64 | - | Federal personal income taxes<br>State and local personal income taxes<br>Excise taxes |
| Hansson (1984) | Sweden | 0.98-7.20 | 0.10-0.38 | 0.40-1.89 | Corporate and personal income taxes<br>Social Security contributions<br>Indirect taxes<br>Wealth taxes |
| Hansson, Stuart (1985) | Sweden | 0.67-4.51 (a) | -0.07-0.38 | - | Corporate and personal income taxes<br>Social Security contributions<br>Indirect taxes<br>Wealth taxes |
| Ballard et al. (1985) | United States | $1.17-$1.33<br>$1.18-$1.46<br>$1.12-$1.23<br>$1.07-$1.12<br>$1.16-$1.31<br>$1.15-$1.28 | 0.0-0.30 | 0.0-0.40(a) | All major U.S. taxes<br>Tax on capital<br>Tax on labour<br>Consumer sales taxes<br>Income taxes<br>Output taxes |
| Fortin and Rousseau (1986) | Canada | $1.19-$1.55 | 0.15-0.20 | - | All major Canadian taxes |

a) The authors also compute MWC assuming a savings elasticity of 0.8, but do not report the associated estimates for individual taxes.

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Table 6

INCOME TAX RATES (a)

| Country | Hypothetical comprehensive flat tax rate (b) | Actual average personal tax rate (c) | Average personal tax and social security rate (d) |
|---|---|---|---|
| United States | 34.0 | 13.6 | 23.2 |
| Japan | 27.7 | 7.7 | 16.2 |
| Germany | 43.5 | 10.7 | 30.9 |
| France | 45.0 | 6.7 | 25.8 |
| United Kingdom | 40.5 | 12.6 | 20.5 |
| Italy | 37.7 | 11.8 | 28.0 |
| Canada | 32.8 | 13.6 | 18.7 |
| Australia | 31.9(e) | 16.6 | 16.6(e) |
| Austria | 45.7 | 12.6* | 25.5* |
| Belgium | 40.0 | 15.1 | 28.8 |
| Denmark | 51.1 | 33.5 | 37.2 |
| Finland | 41.2 | 17.3 | 23.5 |
| Greece | 31.9 | 4.5 | 15.5 |
| Netherlands | 38.2 | 9.8* | 29.8* |
| Norway | 53.9 | 13.3 | 28.0 |
| Spain | 31.7 | 7.3* | 23.4* |
| Sweden | 53.2 | 20.7* | 34.5* |
| Switzerland | 32.2 | 13.5 | 23.9 |

Source: OECD.

a) 1985 data except where marked with an asterisk.

b) Total taxes divided by sum of net domestic product at factor cost and government transfers to persons (including debt interest).

c) Personal direct taxes divided by personal income.

d) Personal direct taxes and employer and employee contributions to social security, divided by personal income.

e) Estimates by the Australian authorities are somewhat higher; 36.2 and 22.7 per cent for the first and third columns, respectively.

Table 7

RECENT AND PROPOSED CHANGES IN PERSONAL TAXATION SYSTEMS

| | Overall taxation | Income tax | | |
|---|---|---|---|---|
| | Marginal tax rates on average wages under present tax systems (a) | Top marginal rate (b) | | |
| | | Previous | Present | Proposed |
| Australia | 47.3 | 60.0 | 55.0 | 49.0 |
| Austria | 54.5 | | 62.0 | |
| Belgium | 63.2 | | 86.7 | |
| Canada | 34.1 | 63.6 | 52.0 | 44.4 |
| Denmark | 62.4 | 73.0 | 68.0 | |
| Finland | 53.2 | | 68.5 | |
| France | 51.2 | 65.0 | 58.0 | 50.0 |
| Germany | 62.7 | | 56.0 | 53.0 |
| Greece | 40.1 | 60.0 | 63.0 | |
| Iceland | n.a. | | 55.6 | |
| Ireland | 60.4 | 65.0 | 58.0 | |
| Italy | 57.8 | 76.0 | 62.0 | 56.0 |
| Japan | 31.9 | | 88.0 | 65.0 |
| Luxembourg | 53.6 | 57.0 | 56.0 | |
| Netherlands | 61.9 | | 72.0 | |
| New Zealand | 30.0 | 66.0 | 48.0 | |
| Norway | 60.1 | 71.0 | 56.0 | |
| Portugal | 35.9 | 84.4 | 68.8 | |
| Spain | 52.8 | 68.5 | 66.0 | |
| Sweden | 62.0 | 87.7 | 77.4 | |
| Switzerland | 39.4 | | 45.8 | |
| Turkey | n.a. | 78.0 | 50.0 | |
| United Kingdom | 43.9 | 83.0 | 60.0 | |
| United States | 40.9 | 75.0 | 38.0 | |

a) Overall marginal tax rate for an average (unmarried) production worker, allowing for direct taxes at all levels of government, social security contributions by both employers and employees, and relevant tax concessions. The major data source is OECD (1986), The Tax/Benefit Position of Production Workers 1981-1985. The figures shown are estimates for 1986.

b) Global effective rate (excluding social security contributions), but allowing for deductibility of taxes paid to lower levels of government.

Table 8

INTEGRATION OF PERSONAL AND CORPORATE TAXATION

| Integration | Zero | Slight | Partial | High (a) |
|---|---|---|---|---|
| None | United States<br>Luxembourg<br>Netherlands<br>Spain<br>Switzerland | | | |
| At company level | | Iceland<br>Sweden | Austria (b)<br>Finland (c)<br>Japan (d)<br>Norway (c) | Greece<br>Germany |
| At shareholder level: | | | | |
| On tax paid | | | Denmark<br>France<br>Ireland<br>Italy<br>United Kingdom | Australia(e) |
| On tax deemed to have been paid | | | Belgium<br>Canada<br>New Zealand (from 1988)<br>Turkey | |

Source: OECD (1987c).

a) Implies non-taxation of capital gains arising from non-distributed profits.

b) Austria operates a half-rate system for both company and individual taxation, which approximates to single taxation overall on dividends.

c) Also a small alleviation at shareholder level.

d) Japan proposes to remove the lower company tax rate for distributed profits, leaving a lower level of integration at the shareholder level.

e) Australia is introducing a "qualifying dividends" system of full imputation in 1987-88, whereby imputation credits apply only to dividends paid out of income on which company tax has been paid. In addition, where retained earnings are used to make a bonus share issue, this will be treated as a distribution and shareholders will have the benefit of available imputation credits.

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Table 9

GENERAL CONSUMPTION TAXES IN OECD COUNTRIES (a)

| | Rates (per cent) | | | | | | Principal exemptions and preferential rates (b) | |
|---|---|---|---|---|---|---|---|---|
| | System | Number of rates (c) | Basic | High | Low | Average (d) | Basic food | Medicine and drugs |
| Australia | WST | 3 | 20.0 | 30.0 | 10.0 | 17.2 | Yes | Yes |
| Austria | VAT | 3 | 20.0 | 32.0 | 10.0 | 31.0 | 10.0 | 10.0 |
| Belgium | VAT | 6 | 19.0 | 33.0 | 1.0 | 19.8 | 6.0 | 6.0,19.0 |
| Canada | MST(e) | 1 | 12.0 | - | - | 18.7 | Yes | Yes,12.0 |
| Denmark | VAT | 1 | 22.0 | - | - | 42.4 | 22.0 | 22.0 |
| Finland | VAT(f) | 1 | 16.0 | - | - | 33.8 | Yes | Yes |
| France | VAT | 4 | 18.6 | 33.3 | 5.5 | 24.6 | 5.5 | 7.0 |
| Germany | VAT | 2 | 14.0 | - | 7.0 | 20.8 | 7.0 | |
| Greece | VAT | 3 | 18.0 | 36.0 | 9.0 | 28.1 | | |
| Iceland | RST | 1 | 25.0 | - | - | n.a. | Yes | 25.0 |
| Ireland | VAT | 3 | 25.0 | - | 0.0 | 36.1 | 0.0 | 0,25.0 |
| Italy | VAT | 4 | 18.0 | 38.0 | 2.0 | 19.0 | 2.0 | 18.0 |
| Japan | - | - | - | - | - | 6.4 | Yes | Yes |
| Luxembourg | VAT | 3 | 10.0 | - | 2.0 | 21.3 | | |
| Netherlands | VAT | 2 | 20.0 | - | 6.0 | 21.4 | 6.0 | 6.0 |
| New Zealand | VAT | 1 | 10.0 | - | - | 16.0 | 10.0 | 10.0 |
| Norway | VAT | 1 | 20.0 | - | - | 53.2 | 20.0 | 20.0 |
| Portugal | VAT | 3 | 16.0 | 30.0 | 8.0 | 24.0 | Yes | |
| Spain | VAT | 3 | 12.0 | 33.0 | 6.0 | 12.1 | 6.0 | 6.0 |
| Sweden | VAT | 2 | 23.46 | - | 12.87 | 31.6 | 23.46 | |
| Switzerland | RST(g) | 1 | 6.2 | - | - | 6.1 | Yes | |
| Turkey | VAT | 4 | 12.0 | - | 0.0 | 6.9 | 0.0 | 5.0 |
| United Kingdom | VAT | 2 | 15.0 | - | 0.0 | 22.3 | 0.0 | Yes |
| United States | - (h) | - | - | - | - | 7.6 | Yes | Yes |

a) At January 1987.

b) Yes denotes exemption; figures denote rates. Exemptions from services typically include rent, banking and property transfers. Sometimes preferential rates also apply to electricity and gas, passenger transport, and insurance.

c) Number of rate classes, including zero rate where applicable.

d) Implied average rate of consumption tax (both general and specific taxes) relative to private consumption (1984 data).

e) In addition, all provinces except Alberta have RST, at rates ranging from 4 to 12 per cent.

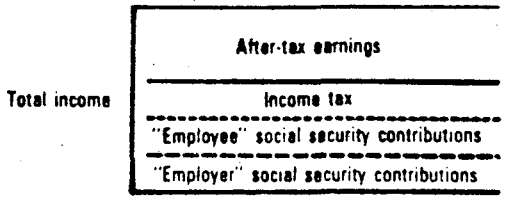
f) In Finland, VAT applies to selected goods, and hotels and restaurants only.

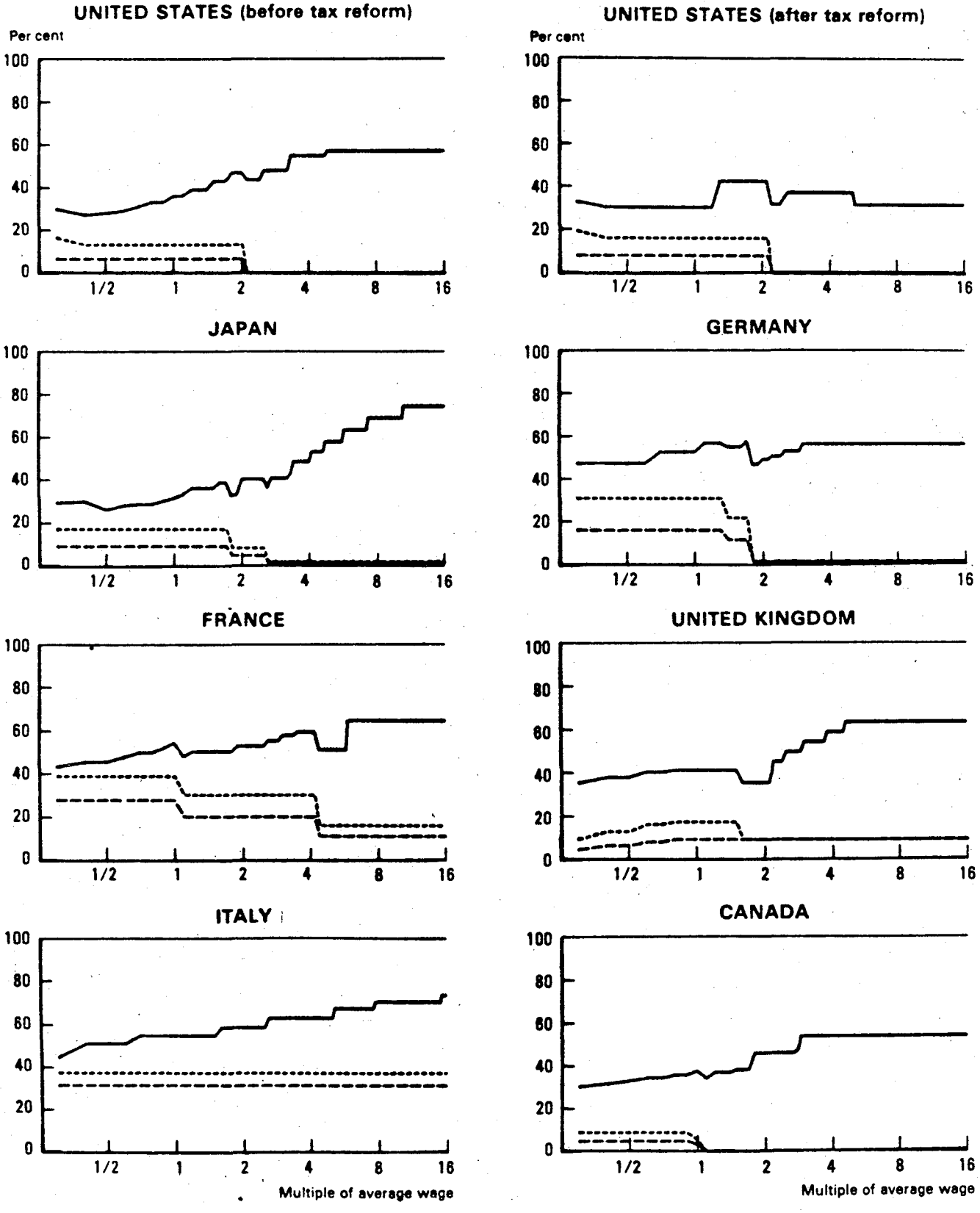
g) In Switzerland, 80 per cent of general consumption taxes is collected at the retail level at a rate of 6.2 per cent. There is also a WST at a rate of 9.3 per cent on some goods.

h) In the United States, there is no general consumption tax at the federal level, although 45 states have RST at rates ranging from 4.25 to 8.25 per cent.

CHART A

# MARGINAL RATES OF OVERALL TAXATION ON WAGES AND SALARIES



## NOTES TO CHART A

All calculations are based on a single individual for whom wages are the only source of income. Gross income includes employer social security contributions. The Chart shows the gap between the wage cost to the employer and the after-tax earnings of the employee.

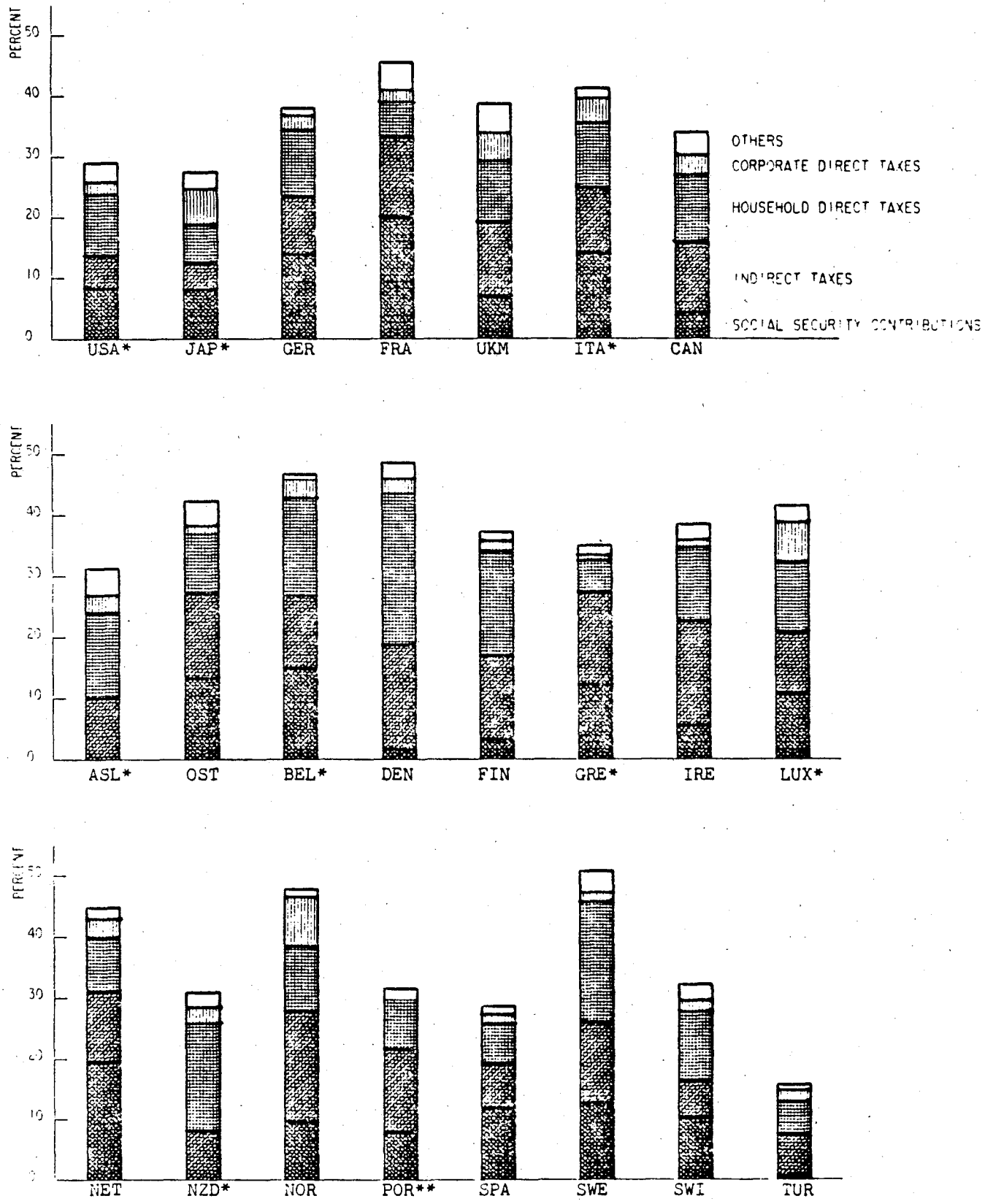
Calculations are based on the taxes paid by someone earning income in 1986, which in the case of France means that the income taxes are those payable in 1987. For the United States, however, the before reform figure is for 1984 and the post reform figures for 1988 (when the new scales will be in place). The average wage for 1988 is based on the forecasts in Economic Outlook 40.

