

Tax coordination in the European Union: What are the issues?

Peter Birch Sørensen*

Summary

■ In principle it is not necessary to harmonise tax policies in the EU to avoid tax distortions to the location of economic activity within the single market. If indirect taxes were always collected in the country of final consumption and if income taxes were always levied by the taxpayer's country of residence, producer prices of tradable goods would tend to be equated across EU countries even if member states choose different levels of taxation. However, because of practical obstacles to the implementation of these tax principles, the current tax systems in the EU distort the workings of the single market, and national tax policies may have significant international spillover effects. The problems are most severe in the area of capital income taxation. I argue that a fully harmonised corporation tax should be a long-term goal for EU policy.

The paper presents an applied general equilibrium model of the OECD economy designed to evaluate the economic effects of tax coordination within the EU. According to the model a complete harmonisation of capital income taxes within the EU would generate a welfare gain of almost 0.4 per cent of GDP for the EU as a whole, but several member states would lose from harmonisation. I also consider the effects of a coordinated 10 percentage point increase in effective capital income tax rates in all EU countries, serving to finance a cut in taxes on labour income. This policy is estimated to benefit the great majority of EU member states and to pave the way for a 0.6 percentage point drop in European unemployment, but sensitivity analysis indicates that the welfare effects are rather sensitive to the assumptions on the degree of capital mobility and the elasticity of labour supply. ■

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Ever since the signing of the Treaty of Rome, policy makers in the European Union have seen the creation of a common European market as the road to economic prosperity. For at least as long, they have debated whether the move to a fully integrated market for goods and factors of production requires a coordination or even a harmonisation of national tax policies within the union. Although the “Europe-builders” in the European Commission have presented numerous proposals for tax coordination and tax harmonisation over the years, EU member states have jealously guarded their sovereignty in matters of tax policy, and so far only a limited amount of coordination has been achieved.

In recent years the debate on European tax coordination has become more polarised. On the one hand, many observers fear that rising cross-border capital mobility will initiate a “race to the bottom”, as governments try to lure increasingly mobile capital into their jurisdiction by undercutting each others’ taxes on income from capital. The concern is that growing capital mobility—likely to be further accelerated by the advent of the euro—may cause a gradual shifting of the tax burden away from capital towards less mobile labour, undermining the ability of governments to redistribute income from rich to poor, and exacerbating the European unemployment problem via excessive taxes on labour. Opponents of this view point to the long-term growth of government and argue that unfettered tax competition

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among EU member states will serve as a healthy constraint on the ability of governments to overtax their citizens.

This paper contributes to the ongoing debate on the need for tax coordination in the EU. As we shall see, many obstacles to the smooth functioning of the single market could indeed be removed via extensive tax harmonisation. On the other, hand it seems natural that national preferences for public consumption and income redistribution should differ, given the differences in history, culture and economic structure across EU member states. Tax harmonisation therefore involves a trade-off between the loss of national tax autonomy and the potential gains from reduced tax distortions to cross-border economic activity.

It is not the economist's job to determine how national autonomy should be traded off against international economic efficiency, but the tax economist may help policy makers to make informed choices by seeking answers to questions such as the following: (1) In what ways and to what extent do current tax policies distort the single market? (2) What are the most serious distortions of cross-border activity implied by current tax systems? (3) What kind of coordinating policy measures could serve to reduce or eliminate these distortions, and what is the likely (quantitative) effect of these measures on income, employment and economic welfare?

The literature on European tax coordination and tax harmonisation is enormous, and many of the problems involved are highly complex.¹ In this article I will only briefly discuss some of the tax policy issues which seem to be the most important ones at the present stage of European integration. To limit the scope of the paper, I will not touch on issues of tax coordination arising from the international mobility of labour, since labour mobility is still rather limited within the EU. Instead I will focus on problems of capital taxation and indirect taxation.

The rest of the paper falls in five main parts. Section 1 presents some basic economic concepts that are relevant for the debate on EU tax coordination. In Section 2 and 3 I discuss the practical problems

¹ Important early contributions to the debate on EU tax coordination were made by the Tinbergen Report (1953), the Neumark Committee (1963), and Shoup (1967). For more recent surveys of the policy issues and the literature, see Cnossen and Shoup (1987), Sinn (1989), Keen (1993), Sørensen (1993), Genser et al. (1995), Haufler (1999), Bond et al. (2000), Sørensen (2000), and Centre for European Policy Studies (2000).

of coordinating indirect taxes and capital income taxes and some alternative policy options which have figured in the debate in recent years. Section 4 presents an applied general equilibrium model illustrating the likely quantitative effects of European tax coordination, and Section 5 summarises my main conclusions.

1. The policy debate on European tax coordination: basic concepts

To evaluate the need for tax coordination within the EU, we must study the current differences in the level and structure of taxation within the union. The economic effects of taxation depend on the *effective* tax rates, which are functions of statutory tax rates and of all the rules defining the tax bases. A high statutory tax rate may go hand in hand with a low effective tax rate if the true value of income, consumption or wealth exceeds the taxable value. Most of the distortionary substitution effects induced by taxation are driven by the *marginal* effective tax rate, defined as the amount of tax collected on the marginal unit of (true economic) income or consumption. In contrast, the effects of taxation on income distribution and public revenue are determined by the *average* effective tax rate, defined as the total amount of tax on a given activity in proportion to the total amount of (true economic) income or consumption. Average effective tax rates may also distort economic behaviour in important ways. For example, the average effective tax rate on corporate income may affect the decision of a multinational corporation to locate activity in one country rather than another, and the average effective tax rate on labour income may influence a person's decision to join the labour force as well as the pressure for higher wages exerted by trade unions.

Estimation of marginal effective tax rates requires detailed information on the tax code for each country. In cross-country studies the key features of national tax systems are therefore often summarised by use of average effective tax rates, which are typically easier to calculate on a cross-country basis. To the extent that marginal effective tax rates are correlated with average effective tax rates, the latter may serve as a rough indicator of the incentive effects as well as the distribution effects of taxation.

**Table 1. Average effective tax rates, 1991-95
(changes since 1981-85 in brackets)**

Country	Average effective direct tax rate on labour income (t^d)	Average effective tax rate on consumption (t^c)	Total average effective tax rate on labour income $(t^d + t^c)/(1 + t^c)$	Average effective tax rate on capital income (τ)
<i>Continental European countries</i>				
Austria	46.3 (+2.0)	21.3 (-1.4)	55.7 (+1.1)	22.7 (+1.2)
Belgium	46.7 (+2.0)	16.4 (+0.3)	54.2 (+1.8)	35.0 (-2.6)
France	48.8 (+4.6)	19.7 (-1.6)	57.2 (+3.2)	24.7 (-3.7)
Germany	42.0 (+3.1)	16.5 (+1.1)	50.2 (+3.1)	26.5 (-4.5)
Italy	45.4 (+7.8)	15.6 (+3.6)	52.8 (+8.5)	34.2 (+8.7)
Netherlands	52.5 (+0.7)	18.0 (+1.3)	59.7 (+1.0)	31.7 (+2.5)
Average^a	47.0 (+3.4)	17.9 (+0.6)	55.0 (+3.1)	29.1 (+1.5)
<i>Nordic countries</i>				
Denmark	46.6 (+10.3)	32.7 (-0.8)	59.7 (+4.1)	40.0 (-7.8)
Finland	46.1 (+10.3)	26.7 (+0.9)	57.5 (+8.5)	44.2 (+10.6)
Norway	38.7 (+1.3)	32.8 (-0.6)	53.8 (+0.7)	29.9 (-9.2)
Sweden	50.9 (-0.2)	24.1 (+2.1)	60.4 (+0.5)	53.2 (+5.8)
Average^a	45.6 (+4.3)	29.1 (+0.4)	57.9 (+3.5)	41.8 (-0.2)
<i>Other peripheral European countries</i>				
Greece^c	37.0 (+2.3)	18.2 (+6.5)	46.7 (+5.2)	9.6 (+2.8)
Ireland^b	35.5 (+5.9)	26.7 (-2.5)	49.1 (+3.6)	11.1 (-0.2)
Portugal^c	25.8 (n.a.)	19.1 (+6.1)	37.7 (n.a.)	17.0 (n.a.)
Spain	36.0 (+4.6)	13.4 (+5.5)	43.6 (+7.2)	22.3 (+8.6)
Average^a	33.6 (+4.3)	19.4 (+3.9)	44.3 (+5.3)	15.0 (+3.7)

Notes: ^a) Unweighted average. ^b) Figures for 1991. ^c) Averages for 1991-93.

Sources: The estimates of t^d , t^c and τ were calculated by Volkerink and de Haan (2000, Tables 15, 16, and 18), based on the methodology developed by Mendoza, Razin and Tesar (1994).