For the United States state and local marginal income tax rates were assumed to be 14 per cent of those at the federal level. For Canada the marginal tax rates for Ontario were used (48 per cent of the federal basic rate, not including surtax).

The non-refundable Italian tax credits mean that the marginal tax rate is zero for low income earners.

CHART B

RELATIVE IMPORTANCE OF DIFFERENT TYPES OF TAXATION




Source: (OECD 1987c)

1985 data except, where marked with *, 1984.
**No distinction between corporate and household direct taxes.

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# ANNEXES

## CONTENTS

# ANNEX A

## EFFECTS OF TAXATION ON ECONOMIC BEHAVIOUR

There is a growing consensus that the welfare costs of existing tax systems are greater than previously thought, a view based on advances in the quantitative analysis of the effects of taxation on economic behaviour. The measurement of the impact of taxation on labour supply, saving and capital allocation, and the refinement and wider use of applied general equilibrium models (A.G.E.) are particularly important in this respect. This annex looks at these questions in some detail; although it is far beyond its scope to present a full review of the relevant literature, references to recent surveys are made throughout.

### 1. Tax wedges and tax incidence

The discussion of "tax wedges" in the main text, and the data reported in Tables 2 and 3, are based on previous work by the OECD Secretariat [see McKee, Visser and Saunders (1986)]. Tax wedges represent the difference between before- and after-tax wages or rates of return. They are built up directly from the component taxes. Thus the tax wedge on labour is typically composed of the taxes on consumption (indirect taxes), the taxes on income (personal income taxes) and the direct taxes on labour (social security contributions and payroll tax). The tax wedge on capital is built up from the direct taxes on profits (primarily the corporate tax, but including other business taxes as well) and the taxes on income (personal income taxes).

These measures do not give an indication of the incidence of taxes (i.e. of who really pays the tax or "who bears the burden"). The tax wedge on labour, for example, could be "shifted" to the owners of capital if workers succeeded in preserving the real value of their after-tax salary. Similar shifting is conceivable for saving and the tax on capital. The economic consequences of these wedges will depend on the actual incidence of taxes, which is not easily determined. The labour tax wedge, for example, will be largely borne by workers if the elasticity of supply of labour is relatively small relative to the elasticity of demand and by firms if the reverse holds. The tax wedge is a tax on labour use that can be thought of as a tax on either the supply of or the demand for labour so that it may be difficult to distinguish whether a tax enters the tax wedge on labour or that on capital. In practice however, and in part precisely because the elasticities of both labour supply and saving are thought to be relatively small (albeit larger than previously believed -- see below) there is an assumption, built into most of the analysis of these questions, that in equilibrium the tax wedges on labour and capital are to a large extent borne by labour and capital respectively.

### 2. Taxes and labour supply

In principle, the analysis of the effects of taxation on labour supply is straightforward, although theory cannot predict the response to changes in the reward to work a priori. The ambiguity arises because a change in after-tax wages from, say, an increase in the tax rate, generates opposing

income and substitution effects. While lower after-tax income increases labour supply as individuals opt for less leisure, it also decreases labour supply because the relative price of leisure has declined (since the opportunity cost of an additional unit of leisure -- the foregone income -- has declined) and hence individuals substitute leisure for work. The actual change in labour supply depends upon the relative strengths of these income and substitution effects and is theoretically indeterminate.

However, a welfare loss results from an increase in any tax which alters the relative prices of leisure and consumption, because such losses depend only on the substitution effect, or, equivalently, the compensated elasticity of labour supply, which is unambiguously negative. The greater the substitution effect the larger the welfare loss, so even if the uncompensated elasticity of labour supply (i.e. the total effect of a reduction in after-tax wages) is very low, the tax on income can impose substantial losses. Clearly the compensated elasticity is the relevant measure of the effect on labour supply of a revenue-neutral tax reform, in which lower marginal tax rates on wages would be offset by increases in other taxes, with after-tax income remaining the same.

Despite the amount of attention received from economists over the past several decades, labour supply research has only recently begun to arrive at a consensus about the responsiveness of labour supply to taxation, both for various subgroups of workers (men and women, low and high income workers) and, to a great extent, in the aggregate. While there still exists no agreement on the precise magnitude of the responsiveness of labour supply to changes in after-tax wages, estimates tend to be greater than previously obtained.

Most of the empirical analysis of labour supply has been done since 1970, prior to which the limited evidence came mainly from relatively simple studies, principally of an interview type. Pechman (1971) noted that the general result of these studies was that taxes, while resented, did not ultimately affect the labour supply decisions of workers. There were certainly very few formal attempts to measure the parameters of the labour supply decision described in theoretical models. The 1970s witnessed a burst of interest in the quantitative analysis of labour supply, particularly but not exclusively in the United States, facilitated by the increased availability of household-specific data and by the more widespread use of econometric tools. Large cross-sectional, and in some cases longitudinal, surveys provided extensive data with which to calculate labour supply elasticities, which generally meant estimating relatively straightforward labour supply functions, with the number of hours worked per period (usually a year) as the dependent variable, and gross or after-tax wage as one of several "determinants" of labour supply (1). With increased socioeconomic detail, the differential behavior of subgroups could more easily be studied. A summary of the results from these are shown in Tables A-1 and A-2 for men and women, respectively.

Several general conclusions are drawn from this extensive body of research, which distinguishes further between earlier and later studies [see Killingsworth (1983)]. First, the uncompensated own-wage elasticity of labour supply of married men was usually negative or zero, although some studies did find statistically significant positive responses. These "first generation" studies also found fairly low compensated own-wage elasticities among men, in

the range up to 0.36 (Killingsworth, p. 107). Second, most studies found substantial compensated and uncompensated own-wage elasticities for married women, with estimates of the former between 0.20 to 0.90 range, while estimates of the compensated labour supply elasticities, ranged from 0.10 to 2.00. Third, the aggregate labour supply elasticity, taking account of both men and women, was estimated to be low, although the range of estimates was very large. This great diversity of results obviously severely limited their usefulness for policy analysis.

Many of these early studies, notwithstanding their substantial contribution to the state of knowledge about labour supply, were deficient in a number of respects. First, taxes were incorporated in a relatively simple fashion, tending to obscure the manner in which they could affect labour supply. There are many taxes which contribute to the "wedge" driven between the gross and net wage, and failure to take as many as possible into account can seriously bias estimates. Second, given progressive taxation and government transfer programmes, the true budget constraint can be very non-linear, creating modelling and estimation difficulties not previously taken into account. The effect of taxes on labour supply depends critically on the segment of the budget line on which an individual falls, and on the underlying utility function [Hausman (1985)]. Third, much of the micro-data used to analyze labour supply suffer from sample truncation and censorship (i.e. samples tend to be restricted to workers), while the joint decision of labour force participation and hours of work -- conditional on participation -- was seldom dealt with in early studies. These deficiencies tend to bias the estimated elasticities downwards [Heckman et al. (1981)].

Incorporation of these features into econometric models, in order to reduce the bias of estimated parameters, requires estimation techniques which have only recently been developed. A number of "second generation" studies have used them, the results of which are summarized in Tables A-3 and A-4 for men and women, respectively. Several important conclusions emerge: i) the studies confirm the comparatively higher responsiveness of married women than men to changes in after-tax wages; ii) the labour supply responsiveness of men appears, however, higher on average than previously believed, although the range of estimates of compensated elasticities, is still large (from 0.03 to 1.00, excluding one study with a negative compensated elasticity); iii) the newer techniques yield substantially higher female own-wage elasticities, with some estimates well above 2.0. For the aggregate labour supply as a whole, the estimated responsiveness is correspondingly greater. Hansson and Stuart (1985) report that the median weighted average wage elasticity of males and females for second generation studies is about 0.4, much greater than the 0.10 for all studies combined.

The higher estimates of labour supply elasticities suggest that existing taxes reduce labour supply significantly, particularly for married women. High marginal tax rates can clearly play an important role in discouraging labour force participation and reducing the number of hours worked. Several studies [Hausman and Lund (1984), and Ashworth and Ulph (1981)] model the labour supply decision at the household level, which takes account of the interactions of the decisions of husbands and wives. This is significant, since, if tax reform raises total family income by reducing tax on the husband's income, the positive effect on the wife's participation rate from the increased after-tax wage will be partly offset. At least as regards

the evidence on the United States, Burtless and Havemann (1986) concluded that a reasonable assumption based on existing literature is that taxes in the U.S. reduce total labour supply by between 5 and 12 per cent.

Several other studies quantify the potential labour supply responses to lower taxes. Hausman (1985) estimates that, in the case of the United States, a 30 per cent reduction in taxes (under the structure of taxation in existence in 1983) could increase the labour supply of prime-age males by 1.3 to 4.6 per cent depending upon the income of the worker. The effect would be larger for wives, for whom Hausman estimates a 30 per cent tax cut would induce a 9.4 per cent increase in their labour supply (2). With a more radical change, replacing the actual 1983 tax system by an equal yield flat-rate tax of 20 per cent with a $4,000 (1975 dollars) exemption, the labour supply of prime-age men would increase by 7.7 per cent. Ashworth and Ulph (1981), in a study of the effect of taxes on labour supply in the United Kingdom, estimated that a reduction in the standard 30 per cent tax rate to 7 or 15 per cent would increase adult male labour supply by 0.8 and 1.8 per cent, respectively. Blomquist (1983) estimates that taxes on labour in Sweden reduce the labour supply of adult men by 13.1 per cent, and that a revenue neutral flattening of the rate schedule to achieve a proportional rate of 34 per cent would increase their labour supply by 6.9 per cent.

What is important is the extent to which even a small elasticity of labour supply combines with the structure of taxes to produce welfare losses. The magnitude of the economic costs of taxes that discourage labour supply is suggested by the ratio of the tax-induced welfare loss to the revenue it raises. The greater the ratio, the less desirable a particular tax structure. For example, in the United States, the ratio for prime-age males under the 1983 tax system, which was estimated to be about 0.22, would fall to 0.07 under the flat-rate system mentioned above. For Sweden, Blomquist estimates that a proportional tax could reduce the existing ratio of 0.19 to 0.04.

Although it is important not to assign too much weight to individual results derived from what are relatively new, and certainly complex, econometric models, most recent studies support the view that aggregate labour supply is sensitive to changes in taxation. If research continues to substantiate these results, concern about the adverse labour supply effects of taxes will grow still further.

## 3. Taxes and saving

Taxes on capital income have an important economic effect by lowering the rate of saving in an economy. There is considerable debate over the extent to which this occurs, arising in part from the theoretical ambiguity of the effects of changes in after-tax rates of return to saving, but which has to a slight degree been reduced by recent empirical work.

In the literature on the subject, individuals are usually portrayed as maximizing multiperiod utility (in the simplest models treated as two periods -- one during which they work, the other during which they are retired) as a function of consumption and leisure in each period, subject to the lifetime budget constraint (defined by labour income, exogenous income, and returns to saving). The utility maximizing individual trades off current for future consumption at a rate determined by the real rate of interest. For given

preferences (which define the rate at which a consumer is willing to shift from current to future consumption) and a real rate of interest (which defines the consumer's ability to make such a shift), an optimum is reached at the point of tangency of an indifference curve defined over current and future consumption and the budget line, which determines the set of feasible combinations, and whose slope is determined by the rate of interest.

A tax on returns to saving causes the budget line to rotate as the feasible trade-off between current and future consumption is altered. This results in two opposing effects. Because the lifetime consumption achievable at the previous rate of saving is lower, there is an income effect which raises saving. However, since the relative price of future consumption is increased, there is a substitution effect which causes a reduction in the rate of saving (3). The net outcome is thus ambiguous, and depends on the relative strengths of the two effects.

The empirical evidence on the aggregate elasticity of saving with respect to the after tax rate of return is substantially less conclusive than it is regarding the effect of taxes on labour supply. Whereas quantitative analyses of the labour supply decision have narrowed the range of estimates, there remains great uncertainty about the size of the effect of taxes on saving. Nevertheless, a tentative conclusion which may be drawn is that economists are much less ready than in the past to assume the effect is negligible. It was for many years believed that the uncompensated elasticity of saving was zero, a conclusion partly based on "Denison's Law" -- that saving in the United States was a constant fraction of income. Moreover, from results obtained by Wright (1969) and Blinder (1975), it was also generally believed that the compensated elasticity was quite low. Wright obtained an estimate of -0.03, while Blinder's estimate was only one tenth of this. Results obtained by Boskin (1978), Boskin and Lau (1978), and Summers (1983), however, challenge this view. Far from obtaining low estimates of the compensated elasticity, Boskin found relatively large uncompensated elasticities, ranging from 0.20 to 0.60, with a central estimate of 0.40. The estimates vary depending upon (1) the definition of saving, (2) the measure chosen for the interest rate, (3) the sample period chosen, and (4) the measure of expected inflation. Summers (1983) obtains even larger estimates, in the range of 1.5 to 3.0. These latter results are, however, quite controversial (Howrey and Hymans, 1978).

Two recent studies provide further evidence that household saving responds to the after-tax rate of interest. In a paper for the European Commission, Tullio and Contesso (1986) found significant negative uncompensated elasticities of private consumption with respect to the after-tax return on saving. For most countries this held only for the nominal return (although for Italy and the United States it was also true for the real return) but a pooled sample for the period 1973-83 showed the same result when the rate of inflation was taken into account. A study by Beach, Boadway and Bruce (1986) for the Economic Council of Canada took the question a significant step further by considering the effect of the age distribution of the population. They found, as the life-cycle theory would suggest, that the effect on saving of the after-tax real return was positive for the young (the substitution effect dominated) and became negative as agents approached the age of retirement (the income effect dominated). Their work also suggested that shifting the tax on capital income to a consumption tax or a wage tax would have a similar effect.

The shifts in the age structure of the population may be one explanation of the lack of significant interest rate effects on consumption and saving reported by many studies based on time series data. If, as recent work seems to suggest, savings do respond to the rate of return, then the compensated elasticity will be unambiguously positive. A revenue neutral shift in taxation away from income and towards consumption or expenditure would then be expected to increase savings, allowing households to reallocate their consumption over time to take full advantage of the options that are economically feasible. The effects on aggregate savings would, however, depend to an important extent on the age structure of the population.

4. Taxes and capital allocation

Another tax-based inefficiency arises because the effective tax rate on capital income varies across alternative investments in most tax systems. As noted above, the taxation of capital income drives a wedge between the before-tax social rate of return and the private after-tax rate of return. The combination of the incentives built into tax systems (such as investment tax credits and accelerated depreciation), unexpected changes in inflation rates, the method of financing and other factors leads the tax wedge on capital used for different purposes to vary widely, causing a misallocation of resources and an inefficient capital stock. Recently a number of empirical investigations have attempted to measure this loss; these are discussed below.

A simple analysis of the ex post tax-to-income ratio can be used to identify industries or groups of individuals which benefit from one form or another of preferential tax treatment. This approach is, however, ad hoc. It does not model systematically the way in which the tax system affects the marginal decisions of economic agents. Nor does it take account of other factors which determine both income and tax liability. An alternative approach, based on neoclassical microeconomic analysis, has become more widely accepted for the purposes of measuring the ex ante influences of tax policies on investment.

In a taxless world with no market imperfections, differences in risk-adjusted real rates of return to alternative investments would not persist in the long run. An initial difference in rates of return would lead resources to flow towards more productive investments, reducing the marginal product there (and vice versa for less productive investments). The process would continue until the risk-adjusted real rate of return to capital was the same at the margin in alternative uses. With the introduction of taxes the same forces would, in the long run, equalize the real after-tax rate of return across assets. If the tax system was neutral toward all types of capital, the composition of the capital stock would not change. In practice, however, tax systems do not affect all assets in the same way, and hence equalization of after-tax marginal rates of return leads to differences in before-tax returns across assets and a less productive capital stock.

The non-neutrality of existing capital income taxation arises primarily because of the wide variation the difference between taxable income and actual income (especially because of the tax treatment of different types of financing and inappropriate deductions from gross income for the capital costs incurred in generating it). A neutral tax system would require a present

value for the stream of depreciation allowances equal to the cost of the asset and the same treatment for alternative means of financing the asset. With a non-neutral tax system, the relative ranking of projects on before and after tax bases is different.

Recent empirical research has revealed the extent to which existing tax systems disproportionately favour some types of capital income over others. King and Fullerton (1984) quantified the level and variation of marginal effective tax rates on income from different sources of capital income in four countries: the United States, the United Kingdom, Sweden and Germany. Daly et al. (1985) extended this analysis to Canada, Kikutani and Tachibanaki (1986) have done the same for Japan, while McKee, Visser and Saunders (1986) applied, as closely as possible, the King-Fullerton methodology (hereafter "K-F") to most OECD countries (the results of the latter are reported in Table 3 of the main text). These studies identify several sub-categories of "capital", each one defined as a hypothetical project: i) entailing one of three types of assets (machinery, buildings, or inventories), ii) within one of three industries (manufacturing, other industry or commerce), iii) financed by either debt, new shares or retained earnings, and iv) provided by either households, tax-exempt institutions, or insurance companies. This substantial disaggregation of the "investment grid", enables the researchers to account or most of the tax provisions that affect the rate of return to investment.

The K-F methodology determines the tax-inclusive cost of capital (i.e. accounting for the effects of tax provisions such as investment incentives) for a hypothetical project, with any combination of the characteristics listed above, and compares this with the after-tax return to those providing the funds. The cost of capital, or required rate of return, is expressed as follows [see K-F (p.19) (4)]:

$$p = \left[\frac{(1-A)}{(1-t)} x \{r+d-e\}\right] - d$$

where e is the expected rate of inflation, t is the statutory marginal corporate tax rate, r is the nominal discount rate, d is the rate of economic depreciation and A is the present value of grants and allowances that reduce the acquisition cost of an asset (note that A varies with both e and t). The firm's discount rate r is related to the market interest rate i and depends on the method of financing. From this equation it can be seen how various tax provisions affect the cost of capital for a project and, hence, its attractiveness. For instance, where an immediate tax credit is provided for the purchase of a specified asset, the cost of the project is directly reduced by the amount of the credit, through the parameter A. Similarly, the greater the present value of depreciation allowances, the greater will be A.

Table A-5 shows the K-F estimates of marginal effective tax rates for what is referred to as the "fixed-p" case, where all investment projects earn the same pre-tax rate of return (10 per cent in these calculations). It also indicates the results from other studies which use the same methodology (5). In all countries marginal effective tax rates vary considerably according to the type of asset, the industry in which it is used, the type of financing, and the source of funds. In most cases, machinery is favoured over buildings and inventories, while debt is more attractive than other methods of

financing. Clearly, borrowing from tax-exempt institutions is favoured relative to households and insurance companies, with the exception of Germany and Canada. No uniformity with respect to industry emerges. The influence of inflation on the effective rates of taxation depends on the prevailing mix of financing methods. Inflation lowers the effective tax rate on debt-financed investment (outside Sweden), while raising it on other forms of finance, except for new share issues in the United Kingdom. The impact of inflation on asset types and industries clearly varies.

Variable tax rates such as those depicted in Table A-5 inevitably favour some investments over others. Because investment incentives tend to favour equipment, machinery usually faces low tax rates, even with inflation, thus encouraging machinery-intensive production. Structures do not benefit as much from such incentives, so investment in buildings tends to be discouraged by the interaction of the tax system and inflation. However, this problem is mitigated by the fact that structures are more likely to be financed by debt. Inflation is not therefore as unfavourable to construction as might be suggested by a comparison that did not recognise the differences in financing methods. (This can be seen in the figures for Germany and Japan, where debt financing is important and where buildings are favoured over machinery at high inflation rates.)

## 5. General equilibrium tax models

Although taxation can be an important short-run factor in stabilization policies, it is fundamentally a long-run policy problem. Indeed, the general equilibrium effects of taxes, which can take time to be fully worked out, are not likely to be the same as the short run consequences. There are two main reasons for this. First, depending upon the relative elasticities of supply and demand of the taxed goods and factors, some or all of the taxes will be shifted forward or backward. This has obvious implications for the ultimate incidence of taxes, since there is no necessary one-to-one correspondence between the original collection point and the final bearer of the tax. Second, long-run responses to changes in relative prices and incomes are larger than their short run counterparts. As a consequence, where a short-run tax-induced welfare loss may be negligible, the greater long-run response will result in a correspondingly larger ultimate efficiency cost. It is therefore preferable that tax policy be analyzed in a general equilibrium framework.

From this perspective, it is useful to highlight the principal developments in applied general equilibrium analysis which have influenced the views of economists on the effects of taxes, particularly their costs. The objective here is not to survey the now extensive literature on general equilibrium modelling. The interested reader may refer to Shoven and Whalley (1984) and Borges (1986) for authoritative introductions to and overviews of the topic.

An applied general equilibrium model (A.G.E.) is based on the Walrasian principle of exhaustion of all excess demands in a market economy, and is used to trace and measure the long-run responses of producers and consumers to initial shocks to the "stylized" economy. Producers, of which there may be few or many depending upon the vintage of the model and its objective, maximize profits subject to a pre-specified production technology and initial supplies and prices of factors and outputs. Utility-maximizing households, of

which there may also be few or many, provide labour and capital, with which they are initially endowed to varying degrees. Capital and labour are typically assumed to be perfectly mobile and homogeneous. In the specific case of an A.G.E. tax model, ad valorem taxes are imposed on incomes, factors, and outputs and therefore affect the optimization processes of households and producers. A general equilibrium is attained at the price-quantity combinations for goods and factors at which supplies equal demands. There are no excess profits in the typical A.G.E. tax model, and all resources are fully employed at equilibrium [see Fullerton, Henderson, and Shoven (1985)].

The origins of A.G.E. tax models are found in the work of Harberger (1962, 1966), whose interest in the general equilibrium analysis of taxation stimulated extensive subsequent research. This early model was based on a set of differential equations, enabling the solution of new equilibria following small changes from an initial starting point. Harberger's model distinguished between two sectors in the economy, namely corporate and noncorporate, with an industry assigned to one or the other depending upon whether it was taxed "lightly" (noncorporate) or "heavily" (corporate). The economy's demand side was composed of a single consumer. Elimination of the corporate income tax, with the lost revenues made up by lump-sum taxes (admittedly an unrealistic alternative), was estimated to yield welfare gains between 0.3 and 0.6 per cent of GNP, or between 6 and 15 per cent of the revenue raised by the corporate tax.

The development of solution algorithms [Scarf (1984)], along with the advent of larger and faster computers, has enabled researchers to correspondingly broaden the scope of their models in three directions. First, the ability to solve larger models brought with it the opportunity for greater detail and disaggregation of the economy. Second, since the cost of computing solutions has been greatly reduced, some models have incorporated a dynamic dimension whereby multiple equilibria are computed, tracing paths through time. Third, the computational approach, as distinct from the analytical method used by Harberger and others, made possible the simulation of many alternative tax structures. This is in contast to the small changes to unrealistic lump-sum replacement taxes typically considered before. These developments have substantially improved the quality of the results and therefore the usefulness of such methods.

The degree to which an A.G.E. model disaggregates the economy (in terms of number of different producers and consumers) can have a marked influence on the estimated effects of taxation. The importance of disaggregation has an intuitive basis. Where a tax system purposefully or inadvertently provides incentives, which vary across industries and sectors, distortions that are not captured by an aggregated model are picked up by a disaggregated analysis. Moreover, since the tax burdens depend on the degree of capital intensity of an industry, the price elasticity of demand for its output, and the degree of factor substitutability, in addition to its tax rate, disaggregation is all the more important. Whereas Harberger's model identified only two sectors, more recent models generally have at least four industrial groups [Keller (1980) and Slemrod (1980, 1983)], and as many as 33 [Piggott and Whalley (1982)]. Disaggregation of households is potentially important in terms of a number of variables, including income, age, occupation, family composition, and work status. The degree to which households are distinguished according to income obviously affects a model's results regarding the distributional

impact of taxes. Thus, while Harberger allowed for only one income group, most newer A.G.E. tax models allow for between 9 and 12 income groups, with the Piggott and Whalley model (1982) distinguishing between 100 groups partitioned by income and occupation.

The quantitative importance of disaggregation of the production side of the economy is vividly illustrated by Fullerton, Henderson, and Shoven (1984). Using the A.G.E. tax model generally referred to as the Fullerton-Shoven-Whalley model (FSW) (6) they calculate the efficiency gains from a removal of the differential tax rates on industry in the United States under alternative levels of aggregation. The levelling of the tax rates is achieved in this simulation by eliminating the corporate income tax, and assigning the corporate profits to taxation at the personal level. The results of these simulations are shown in Table A-6. As can be seen, disaggregation from 2 sectors to 19 increases the estimated welfare gains from this type of "reform" by about 57 per cent. The extent to which further disaggregation would enlarge the estimates depends upon the degree of variability in the impact of tax preferences.

Similar simulations are not available for the specific effects of household disaggregation, although, as noted above, most recent A.G.E. models identify several distinct subgroups of the population, usually in terms of income. The importance of such disaggregation is clear, however, for at least four reasons. First, to the extent that the relative importances of categories of consumption varies with income, measurement of the "demand effect" of taxes requires distinguishing between income classes. Second, since the capital to labour income ratio increases with total income, the general equilibrium analysis of taxes requires that such variation be taken explicitly into account, particularly when considering the incidence of taxation. Third, portfolio composition differs greatly across income groups and, to the extent that tax systems discriminate between many types of assets (owner-occupied housing, equity, debt, etc.), this too warrants disaggregation. Lastly, the fact that marginal and average tax rates generally increase with income makes the calculation of welfare losses from taxation sensitive to the degree to which such progressivity is reflected in the model (7).

Typically, A.G.E. models focus on the static equilibrium of a given combination of parameters and variables, even though the time required to reach equilibrium may in fact be quite long. Dynamic elements are generally not incorporated. Indeed, general equilibrium analysis is inherently not well suited to handle dynamic aspects of economic processes, as these involve intervening stages of disequilibrium, at which by definition there are excess demands in the economy [see Borges (1986)]. Nevertheless, the intertemporal effects of taxes, particularly those which affect the rate of saving, can have an important impact on the ultimate welfare gains from tax reform. Thus, some models (particularly those using the F-S-W model) incorporate a "dynamic" element by linking sequenced equilibria via changes in (endogenously determined) saving which, in turn, alter the capital stock (8). This can have a large effect on the estimated welfare gains of a tax change which alters an economy's rate of saving. This is brought out in Table A-6 where the estimated "dynamic" welfare gains from the simulated integration of corporate and personal taxes in the United States are almost 5 times greater than the estimated static ones.

A final notable advance of A.G.E. tax models, one which is less important in terms of its impact on the size of estimates than on their usefulness, is the greater ability to model practical alternatives to existing distortionary taxes. Thus, rather than measure the welfare costs of taxes based on lump-sum alternatives, modellers have considered corporate and personal integration [Ballard et al. (1985), Slemrod (1983), Piggott and Whalley (1982)], the introduction of a value added tax [Fullerton, Shoven and Whalley (1983), Serra-Puche (1984), Borges (1986)], and a complete switch to a consumption tax [Ballard et al. (1985), Auerbach and Kotlikoff (1983)], as well as a variety of specific changes to personal and company income taxation. As an illustration, Table A-7 shows the variety of results obtained by Ballard et al. (1985) for alternative reforms aimed at integrating personal and corporate income taxes in the United States.

One of the advantages of recent A.G.E. tax models is their greater sensitivity to the underlying parameters assumed to characterize the economy. A particularly important parameter, about which there is considerable uncertainty, as indicated in subsection 3 above, is the elasticity of saving with respect to the after tax rate of interest. While Feldstein (1978) showed that the welfare cost of capital taxation is linearly related to the compensated elasticity of demand for future consumption with respect to the price of future consumption, this linearity does not hold in a highly disaggregated general equilibrium model. Thus, while the newer models suggest higher welfare costs of taxation, these estimates are also highly sensitive to their chosen parameters.

To demonstrate this, Fullerton and Lyon (1986) simulated several alternative revenue-neutral tax reform plans using the A.G.E. model of Ballard et al. (1985), calculating the welfare gains associated with each as the elasticity of saving changes. The four plans the investigators considered are: i) taxation of implicit rental income from owner-occupied housing; ii) indexation of capital gains; iii) integration of personal and corporate income taxes; (iv) indexation and integration. The results of the simulations are shown in Chart A-1. The welfare gains from taxing implicit rental incomes, which arise from a reduction in the dispersion of tax rates on capital income, decrease as the elasticity of saving rises, reflecting the importance of the capital taxation distortion. The welfare gains of all other plans are positively related to the elasticity, but their ranking depends critically on the degree of sensitivity of savings to changes in after tax returns to capital. Thus, for low values of the elasticity, taxation of the implicit rental income from owner occupied housing dominates all other plans, while for values around 0.20 there is great uncertainty. Pending greater precision in the estimates of the elasticity of saving with respect to the after-tax interest rate, the superiority of one type of tax reform over another with respect to efficiency will remain uncertain.

This last point highlights the need to place the developments in applied general equilibrium analysis in perspective. Such analysis has substantially advanced the state of knowledge about the potentially large and subtle effects of complex tax systems. It has also provided a theoretical framework for understanding and measuring the effects of alternative tax structures. At the same time, however, general equilibrium models have several limitations for the analysis of tax policy [see Borges (1986)].

First, the results generated by these models are not empirically verifiable; the simulations have no real world counterparts against which to make an assessment. Second, as already mentioned, such models do not yet incorporate true dynamic elements which would track disequilibria as well as equilibria. Third, they examine long-run problems, while many policy questions are of short- and medium-term concern. Finally, it needs to be noted that most tax models tend to be for closed economies. In the present context of increasing international integration of capital markets, it would be misleading to conclude that investment will necessarily be significantly reduced by a tax on the return to domestic savings that was not also levied on income earned by foreign owned capital. While investment from abroad could serve to sustain GDP, it will not have as much effect on GNP (i.e. the income that accrues to domestic residents). The welfare losses suggested by these models may thus be overstated, but their basis -- the inability of domestic residents to make inter-temporal transfers at rates that are economically feasible -- is not affected by extending the analysis to an open economy situation (9).

## NOTES TO ANNEX A

1. Of great importance to the empirical study of labour supply were the several "negative-income-tax" (NIT) surveys in the United States, designed to test "scientifically" the effects of taxes and transfers on low income households' behaviour.

2. The effect of very large changes in after-tax income on the participation of married women may be over-stated by calculations based on estimated labour supply functions, if the availability of child care facilities affects the participation decision differently outside the sample from the way it affected behaviour over the available observations.

3. Sandmo (1985) has pointed out, however, that the negative substitution effect depends critically on the assumption that leisure is fixed (if leisure, labour supply and lifetime income are all fixed, current and future income must be substitutes). When allowance is made for the possibility that leisure (and hence lifetime income) is variable, current and future consumption may be complements. Whether in this case the substitution effect is negative or not then depends upon the effect of changes in the rate of interest on an individual's demand for leisure.

4. Where applicable, wealth taxes also affect this expression.

5. These investigations also compute tax wedges under alternative assumptions that the market interest rate is fixed rather than the overall rate of return. For a discussion of the differences between these two approaches, see K-F, Chapter 2.