Table 1. Continued...

Country	Average effective direct tax rate on labour income (t^d)	Average effective tax rate on consumption (t^c)	Total average effective tax rate on labour income $(t^d + t^c) / (1 + t^c)$	Average effective tax rate on capital income (τ)
<i>Anglo-Saxon countries</i>				
Australia	20.9 (+0.2)	7.3 (-2.0)	26.3 (-1.1)	43.3 (-0.5)
Canada	31.4 (+6.4)	11.4 (-0.6)	38.4 (+5.4)	50.5 (+12.7)
UK	24.3 (-4.5)	17.3 (+0.6)	35.5 (-3.5)	45.8 (-19.7)
US	26.1 (+1.3)	5.4 (-0.3)	29.9 (+1.0)	41.9 (+2.1)
Average^a	25.7 (+0.9)	10.4 (-0.6)	32.5 (+1.8)	45.5 (-1.4)
Japan	27.9 (+3.5)	5.9 (+1.1)	31.9 (+4.0)	43.2 (+3.5)
EU average^a	41.7 (+3.4)	20.4 (+1.6)	51.4 (+3.4)	29.9 (+0.1)
Average for all countries^a	38.4 (+3.2)	18.3 (+1.0)	47.4 (+3.0)	33.0 (+0.6)

Table 1 shows the levels and the recent rates of change of average effective tax rates in the EU and in the OECD, estimated by Volkerink and de Haan (2000) based on the method proposed by Mendoza, Razin and Tesar (1994).² The effective tax rate on capital income includes taxes on corporate income, property and wealth plus that part of the personal income tax which is estimated to fall on income from capital. The effective direct tax rate on labour income includes the share of the personal income tax imputed to labour plus payroll taxes and social security taxes paid by employers and employees, while the effective consumption tax rate includes VAT plus the various excises. Since consumption taxes erode the real purchasing power of wages, they should be incorporated in a comprehensive measure of the total direct and indirect tax burden on labour income. The total effective

² As pointed out by Volkerink and de Haan, the method of Mendoza, Razin and Tesar (MRT) is problematic in several respects. In particular, it tends to overestimate the effective tax burden on labour and capital in those countries that impose full personal tax on social transfers, since the revenue from taxes on transfers enter the numerator (but not the denominator) in the estimated personal tax ratio. Nevertheless, the MRT-method remains popular because it represents a simple way of combining the OECD national income statistics with the OECD member state revenue statistics to produce internationally comparable estimates of effective tax rates on the main tax bases.

tax rate on labour income is given by $(W-w)/W$, where W is the total labour cost of the employer (including payroll taxes and social security taxes) and w is the real after-tax wage rate of the employee after payment of direct and indirect taxes. If t^d is the average effective *direct* tax rate on labour and t^c is the effective tax rate on consumption, we have $w=W(1-t^d)/(1+t^c)$ from which it follows that the total effective tax rate on labour income is $(W-w)/W=(t^d+t^c)/(1+t^c)$. In Table 1, I have included this measure of the total tax burden on labour.³

The table shows that countries can be divided into four regions with fairly similar levels and structures of taxation within regions, but clear differences across regions. The “core” EU countries on the European continent have high total tax burdens on labour, but relatively low tax rates on capital. The Nordic countries have even higher total taxes on labour, due to very high consumption tax rates, and they also seem to impose rather high taxes on capital (notice, however, that effective income tax rates in the Nordic area are statistically exaggerated by the fact that these countries impose personal tax on social transfers). “Peripheral” EU countries like Greece, Ireland, Portugal and Spain levy considerably lower taxes, particularly on income from capital. Like Japan, the Anglo-Saxon countries stand out as having the lowest tax rates on labour combined with the highest tax rates on capital. To some extent the high Anglo-Saxon tax rates on capital reflect the significant role of property taxes in those countries.

It is striking that labour taxes have risen by nontrivial amounts in almost all countries from the first half of the 1980s to the first half of the 1990s, whereas capital taxes have on average hardly risen at all. Apparently the growing international mobility of capital over this period has induced many governments to shift more of the overall tax burden towards the less mobile labour factor. At the same time, the fact that rising taxes on labour have not on average been accompanied by a fall in taxes on capital shows that tax competition for mobile capital has not so far been able to force a reduction of the size of the public sector. These observations suggest that while tax competition may not cause an underprovision of public goods, it may lead to an unfair or inefficient distribution of the tax burden. This theme will be taken up in Section 4.4.

³ Due to lags in the publication of national income statistics, the table only covers the period until the mid-1990s. Figures for Luxembourg are left out because of lack of data.

1.1. Minimising tax distortions to the single market: production efficiency versus consumption efficiency

Table 1 showed that considerable tax rate differentials persist within the EU, despite the deepening integration of the European economies. Suppose that EU member states wish to preserve their right to set their own tax rates, but that they are willing to act cooperatively so as to minimise any tax-induced distortions of the EU single market. In these circumstances, how should economic transactions between member states be taxed?

In discussing this issue of economic efficiency, it is useful to distinguish between efficiency in *production* and efficiency in *consumption*. In a competitive international economy production efficiency is achieved when *producer prices* of tradable outputs and inputs are equated across countries. Equalisation of producer prices of tradable outputs implies equalisation of marginal costs, ensuring that no costs can be saved by reallocating production from one country to another. Equalisation of producer prices of tradable inputs will equate the value of the marginal products of factors of production so that the global value of output is maximised.

In contrast, consumption efficiency requires a cross-country equalisation of *consumer prices* to ensure that utility-maximising consumers will have the same marginal rate of substitution (MRS) between any two goods, including the same MRS between present and future consumption, so that no increase in utility can be gained by reallocating consumption and savings across borders.

Equalisation of producer prices (production efficiency) is attained if all countries follow the *destination* principle of indirect taxation and the *residence* principle of income taxation. Under the destination principle all goods and services are taxed in the country of final consumption. Exported goods are allowed to leave the origin country free of domestic tax, since they will be taxed in the foreign destination country, and imported goods are subject to the same indirect tax rate as similar goods produced domestically. Foreign and domestic producers selling in the same national market at a given consumer price will thus obtain the same producer price net of tax.

Similarly, under the residence principle of income taxation, the taxpayer is liable to tax in his country of residence on his worldwide income from all sources. He thus faces the same marginal tax rate on

foreign source income and on domestic source income.⁴ With perfect capital mobility, he will therefore engage in arbitrage until the marginal pre-tax rates of return on domestic and foreign investment are equated, since this will also ensure equalisation of after-tax rates of return. Since the required marginal pre-tax rate of return represents the cost of capital to firms, the residence principle thereby ensures a cross-country equalisation of the producer price of capital.

On the other hand, equalisation of consumer prices (consumption efficiency) requires that commodities be taxed according to the *origin* principle and that income be taxed according to the *source* principle. Under the origin principle commodities carry the tax rate imposed by the country of production, whether they are sold in the domestic or in the foreign market, and no domestic tax is imposed on imported goods. International trade will then tend to equate the tax-inclusive consumer prices across countries, but with different national tax rates, this is incompatible with equalisation of producer prices, implying violation of production efficiency.

By analogy, the source principle of income taxation implies that income is taxed in the country from where it originates (the source country), i.e. investment income is taxed in the country where the investment is made, and the residence countries of foreign investors impose no further tax when income from foreign investment is repatriated. Under the source principle perfect capital mobility implies a tendency for after-tax rates of return to be equated across countries. Consumers in different countries will then have the same marginal rate of substitution between present and future consumption, so no welfare gain can be made by reallocating savings from one country to another. However, with different national tax rates on capital income, equalisation of *after-tax* returns will imply cross-country differences in *pre-tax* rates of return, so firms in different countries will face different costs of capital, inconsistent with production efficiency.

Should international tax policy strive for production efficiency or for consumption efficiency or for some compromise between the two? In answering this question, tax theorists often appeal to the famous Production Efficiency Theorem of Diamond and Mirrlees (1971). This theorem says that, in a competitive economy, a Pareto-efficient tax structure is characterised by production efficiency so long

⁴ Following Musgrave (1969, Part III), such a tax regime is said to be characterised by 'capital export neutrality'.

as any pure profits can be taxed at 100 per cent and there are no restrictions on the distorting tax instruments available to government. In other words, even if taxes must inevitably distort consumer choices, it is second-best optimal to leave the input choices of firms undistorted by taxes, thereby allowing minimisation of aggregate production costs, unless input taxes can serve as a surrogate for missing output taxes or for missing taxes on pure profits.

The intuition for the production efficiency theorem may be explained as follows: via its cost effect on prices, an input tax will distort consumer choices, just like a commodity tax. But in addition the input tax will distort the input choices of firms. This additional distortion can be avoided if the government restricts itself to raising revenue via taxes on outputs and factor supplies. Note that in the context of the global economy, a source-based capital income tax can be seen as a selective tax on the use of capital inputs in a particular country, and hence it will work like a distortionary input tax.

The production efficiency theorem establishes a strong presumption in favour of the destination and residence principles of international taxation. I will now briefly discuss some arguments which might nevertheless tilt the balance in favour of origin-based and source-based taxation.

Absence of international transfers: The Diamond-Mirrlees production efficiency theorem was derived for a closed economy with a single government facing a single budget constraint. As Keen and Wildasin (1999) have recently stressed, this means that the theorem cannot be directly applied in an international context with many independent governments subject to separate budget constraints, unless the marginal cost of public funds (the excess burden of taxation) is equated across countries through lump-sum transfers between governments. If such transfers are not possible, it may be second-best optimal to use origin and source taxes to shift tax bases and fiscal resources towards “fiscally needy” countries where the marginal cost of public funds is relatively high, even if this violates production efficiency. However, in the EU context there would seem to be several ways of effecting intergovernmental transfers through the common EU budget. Compared to distortionary origin and source taxes, the common budget is a more direct and hence more efficient instrument for implementing any desired redistribution among member states. Co-operative sharing of the revenue from taxes on border-crossing trans-

actions is another means of engineering lump-sum fiscal transfers among EU governments.

Untaxed pure profits: In establishing the desirability of production efficiency, Diamond and Mirrlees assumed that governments would tax away all pure profits before resorting to distortionary taxes on income and consumption. In the real world it is obviously very difficult to implement 100 per cent taxation of pure profits. As shown by Keen and Piekkola (1997), in such circumstances it may be second-best optimal from an international perspective to allow capital-importing countries to violate production efficiency by using source-based capital income taxes as an indirect means of taxing pure profits. Keen and Piekkola also demonstrate that the greater the extent to which countries can use other fiscal instruments to tax pure profits, the less they should rely on source-based capital income taxes. In practice, a large part of pure profit arises from the exploitation of land and natural resources. For the purpose of capturing such rents, a general source-based capital income tax seems a poorly targeted instrument compared to more specialised instruments such as taxes on land or real estate, royalties related to the extraction of mineral resources, and taxes on energy inputs etc. Thus, while the existence of pure profits would certainly seem to justify certain elements of source and origin taxation in the overall tax system, it does not validate a wholesale rejection of the residence and destination principles.

Source country entitlement: The arguments above relate to economic efficiency, but tax policy also involves considerations of inter-nation equity, as stressed by Musgrave and Musgrave (1989, ch. 33). It is often argued that since source country governments provide the costly infrastructure and protection of property rights, which are a precondition for the profitable use of capital, they are entitled to a (tax) share of the income earned by foreign investors within their jurisdiction. Indeed, this view is reflected in the OECD Model Double Taxation Convention which allows source countries to tax the income from foreign-owned “permanent establishments” doing business in the country. However, this source country entitlement can be fully respected without violating production efficiency if the residence countries of foreign investors offer a full credit for any source country tax against the residence country tax on foreign source income. In that case the effective tax rate paid by investors will always correspond to the residence country tax, whether they invest at home or abroad, and

perfect capital mobility will then equate the pre-tax rates of return, as required for production efficiency.

Turning from inter-nation equity to interpersonal equity (equity among taxpayers), the case for residence-based taxation is further strengthened. The main tax instrument for achieving the desired personal distribution of income is the progressive personal income tax. The ideal of comprehensive income taxation requires that the taxpayer's income from all sources (including foreign source income) be added together and subjected to a single, progressive tax schedule. Clearly this requires adherence to the residence principle. If foreign source income is exempted from domestic tax, as implied by the source principle, the taxpayer's income from abroad escapes the intended progressivity of the personal income tax.

In summary, it seems that considerations of equity as well as efficiency would call for a European tax system which is predominantly based on the residence and destination principles, supplemented by elements of source and origin taxation to capture pure profits, by a foreign tax credit mechanism to allow more generally for source country entitlement, and perhaps by intergovernmental transfers towards fiscally needy member states.

1.2. Non-cooperative tax setting

I have so far assumed that EU member states have the political will to act cooperatively to internalise any cross-country spillover effects of national tax policies. At the present stage of European integration, this assumption may be too optimistic. Suppose therefore that national governments set their tax rates in a non-cooperative manner to maximise national welfare without any regard to possible spillover effects on other countries. We may then ask whether the destination and residence principles will offer better insulation from international spillover effects of national tax policies, compared to the origin and source principles?

International tax spillovers may take the form of terms-of-trade manipulation, rent shifting and tax base stealing. Tax-driven terms-of-trade manipulation is only possible for large countries with international market power, so rent shifting and tax base stealing are the most relevant fiscal externalities in the EU context. For example, if foreign investors earn pure profits on their investment in the domestic economy and income taxation follows the source principle, the domestic government may set a high capital income tax rate in order

to shift rents from foreigners to domestic residents. In this way the government may “export” part of the domestic tax burden to the foreign investors who do not count in the domestic political process. On the other hand, the source principle enables the government to attract capital from abroad by setting a low capital income tax rate, thereby expanding the domestic tax base at the expense of the foreign tax base. A priori it is not clear whether the net result of these offsetting incentives will be excessively high or inefficiently low capital income tax rates, but it is clear that the source principle generates fiscal externalities through several channels. Similarly, under origin-based commodity taxation governments may attract consumer purchases and hence “steal” tax bases from abroad by lowering domestic commodity tax rates.

With perfect competition, the residence and destination principles do not leave such possibilities for rent shifting and tax base stealing. By definition, residence-based taxes are not levied on domestic source income accruing to foreigners and hence cannot be used for tax exporting purposes. Moreover, a change in the domestic capital income tax rate applies to income from foreign as well as domestic investment, generating no incentive for international reallocation of investment, and changes in destination-based commodity tax rates apply equally to importables and goods produced domestically. These observations seem to strengthen the case for the destination and residence principles already established in a cooperative policy setting.

However, with imperfect competition the case for destination-based commodity taxation has turned out to be less clear-cut under non-cooperative tax setting. Domestic tax policy will then try to correct the domestic distortion from imperfect competition and to shift monopoly profits from the foreign to the domestic economy. With such strategic motives for tax policy and zero costs of international trade, Keen and Lahiri (1998) actually found a presumption in favour of origin-based taxation, whereas Haufler et al. (2000) conclude that trade costs of a realistic magnitude tilt the balance in favour of the destination principle. Future research will have to reveal whether robust results on the relative merits of the destination and origin principles can be established under imperfect competition.

In the meantime, one important practical consideration weighs heavily in favour of destination-based taxation. Under the origin principle, vertically integrated multinational firms may use transfer-pricing to shift their taxable value-added towards countries with low rates of

VAT, since this will reduce the overall VAT burden on the final product. The destination principle provides no incentive for such transfer pricing, since it implies that all of the value-added will be taxed at the rate prevailing in the country of final consumption. With non-cooperative tax setting, the scope for transfer-pricing under the origin principle may induce governments to undercut each others' VAT rates to expand their tax bases at each others' expense.

Given our current state of knowledge, I conclude that non-cooperative tax setting does not seem to undermine the case for residence-based and destination-based taxation.

1.3. Why the destination and residence principles fail in practice

I have discussed the theoretical case for the destination and residence principles at some length to stress the important point that European economic integration does not necessarily require EU harmonisation of tax rates. Under the destination and residence principles member states can choose their own preferred tax rates without violating pan-European production efficiency, i.e. without distorting the location of economic activity in the single market. Unfortunately there are serious practical obstacles to the consistent implementation of the destination and residence principles.

Consider first the problems of indirect taxation. Historically, the administration of the destination principle has relied on a system of national border controls. By controlling all imports and exports at the border, the customs authorities were able to check that all imported goods were subject to domestic indirect tax and that all goods exempted from domestic tax were in fact exported. However, with the implementation of the Single Market Programme, border controls within the EU area were abolished, partly for ideological reasons, but also because border formalities tended to increase the transactions costs of cross-border trade, thereby inhibiting the creation of a truly integrated European market. Instead of collecting indirect tax at the border, EU member states now collect the tax on imported goods when the goods are resold by the registered importer to domestic consumers or firms. In this way the destination principle of taxation is maintained as far as imports through registered traders are concerned. But with some modifications, consumers in the EU are now free to engage in cross-border shopping to import goods from another member state for private consumption without having to pay any domestic indirect tax. Cross-border consumer purchases therefore

carry the indirect tax of the country where the purchase was made—the origin country—rather than the indirect tax of the destination country where final consumption takes place. As demonstrated by Genser et al. (1995), this odd mixture of destination-based and origin-based taxation combined with different national VAT rates drives a wedge between relative producer prices and hence between relative marginal costs in the different EU member states, implying an inefficient allocation of production within the single market.