6. This model is described at length in Ballard et al. (1985).

7. In principle labour and savings elasticities could vary with income. However, none of the models allow for this.

8. Some other models make an unrealistic assumption of an instantaneous adjustment of the capital stock.

9. Borges (1986) notes two other limitations, but these may be less important for the analysis of tax problems.

Table A-1

ESTIMATED ELASTICITIES OF LABOUR SUPPLY FOR MEN IN FIRST-GENERATION STUDIES(a)

| Study | Wage Elasticities | | Total income elasticity |
|---|---|---|---|
| | Uncompensated | Compensated | |
| Ashenfelter and Heckman (1973) | -0.15 | 0.12 | -0.27 |
| Atrostic (1982) | -0.05 to 0.34 | -0.11 to 1.26 | -1.01 to 0.06 |
| Boskin (1973) | -0.20 to -0.29 | 0.00 to 0.12 | -0.41 to -0.20 |
| Fleishen, Parsons and Porter | -0.19 to -0.27 | -0.19 to 0.04 | -0.23 to -0.08 |
| Garfinkel | 0 | 0 | 0 |
| Greenberg and Kosters (1973) | -0.09 | 0.20 | -0.29 |
| Hall (1973) | -0.18 to -0.45 | -0.10 to 0.06 | -0.12 to -0.51 |
| Hill (1973) | -0.08 to -0.34 | 0.27 to 0.56 | -0.35 to -0.88 |
| Kniesner (1976) | -0.06 to -0.17 | -0.16 | -0.01 |
| Wales and Woodland (1976) | -0.11 to -0.12 | n.a. | <0 |
| Wales and Woodland (1977) | -0.07 to 0.00 | n.a. | n.a. |
| Masters and Garfinkel (1977) | 0.04 | 0.08 | -0.04 |
| Rosen (1978) | -0.02 to -0.42 | 0.14 to 1.00 | -0.55 to -1.02 |
| Brown, Levin and Ulph (1976, 1981) | -0.09 to -0.31 | 0.16 to 0.47 | -0.30 to -0.73 |
| Layard (1978) | -0.12 to -0.13 | -0.08 to -0.09 | -0.03 to -0.05 |
| Atkinson and Stern (1980) | -0.15 to -0.16 | -0.09 to -0.21 | -0.07 to -0.06 |
| Atkinson and Stern (1981) | -0.15 to -0.23 | -0.16 to -0.30 | 0.01 to 0.08 |
| Ashworth and Ulph (1981b) | -0.03 to -1.00 | 0.47 to 2.17 | -1.47 to -2.21 |
| Glaister, McGlone and Ruffell (1981) | -0.02 | -0.06 | 0.04 |
| Gayer (1977) | -0.45 | -0.27 | -0.18 |

Source: Killingsworth (1983).

a) Greater detail is provided in tables of original source.

Table A-2

ESTIMATED ELASTICITIES OF LABOUR SUPPLY FOR WOMEN IN FIRST-GENERATION STUDIES(a)

| Study | Wage Elasticities | | Total income elasticity |
|---|---|---|---|
| | Uncompensated | Compensated | |
| Boskin (1973) | 0.19 to 0.70 | 0.29 to 0.77 | -0.07 to -0.10 |
| Hall (1973) | 1.66 to 4.60 | 0.26 to 2.50 | 1.40 to 2.10 |
| Gramm (1974, 1975) | 0.68 to 0.85 | 0.68 to 0.85 | 0 |
| Wales and Woodland (1976) | -0.02 to 0.01 | n.a. | <0 |
| Wales and Woodland (1977) | -0.35 to 0.27 | n.a. | n.a. |
| Masters and Garfinkel (1977) | 0.43 | 0.49 | -0.06 |
| Rosen (1976) | 1.30 to 1.90 | n.a. | n.a. |
| Rosen (1978) | -0.16 to 1.06 | 0.26 to 1.53 | -0.42 to -0.47 |
| Leuthold (1978) | 0.05 to 0.16 | 0.09 to 0.18 | n.a. |
| Layard (1978) | 0.66 | 0.84 | -0.19 |
| Greenhalgh (1980) | 0.64 to 0.72 | 0.72 to 0.80 | -0.08 |
| Ashworth and Ulph (1981b) | -4.46 to -1.18 | -5.02 to -1.14 | 0.04 to 0.56 |
| Glaister, McGlone and Ruffell (1981) | 0.09 | 0.09 | 0.00 |
| Gayer (1977) | -0.50 | -0.27 | -0.23 |

Source: Killingsworth (1983).

a) Greater detail is provided in tables of original source.

Table A-3

ESTIMATED ELASTICITIES OF LABOUR SUPPLY FOR MEN IN SECOND GENERATION STUDIES(a)

| Study | Wage Elasticities | | Total income elasticity |
|---|---|---|---|
| | Uncompensated | Compensated | |
| Hausman and Wise (1976) | 0.14 | n.a. | -0.02 |
| Hausman and Wise (1977) | 0.09 | 0.11 | |
| Ham (1982) | -0.14 to -0.16 | -0.05 to -0.08 | -0.08 |
| Ransom (1982) | -0.03 to 0.05 | 0.08 to 0.24 | -0.05 to -0.21 |
| Wales(1978) | -0.20 | n.a. | -0.12 |
| Burtless and Hausman (1978) | 0.00 | n.a. | -0.05 |
| Wales and Woodland (1979) | 0.06 to 0.84 | 0.77 to 0.84 | -0.70 |
| Hausman (1981) | 0.00 to 0.03 | 0.95 to 1.00 | -0.95 to -1.03 |
| Blundell and Walker (1982) | -0.23 | 0.13 | -0.36 |
| Ashworth and Ulph (1981a) | 0.00 to -0.38 | 0.19 to 0.50 | -0.36 to -0.62 |
| Ruffell (1981) | -0.05 to -0.07 | 0.03 to 0.09 | -0.08 to -0.16 |

Source: Killingsworth (1983).

a) Greater detail is provided in tables of original source.

Table A-4

ESTIMATED ELASTICITIES OF LABOUR SUPPLY FOR WOMEN IN SECOND GENERATION STUDIES(a)

| Study | Wage Elasticities | | Total income elasticity |
|---|---|---|---|
| | Uncompensated | Compensated | |
| Heckman (1976) | 1.46 to 4.31 | 1.48 to 4.35 | -0.02 to -0.04 |
| Cogan (1980a) | 1.14 to 3.50 | 1.17 to 3.60 | -0.03 to -0.10 |
| Schultz (1980) | 0.16 to 1.04 | 0.19 to 0.83 | -0.05 to 0.48 |
| Trussell and Abowd (1980) | 2.93 to 4.50 | n.a. | -0.41 to 0.00 |
| Heckman (1980) | 1.47 to 14.79 | 1.47 to 14.79 | 0 |
| Hanoch (1980) | 0.42 to 0.64 | 0.54 to 0.81 | -0.13 to -0.17 |
| Cogan (1980b) | 0.89 to 2.45 | 0.93 to 2.64 | -0.05 to -0.19 |
| Cogan (1981) | 0.65 to 2.10 | 0.68 to 2.18 | -0.03 to -0.08 |
| Nakamura and Nakamura (1981) | -0.05 to -0.31 | -0.12 to 0.23 | -0.05 to -0.50 |
| Dooley (1982) | -0.89 to 15.24 | -1.06 to 15.35 | -0.48 to 0.18 |
| Ransom (1982) | 0.40 to 0.42 | 0.46 to 0.50 | -0.05 to -0.09 |
| Hausmann (1980) | 0.05 | 0.16 | -0.11 |
| Hausmann (1981) | 0.46 to 1.00 | 0.44 to 0.77 | -0.12 to -0.47 |
| Layard, Barton and Zabalza (1980) | 0.06 to 0.78 | 0.06 to 0.97 | -0.01 to -0.19 |
| Blundell and Walker (1982) | -0.30 to 0.43 | -0.11 to 0.83 | -0.19 to -0.22 |
| Zabalza (1983) | 1.59 | 1.82 | -0.23 |
| Ashworth and Ulph (1981a) | -0.21 to 0.63 | 0.26 to 0.84 | -0.09 to -0.48 |
| Ruffell (1981) | 0.00 to 0.72 | 0.04 to 0.77 | -0.04 to -0.08 |
| Franz and Kawasaki (1981) | 1.08 | 1.28 | -0.20 |
| Franz (1981) | 1.37 | 1.66 | -0.29 |

Source: Killingsworth (1983).

a) Greater detail is provided in tables of original source.

Table A-5

EFFECTIVE MARGINAL TAX RATES ON CAPITAL
IN 1980

| | United Kingdom | | Sweden | | Germany | | United States | | Canada | | Japan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inflation: | 0 | 10% | 0 | 10% | 0 | 10% | 0 | 10% | 0 | 10% | 0 | 10% |
| ASSET | | | | | | | | | | | | |
| Machinery | -24.2 | -33.3 | -18.1 | 1.5 | 38.1 | 46.6 | 3.9 | 22.8 | 8.4 | 11.8 | 25.1 | 7.4 |
| Buildings | 41.5 | 41.0 | 28.9 | 37.3 | 42.7 | 31.2 | 35.4 | 41.8 | 41.3 | 44.8 | 25.8 | 1.7 |
| Inventories | 50.5 | 42.7 | 26.5 | 71.0 | 57.7 | 60.8 | 50.9 | 45.5 | 35.1 | 56.5 | 35.8 | 4.1 |
| INDUSTRY | | | | | | | | | | | | |
| Manufacturing | -1.7 | -6.9 | 8.1 | 28.3 | 44.7 | 46.8 | 44.2 | 55.0 | 20.7 | 27.6 | 29.3 | 10.6 |
| Other industry | 4.6 | -2.3 | 29.6 | 62.6 | 50.8 | 57.9 | 10.0 | 15.8 | 32.2 | 38.2 | 24.4 | -8.6 |
| Commerce | 46.8 | 39.5 | 12.1 | 40.7 | 44.6 | 36.6 | 37.9 | 37.5 | 28.8 | 39.5 | 32.9 | 7.5 |
| SOURCE OF FINANCE | | | | | | | | | | | | |
| Debt | -29.6 | -81.7 | -12.9 | 6.4 | 12.1 | -33.3 | -2.0 | -22.2 | 11.7 | 4.8 | 1.0 | -68.0 |
| New share issues | 7.6 | -0.9 | 44.2 | 93.2 | 56.1 | 65.7 | 61.0 | 104.6 | 35.3 | 57.0 | 54.1 | 76.3 |
| Retained earnings | 23.5 | 29.3 | 40.9 | 69.5 | 72.0 | 111.5 | 48.4 | 66.5 | 36.0 | 52.5 | 52.4 | 66.1 |
| OWNER | | | | | | | | | | | | |
| Households | 26.6 | 38.3 | 57.1 | 108.0 | 59.7 | 82.0 | 44.1 | 61.9 | 31.0 | 44.0 | 28.4 | 3.0 |
| Tax-exempt institutions | -5.1 | -33.5 | -39.2 | -52.8 | 17.6 | -17.9 | 4.0 | -37.2 | 4.8 | -10.6 | 27.4 | 3.8 |
| Insurance companies | 8.7 | -2.1 | -16.0 | 22.0 | 14.6 | -38.9 | 4.0 | 44.3 | -18.3 | -65.4 | 30.8 | 13.1 |
| OVERALL | 12.6 | 6.6 | 12.9 | 37.0 | 45.1 | 46.1 | 32.0 | 38.4 | 26.3 | 33.9 | 28.7 | 38.4 |

Source: King and Fullerton (1984) for the United Kingdom, Sweden, Germany and the United States; Daly et al. (1985) for Canada; and Kikutani and Tachibanaki (1986) for Japan.

Table A-6

EFFECTS OF DISAGGREGATION ON ESTIMATES OF WELFARE COSTS OF TAXES IN GENERAL EQUILIBRIUM MODELS(a)

| Number of sectors | Estimated efficiency gain from integration (per cent of income) | |
|---|---|---|
| | Static(b) | Dynamic(c) |
| 2 | .05 | .441 |
| 5 | .02 | .503 |
| 19 | .14 | .691 |

Source: Fullerton, Henderson and Shoven (1984).

a) Results shown in the table come from simulations of the Fullerton, Shoven and Whalley model (1978).

b) The static gain represents the additional consumption and leisure, as a per cent of the pre-reform income, due to the tax change.

c) The dynamic welfare gain refers to the present value of additional consumption and leisure achievable with tax reform as a per cent of the no reform case.

Table A-7

DYNAMIC WELFARE EFFECTS OF TAX REFORMS(a)
IN THE UNITED STATES

| Reform | Tax replacement | | | |
|---|---|---|---|---|
| | Lump-sum scaling(a) | Multiplicative scaling(c) | Additive scaling(d) | VAT scaling(e) |
| Full integration with indexing | 1.394 | 0.623 | 0.839 | 1.122 |
| Full integration without indexing | 0.950 | 0.578 | 0.681 | 0.819 |
| Dividend deduction from corporate income tax | 0.521 | 0.115 | 0.230 | 0.378 |
| Dividend deduction from corporate income tax, with extreme behaviour assumption | 0.989 | 0.593 | 0.704 | 0.850 |
| Dividend deduction from personal income tax | 0.529 | 0.417 | 0.446 | 0.478 |
| Dividend deduction from personal income tax with extreme behaviour assumption | 0.633 | 0.475 | 0.515 | 0.575 |
| Dividend gross-up | 0.359 | 0.258 | 0.285 | 0.323 |

Source: Ballard et al. (1985), Chapter 8.

a) The welfare gains refer to the present value of additional consumption and leisure achievable with the tax reform as a per cent of the no reform case.

b) Each consumer group's tax liability is increased by a fixed amount.

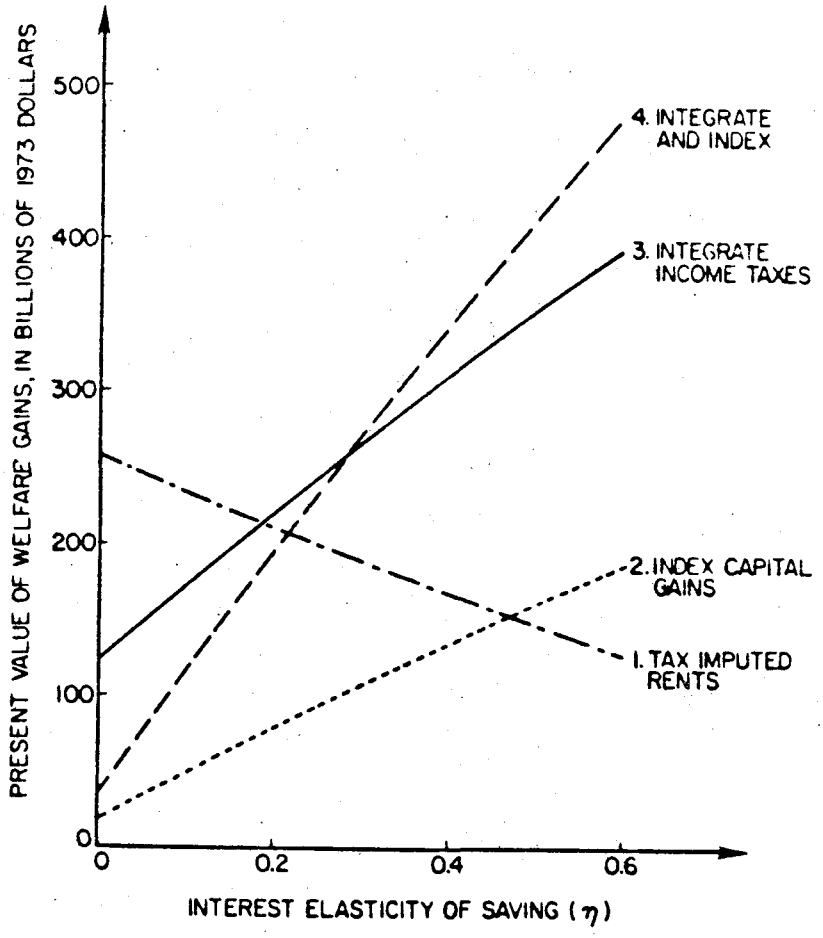
c) Marginal personal income tax rates are increased by a multiplicative scaler.

d) Marginal personal income tax rates are increased by an additive factor.

e) Consumer sales taxes are increased.

Chart A-1

WELFARE GAINS FROM FOUR TAX REFORMS
AS FUNCTIONS OF THE SAVING ELASTICITY




Source: Fullerton and Lyon (1986).

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## ANNEX B

## TAX SYSTEMS AND TAX REFORM IN OECD COUNTRIES

This Annex provides a brief description of the tax systems of Member countries, together with a short summary of recent and proposed changes to them. It focuses on personal and corporate income taxation, social security contributions (without distinguishing between health, pensions, etc.) and taxes on goods and services. Taxes on capital and other taxes are mentioned where relevant (1).

### UNITED STATES

Total taxes amounted to 29.0 per cent of GDP in 1984 (2). Personal tax represented 35.3 per cent of tax revenues, social security contributions accounted for 29.1 per cent, direct taxes on business contributed 7.1 per cent while taxes on goods and services were 18.2 per cent of the total. Capital and other taxes were 10.3 per cent of the total. The last two categories were of much greater importance for state and local governments, which collected 27 per cent of total taxes.

1. The federal income tax system

a) The system prior to the reform

Until 1987 personal income taxes at the federal level were levied at rates ranging up to 50 per cent across fourteen brackets, which were adjusted annually for inflation. The system generally taxed married couples as a unit. Gross income subject to tax included labour income, capital income as measured (except for interest from state and local bonds and 60 per cent of long-term nominal capital gains), and alimony. Most fringe benefits, implicit rental income on owner-occupied housing, and social security payments (for taxpayers below a threshold level) were excluded from income. Taxable income was then calculated as net of either the standard or itemized deductions, whichever was greater. Deductions included mortgage and consumer interest, all taxes paid to lower levels of government, charitable donations and medical expenditures above a threshold. In addition, as an encouragement to save, contributions to qualified retirement accounts were deductible.