The element of origin-based taxation also opens the door to tax competition, as EU member states may be tempted to lower the domestic tax rate to attract foreign cross-border shopping and increase the national tax base at the expense of neighbouring countries. Allowance for transportation costs would not change these qualitative conclusions, although such costs clearly reduce the scope for distorting cross-border trade. On the other hand, the time and transportation costs incurred by consumers who engage in cross-border shopping only to take advantage of indirect tax differentials are an obvious waste of resources from society's point of view. In summary, in a single market with free mobility of consumers and no border controls, consistent implementation of the destination principle to secure production efficiency seems impossible.

Let us turn next to the difficulties of implementing the residence principle of income taxation. First of all, for residence countries to be able to monitor and tax foreign source income, source countries must be able and willing to provide information on income earned in their jurisdiction by foreign residents. As pointed out by Tanzi and Zee (1998), such international information exchange is hampered by administrative, judicial and political problems, including the tradition of bank secrecy in many countries.

A second practical difficulty stems from the fact that corporate investment is subject to corporate as well as personal income tax. The hallmark of a true residence-based tax system is that investors face the same *total* corporate and personal tax burden whether they invest at home or abroad, and that this total tax burden corresponds to the sum of the *domestic* corporate and personal tax. Consider what it would take to implement this principle for a household investor holding shares in a domestic corporation which in turn holds shares in a foreign corporation. First of all, the domestic corporation should be subject to domestic corporate tax on its pro rata share of the profits of the foreign corporation. The taxable foreign profits should be cal-

culated according to domestic corporate tax rules, and the domestic corporation should be given full domestic credit for any foreign corporation and withholding taxes levied on its imputed foreign profit share. Further, when the domestic corporation distributes income from foreign sources to the ultimate domestic shareholder, the latter should be given the same amount of personal tax relief for the economic double taxation of dividends as that granted when domestic-source profits are distributed.

Implementing such procedures for all corporate-source income originating from abroad would probably be an administrative nightmare, and no country has actually tried to do so. Indeed, most EU member states simply exempt foreign source corporate income from domestic corporation tax when the foreign income originates from a tax treaty partner country. Even member states which formally adhere to the residence principle normally defer domestic corporation tax until the profits from the foreign corporate affiliates are repatriated in the form of dividends. As long as the profits are retained abroad, they are thus subject only to source country corporation tax.⁵ Moreover, when residence country tax is applied, residence countries only grant a credit for taxes paid abroad up to a limit given by the amount of domestic tax on the foreign source income. When the effective foreign tax rate exceeds the effective domestic tax rate, investors thus end up paying the higher foreign tax rate on their foreign income, as would be the case under pure source taxation. Because of these practices, the current corporate tax regime in the EU comes close to a source-based system. Since information exchange among member states is still very ineffective, it is generally believed that the foreign source capital income of household portfolio investors largely escapes residence country tax, even though the personal income tax systems of member states are formally based on the residence principle.

In short, the system of indirect taxation in the EU includes a significant element of origin taxation, and the system of capital income taxation is mainly source-based. As we have seen earlier, the origin and source principles leave considerable scope for international spillovers of national tax policies, suggesting a need for some form of

⁵ As an exception to this general rule, some EU member states have introduced so-called CFC (Controlled Foreign Corporation) legislation enabling them to tax passive financial income accumulated in tax haven countries on a current basis, without deferral of tax until repatriation of income.

tax coordination. In the sections below I will discuss how the EU could deal with this challenge, starting with the problems of indirect taxation.

2. Taxation in practice: indirect taxes

2.1. The current problems of indirect taxation in the EU

The current problems of indirect taxation in the EU stem from the fundamental tension between the goal of creating a border-less Europe and the goal of preserving member state autonomy in the setting of indirect tax rates. When consumers are free to engage in cross-border shopping and national indirect tax rates differ substantially, the door is inevitably opened to trade distortions and tax competition.

The current border trade between Denmark and Germany provides an illustration of this. The German standard VAT rate of 16 per cent is significantly below the Danish VAT rate of 25 per cent, and Denmark also levies much higher excises on alcohol and tobacco. As a consequence, Danish consumers make roughly one fifth of their total purchases of alcoholic beverages and one tenth of their purchases of cigarettes in Germany, and total Danish border trade amounts to about 1.4 per cent of total private consumption, according to recent official estimates. Following the opening of the EU Single Market in 1993, Denmark was allowed to maintain certain temporary restrictions on the total value of excisable products which Danish consumers may legally import from other member states for private consumption. When the remaining restrictions are lifted in 2003, Denmark will undoubtedly have to lower some of its excises to keep border trade within tolerable limits, and this may force a reduction of the high excise tax rates in Sweden to prevent a boom in Swedish cross-border shopping in Denmark.

To limit the scope for cross-border shopping and indirect tax competition, EU member states have agreed on a set of minimum VAT and excise tax rates establishing a floor for indirect taxation. They have also agreed that cross-border mail-order sales above a certain limit and cross-border consumer purchases of big items such as cars and boats should be taxed at the rates prevailing in the destination country. However, many of the minimum excise tax rates are very low, providing no serious protection of the tax base of high-tax countries. Moreover, enforcement of indirect tax on the growing vol-

ume of direct consumer purchases via the internet represents a new challenge to member state tax administrations. Collection of indirect tax on electronic deliveries of digital services presents a special problem requiring truly international cooperation, since such services can easily be supplied from a non-member state if the EU were to impose a significant minimum VAT rate on e-commerce suppliers based in a member state.

While the abolition of border tax formalities has increased the scope for distortionary cross-border shopping, one might think that it has at least had the benefit of reducing the costs of intra-EU trade for registered traders. Unfortunately it is far from clear that such benefits have indeed materialised. Under the current so-called transitional VAT regime, border controls have been replaced by a VAT information exchange system requiring VAT registered traders to report their taxable sales to (and the VAT identification number of) registered traders in other member states in order to qualify for a zero VAT rate on these sales. For official statistical purposes, firms also have to report statistics on their intra-EU trade in goods, since this information can no longer be collected via customs controls. In a recent survey study of Dutch firms, Verwaal and Cnossen (2001) found that the extra compliance costs implied by these administrative requirements averaged 5 per cent of the value of Dutch trade with other member states. As the authors point out, trade costs of this magnitude may be as high as the burden on cross-border trade implied by the previous border controls.

2.2. Removing indirect tax barriers to intra-Community trade

The different VAT treatment of domestic and cross-border trade in the EU impedes the creation of a truly integrated single market. But is there a way of ensuring equal indirect tax treatment of domestic and cross-border sales without redistributing VAT revenues and undermining the ability of member states to set their own VAT rates? Let us take a look at some of the policy options discussed since the launching of the Single Market Programme.

The 1985 Commission proposal: In 1985 the European Commission proposed to abandon the practice of VAT exemption (zero-rating) of exports from one member state to another, to ensure identical VAT treatment of domestic and cross-border sales within the EU. Upon resale, importing firms would be able to credit the VAT paid on imports from other member states against the VAT on their sales (and

would be entitled to a refund, if necessary), so the tax on final consumption would still equal the VAT rate of the destination country. To restore the distribution of VAT revenues implied by the previous system of zero-rating of exports, the difference for each member state between total VAT collected on exports and total VAT credits granted on imports would be paid to or refunded from a central Clearing House. This proposal came under heavy fire for two main reasons. First of all, member states complained that the required adding up of all credits for import VAT and all VAT collected on exports on the basis of individual invoices would imply an onerous administrative burden. Second, the Clearing House mechanism would seriously erode incentives for tax enforcement: a member state would have no motive to guard against false invoices overstating the VAT paid on its imports, since it would be entitled to a refund of import VAT credits, and it would have no incentive to enforce VAT on exports since the resulting revenue would be payable to the Clearing House. For these reasons the 1985 proposal was never adopted.

The 1996 Commission proposal: In its 1996 proposal for a “definitive” VAT regime, the European Commission still called for abolition of the zero-rating of exports to other member states combined with a clearing mechanism to maintain the distribution of VAT revenues implied by a destination-based system. As a novelty, the allocation of VAT revenue would be based on statistics of aggregate consumption in each member state and not on the adding up of individual VAT invoices. This would radically reduce the administrative workload associated with clearing, but critics were quick to point out that it would not solve the problem of lacking incentives for tax collection: any member state improving the enforcement of tax would only receive a share of the added revenue corresponding to its share of overall consumption in the EU. Due to this weakness combined with other controversial elements such as the proposed near-harmonisation of VAT rates, the Commission’s 1996 proposal was not accepted by member states.