Corporate income taxes were levied at a top rate of 46 per cent on corporate income. There was no integration with personal taxation. Most assets could be depreciated over periods ranging from 3 years to 19 years but the availability of accelerated depreciation was sharply increased after 1981. An investment tax credit of 6 to 10 per cent applied for equipment but not for structures (except for a "rehabilitation" tax credit). There was no indexation for price increases for computation of capital gains or depreciation, but LIFO (last in-first out) accounting was allowed for inventories. Some industries (petroleum drilling, forestry, commercial real estate) had special tax preferences and effective tax rates varied widely across industries.

b) The 1986 tax reform package

The primary aims of the Tax Reform Act of 1986 (TRA) were to broaden the tax base, reduce the level and number of personal marginal tax rates, eliminate variable marginal effective tax rates across sources of capital income, and reduce the statutory corporate tax rate. One result of the TRA was a shift in the tax burden from the personal to the corporate sector, of approximately $120 billion over 5 years, to allow additional cuts in personal tax rates.

The new personal tax schedule will apply fully from 1988. There will be three rates and four brackets: the marginal rate is 15 per cent over the first bracket, then 28 per cent over the second. In the third bracket (for upper middle incomes) a rate of 33 per cent applies as the personal exemption and the 15 per cent tax bracket are phased out, and for all higher incomes 28 per cent is both the marginal and average rate. Unemployment benefits and all realized long-term capital gains will be included in taxable income (the maximum rate on realised long-term capital gains increases to 28 or 33 per cent from 20 per cent). There are now further limitations on contributions to retirement accounts and the two-earner deduction will be eliminated. Various other tax deductions (including local and state sales taxes and interest on consumer loans) and credits are eliminated and the ability to shelter income is significantly less, as the rules for passive investors have been tightened and allowable interest expenses reduced. However, many deductions will be retained: for example, mortage interest on first and second homes, state and local income taxes, and property taxes. For those not itemizing, the standard deduction is substantially increased as is the personal exemption for lower income taxpayers. As a result 4.3 million families will cease to pay tax.

The major changes in the corporate tax structure are: first, a reduction in the top corporate tax rate to 34 per cent; second, the repeal of the investment tax credit and the lengthening of depreciation schedules for many assets; third, a strengthening of the minimum tax to ensure that remaining tax preferences do not eliminate tax liability. The effect of all the changes to the corporate income tax is to raise the average capital tax burden and cost of capital. Adjustment to provisions allowing firms to depreciate second-hand assets and changes to capital gains taxation remove much of the incentive for corporate mergers.

2. Other features of the U.S. tax system

Forty states and the District of Columbia tax personal income as well: in some states, simply as a fraction of the federal tax liability, while in others in more complicated ways. The state and local rates are much lower but more progressive across narrower, and for the most part, unindexed brackets. A working assumption is that a weighted average marginal state tax rate is about 5 per cent. The changes to federal income tax will have widely varied effects on state tax revenues (ranging from an 11 per cent reduction to a 22 per cent increase), but increase them for most states. The states also have their own corporate taxes.

Social security taxes are imposed on the earnings of most workers up to an indexed ceiling at a total rate (1987) of 14.3 per cent divided evenly between both workers and employers. There are also contributions for

unemployment insurance (6.2 per cent of earnings up to a low ceiling) and for workers' compensation insurance.

Taxes on goods and services are relatively unimportant in the economy-wide context. Excise taxes (on, for example, gasoline, alcohol and tobacco) are collected by federal and state governments. 45 states and the District of Columbia also collect retail sales taxes at rates from 4 1/4 to 8 1/4 per cent. Property taxes are quite important.

## JAPAN

In 1984 total tax revenues were 27.4 per cent of GDP, of which 24.5 per cent came from personal income tax, 21.1 per cent from corporate income tax, 29.7 from social security contributions 15.1 per cent from taxes on goods and services, and 9.7 per cent from other taxes (mainly on capital). In 1984, local governments collected 26.0 per cent.

### 1. The present tax system

Personal income tax is levied by the central government at rates ranging up to 70 per cent and by local governments (individual inhabitants tax) at rates ranging up to 18.0 per cent. The maximum effective marginal tax rate for all taxes combined is 88 per cent (85 per cent on wage income because of an income-related deduction for employment expenses). The income base is very similar for each tax and includes most labour income and fringe benefits, life insurance payments, public and private pensions (but only above a rather high ceiling), strike pay, foreign income and some capital income. Exempt income includes: employer's contribution to private pension schemes; implicit income from owner-occupied dwellings; social security benefits except for pensions above a limit; capital gains on securities and one half of other capital gains; alimony and maintenance receipts. About 60 per cent of interest income is exempt (interest on investments in bank accounts, Post Office saving accounts and government bonds, up to a ceiling in each category). Allowable deductions from income (some of them limited) include: spousal and dependant allowances; social security contributions; life and casualty insurance premiums; contributions to private pension funds; and medical expenses; charitable donations; and work-related expenses. There are special allowances for certain types of income (lump-sum retirement benefits, a limited amount of net capital gains and public pensions) and for certain categories of disadvantaged persons. There are tax credits for some housing loans, but only for the first 3 years and subject to both an upper limit and an income test, and for 10 per cent of dividend receipts (5 per cent for high income earners).

Corporate tax is levied at both the national and local level. The national tax has a standard rate of 43.3 per cent, although there are preferential rates for distributed income (33.3 per cent, which, together with the dividend tax credit and the non-taxation of capital gains on securities provides some integration of the personal and corporate tax) and for small companies. Local company taxes include an enterprise tax, deductible from the national corporate tax base, and inhabitants tax, calculated as a percentage of national corporate tax. The rates vary but a normal combined rate is about 55 per cent for undistributed income of a large company. No inflation

adjustment is allowed in calculating income (although there is an option to use LIFO valuation of inventories). There are no general investment incentives, although there are specific incentives for energy saving and computer systems for small firms.

Social security taxes are collected from both employers and employees on wage income (excluding bonuses) at a combined rate of around 23 per cent for men (slightly lower for women, but higher for industries with higher accident rates) up to nearly twice the average wage and at a lower rate up to almost three times the average. There are no general consumption taxes, but a wide range of taxes on goods and services at both the national and local levels (including fuel, liquor, commodities, tobacco, travel, electricity) and a range of other indirect taxes (including those on financial transactions). Property taxes are an important part of the tax on capital.

2. Proposed changes

A wide-ranging tax reform package was presented in 1986 and is currently under consideration by a special Parliamentary Committee. It was revenue neutral, proposing to cut personal tax rates by base broadening and a shift to indirect tax. The personal income tax schedule would be changed over 2 years to 6 brackets (10-50 per cent) and the local individual income tax to 4 brackets (5-15 per cent). The top effective combined marginal tax rate would be reduced to 65 per cent (about 62 per cent on wage income). Most middle income earners would pay combined rates of 15 to 20 per cent. The spousal allowance would be increased, subject to an income limit. Base broadening would be achieved by restricting access to the tax exempt savings system to low income earners, and taxing interest at a combined rate of 20 per cent (separate from other income). The reform would also lower the national corporate tax rate from about 43.3 per cent to 37.5 per cent over three years, and phase out the preferential rate for distributed income.

The intention was to introduce a VAT-type tax at around 5 per cent from 1988 to replace existing indirect taxes and to finance part of the cut in personal taxes. However, this proved very unpopular. The Parliamentary Committee is currently studying how the revenue shortfall can be made up. There is a presumption that some alternative changes to indirect taxation will be proposed. It is expected that personal taxes will be cut as planned (by over Yen 1 trillion in the current fiscal year, and nearly Yen 3 trillion in a full year) as part of the government's recently announced fiscal stimulus.

## GERMANY

Total 1985 tax revenues for the general government (38.0 per cent of GDP) came 28.6 per cent from personal direct taxes, 36.7 from employee and employer social security contributions, 6.0 per cent from direct taxes on business income and 25.6 per cent from taxes on goods and services (3). The Länder and local governments receive specified shares of the different types of taxes, which amounted to 30.5 per cent of total tax revenues in 1984.

1. The present tax system

The personal income tax is collected at rates that rise to 56 per cent. The tax base includes most income from labour and capital (but not capital gains, except when the holding period is less than a year). It excludes many transfers (including pensions) and the implicit income from owner-occupied housing. However, deductions for mortgage interest are limited to the first three years and apply only to new construction. There is an income-related basic deduction (which includes an allowance for social security contributions). There are also deductions for charitable donations and a tax credit to prevent double taxation of dividend income. The system is de facto a joint filing system -- the couple is the normal tax unit.

The standard corporate tax rate on undistributed profits is 56 per cent. A lower rate is applied to distributed profits, which, in conjunction with the tax credit on dividends and the non-taxation of long-term capital gains, ensures integration of the personal and corporate tax systems. Depreciation is based on historic cost and is on a straight-line basis or a declining balance (only for movable assets). There is a variety of tax incentives for investment (particularly in Berlin and some border regions), which interact with an extensive system of subsidies. There is also a second tax on business income levied by municipalities at rates between 9 and 20 per cent. This is deductible from the corporate tax base, so the effective total tax on undistributed profits (for a 15 per cent municipal tax rate) would be over 61 per cent.

Social security taxes are levied on employers and employees at a combined rate of 35 per cent (plus accident insurance) on wage income (coverage for farmers and other independent workers is somewhat different, as it is for civil servants), up to approximately twice the average worker's salary. The most important form of tax on goods and services is the value-added tax for which the standard rate is 14 per cent while the preferential rate applying, in particular, to food is 7 per cent. There are, however, significant other indirect taxes (specific taxes on alcohol, tobacco and gasoline, etc.)

2. Recent changes

The tax reform adopted in 1985 was not revenue neutral. It was basically limited to providing tax cuts in 1986 and 1988 that, by adjustments to the tax brackets, had the approximate effect of offsetting the inflationary fiscal drag since the previous tax change in 1981. It also created an additional tax allowance for taxpayers with dependent children.

The government wishes to lower the total tax burden at the same time as it cuts expenditure (notably subsidies) to avoid increasing the deficit. It has announced plans for a revision of both personal and corporate tax systems in 1990, which would lower the corporate tax rate to 50 per cent and reduce personal tax rates, with the maximum rate falling to 53 per cent.

## FRANCE

Total taxes in France amounted to 45.6 per cent of GDP in 1985, 43.6 per cent of which came from social security contributions, 29.4 per cent

from taxes on goods and services, 12.8 per cent from personal income taxes, 4.3 per cent from direct taxes on business and 9.9 per cent from property, payroll, and other taxes.

1. The present system

Personal income taxes are levied at rates up to 58 per cent. The tax base includes wages and salaries, interest, pensions, unemployment and disability benefits, most capital gains, and some fringe benefits. The family is the basic unit for taxation ("quotient system"). The system is indexed for inflation although the procedure is not automatic. Taxes are levied against income reduced by a number of deductions, including: work-related expenses; social security contributions; some life insurance premiums; and child care expenditures. A deduction, variable by profession, is also provided for "income-earning" expenses not otherwise deductible by wage earners. It varies (as a per cent of income) for individual professions, and can in some cases be as high as 40 per cent. Tax credits include: a portion of interest on mortgages and home improvement loans, a portion of the cost of life insurance, and energy conservation expenses. A tax credit equal to 50 per cent of dividends received provides substantial, though not complete, integration of corporate and personal taxes.

The statutory corporate rate of taxation is 45 per cent for both distributed and non-distributed income. Long-term capital gains are subject to a lower rate of 15 per cent unless the profits are distributed. Assets are generally depreciated on a straight line basis, with accelerated depreciation provided only in certain instances (e.g. movable fixed assets installed in 1983-85, immovable assets used for scientific purposes, and industrial structures in economically depressed areas). There is also a 3 year exemption from corporate taxation (which can be extended for an additional two years at a reduced rate of exemption) for acquisition of firms in liquidation located in depressed areas.

Social security contributions -- among the highest in the OECD -- are paid at different rates depending on income: 58.58 per cent on wages and salaries up to about the average wage, 33.44 per cent up to about four times the average wage and 25.95 per cent thereafter. Taxes on goods and services are also an important part of France's total tax system. While the general VAT rate is set at 18.6 per cent, many goods are taxed at one of the other major rates (5.5 per cent, 7.4 per cent, or 33.3 per cent), which tend to vary positively with the degree at which a product is considered a luxury. There are also several specific rates, each of which applies to only a few products. Excise taxes at relatively high rates are imposed on a number of items, including alcohol, tobacco, and motor fuel. Taxes on capital, including those on property and on property transfers, are significant, as are payroll taxes.

2. Recent and proposed changes

In its 1987 budget programme the government introduced tax changes to slightly reduce marginal tax rates on individuals and businesses, and there are tentative plans for further reductions in 1988. The highest marginal tax rate on personal income was reduced to 58 per cent in 1987 from 65 per cent, and is scheduled to decline to 50 per cent. Moreover, the present government has eliminated the tax on large fortunes adopted in 1982, and introduced a

number of tax-induced saving incentives, such as a deduction up to a specified limit for funds placed in a retirement account for equity investment. Small increases in social security contribution rates, have, however, offset a large proportion of the personal rate reduction for low income taxpayers. The higher tax rate on distributed profits was abolished in 1987 and it is proposed to lower the the corporate tax rate to 42 per cent in 1988. Lastly, a commission has been established to study ways of reducing the variability in the tax rates on different capital assets.

## UNITED KINGDOM

Total tax revenues were 38.6 per cent of GDP in 1985 of which 26.5 per cent came from personal income tax, 12.2 per cent from corporate tax, 18.0 per cent from social security contributions, 31.1 per cent from taxes on goods and services and 12.2 per cent from other taxes (primarily on property). In 1984, the central government collected 72.0 per cent of total tax revenue.

### 1. The present system

Personal income tax is levied at rates ranging up to 60 per cent. The standard (and lowest) rate (29 per cent) covers about 95 per cent of taxpayers. The income base includes labour income (including most fringe benefits), unincorporated business income, interest, property income, pensions, annuities, unemployment benefits and alimony. Capital gains are taxed separately at a rate of 30 per cent with a sizeable annual exemption and an indexation allowance for post-March 1982 inflation. The tax unit is usually the married couple. Exempt income includes employer contributions to private pension or sickness schemes, life insurance benefits, imputed rent from owner-occupied dwellings, certain sickness benefits, family allowances, strike pay, company shares acquired under profit sharing schemes, and capital gains and reinvested dividends in "Personal Equity Plans". Deductions include allowances for single and married persons (plus a wife's earned income allowance), single parents, the aged, and bereaved widows. In addition, deductions are allowed for employment expenses, mortgage interest (for a principal private residence, and subject to a limit on the principal), interest on business loans, contributions to retirement schemes, certain equity subscriptions to new businesses and certain charitable donations. There is also a dividend tax credit (providing partial integration with the corporate tax). The system's tax brackets and allowances are indexed although this provision is occasionally overridden.

Corporate income tax is levied on corporate profits (including most real capital gains) at a rate of 35 per cent (29 per cent for small companies). Companies pay Advance Corporation Tax on distributed income which can be offset against company tax liability. No relief is given for the effect of inflation on inventories and LIFO is not permitted. There are no general investment incentives although there are specific incentives for "enterprise zones" and for scientific research and there is a system of regional investment grants. Also, the revenues arising from the exploitation of North Sea oil are subject to a special tax regime.

Social security taxes are collected on wages up to 1.6 times average earnings at rates of 10 to 19.45 per cent (of which about half is paid by

employers) and 10.45 per cent (all of which is paid by employers) for higher incomes. Of the taxes on goods and services, VAT and excise taxes raise roughly the same amount of revenue. The standard rate of VAT (15 per cent) applies to just over half the potential consumption base because of extensive zero rating (food, fuel, light, power, children's clothes, books and public transport) and exemptions (financial, insurance and postal services, owner-occupied housing and construction). The main excise taxes are on oil, tobacco, beer and spirits. Property taxes (rates) also raise substantial revenue for local authorities.

2. Recent and proposed changes

In 1979, there was a substantial shift towards indirect tax with an increase in the VAT rate from 8 to 15 per cent. This allowed a cut in the top rate of personal tax from 83 (98 for investment income) to 60 per cent, and in the basic rate from 33 to 30 per cent. The latter was reduced to 29 per cent in 1986-87 and to 27 per cent in 1987-88; the intention is to lower it to 25 per cent.

The corporate tax rate was reduced from 52 to 50 per cent in 1983. First year and initial allowances (100 per cent for machinery and plant and 75 per cent for industrial buildings) were phased out from 1984 to 1986 and stock relief (a form of inflation relief for inventories) was abolished in 1984-85. These measures allowed the government to reduce the company tax rate from 50 to 35 per cent from 1986-87. The surcharge on employer National Insurance Contributions and the investment income surcharge were also abolished in 1984. The 1985-86 Budget restructured National Insurance Contributions, lowering the contribution rates for low-paid workers and removing the ceiling on employer contributions.