The VIVAT proposal: The year 1996 saw an alternative proposal for a definitive EU VAT regime, the so-called VIVAT (“Viable Integrated VAT”) promoted by Keen and Smith (1996). According to this scheme, all domestic as well as cross-border sales between registered traders within the EU would be subject to a common harmonised VAT rate, whereas all sales to non-registered persons or firms (typically sales to final consumers at the retail stage) would be subject to

the VAT rate chosen in the country of final sale, with full credit (and possibly refund) given for the harmonised input VAT. The VIVAT may thus be described as a combination of a harmonised VAT on all intermediate transactions between registered traders within the single market and a country-specific retail sales tax determined by destination countries. Thus the VIVAT preserves national autonomy in the setting of VAT rates on final consumption and avoids differences in the tax treatment of domestic and cross-border trade within the Community. Because it abolishes zero-rating of exports, the VIVAT would still require a clearing mechanism to avoid a redistribution of VAT revenues, but the associated incentive and distribution problems could be kept within limits by harmonising the VAT rate on intermediate transactions at a relatively low level, since this would limit the redistribution of revenue and imply that there would be no high-tax countries to submit false invoices from. On the debit side, the VIVAT would raise administration and compliance costs by requiring traders and tax authorities to distinguish between sales to final consumers and sales to registered traders.

2.3. Summing up the dilemmas of indirect taxation

There are two main insights from the above discussion of the dilemmas of indirect taxation in the EU. First, if member states wish to combine free cross-border shopping with national autonomy in the setting of indirect tax rates, they will have to live with some amount of trade distortion and indirect tax competition. Second, if they wish to secure equal tax treatment of domestic and cross-border trade without changing the distribution of indirect tax revenues, they will have to devise some form of revenue clearing mechanism which will involve administrative burdens and/or a serious weakening of the incentive for effective tax enforcement. Because of this problem, member states should probably stick to the current transitional regime until they are ready to seek a once-for-all settlement at the time of the regime change, with side payments between member states arranged through the common budget or as part of a wider bargain on a range of issues.

3. Taxation in practice: taxes on capital

Beyond the OECD-inspired network of bilateral tax treaties, very little coordination has been achieved in the field of direct taxation in the

EU. The main coordinating measure is the 1990 parent-subsidiary directive which brought an end to corporate double taxation of dividend payments from a subsidiary in one member state to a parent company in another member state.

Since capital is much more mobile than labour, the distortions and inequities caused by lack of tax coordination are mainly felt in the field of capital income taxation. The current problems may be summarised under the following headings:

1. *Production inefficiency*: Despite some feeble attempts to implement residence-based taxation, the current system of capital income taxation in Europe is mainly based on the source principle. For example, most member states have implemented the parent-subsidiary directive by simply exempting foreign-source dividends from domestic corporation tax. Since capital mobility tends to equate (risk-adjusted) after-tax returns across countries, the existing capital income tax differentials will tend to generate similar differences in required marginal pre-tax rates of return when taxes are levied at source. Hence the marginal value products of capital will differ across member states, and the total value of EU output will fall below its potential.⁶

2. *Tax evasion*: The lack of effective exchange of information makes it very difficult for EU member states to enforce the residence principle of personal income taxation to which they formally adhere. It is widely recognised that the foreign portfolio investment income of private households within the EU goes largely untaxed, due to the lacking capability of tax authorities to monitor this type of income.

3. *Tax competition*: Under source-based capital income taxation an EU member state can attract mobile investment from other member states by lowering its effective capital income tax rate. Due to this possibility of reallocating investment within the Community, the elasticity of capital supply to the individual member country is much higher than the elasticity of supply to the EU as a whole. Hence there is a danger that the level of capital income taxation will be driven down to a level which is inefficiently low from a pan-European perspective.

4. *Double taxation*: While some forms of capital income tend to be undertaxed, there are other types of capital income from cross-border activity which are still subject to a double taxation creating an artificial

⁶ George de Mènil (1999) presents evidence that pre-tax rates of return to equity-financed investment still vary considerably across the EU. The existing national differences in source-based capital income taxes could be part of the explanation.

impediment to the single market. For example, many European multinationals still have to go through a time-consuming and cumbersome procedure to obtain tax credit for the withholding taxes on interest and royalties collected by certain southern member states, and some EU countries alleviating the domestic double taxation of dividends do not grant similar tax relief to dividends originating from foreign sources.

5. Tax base allocation and transfer pricing: A large part of intra-EU trade takes the form of intermediate transactions between business units within the same multinational enterprise. In pricing such transactions, multinationals have an incentive to set transfer prices so as to shift taxable profits from high-tax into low-tax jurisdictions. To reduce their vulnerability to transfer-pricing, governments in the OECD and in the EU area have reacted by cutting statutory corporate income tax rates, thus intensifying the problem of tax competition, and by introducing complex transfer-pricing rules which have increased the administration and compliance costs of taxation and have created overlaps or unfilled gaps between national tax bases.

In the sections below, I will review some (proposed) policy measures dealing with problems 2 through 5. I will then briefly discuss whether the ideal of production efficiency could be realised through a more fundamental reform of the system of capital income taxation.

3.1. Fighting tax evasion: the taxation of interest income

In 2000, after years of hard bargaining, EU member states finally reached a fragile agreement on the future principles for enforcement of tax on interest income paid out from one member state to a household investor residing in another member state. The agreement requires source countries to provide information to residence countries on such interest flows to facilitate residence-based taxation. As an alternative to provision of information, source countries may choose to levy a 15 per cent withholding tax during the first 3 years and a 20 per cent withholding tax during the subsequent 4 years before switching to information exchange, but 75 per cent of the withholding tax revenue must be transferred to the residence country. Countries with strict bank secrecy laws such as Luxembourg, Austria and Belgium have so far opted for the transitional withholding tax regime. Before the directive is implemented, the EU must negotiate with important third countries like the US and Switzerland to induce these countries to introduce similar rules. Regardless of the outcome

of these negotiations, the directive must be approved before the end of 2002, but during the following 7 year transition period it will not be applied to interest payments on bonds issued before 1 March 2002.

Although the directive will apply only to cross-border interest income accruing to personal investors, it signals that EU member states will work towards effective residence-based taxation of personal income as a long-term goal. The Achilles heel of the agreement is the risk that significant amounts of portfolio capital may flee Europe and seek tax asylum in tax havens outside the EU. It remains to be seen if EU member states will be willing and able to set up effective systems of information exchange if jurisdictions outside Europe are unwilling to develop similar systems.

3.2. Fighting “harmful” tax competition: The Code of Conduct for business taxation

In recent decades the member states of the EU and the OECD have invented a number of special tax regimes to attract internationally mobile service activities, for example financial services and other headquarter services offered to the affiliates of multinational enterprises. In December 1997 the EU ministers of the ECOFIN Council concluded that the proliferation of these tax schemes represented “harmful” tax competition, and they declared their intention to establish a Code of Conduct for business taxation aimed at containing and rolling back such practices. A group of civil servants (the Primarolo Group) was appointed to identify the specific tax regimes in EU member states which might constitute harmful tax competition. In identifying harmful regimes, the Primarolo Group was instructed to look for selective tax schemes involving zero or very low effective taxation combined with one or more of the following characteristics: (1) separation of the favoured activity from the domestic tax base (“ring-fencing”); (2) lack of transparency of the special tax rules; (3) absence of significant real economic activities; (4) profit determination deviating from OECD transfer pricing guidelines. The Primarolo Group presented its first list of harmful tax regimes in late 1999. In principle, member states have committed themselves not to introduce new tax schemes of this sort and to phase out existing ones before the end of 2005.

The goal of the Code of Conduct is to protect member state revenues by preventing governments from “stealing” each others’ business tax bases. Another goal is to avoid the economic distortions aris-

ing from selective tax subsidies to highly mobile activities. However, the Code is a political gentlemen's agreement without the legal status of an EU directive, and member states have not yet fully agreed which particular tax schemes should be deemed 'harmful'. It will be interesting to see the extent to which this loose form of tax coordination will succeed in shaping actual tax policies.

Even if the Code does succeed in eliminating the preferential tax regimes for highly mobile activities, it is not obvious that this will be beneficial. If countries are forced to impose the same effective tax rate on highly mobile and less mobile business activities, their competition for the mobile activities may actually induce them to lower the *general level* of business taxation so that all countries end up losing revenue, as Keen (2000) has recently argued. For example, Ireland previously had a general rate of corporation tax of 28 per cent combined with a preferential tax rate of 10 per cent for manufacturing and various other activities, including financial services. Under pressure from the EU Ireland will eliminate the preferential regimes, but at the same time the regular Irish rate of corporation tax will be lowered to 12.5 per cent from 2003.