The 1986 Green Paper "The Reform of Personal Taxation" mainly considered the taxation of married couples and recommended the adoption of independent taxation with transferable allowances. However, in March 1987 the Government announced that they did not yet feel that there was sufficient support to take a decision to go ahead with so far-reaching a reform. There is now a proposal to replace the system of local government property taxation by a poll (head) tax.

## ITALY

In 1984 tax revenues represented 41.2 per cent of GDP (this figure is likely to be revised down somewhat given recent revisions to the national accounts). Personal direct taxes were 26.3 per cent of total tax revenues while corporate taxes were 9.8 per cent. Social security contributions were 33.9 per cent of the total and taxes on goods and services were 26.1 per cent.

1. The present system

The personal income tax is collected at rates that rise to 62 per cent on a tax base that includes labour income, most transfers and capital income (excluding long-term capital gains on securities and, until recently, government bond interest). There is a separate tax on capital gains from real assets. However, self-employment and business income often escapes taxation.

The system is not indexed and treats husband and wife separately. Deductions include social security contributions, local taxes, mortgage and some farm loan interest (up to a ceiling), as well as medical, education and other expenses.

Corporate tax is paid at a rate of 36 per cent (with an additional equalization tax on dividends paid out of previously retained income) and there is a local income tax at a rate of 16.2 per cent, which is deductible from the corporate tax base, so that the overall tax rate is 46.37 per cent. (Partial integration of the corporate and personal tax systems is provided by the non-taxation of capital gains on securities.) Depreciation rates are based on historic cost at rates determined by ministerial decree. (Investment grants are not netted out of the depreciation base.) There is no adjustment for inflation for capital costs but inventory valuation can use the LIFO method. There are significant reductions in the tax rate for income from investment in southern Italy and other depressed areas.

Social security taxes are collected on wages and salaries at a combined rate which varies by region and type of worker. A representative rate is about 59 per cent of wages (of which 50 per cent is paid by the employer). There is no ceiling on contributions. The value added tax provides about 60 per cent of taxes on goods and services and is levied at rates varying from 2 per cent (for some food) to 38 per cent (for goods considered luxuries). The standard rate is 18 per cent. In addition there are substantial excise duties, particularly on tobacco and motor fuels.

2. Reform proposals

A major problem in Italy has been that a large proportion of income of the self-employed escaped tax, thereby imposing a heavy tax burden on salaried employees. Recent reforms have included the introduction in 1985 of a system of imputing non-wage income (and thus taxes) for small businesses and the self-employed in order to reduce the extent of tax evasion. (The change removes the previous provision that allowed these firms to use a simplified and unverifiable book-keeping system). In 1984 tax exemptions on government debt interest for banks was reduced and changes were made to the treatment of interest costs of firms to prevent them borrowing to buy tax-free government securities. In 1986 the tax exemption of government debt interest was removed (non-retroactively) for individuals as well and personal tax rates were reduced. In January 1987 the government announced its intention of lowering marginal tax rates from 1988, particularly for higher incomes, with the highest rate falling from 62 to 56 per cent. The cuts in tax rates, which will compensate for fiscal drag, are to be partly financed by a levy on revalued corporate assets.

## CANADA

Total 1985 tax revenues for the general government (34.2 per cent of GDP) came 34.1 per cent from personal direct taxes, 12.9 per cent from social security contributions, 9.8 per cent from corporate direct taxes, 32.5 per cent from taxes on goods and services and 10.8 per cent from other (primarily property) taxes. Only about one half of the total tax revenues is collected by the federal government (including the social security sector).

## 1. The present system

The personal income tax is collected at rates that rise to a rate between 48 and 62 per cent, depending on the province and on the federal surtax, which varies from year to year, on a base that includes labour and capital income (with some limited exemptions of interest and dividend income and exclusion of one half of eligible capital gains) as well as most transfers. The system is indexed only for that part of the inflation rate above 3 per cent, and taxable capital income is not adjusted for inflation. No deductions are allowed for mortgage or consumer interest but the cost of borrowing to buy assets yielding taxable investment income is deductible. A substantial portion of personal saving is sheltered through contributions to organised pension funds and through investment in (essentially self-administered) registered retirement accounts (the income on which is tax exempt until withdrawn). There is a dividend tax credit that partly integrates the personal and corporate tax systems, although it is based on the corporate tax deemed to have been paid rather than the actual amount.

The corporate income tax system is in the process of change (see below). The statutory marginal rates vary between 35 and 52 per cent (for large businesses) depending on the province and on the industry (manufacturing and processing are treated favourably). Actual average tax rates are significantly lower and vary widely by region, industry and type of capital, because of investment tax credits (at various rates), historic cost depreciation (but with rapid write-offs in some cases) and special treatment for research and development and for resource exploration. There is no adjustment for the effects of inflation on reported income and the LIFO method of inventory accounting is specifically excluded, although until 1986 there was a special allowance to offset inflationary inventory profits.

Social security taxes are levied at a combined rate of about 9 per cent on wage incomes up to a low ceiling (around average weekly earnings). Indirect taxes are collected at the provincial level on a retail sales base (usually excluding food and some other items) at rates varying by province from zero (in one province) to 10 per cent and at the federal level on a relatively narrow base (basically manufacturers' shipments excluding food) at rates that vary from 8 to 15 per cent. These indirect taxes discriminate against exports and, in the case of the federal tax, are biased in favour of imports. In addition there are numerous excise taxes on specific goods (e.g. alcohol, tobacco and gasoline). There is a relatively heavy reliance on property taxes, particularly by local government.

## 2. Recent changes and proposed reforms

In 1981 the federal government broadened the personal tax base by eliminating many deductions and exemptions, while lowering the marginal rates, particularly at the upper end (the maximum federal rate fell from 43 per cent to 34 per cent). However, opposition to the reduction in tax expenditures led to several being reinstated (but the tax rate reductions were retained).

In 1985 the federal government greatly expanded the existing system of encouraging retirement savings. By 1995 individuals will be able to shelter up to 18 per cent of their earnings (subject to a high ceiling). This greatly

increases the importance of the consumption tax features of the tax system. It also announced that individuals would, after a phase-in period, be allowed a lifetime exemption of $ 500 000 of capital gains.

In 1986 the government announced the first stage of a corporate income tax reform that included the elimination of the basic investment tax credit (but not all the special credits) by 1989 and the inventory allowance. At the same time the basic federal rate of tax will fall, in stages, from 36 to 33 per cent (and for manufacturing from 30 to 26 per cent).

In June 1987 the federal government announced a major reform of the personal income tax system. All major deductions and exemptions except those for pension and retirement saving are being eliminated or converted to tax credits (generally at the lowest rate). The lifetime capital gains tax exemption is being limited to $100 000 and a larger proportion of other capital gains will be taxable. The federal tax rate structure will be reduced to three tax brackets (17, 26 and 29 per cent) and the effective maximum rate will fall to a range of 41 to 58 per cent -- including surtax -- depending on the province. The net effect is to reduce personal income tax revenue. Budgetary neutrality is preserved by the second stage of corporate tax reform, which will eliminate additional tax loopholes and lower the statutory tax rate (for large businesses) to 23 per cent (for manufacturing) and 28 per cent (for other businesses) by 1991 (this will raise some additional revenue); by maintaining the existing surtaxes on personal and corporate income (scheduled for removal); and by extending the 10 per cent federal sales tax to telecommunications. The government has proposed three alternative forms of indirect tax reform and hopes to replace the existing federal system by one which would be much more broadly-based [either a national sales tax or a business transfer (VAT-like) tax] after consultations with the provinces. Such a system would allow elimination of the income surtaxes.

## AUSTRALIA

Total tax revenues were 31.2 per cent of GDP in 1984, of which 44.7 per cent came from personal income tax, 9.2 per cent from corporate income tax, and 32.4 per cent from taxes on goods and services. Other taxes (including those on property and payroll) are 13.6 per cent of the total. There were no social security contributions. The central government collected 80.6 per cent of total tax revenue in 1984.

### The present tax system

Personal income tax is levied at rates up to 55 per cent and there is a health insurance surcharge of 1.25 per cent. The income base includes wages and salaries, capital income (with full imputation of company tax paid on dividends from 1987-88), most transfers, pensions and annuities. Realised capital gains are taxed as income but inflation adjustment is allowed if the assets were held more than a year, as are lump-sum severance payments. Employers pay a tax on fringe benefits at the corporate tax rate. Exempt income includes lump-sum life insurance payments, implicit rent from owner-occupied dwellings, family allowances and alimony and maintenance payments. Deductions include expenses incurred in earning income, gifts and contributions to a private pension fund (up to a maximum). Mortgage interest

costs are only allowed as a deduction against rental income. Tax credits are provided for 30 per cent of unreimbursed medical expenses (above a limit) and to adjust for family circumstances. The individual rather than the couple is the tax unit. Income averaging is available for some taxpayers.

Corporate income tax is levied at a 46 per cent rate (rising to 49 per cent in 1987-88 to equal the new top rate of personal tax). No inflation adjustment is made in calculating income. There are no general investment incentives (a scheme applying to plant ordered prior to June 1985 is being phased out). Primary producers, mining, research and development and shipping, among others, benefit from a variety of specific accelerated depreciation provisions. The film industry has particularly generous incentives and income from gold mining is exempt from tax.

Taxes on goods and services include: wholesale tax, at rates from 10 to 30 per cent, on some consumption and intermediate goods, but excluding services; excise taxes on beer, spirits, tobacco, petroleum products and crude oil; and customs duties. State governments levy payroll and property taxes.

2. Recent changes

An extensive tax reform was announced in 1985, including cuts in marginal tax rates. From mid-1987 there will be rates from 24 to 49 per cent (the top rate in 1985 was 60 per cent). The fringe benefits tax was introduced, the deduction for entertainment expenses was disallowed, the sales tax base was broadened, a foreign tax credit system, a dividend imputation system (which provides a tax credit on qualifying dividends made out of income which has been taxed) and a capital gains tax were introduced, and a range of other measures were taken to broaden the tax base and reduce tax avoidance. The reform was not revenue neutral; it lowered total tax revenues.

## AUSTRIA

Total tax revenues were 42.3 per cent of GDP in 1985 of which 23.1 per cent came from personal income tax, 3.2 per cent from corporate income tax, 31.7 per cent from social security contributions 32.6 per cent from tax on goods and services and 9.6 per cent from payroll, property and other taxes. In 1984, state and local governments collected 21.1 per cent of the total.

1. The present tax system

Personal income tax is levied at rates ranging to 62 per cent. The income base includes labour, business and capital income, pensions, some capital gains, strike pay and foreign income. Dividends are taxed at half the average tax rate. Income of spouses is taxed separately. Employer contributions to private pension and sickness schemes, life insurance payments, implicit rent, some transfers, government bond interest and alimony are exempt from taxable income. There are standard deductions for work-related expenses and for special expenses, which include mortgage interest and loan capital repayment and certain insurance premiums, as well as for investment in specified energy saving equipment, bonds and new enterprises (special expenses in excess of the standard deduction are also

deductible). There is also a general tax credit for all taxpayers, as well as tax credits for wage-earners, single-earner families and pensioners. In 1983 tax expenditures are estimated to have halved the potential income tax base. The system is not indexed.

Corporate income tax is levied at rates from 30 to 55 per cent, reduced by 50 per cent for distributed income. (Together with the lower rate at the personal level this ensures approximate single taxation of dividends.) Capital gains are taxed as ordinary income and inventories are normally valued on a moving average basis (LIFO is not usually permitted). Depreciation is based on historic cost. Accelerated depreciation is allowed on investment in equipment and employer housing (a 40 per cent first year allowance) and certain buildings (at 25 per cent). Specific incentives are provided for environmental protection. Companies are also liable for municipal trade tax (at around 15 per cent of income), deductible in calculating corporate income tax.

Social security contributions are levied at rates which range up to 39.5 per cent on wage and salary earnings up to a ceiling, the employer rate being about 23 per cent. The major tax on goods and services is a VAT with relatively few exemptions and a standard rate of 20 per cent (with high and low rates of 32 and 10 per cent respectively). Taxes on specific goods and services are also important (mineral fuels, tobacco).

2. Recent changes

In January 1986 the system of half rates for personal tax on dividends was introduced. There have been several increases in social security contribution rates, as well as ad hoc inflation adjustments to personal income tax scales (1982, 1983 and 1987), an increase in VAT rates (1984), and further specific investment incentives. In 1987, the new government reduced the use of the luxury VAT rate (and thus the dispersion of indirect tax rates), is considering a substantial base-broadening rate reducing reform of personal and corporate taxation (it is hoped to reduce exemptions by at least Sch. 30 billion and to lower personal tax rates by an average of 6 per cent from 1989) and is reconsidering the integration of personal corporate taxation.

## BELGIUM

Total taxes in 1984 amounted to 46.7 per cent of GDP. Taxes on personal and corporate income were 34.7 and 6.2 per cent of the total, respectively. Social security contributions accounted for 32.3 per cent while taxes on goods and services were 24.9 per cent. Local government taxes accounted for only 5.2 per cent of the total.

1. The present tax system

Personal income is generally taxed on a family basis (separate taxation for working spouses is allowed for taxpayers with earnings below a ceiling) at rates up to 81 per cent (including surcharges). The income base includes wages and salaries, some fringe benefits, most capital income (some savings account interest is exempt but implicit rent is included) life insurance payments, and most transfers. Employers' contributions to private pension and

sickness schemes are excluded although some but not all capital gains are subject to taxation. Deductions include work-related expenses, employee social security contributions, business-related interest and contributions to retirement savings. Mortgage interest is deductible only against the associated income. There are tax credits for family circumstances and for those largely dependent on transfer income. In addition, tax credits for dividend income allow partial integration of the personal and corporate tax systems.

Corporate income is subject to a marginal tax rate of 45 per cent (lower rates apply for firms with small profits). Depreciation may be either straight line or double-declining balance, at rates ranging from 3 per cent per year for commercial buildings to 33 per cent for some machinery. All calculations are based on the historical cost with no allowance for inflation. Some assets can be depreciated at an accelerated rate. Investment allowances exist for target regions and industries, and since 1983 there has been a 13 per cent investment deduction.

Social security taxes are assessed at a combined employee-employer rate of 39.8 per cent on all wage income. The major tax on goods and services is the VAT, levied at 6 different rates from 1 to 33 per cent (the basic rate is 19 per cent). There are also important excise taxes on motor fuels and tobacco.

2. Recent and proposed changes

The personal tax system was indexed in 1985. There have been no other major changes to the tax structure, although the government has requested proposals for reform from independent commissions. In February 1987, the Royal Commission for the Harmonisation and Simplification of the Tax System proposed a simplification of the personal tax structure with a reduction in the top rate to 60 per cent, and a shift of the tax burden towards excises and company tax.

## DENMARK

Of total tax revenues in 1985 (49.4 per cent of GDP) 51.6 per cent were from personal income taxation, 34.5 per cent from taxes on goods and services, 5.0 per cent from corporate taxes and 3.8 per cent from social security contributions. Other taxes (particularly on property) were 5.2 per cent of the total. In 1984 local governments collected 29.3 per cent of the total.

1. The present tax system

Personal income taxes are imposed by both central and local governments. Prior to January 1987, the central government's income tax was at rates up to 39.6 per cent on labour and capital income (including a very low estimate of implicit rent but excluding interest on some sheltered savings) and most transfers. Employer contributions to pension and sickness schemes are excluded and most capital gains are taxed separately. Income-earning expenses, interest paid, social security and private pension plan contributions, alimony payments and some charitable donations are fully deductible. There are wastable tax credits based on individual circumstances

and for pensioners. Spouses are taxed separately on their earnings. The system was largely indexed from 1970 until 1984. Local government income taxes are at a flat rate (average rate of 28.1 per cent) on the same base as those of the central government, and they represented 54 per cent of total personal income tax receipts in 1983. The combined marginal income tax rates range from about 37 to 71 per cent according to the locality and the income level.

The corporate tax rate is 50 per cent. Deductions for charitable donations and entertainment expenses are limited. Full expensing is allowed for relatively low-cost and short-lived assets. Depreciation is on a straight-line or double-declining balance at rates varying from 4 to 30 per cent per year, and the cost base is fully indexed. (On the other hand no adjustment is made to interest costs, which are fully deductible.) Accelerated depreciation is available for only a very limited number of structures. A special investment deduction of 2.5 per cent of the acquisition cost is provided as an investment incentive, and an allowance is made for contributions to an "investment reserve".

Prior to 1987, social security contributions consisted of a fixed charge per employee (levied on both employees and employers) plus 5.5 per cent of an employee's taxable income. In 1987, the employee component was absorbed into the central government income tax. Taxes on goods and services include a VAT of 22 per cent which has almost no exemptions. There are also excise taxes, notably on tobacco, alcohol and motoring-related costs.