In general, when restrictions on preferential tax regimes force a harmonisation of tax rates across activities, the coordinated rise in the tax rate on the mobile tax base will increase public revenues, but the lower tax rate on the less mobile tax base will cause revenue to fall. If the latter tax base is sufficiently elastic, the lower tax rate will to a large extent be offset by a stronger base, and the net revenue effect of restrictions on preferential tax regimes will then be positive, as shown by Janeba and Smart (2001). However, with inelastic tax bases Janeba and Smart find that a ban on preferential tax regimes will lower net public revenues, in accordance with Keen's conclusion. These analyses suggest that the Code of Conduct may not be very effective in protecting member state revenues unless it is supplemented by broader coordination measures such as a minimum (effective) corporate tax rate below which no member state is allowed to go.

3.3. Eliminating double taxation

While some cross-border capital flows bear little or no tax due to evasion and preferential tax regimes, other forms of cross-border investment are still subject to double taxation hampering the establishment of a truly integrated EU capital market. The parent-subsidiary directive of 1990 marked an important step towards the elimination

of double taxation, but the business community has complained that the directive does not require abolition of withholding taxes on dividends from one subsidiary to another within a group of related companies. There have also been complaints that inability to set business losses in one member state against taxable profits in another member state puts EU multinationals at a competitive disadvantage vis-à-vis companies which are only operating in the domestic market. In addition, southern member states impose withholding taxes on interest and royalty payments between affiliates of a multinational group. Although double tax treaties usually entitle the receiving company to a credit from the residence country for such withholding taxes, in practice it may take a long and cumbersome administrative procedure before the credit is actually obtained. As a further example of tax discrimination against cross-border activity, member states alleviating the double taxation of domestic-source dividends by means of the so-called imputation system typically do not grant imputation tax credits when dividends are paid out of foreign-source profits.

Fear of revenue losses seems to be the only reason why EU member states have not already abolished these tax obstacles to intra-Community investment. As a first step member states have committed themselves to abolition of double taxation of cross-border interest and royalty payments, once they have agreed on the remaining details of the directive on the taxation of interest income mentioned in Section 3.1. As indicated above, there is a case for reviewing other parts of the tax system with the purpose of weeding out remaining elements of international double taxation.

3.4. Allocating the corporate tax base

The growing intra-company trade between business entities within the same multinational group makes it increasingly difficult to ensure a fair and simple division of the international tax base between countries. According to the arm's length principle underlying the OECD transfer pricing guidelines, the pricing of transactions between related business parties should correspond to the prices paid for similar goods or services traded between independent parties. The problem is that the items traded within multinational enterprises are often so specialised that no comparable open market transactions exist, preventing the use of the so-called "comparable uncontrolled price method" recommended by the OECD.

Because of this difficulty of applying the arm's length principle, multinationals have an obvious incentive to set prices on intracompany transactions so as to shift taxable profits from jurisdictions with high statutory corporate income tax rates to jurisdictions with low statutory tax rates. To protect themselves against such practices, a growing number of countries in the OECD and in the EU have introduced intricate rules for determining transfer prices within multinational enterprises. These rules rely on principles such as the "resale price method", where the transfer price on intermediate inputs is determined by subtracting a "reasonable" profit margin from an observed market resale price, or the "cost-plus" method where the transfer price is calculated by adding a "reasonable" profit margin to the estimated cost of delivering the input. If these transactions-based rules cannot be applied due to lack of information, resort is often taken to various "profit-split" methods whereby the transfer price is set so as to achieve a "reasonable" division of the total profit earned by the two related parties. Many EU and OECD countries have also introduced so-called "thin capitalisation" rules aimed at preventing multinationals from concentrating their debts and the associated deductible interest payments in countries with high corporate tax rates.

There are at least three problems with this international tax regime. First, the rules are highly complex, generating substantial compliance and administration costs. Second, the rules contain an inevitable element of arbitrariness, which still leaves multinationals with some room for transfer pricing, while at the same time generating repeated conflicts between companies and tax administrators. Third, the rules are largely uncoordinated across countries, so the transfer prices determined by one country may differ from those defined by another country. Hence the total profit of a multinational may either be over-taxed or undertaxed.

To ensure some coordination of transfer price rulings, the EU Arbitration Convention adopted in 1990 seeks to prevent double taxation when the tax authorities in a member state decide to adjust the transfer price reported by a multinational company. The Convention establishes a procedure to ensure that an upward adjustment of taxable profits in one country is followed by a downward adjustment of taxable income in another member country. However, in practice this procedure seems to work very slowly.

As economic integration and the growth of multinational enterprise proceeds, the problems of international tax base allocation and

transfer pricing are bound to become ever more pressing. It has therefore been debated whether the EU should divide the corporate tax base by the method of formula apportionment which is currently used to allocate taxable corporate profits across states in federations like the US, Canada and Switzerland. Under formula apportionment the total EU-wide income of a multinational company would be allocated across member states by a fixed formula reflecting the distribution of the company's activity across countries. For example, profits could be allocated in proportion to the cross-country distribution of final sales, payroll or property (assets) or in proportion to any combination of such indicators of a company's presence in a given jurisdiction. Member states would then apply their national corporate income tax rates to their respective allocated shares of the total EU-wide profit of the multinational company, and the company would be unable to shift taxable profits into low-tax member states through transfer-pricing, since the pricing of intra-company transactions would not affect the allocation of total taxable profit, as long as the valuation of the factors entering the formula is not affected.⁷

If they could agree to a common formula for the apportionment of profits, EU member states would obtain a once-and-for all solution to the problem of dividing the international tax base. By reducing the scope for transfer-pricing and thin capitalisation, formula apportionment would also reduce the need for all the related tax regulations, paving the way for lower compliance and administration costs. However, implementation of formula apportionment also raises a number of challenges, since EU member states would have to agree on (1) how to define a "unitary" business, i.e. how to determine whether a given business entity should be included in a multinational group subject to formula apportionment; (2) the indicators of activity to be included in the formula for profit allocation and the weights attached to each indicator in the formula; and (3) the accounting principles used in calculating the total EU wide profits of multinationals subject to apportionment.

These demands are a tall order indeed, essentially requiring member states to agree on the definition as well as the division of the corporate tax base. At the same time there would be a need for a so-called water's edge limitation: it would still be necessary to rely on the

⁷ The case for formula apportionment has recently been restated by Mintz (1999). McLure and Weiner (2000) offer an informative discussion of the technical issues involved.

arm's length principle to separate the EU corporate tax base from corporate income earned outside the EU.

Further, while formula apportionment would do away with the problem of transfer pricing within the EU, it would not eliminate other distortions arising from differences in national tax rates. If a member state were to impose an above-average corporate tax rate, this "excess" national tax would essentially work like a local tax on the factors entering into the formula for apportioning profits. For example, if profits were allocated in proportion to payroll, a rise in a country's corporate tax rate would be equivalent to a higher local tax on the use of labour, discouraging employment in that country.

Despite these reservations, the growing problems of implementing arm's length pricing within a highly integrated area like the EU suggest that the alternative of formula apportionment deserves serious study.

3.5. Home state taxation

The proposal for Home State taxation developed by Gammie (1998) may be seen as a more flexible and pragmatic form of taxation by formula apportionment. Under Home State taxation national tax bases are not required to be harmonised, and European multinationals are allowed to choose a "home state" whose rules for determining the corporate tax base will be applied to all of their European branches and subsidiaries. The company's EU wide profits—calculated on the basis of Home State rules—will then be apportioned to member states according to an agreed formula, and the profits allocated to each state will be taxed at that country's corporate tax rate.

One can also imagine a *residence-based* system of Home State taxation where *all* of the EU profits earned by the multinational are taxed at the rate of the Home State. The *revenue* (rather than the profit) is then allocated across member states in accordance with an agreed formula.

The freedom of member states to choose their own tax base definitions and their own corporate tax rates is a politically attractive feature of Home State taxation. At the same time it is also the weakness of the system, since it invites tax competition by enabling countries with favourable tax rules to attract corporate headquarters. Given the relative ease with which headquarters can be relocated, destructive tax competition might ensue unless member states were willing to keep their national tax rules broadly in line. To be viable, the system would

thus need to be supported by certain minimum rules limiting the scope for competitive tax base erosion. Under the residence-based system there would also be a need for a minimum corporate tax rate.

3.6. Harmonisation after all?

One might think that a residence-based system of Home State taxation for multinationals combined with exchange of information to enforce residence-based personal income taxation would roughly suffice to equate pre-tax rates of return to capital within the EU, as required for production efficiency. However, under such a tax regime the source principle would still be applied in the taxation of corporate income earned outside the multinational sector, so even if pre-tax interest rates were equated across EU member states via consistent residence-based taxation of income from portfolio investment, the cost of corporate equity capital would still differ across member states as long as they apply different corporate tax rates.

Hence it seems that the only realistic way of equating the cost of corporate capital across the EU would be full harmonisation of the base as well as the rate of corporation tax. The logic of the single market suggests that corporate tax harmonisation combined with formula apportionment might be a legitimate long-term goal for EU tax policy. The advantages of such an ambitious reform would be manifold: (1) the cost of corporate capital would no longer be distorted by national tax differentials; (2) EU companies would only have to comply with a single corporate tax system; (3) governments would no longer need to enforce complex transfer pricing rules and thin capitalisation rules; and (4) beggar-thy-neighbour tax competition in the field of corporate taxation would be put to an end.

To secure pan-European production efficiency without wiping out national autonomy in the area of capital income taxation, corporate tax harmonisation could be combined with effective exchange of information enabling member states to enforce residence-based taxation of income from portfolio investment. By controlling the level of *personal* taxes on dividends and capital gains, each member state would be able to determine the *total* (corporate plus personal) tax burden on all corporate source income accruing to its residents, whether this income originated from the domestic economy or from another EU country. In other words, while corporate tax harmonisation would reduce national autonomy, effective exchange of information would *increase* the ability of member states to control the tax burden on capi-

tal income accruing to portfolio investors. The harmonised corporation tax would serve only as a preliminary withholding tax guaranteeing a minimum level of taxation of corporate source income, including profits retained and reinvested within the corporate sector.

Admittedly, in the absence of effective exchange of information between the EU and important third countries, EU citizens would still be able to evade personal tax on their portfolio income by investing their funds outside the EU, although this would typically entail higher transactions costs and exchange rate risk. This escape route would clearly constrain the ability of EU countries to set their preferred level of capital income taxation without having to fear capital flight. Hence coordinated EU support for the current OECD initiatives against international tax evasion (OECD, 1998a) should be an important priority for EU tax policy.

Whether the advantages of corporate tax harmonisation are sufficient to outweigh the loss of autonomy implied by the removal of the corporation tax from the national armoury of tax policy instruments will depend *inter alia* on the magnitude of the economic gains from tax harmonisation. In the next part of the paper I will offer an estimate of the gains from harmonisation.

4. Estimating the gains from European tax coordination

So far there have been very few attempts to quantify the expected gains from harmonisation or coordination of capital income taxes in the EU. An early attempt was made by Fuente and Gardner (1990), but their simulation model was highly simplified, assuming fixed factor supplies, full employment and perfect capital mobility throughout the world economy.⁸

Below I will set up a more elaborate simulation model allowing for endogenous factor supplies, involuntary unemployment and imperfect capital mobility. The model accounts for the fact that tax policy

⁸ Maintaining the assumptions of full employment and perfect mobility of financial capital, Mendoza (2001) sets up a dynamic model of the effects of capital tax harmonisation, but the model includes only two jurisdictions, interpreted as the UK and Continental Europe. Thalmann et al. (1996) develop a two-country dynamic simulation model with imperfect capital mobility to study the international spillover effects of source-based versus residence-based capital income taxes, likewise assuming full employment.

changes within the EU may induce capital flows between Europe and the rest of world. I will use the model to estimate the economic effects of two policy experiments. The first experiment involves a complete revenue-neutral harmonisation of effective tax rates on capital income within the EU. The second experiment is a coordinated revenue-neutral shift from labour income taxation to capital income taxation within the EU. I study whether such a shift of the tax burden away from labour is capable of reducing unemployment and increasing economic welfare, given that capital is free to move out of Europe in response to higher European capital taxes.

4.1. EUTAX: An applied general equilibrium model of taxation, unemployment and capital flows

The simulation model developed for the purpose of this paper is called EUTAX. In this section I will give a non-technical account of the model; a complete technical documentation of the formal model and its calibration is provided in Sørensen (2001).

The model is static, describing a stationary long-run equilibrium. Variations in endogenous variables may be interpreted as *level* changes in a time path of exogenous steady-state growth.⁹ In each national economy firms combine internationally mobile capital with immobile labour to produce a homogeneous internationally traded good. Each country is inhabited by a large number of identical households endowed with a predetermined stock of human as well as non-human wealth. A consumer may consume his initial non-human wealth immediately, or he may accumulate a capital stock earning an interest which may be consumed along with the principal at the end of the period. Weighing the return to saving against the disutility of postponing consumption, the utility-maximising consumer chooses to increase his supply of savings as the after-tax real rate of interest increases. While *endowments* are exogenous, the supply of productive *capital* is thus endogenous.

The product market is competitive, but the labour market is characterised by imperfect competition. Workers are organised in decentralised monopoly trade unions, and each union sets the real wage and

⁹ The assumption that long-run growth is not significantly affected by taxation is supported by the analysis in Lucas (1990), Jones (1995), Stokey and Rebelo (1995), and Mendoza et al. (1997) and by the empirical evidence surveyed by Engen and Skinner (1999) and Myles (2000).

the length of the working day for its sector with the purpose of maximising the sum of utilities of its members, subject to the “right-to-manage” constraint that employers choose the total input of working hours with the purpose of maximising their profits. Union market power leads to some amount of involuntary unemployment as the employed workers’ gain from wages above the market-clearing level outweighs the income loss from unemployment. After-tax wages are set as a mark-up over the representative union member’s “outside option”, which is the income-equivalent of the expected utility obtainable outside the sector, depending inter alia on after-tax unemployment benefits and on the level of unemployment. Because of rising marginal disutility of work, the working hours set by unions are an increasing function of the after-tax real wage rate.

The world economy is divided into two main regions called the European Union (EU) and the Rest of the World (ROW). Both of the two regions consist of several countries. Capital is imperfectly mobile across nations, and the supply of capital to an individual country is an increasing function of the rate of return offered in that country. The EUTAX model does not explicitly allow for uncertainty, but an incentive for portfolio diversification is generated by assuming that the consumer’s total stock of capital is a CES-aggregate of the capital stock invested in the different countries. With a finite substitution elasticity between different national assets, this specification implies that the consumer’s aggregate capital stock tends to be more productive—generating a higher net income—if it is spread across countries rather than concentrated in one jurisdiction. The interpretation is that portfolio diversification enables consumers to increase their risk-adjusted (certainty-equivalent) income from capital. By parametrically varying the elasticity of substitution between assets invested in different countries, one can vary the degree of capital mobility. In particular, the model is designed to allow for a higher degree of capital mobility within the EU than between the EU and the rest of the world.

The government of each country levies taxes on labour income, unemployment benefits and capital income (including pure profits), and revenues are spent on unemployment benefits and on an exogenous expenditure component covering all other public expenditures. To capture the different tax treatment of wages and unemployment benefits, the tax rates on wages and benefits are allowed to differ. Apart from that, no allowance is made for the progressivity of the

personal income tax.¹⁰ Since the existing national systems of capital income taxation are in practice mainly source-based (see the introduction to Section 3.1), the capital income tax is assumed to be levied at source.

The labour income tax distorts the choice of working hours. It also drives up the equilibrium unemployment rate since it increases union wage pressure by reducing the after-tax wage rate relative to the value of the outside option for union members. The capital income tax interferes with the savings decision, and cross-country capital income tax differentials distort the international allocation of capital. The magnitude of these distortions depend on the calibration of the model to which I now turn.

4.2. Calibration of the EUTAX model

The EUTAX model relies on simple functional forms to ensure transparency and to allow easy identification of the key structural parameters determining the quantitative properties of the model. Production functions are Cobb-Douglas, utility functions are quasi-linear, and the individual consumer's aggregate non-human wealth is a CES function of the capital stocks invested in different countries.

Table 2 lists the parameter values used to obtain the central estimates in the policy scenarios below. Empirical estimates of labour supply elasticities vary considerably, depending on the country, the time period, the demographic group, and the estimation method, but most estimates of uncompensated net wage elasticities of hours worked fall in an interval between 0.1 and 0.3. I have set this elasticity equal to 0.2 for all countries. A similar value was chosen for the net interest elasticity of capital supply, since empirical estimates of savings elasticities typically range from zero to 0.4. Further, for all countries I assume the presence of a local fixed factor (say, land and natural resources) generating pure rents equal to 5 per cent of GDP.