2. Recent changes

In October 1986, parliament enacted a large tax reform to take effect in January 1987. This i) subjects all capital income to a single rate of 50 per cent; ii) flattens the combined central and local income tax rates to about 50, 56 and 62 per cent of earned income (with a maximum of 68 per cent); iii) restricts the value of deductions (including that for mortgage interest) to a maximum of 50 per cent even if income is actually taxed at a higher marginal rate; iv) increases the personal exemption and indexes it; and v) reduces deductibility of entertainment expenditure. A separate measure introduced a tax on consumer loan interest, offsetting part of the now limited value of the deductions.

## FINLAND

Total tax revenues in Finland amounted to 37.1 per cent of GDP in 1985, of which personal income taxes provided 46.0 per cent, taxes on corporate income 4.4 per cent, social security taxes 9.0 per cent, taxes on goods and services 36.9 per cent, and other taxes (mainly on property) 3.7 per cent. Local government taxes accounted for only about 8.5 per cent of the total in 1984.

1. The present tax system

The personal income tax system, which is not indexed, has rates ranging, up to 51 per cent for central government tax, while local government income tax and church tax are levied on a similar base at a combined flat rate

of between 14 and 20.5 per cent depending on locality. Earned income is taxed separately for each family member, while other income is taxed on a family basis. Income includes wages, several fringe benefits, most transfers, foreign income, and the implicit rental income on owner-occupied homes a large amount of which is, however, exempted. Capital income is in principle subject to taxation but several provisions exclude much of it. Interest on government bonds and on some deposits is tax-exempt, as are capital gains on assets held longer than 5 years (up to a limit, above which only 80 per cent is exempt). Deductions, all limited, include allowances for family circumstances, interest paid on loans (subject to a ceiling) some pension contributions, life insurance premiums, alimony payments, medical expenses, and work-related outlays.

The national corporate income tax rate is 33 per cent, to which is added municipal tax at rates from 13.5 to 18.5 per cent. There is a lower rate for corporations with low profits. Partial integration of personal and corporate income taxes is provided by a deduction from corporate income of 60 per cent of the excess of dividends paid over domestic exempt dividends received, and a 100 per cent deduction for dividends on new shares during the first six years. Depreciation, usually on a declining balance method, is based on the unindexed acquisition cost at rates ranging from 30 per cent for machinery and equipment to 5 per cent for certain structures, with expensing allowed for assets with lives less than 3 years. There is no accelerated depreciation. Special investment incentives allow a firm to reduce its tax liability by contributing to an investment reserve, provided the funds are then invested within a specified time period.

Social security contributions are imposed at a rate of 3.75 per cent of taxable income for employees, with the employer paying 6.1 per cent of the payroll (higher for capital intensive industries). Indirect taxes include a VAT at a 16 per cent rate. However it applies only to a limited number of goods and services. Excise taxes on tobacco, alcohol, motor fuels and cars are also important.

2. Recent changes

The government has in recent years made piecemeal reforms to both direct and indirect taxes. First, the tax exemption for long-term capital gains was limited, as noted above. Second, the central government corporate tax rate was reduced in 1986 from 43 to 33 per cent. Third, the amount of unearned income exempt from personal tax was increased by more than 25 per cent in 1985. Fourth, unemployment and child care benefits were added to taxable income from 1985. Taxation of energy usage switched from an excise tax to a value-added tax of 16 per cent on virtually all energy sources.

## GREECE

Total tax revenues were 35.2 per cent of GDP in 1984 of which 14.6 per cent came from personal income tax, 2.6 per cent from corporate taxation (the lowest share of both personal income tax and corporate tax in the OECD area), 35.2 per cent from social security contributions and 43.4 per cent from taxes on goods and services. 4.2 per cent came from other taxes, primarily payroll and property. Local government taxes accounted for only about 1.4 per cent of the total.

## 1. The present tax system

Personal income tax is levied at rates up to 63 per cent (by the central government only). In addition, there are surtaxes of 3 per cent on income from securities and up to 4 per cent on certain property income. The income base includes labour, business and capital income (including implicit rent) and pensions. Some capital gains are included, while others (from the sale of a business or intangibles) are taxed separately at a flat rate of 30 per cent. The tax unit is generally the individual but family business income and income of minor children is imputed to the spouse whose income is higher, and some transfer of allowances is permitted. To combat evasion income is taken as the higher of declared income, or imputed income based on lifestyle. Exempt income includes interest on government loans and bank deposits, dividends (up to a limit of Dr. 100 000) foreign pensions, and capital gains from securities where they are put into a reserve account (to cover possible future losses). Deductions include differentiated allowances for various types of income (these allowances are substantial, for instance, 50 per cent of wage income up to a limit of Dr. 510 000) and allowances for mothers and the aged. In addition, interest on the purchase of immovable property or participation in a business enterprise, social security contributions, life assurance and accident insurance, hospital and medical costs, charitable donations, alimony payments, rent, funeral expenses and the cost of solar heating are all deductible. There are also tax credits that depend on family circumstances. The system is unindexed but ad hoc adjustments have broadly offset the effects of inflation.

The corporate income tax rate is 49 per cent (44 for domestic mining and manufacturing companies). There is full integration of personal and corporate taxation. Tax is withheld by companies on distributed income at rates ranging from 42 to 53 per cent (according to whether the company is listed on the stock exchange and whether the shares are registered or in bearer form) which relieves the shareholder of any additional liability for tax on dividends. A tax credit is available to the shareholder if the tax withheld is greater than would be payable by the shareholder as personal tax (e.g. given the exemption of some dividend income). Most capital gains are taxed at 30 per cent and there is no inflation relief on inventories. There is a wide range of specific investment incentives for manufacturing, mining, handicrafts and hotels, and certain foreign investors are eligible for tax concessions, all of which contribute to a substantial erosion of the tax base.

Social security contributions are levied on wages up to a ceiling of about twice the average at a normal rate of 35 per cent (21.75 per cent for the employer). The main taxes on goods and services are VAT (levied at rates of 6, 18 and 36 per cent), commodity taxes (fuel, cotton, tobacco) and customs duties.

## 2. Recent changes

The most significant change has been the introduction of VAT in 1987, which replaced a variety of taxes including sales and turnover taxes, as well as stamp duties. Reform in the 1980s has mainly concentrated on combatting tax evasion, and simplification (including the abolition of a large number of minor taxes), but extensive tax expenditures remain (for example many farmers are effectively exempt) and tax evasion is still a major problem.

## ICELAND

Total tax revenues amounted to 18.5 per cent of Iceland's GDP in 1986, of which 87.3 per cent came from indirect taxes (including payroll and property taxes), while direct taxes on invididuals and corporations provide the remaining 12.7 per cent of the total (4).

### 1. The present tax system

Personal income taxes are assessed on the income of the previous year at rates rising to about 43.5 per cent on individual incomes (the earnings of children under age 16 are taxed at a flat 5 per cent). The income base includes labour income (except for some fringe benefits), transfers and capital income (except for interest). Only real capital gains are taxed and some dividends are excluded (a means of partial integration of personal and corporate taxes). Deductions, subject to limitations, include contributions to a retirement fund, union dues, medical care and life insurance premiums, charitable donations, mortgage interest (but only for four years) and part of the cost of renting. There is a deduction to encourage domestic investment and a tax credit of 25 per cent of the contribution to a Home Saving Account (up to a ceiling). There is also a municipal income tax on a similar base (but excluding some transfers and including all dividends) which varies across municipalities (at a maximum rate of 12.1 per cent for adults and 3 per cent for children under age 16).

Corporate taxes are levied at a flat rate of 51 per cent but some distributed profits are not taxed. The system is indexed for inflation. Accelerated depreciation is provided in some circumstances. Firms may reduce tax by allocating income to an "Investment Fund" which must be invested within a specified period.

Indirect taxes are by far the most important source of tax revenues. A retail sales tax at a flat rate of 25 per cent applies to most goods and services, except for food and a few other items, and provides about half of indirect tax revenues. Custom duties are about one-fifth of the total and there are excise taxes on various items.

### 2. Proposed changes

The government's principal goal for the tax system has been to eliminate the income tax altogether for normal income. This reflected concern about the volatile weight of direct taxation, given the lagged tax collection method and the high and variable rate of inflation (which explains why an income tax sytem that sounds similar to other countries produced so little revenue). The authorities have recently proposed a shift to a pay-as-you-earn system in 1988 -- which would effectively abolish direct taxes on income earned in 1987.

## IRELAND

Total tax revenues were 38.4 per cent of GDP in 1985, of which 31.3 per cent came from personal income tax, 3.2 per cent from corporate income tax,

14.8 per cent from social security contributions and 44.4 per cent from tax on goods and services (the highest in the OECD area other than Iceland). In addition taxes on property and payrolls yield 6.3 per cent. In 1984, the central government collected 82.2 per cent of total revenue.

## 1. The present tax system

Personal income tax is levied by central government only at rates up to 58 per cent on wages and salaries, pensions and capital income (a dividend tax credit provides partial integration with the system of company tax). Income of spouses is generally taxed jointly although there is an opotion for separate assessment. There is, however, a substantial erosion of the tax base. Exempt income includes most fringe benefits, life insurance payments, lump-sum retirement benefits, implicit rent, short-term social welfare benefits and strike and redundancy payments. Deductions include a standard allowance (about one-fifth of average earnings), an employee allowance, work-related expenses, social security contributions (a lump-sum allowance), annuities, premiums for private pension schemes and life insurance and mortgage interest for a principal residence (up to a limit). Capital gains are taxed separately, and limited to real gains if assets are held more than one year. In addition the tax exempts the first £2 000 per year, as well as gains on a principal residence, government securities and where proceeds are reinvested.

The corporate income tax rate is 50 per cent (40 per cent for companies with small profits). However, profits from manufacturing are taxed at 10 per cent, and companies established before 1981 are not taxed on profits from the export of manufactures or from operations in Shannon airport. No relief is given for the effect of inflation on inventory values, and LIFO valuation is not permitted. There is a 100 per cent first-year write-off (120 per cent for mining) for most investment in new equipment, first year allowances ranging from 10 to 100 per cent for industrial buildings, and allowances for research and development.

Social security contributions are collected at a combined rate of 20.8 per cent of labour income (12.3 per cent on employers) up to a ceiling equal to about 1 1/2 times average earnings, and one per cent thereafter (a youth employment levy on employees). The main indirect taxes, of roughly equal importance, are VAT and excise taxes. The standard VAT rate is 25 per cent, with other rates at 10 and 0 per cent. There is a wide range of exempt or zero-rated items (more than half the potential base). The most important excise taxes are on alcohol, tobacco, fuels and motor vehicles. Some revenue is also raised by property taxes and payroll tax.

## 2. Recent changes

The Commission on Taxation in the early 1980s proposed a sweeping reform, including a comprehensive income base with the family as the basic tax unit and a single rate of tax on all personal (and corporate) income (replacing all personal exemptions and deductions by a standard personal tax credit). It suggested that redistribution be achieved by direct payments to the poor, the personal tax credit, and the introduction of a progressive direct expenditure tax at the top of the scale. Moreover, it recommended a single social security rate on the same base as income tax; full indexation

(including capital income); full imputation of tax paid at the company level; and a single VAT rate on all purchases. A narrow range of excises would be retained and the rates would be indexed.

Following these recommendations the 1985 Budget rationalised the VAT structure from 6 to 3 rates, lowering the top rate (35 per cent). The 1985 and 1986 Budgets together reduced the top marginal tax rate on personal income from 65 to 58 per cent, increased exemption limits, extended the basic rate (35 per cent), indexed the rate structure and allowances, and lowered the long-term capital gains tax rate to 35 per cent. The reductions in personal tax were offset by the abolition or limitation of interest exemptions and introduction of a withholding tax on interest, and anti-evasion measures.

## LUXEMBOURG

Total tax revenues in Luxembourg amounted to 41.4 per cent of GDP in 1984, of which 27.5 per cent was from direct taxes on individuals, 26.1 per cent from social security contributions and 15.5 per cent from corporate taxes, while taxes on goods and services provided 24.5 per cent. Other taxes, primarily on property, were 6.4 per cent of the total. Local governments collected 11.5 per cent of total revenue.

### 1. The present tax system

Personal income is taxed on a family basis at rates of up to 57 per cent. The tax base includes wages and salaries (except for some fringe benefits), capital income (including implicit rental income from owner-occupied housing) and most transfers. Deductions include work-related expenditures, social security contributions, deposits to specified savings accounts, and certain standard allowances. Mortgage interest is deductible only up to a limit, but other interest payments are fully allowed. The system is fully indexed.

Corporate income taxes in Luxembourg are assessed at 40 per cent (20 per cent if profits are small). Corporations also pay a 3 per cent surtax to an unemployment insurance fund, as well as a municipal business tax at a rate of 4 per cent and miscellaneous other capital taxes. Dividends paid out to individuals are not deductible. Depreciation must be based on historical cost and accelerated depreciation is only allowed for assets related to environmental protection or energy-saving. There are a number of investment incentives, including a tax credit ranging from 2 to 12 per cent for some assets.

Social security taxes are levied on wages at combined rates that vary from 27.2 to 35.8 per cent depending on the industry. Indirect taxes include a VAT with a standard rate of 10 per cent and reduced rates of 5 per cent (food, energy, professional and other services) and 2 per cent (drugs some food), as well as excise taxes.

### 2. Proposed changes

The 1987 budget lowered the overall tax burden. It reduced the maximum personal tax rate to 56 per cent from 57 per cent, increased the threshold

below which no tax is due, and signficantly raised the entry points for the higher rates. It also adjusted spousal and child-care allowances. The corporate tax rate is to fall from 38 to 36 per cent by 1988 and a local payroll tax is to be abolished.

## NETHERLANDS

Total tax revenues were 44.8 per cent of GDP in 1985, of which 20.1 per cent came from personal taxation, 6.8 per cent from corporate taxation, 43.7 per cent from social security contributions and 25.7 per cent from taxes on goods and services. In 1984, the central government collected 51.9 per cent of total taxation with the remainder largely accounted for by social security.

### 1. The present tax system

Personal income tax is levied by the central government only, at rates up to 72 per cent. There is some income averaging. Formal indexation provisions (since 1972) require at least 80 per cent indexation of the rate scale and 100 per cent for some allowances. The income base includes labour, business and capital income (including implicit rent), employer health insurance contributions and most transfers. The earned income of spouses is taxed separately (including certain social security benefits), with provision for the transfer of standard deductions. Exempt income includes employers' contributions to private pensions, life insurance payments (unless the premium was deductible), some transfers, capital gains (except on the sale of business assets or a substantial interest in a company) and a limited amount of dividends. Deductions include lump-sum allowances based on family circumstances, social security contributions (except health insurance), contributions to private pensions and annuities, sickness and accident premiums, work-related expenses (subject to limits) and charitable donations. Interest payments on personal loans and the excess of mortgage interest over imputed rent are generally fully deductible from taxable income.

Corporate income tax is levied on income including capital gains at a 42 per cent rate. There is an option for LIFO for inventory valuation while depreciation can be calculated on any sound commercial basis. There is a general incentive (12.5 per cent tax credit) for investment in most fixed assets, with additional incentives for small and medium-sized businesses, venture capital, pollution control and energy saving, as well as investment in certain growth areas.

A complex system of social security contributions taxes individuals at about a 26.5 per cent rate on wages up to a ceiling (with relief provisions for low income earners) while employers pay a rate of about 23.5 per cent. The major tax on goods and services is VAT, which is levied on a fairly wide base with a standard rate of 20 per cent, a 6 per cent rate for certain necessities and exemptions for a range of services (including finance, insurance, medical, education, cultural and social). Taxes on specific goods and services (mainly petrol, tobacco, motor vehicles, imports and spirits) raise about half as much revenue as VAT.

Recent and proposed changes

The Tax Reform Commission which reported in 1986 focussed on complexity in the personal income tax system. The Commission recommended: combining income tax and social security contributions into a single tax at a flat rate of 40 per cent over a large income range (including 88 per cent of taxpayers); collecting general employer contributions at source, with wages to be grossed up to include them; abolition of all personal allowances and replacement by the same standard deduction for all. The Commission estimated that removing all deductions that could reasonably be abolished would allow an across the board reduction of 2 to 3 percentage points in the rate scale. However, it did not consider such an exercise feasible (because most of the deductions are strongly held to be socially desirable, or related to costs of earning income) and recommended limited abolition and simplification of deductions. The government accepted the proposals in principle.

The 1984 Budget announced a phased reduction of the company tax rate from the then current level of 48 per cent (it was cut to 42 per cent in 1986), financed by a 1 percentage point increase in VAT rates. In 1986 capital allowances were reduced and stock allowances abolished. The 1987 budget increased VAT rates by a further 1 percentage point.

## NEW ZEALAND

In 1984 tax collections amounted to 30.9 per cent of GDP, of which 56.7 per cent came from personal income taxes, 8.8 per cent from business income taxes and 27.2 per cent from various indirect taxes (including highways taxation). Taxes on capital (estate duties and land taxes) provided 7.3 per cent of the total. There were no social security taxes. The central government collects the overwhelming majority of tax revenue (more than 93 per cent in fiscal year 1981-82).

1. The tax system prior to the reform of October 1986

The personal income tax was collected at rates that rose to 66 per cent, and on a base including almost all labour, business, capital or transfer income. Exempt income included alimony, welfare and unemployment payments to those with dependent children, veterans' pensions, employer contributions to private pension schemes, and payments under life insurance policies. There was no taxation on capital gains, but some (particularly on property development) were taxed as income. Fringe benefits were taxed at 45 per cent (rising to 48 per cent in 1986/87), paid by the employer. Tax credits encouraged savings for the purchase of a house, a farm or a fishing vessel. However, the limited rebates which offset some mortgage interest were being phased out. There was no integration with the corporate tax system.

The corporate income tax rate was 45 per cent (rising to 48 per cent in 1986-87) for resident and 50 per cent for non-resident companies (rising to 53 per cent in 1986-87), with tax credits for export market development, tourist promotion and other activities. Accelerated depreciation schedules were allowed for several types of investment.

The indirect tax system included a wholesale tax (levied at rates from 10 to 50 per cent) on selected goods (an estimated 27 per cent of household expenditure), customs duties and a wide variety of special taxes on alcohol, air travel, fuels, financial transactions, etc.

2. The current reform

On 1st October 1986 New Zealand replaced the wholesale tax and many other indirect taxes (retaining some taxes on fuel, alcohol, tobacco and motor vehicles) by a new Goods and Services Tax, which is similar to a value-added tax. It applies to all transactions and is levied at a uniform rate of 10 per cent. The revenues from this will be about 5 1/2 per cent of GDP, about twice that from the previous indirect taxes. At the same time personal income taxes were reduced by about 4 per cent of GDP (on a full-year basis) by lowering tax rates: they now range from 15 to 48 per cent. However, reforms to the social security system, including the provision of a guaranteed minimum family income, mean that low income taxpayers will face much higher effective marginal tax rates (100 per cent in some cases). The reform increases indirect taxation from one quarter to over a third of tax revenues. It is not completely revenue neutral: the government plans to offset the net reduction in taxes by cuts in spending. Accelerated depreciation schedules are being abolished.

3. Proposed changes

The government has proposed to integrate the company and personal income tax systems from fiscal year 1988/89 via a system of full imputation. Tax credits in favour of various business activities are to be phased out by 1990/91. Moreover, a withholding tax on interest payments is to be introduced in 1987.

## NORWAY

In Norway total tax revenues were 47.8 per cent of GDP in 1985. Personal direct taxes contributed 22.5 per cent of the total, company taxes 17.0 per cent, social security contributions 20.7 per cent and taxes on goods and services 37.6 per cent. Local government taxes accounted for 18.1 per cent of the total in 1984.

1. The current tax system

There are personal income taxes at the central and local government levels. The tax base includes labour, business and capital income (including capital gains, but with the exception of a small amount of interest and dividends) and transfers, and excludes only employer's contributions to private pension and sickness schemes, family allowances, strike pay and life insurance payments. However, implicit income from owner-occupied housing, as defined for tax purposes, is very low. Married couples are taxed jointly, although they may opt for individual taxation. Deductions are allowed for all interest paid, contributions to private pension schemes as well as work related and child care expenses (there are standard deductions for work-related expenses, with provisions to claim amounts in excess of the ceiling). There are small credits for children and for some savings schemes.

The central government tax schedule is progressive, with rates rising to 34 per cent. The local government tax is a flat rate (which averaged 22 per cent in 1986), and accounts for over 70 per cent of personal income taxes.

The corporate income tax is also divided into central and local government components, with rates of 27.8 and 23 per cent respectively. However, distributed profits are not subject to the central government tax (so there is partial integration of the personal and corporate tax systems). Depreciation is on a declining balance basis (at rates from 6 to 35 per cent) using historical costs. There is no provision for indexation and inventory valuation cannot be based on the LIFO method. There are investment incentives to encourage development in northern Norway and other special areas.

Employers pay social security contributions on the total wage bill at rates that vary by region between 5 and 16.8 per cent. Social security taxes on individuals are essentially part of the personal income tax system and are based on gross income (i.e. before deductions) at a flat rate of 11.4 per cent (prior to 1987, they were based partly on gross income and partly on net income).

Indirect taxes include a VAT at a 20 per cent rate, which is very broadly based (food is included), excise taxes (especially those on tobacco, alcohol and, in particular, on oil and gas products) and a 10 per cent tax on most investment goods.

2. Recent and proposed changes

In 1987, the government shifted part of the tax burden to the gross income base. The rate of social security contributions on gross income was increased from 7.4 to 11.4 per cent, social security contributions based on net income were abolished, and the rate scale for general income tax was lowered (e.g. the top rate was lowered from 40 to 34 per cent). This will have the effect of reducing the importance of deductions such as that for interest payments, and of reducing the progressivity of the tax system (as long as the tax on gross incomes remains proportional).

## PORTUGAL

Total tax revenue represented 31.5 per cent of GDP in 1985. Total taxes on income and profits provided 25.9 per cent of the total, and social security contributions 25.8 per cent. The biggest single component is indirect taxation, which provided 42.6 per cent of total revenue, while payroll property and other taxes accounted for 5.7 per cent. Local governments collected only 3.4 per cent of the total in 1984.

1. The present tax system

The direct tax system has several components. The "complementary tax" is levied on a family basis. The system is unindexed and the rates rise to 60 per cent (70 per cent for single taxpayers). The tax base includes all income (including implicit rent) except for some transfers. There are however numerous deductions covering employment-related expenses, family status, social security contributions, disability, mortgage interest, life insurance

premiums, medical care, and union dues. There are two other important taxes: the "professional" tax, levied on an individual basis on gross wages at marginal and average rates ranging from 2 to 22 per cent (the marginal rate is discontinuous at the end of each bracket), which is deductible from total income in calculating income tax, and a "supplementary" tax, imposed on upper-income taxpayers. The "industrial tax" is assessed (on individuals or firms) on profits from commercial and industrial activity at a rate of 40 per cent (30 per cent for small profits). Since 1985, an extraordinary tax on profits has been imposed at a rate of 5 per cent. Nominal capital gains are subject to tax at a different rate, except in the case of the sale of fixed corporate assets, in which case the gains are adjusted for inflation. There is no deductibility of dividends distributed (since dividends are not taxed at the personal level). Depreciation is typically taken on a straight-line basis at rates generally used in private business. Accelerated depreciation may be used under certain circumstances, but usually for only a limited period. A variety of investment incentives are provided for different industries, ranging from complete exoneration from the industrial tax for up to 9 years to a reduction to 2 per cent (or complete exemption) in the real estate transfer tax.

Social insurance contributions are paid by both employers and employees on all wages; at a combined rate of 37 per cent. The most important tax on goods and services is the value-added-tax, which has differentiated rates of 8 per cent, 14 per cent, and 30 per cent, with about half of final consumption exempt.

2. Recent changes

In 1986, at the time of Portugal's entry into the EEC the indirect tax system, which had a fairly narrow base and very high rates, was replaced by the VAT. The 1987 budget proposes the introduction of a full imputation system to integrate personal and corporate tax.

## SPAIN

Total tax revenues were 28.5 per cent of GDP in 1985 of which 22.6 per cent came from personal income tax, 5.5 per cent from corporate income tax, 41.5 per cent from social security contributions and 26.4 per cent from taxes on goods and services. Property and other taxes contributed 4.0 per cent to the total. In 1984 local governments collected 15.1 per cent of the total.

1. The present tax system

Personal tax is levied on family income at rates rising to 66 per cent, with total tax limited to 46 per cent. The income base includes labour, business and capital income (including implicit rent and capital gains), as well as most transfers, although permanent sickness benefits and unemployment benefits are exempt. Deductions include a basic allowance of 1 per cent of earned income, social security contributions and interest related to a source of income. There are extensive credits based on family circumstance, residential investment, medical expenses, pension, insurance and life assurance premiums, dividend income (providing partial integration of corporate and personal tax) and a range of other expenditures and investments.

Corporate income tax is levied at a rate of 35 per cent. There is no inflation relief for inventories but LIFO is possible. There are no general investment incentives, but accelerated depreciation is allowed for certain assets, and there are tax credits for many investments, and for employment creation.

Social security contributions on are assessed wages between prescribed limits at a usual rate of 39 per cent (about 33 per cent on employers depending on industry). The major tax on goods and services is a VAT with a standard rate of 12 per cent and necessities and luxuries rates of 6 and 33 per cent respectively. Import duties, and special excise taxes are also important.

2. Recent changes

A single general income tax replaced separate taxes on different kinds of income over the period 1975-79. Since 1980, social security reform has cut contribution rates and reduced rate dispersion, partly by broadening the base. In 1976, 1982 and 1983 there were attempts to increase the effective progressivity of the income tax by steepening the rate structure. In 1986, VAT was introduced and a number of other indirect taxes were abolished, the indirect tax base was broadened, income tax rates were cut and a number of loopholes were closed. The 1987 Budget abolished a tax incentive for investment in fixed interest securities, reduced incentives for share purchases and increased the withholding tax on interest and dividend income (18 to 20 per cent). Other reforms in recent years have attempted to reduce the high level of tax evasion.

## SWEDEN

Total tax revenues in Sweden, amounted to 50.6 per cent of GDP in 1985. 38.6 per cent of GDP came from taxes on personal income, 3.2 per cent from business taxation and 25.1 per cent from social security contributions. Taxes on goods and services were 26.3 per cent of total taxes while other taxes (principally on payrolls) were 6.8 per cent. In 1984 local governments collected 31.5 per cent of total tax revenue.

1. The present tax system

Personal incomes are taxed by the central government on a family basis (except for the wages of spouses) at rates that rise to 50 per cent (including the surtax). The tax brackets are adjusted for inflation and the tax base includes labour, business and capital income (except for employer pension and sickness contributions and income on sheltered savings) and most transfers. Implicit rent is taxed but the estimate used is very low and mortgage interest in excess of the imputed rent is deductible. Only real capital gains are taxed. Income earning expenses and interest payments on debt are deductible, as are contributions to private pensions and alimony. Tax credits are provided for single parents, one income families, and for union dues. Local income taxes are levied on essentially the same base as for the central government tax system, at a flat rate which adds (on average) an additiional 30.3 per cent to marginal tax rates. In revenue terms they are more important

than the central government income taxes, raising 75 per cent of personal income tax revenues.

Corporate income taxes are imposed at a rate of 52 per cent. There are specific efforts to curb uses of the corporate tax system to avoid taxes. Partial integration of corporate and personal income taxes is provided via an allowance for a deduction of up to 10 per cent of qualifying capital for dividends paid. Assets with economic lives of three years or less can be expensed in the acquisition year while other capital goods must be depreciated over their expected economic lives. The depreciable base is not indexed for inflation. Firms can reduce taxes by having a special investment reserve. When the reserves are subsequently used to finance new capital investment, they provide a deduction against current taxable income while not reducing the depreciable base of the acquired good.

Social security taxes, collected only from employers, are currently at a 30.9 per cent rate on all wages and salaries. Taxes on goods and services take the form of value added taxes at two different rates, a basic rate of 23.46 per cent, and a lower rate of 12.87 per cent for a small range of services (mainly restaurants). Exemptions include fuel, medicine and periodicals.

2. Recent changes

Several of the sheltered savings schemes have been abolished in recent years and the dividend tax credit was eliminated. The top rate of central government personal income tax has been lowered progressively from 58 per cent in 1982 to 47 per cent in 1987.

## SWITZERLAND

Total tax collections in Switzerland represented 32.0 per cent of GDP in 1985, of which 34.7 per cent were from personal income taxes, 5.9 per cent from taxes on corporate profits, 32.1 per cent from social security contributions, and 19.0 per cent from taxes on goods and services while 8.2 per cent came from capital taxes. Cantonal and communal tax receipts were 39.1 per cent of the total in 1984.

1. The present tax system

The personal tax system is distinctive in that there are three separate tax regimes (of which the central government's is the least important) and because tax is collected with a substantial delay. Income is assessed for non-overlapping two-year intervals and the corresponding tax is paid over the following two years or over the second and third year after the assessment period. The family is the basic tax unit. The tax rates vary by district, the top central government rate is 13.2 per cent (although for high incomes the rate is only 11.5 per cent). Indexing is not general, although the canton of Zurich has had an indexed system since 1983 and the central government since 1985. As an illustration the maximum marginal rate for all levels of income tax for a taxpayer in Zurich is about 47.5 per cent. Both labour and capital incomes (including implicit rent and employer contributions to voluntary benefit plans) are taxed as well as transfers. Life insurance

benefits, alimony and capital gains (except for those from the disposal of business assets) are excluded. There are certain standard deductions for work expenses and family situation. Social security contributions and all interest costs are deductible (although there is a ceiling on deductibility of pension contributions for canton income taxes), while there are limited deductions for pension contributions and life insurance premiums.

The corporate income tax is also levied by all three levels of government. The rates are a function of the ratio of profits to assessed capital. (As an example for the City of Zurich, if the ratio is 10 per cent the combined marginal tax rate would be about 20 per cent). Depreciation is usually on a straight-line or declining balance method on a historic cost basis. Inventory valuation is not adjusted for inflation. There are some investment incentives, particularly for regional development. There is no integration of personal and corporate taxation.

Social security contributions are collected at a combined rate of about 22 per cent on all wages (and are split evenly between employee and employer). Taxes on goods and services include a turnover tax at rates of 6 per cent (retail) and 9 per cent (wholesale) which applies only on goods and with many exemptions (such as food, fuel) excise taxes, particularly on motor fuels and tobacco. Capital taxation is a very importance source of revenue.

2. Recent changes

The central government indexed its personal tax system from the 1985-86 assessment period and was generally followed by the other levels of government.

## TURKEY

The total tax revenues were 15.6 per cent of GDP in 1985, of which 33.8 per cent came from direct taxes on individuals, 11.4 per cent from the corporate income tax, 4.7 per cent from social security contributions, 44.4 per cent from taxes on goods and services and 5.6 per cent from taxes on capital.

1. The present tax system

Personal income tax is levied by the central government on individual income (although couples are taxed jointly in some cases where either wage or other income is very large) at rates up to 50 per cent. The system is not indexed. The income base includes labour income, fringe benefits, foreign earnings and pensions and some capital income. However employer's contributions to pension or sickness schemes, long-term capital gains, interest on government securities, implicit rents and domestic transfers are exempt. Except for employee contributions to social security there are no deductions or tax credits.

The corporate income tax is levied at a rate of 46 per cent and there is a surcharge of 3 per cent on income and withholding taxes for the defense fund. There is no inflation adjustment for inventories. For assets acquired after 1982 depreciation (calculated using historic) cost can be either on a straight-line basis (at any rate up to 25 per cent) or a declining-balance

method (at any rate up to 50 per cent). There are significant investment incentives (at rates of 30 to 60 per cent or even higher) for projects outside certain developed areas that can be claimed against taxable income (but which are partly recovered if profits are distributed) and allowances for foreign currency earning activities.

Social security contributions are collected on wages and salaries at a combined rate of between 33.5 and 39.5 per cent depending on the industry (28 per cent for civil servants), most of which is levied on the employer. Indirect taxation includes a VAT at a general rate of 12 per cent, with lower rates of 5 and 1 per cent, and food is zero-rated. Financial services are exempt but subject to a separate 3 per cent tax.

## 2. Recent changes

Over the period 1981-85 the personal tax system was substantially revised to remove part of the fiscal drag from earlier inflation. Marginal rates were reduced, with the highest rate falling from 75 per cent in 1981 to 65 per cent and the 3 per cent surcharge ("Fiscal Balance Tax") was abolished. In 1985 a flat rate VAT of 10 per cent replaced several taxes including the sales and production taxes, while increasing the share of indirect taxes. In 1986 the maximum personal income tax rate was cut to 50 per cent and the corporate tax rate raised from 40 to 46 per cent. The base rate for VAT was raised to 12 per cent in 1987, 5 and 1 per cent categories were introduced and the zero-rate for food was retained.

## NOTES TO ANNEX B

1. Note that in most countries the special advantages accorded within the corporate tax system were also available for unincorporated business income under the personal tax. Further details on personal tax systems can be found in OECD (1986b) and on corporate tax systems in Price, Waterhouse (1986).

2. The measures of tax burden described here are based on data published in OECD (1986a) rather than those based on the Systems of National Accounts. National Accounts figures are somewhat higher for several countries. Where relevant major differences between the two measures are given in footnotes.

3. Germany is one country for which the difference between National Accounts data and those used here is most striking (4.5 per cent of GNP). Reasons include the netting out of subsidies delivered through the corporate tax system in the OECD (1986a) data and the exclusion of some forms of social security.

4. These data are from the Icelandic Budget for 1987 (October 1986) as opposed to OECD (1986).

## REFERENCES

OECD (1986a) Revenue Statistics of OECD Member Countries 1985-1986.

OECD (1986b) Personal Income Tax Systems Under Changing Economic Circumstances.

OECD (1986c) The Tax/Benefit Position of Production Workers 1981-1985.

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