¹⁰ Theory as well as evidence suggests that changes in the degree of tax progressivity affect union wage pressure and equilibrium unemployment, see Lockwood and Manning (1993), Holmlund and Kolm (1995), Sørensen (1997, 1999), Kreiner et al. (2000), and Lockwood et al. (2000). The implicit assumption below is that the tax reform experiments do not involve changes in the degree of progressivity of the labour income tax.

Table 2. Calibration of the EUTAX model

Parameter values common to all countries	
Net interest elasticity of capital supply ($1/\varphi$)	0.20
Net wage elasticity of working hours ($1/\varepsilon$)	0.20
Pure profit share of GDP	0.05
Region-specific parameter values	
Elasticity of substitution between EU assets and ROW ^a assets (σ)	2.00
Elasticity of substitution between national assets within EU (ω)	4.00
Elasticity of substitution between national assets within ROW ^a (ζ)	2.00
Degree of home bias between EU and ROW ^b (ψ)	75/25
Degree of home bias within EU (ϕ)	70/30
Degree of home bias within ROW (ν)	75/25
Country-specific parameters (population-weighted averages)	
Elasticity of output w.r.t. labour input (wage share of GDP) (α)	0.642
Elasticity of output w.r.t. capital input (β)	0.308
Elasticity of unemployment risk w.r.t. unemployment (η)	0.771
Average skill level of labour force (H, US = 100)	77.5
Initial per-capita endowment of non-human wealth (V, US = 100)	100.0
Effective tax rate on labour income (t)	0.394
Effective tax rate on capital income (τ)	0.371
Gross replacement ratio (b)	0.187
(Effective tax rate on benefits)/(effective tax rate on wages) (μ)	0.505

Notes: ^a) ROW = Rest of the World. ^b) A degree of home bias equal to 75/25 means that investors will invest 75 per cent of their wealth in domestic assets and 25 per cent of wealth in foreign assets if the two asset types yield the same after-tax return.

As a guideline for choosing the elasticity of substitution between national assets within the EU, I relied on the recent empirical study of Gorter (2000), who estimated the semi-elasticity of the net foreign direct investment position with respect to the effective capital income tax rate to be roughly -4 for the typical EU country. If directly translated to the EUTAX model, this would correspond to an intra-EU asset substitution elasticity of about 3. However, since Gorter's study

does not cover the more mobile portfolio capital flows, I have chosen to work with an intra-EU substitution elasticity for total capital flows equal to 4. My choice of asset substitution elasticity between the EU and the rest of the world (ROW) utilises Hines' (1999) reported consensus estimate of the tax rate elasticity of the US net FDI position vis-à-vis the rest of the world. In terms of the EUTAX model, Hines' estimate would imply an EU-ROW asset substitution elasticity of 1.5, but to allow for the higher mobility of portfolio capital I have adjusted this elasticity upwards to 2. Moreover, since the European economies are more integrated with each other than with the ROW, I assume a smaller degree of "home bias" in investor portfolios within the EU than in other parts of the world economy, as reported in Table 2 (see the explanatory note 2 below the table).

A number of parameters are allowed to vary across the 20 countries included in the model. Table 2 only reports the population-weighted average values of these parameters, which are heavily influenced by the values for the large US economy. The estimated effective tax rates on labour income and capital income (averages for 1991-95) were taken directly from Table 1, except that an ad hoc adjustment was made to the capital income tax rates for Finland and Sweden to account for the fact that the dual income tax systems of these countries imply a lower marginal personal tax rate on capital income than on labour income.¹¹ Data for the gross and net replacement ratios in the system of unemployment compensation were taken from OECD (1994, ch. 8), and from these ratios I calculated the implied ratio between the effective tax rate on benefit income and the effective tax rate on labour income, following the method suggested by Daveri and Tabellini (2000, p. 59). The wage shares of GDP were obtained from OECD (1998b), and the productivity parameter capturing the average skill level of the labour force was calibrated such that the model reproduces the observed cross-country differences in PPP-adjusted GDPs per capita. Initial endowments of non-human wealth were chosen so as to reproduce observed net foreign asset positions, proxied by the ratios between national income and domestic product recorded in the OECD National Income Accounts. The elasticity of unemployment risk with respect to the unemployment rate influences the strength of union wage pressure and hence the equilibrium unem-

¹¹ The capital income tax rates for Finland and Sweden displayed in Table 1 were adjusted by a factor of 0.8.

ployment rate in the EUTAX model. The values chosen for this parameter ensure that the model generates a level of unemployment for each country corresponding to OECD estimates of the country's average structural unemployment rate (the Non-Accelerating-Wage-Inflation-Rate of Unemployment) for 1991-95.

The transmission from labour taxes to unemployment in the EUTAX model is straightforward: because unemployment benefits are taxed more lightly than wages in all of the countries considered, a rise in the labour income tax rate increases the ratio of after-tax benefits to after-tax wages, generating stronger union wage pressure so that an increase in unemployment is needed to keep union wage claims in check. The empirical study of Elmeskov et al. (1998) found that a one percentage point increase in the labour income tax rate generates a 0.1 percentage point increase in unemployment in the average OECD country. According to the estimates of Daveri and Tabellini (2000) the corresponding coefficient in continental Europe ranges from 0.3 to over 0.5, while the estimates of Nickell and Layard (1999) imply a tax coefficient of about 0.22 for a sample of OECD countries. The calibration of the EUTAX model implies that the tax coefficient varies between 0.01 and 0.4 within the EU, with an unweighted average of 0.13 and the bulk of the coefficients falling in the interval from 0.05 to 0.2. This suggests that the quantitative effects of labour taxes on unemployment in the EUTAX model are plausible, given the empirical evidence.

4.3. Harmonising capital income taxes in the EU

In Section 1.1 we saw that cross-country differences in effective capital income tax rates will either generate inefficiency in production (if taxation is based on the source principle) or inefficiency in consumption (under residence-based taxation). We argued that production inefficiency is the more serious of the two types of distortion, implying a presumption in favour of residence-based taxation. But we also saw in Sections 1.3 and 3.6 that the pure residence principle is very hard to implement in the area of business income taxation. An international harmonisation of capital income tax rates would eliminate inefficiencies in production as well as consumption, even if it is necessary for administrative reasons to maintain strong elements of source-based taxation. It is therefore of interest to estimate the potential gains from such harmonisation.

Table 3 summarises the effects of a complete harmonisation of effective capital income tax rates within the EU, estimated by means of the EUTAX model. The harmonised capital income tax rate (covering corporate taxes as well as personal taxes on capital) is set equal to 30.2 per cent, which is the population-weighted average of the effective capital income tax rates prevailing prior to harmonisation.¹² It is assumed that all countries maintain constant total tax revenues net of unemployment benefits. Countries which are forced to lower their capital income tax rates must therefore raise their effective labour income tax rates, and vice versa. Economic welfare is measured by the utilitarian sum of individual utilities. Roughly speaking, the welfare measure is given by national income per capita adjusted for the income equivalent of the disutility from work. For the EU as a whole, we see from Table 3 that harmonisation of capital taxes generates a welfare gain of almost 0.4 per cent of initial GDP, due to an improved intra-European allocation of capital. As capital is reallocated from previous low-tax countries with a relatively low marginal productivity of capital towards the previous high-tax countries where capital's marginal product is high, the aggregate European tax base increases, allowing a slight decrease in the average EU labour income tax rate, which in turn reduces unemployment and stimulates working hours, thereby adding to the welfare gain. The more productive use of the European capital stock and the increase in labour input combine to raise EU GDP per capita by 0.4 per cent.

¹² The unweighted EU average effective capital income tax rate is very close to this level, amounting to 28.5 per cent, so the choice of the weighted rather than the unweighted average does not matter much for the estimated effect of harmonisation.

Table 3. Effects of a harmonisation of the effective capital income tax rate in the EU^a

	Change in percentage points			Change in per cent			
	Labour income tax rate	Capital income tax rate	Unemployment	Capital stock per worker	Working hours	GDP per capita	Welfare change ^c
Austria	-3.0	7.5	-0.30	-10.1	-10.1	-2.9	-0.09
Belgium	2.6	-4.8	1.11	5.5	5.5	0.6	-0.61
Denmark	3.4	-9.8	1.05	13.0	13.0	3.5	0.11
Finland	1.3	-5.2	0.13	7.0	7.0	1.9	0.26
France	-2.3	5.5	-0.39	-7.5	-7.5	-2.1	0.01
Germany	-1.3	3.7	-0.20	-5.0	-5.0	-1.3	-0.04
Greece	-12.6	20.6	-0.41	-30.4	-30.4	-10.5	-0.28
Ireland	-7.1	19.1	-0.57	-25.1	-25.1	-5.6	0.42
Italy	1.3	-4.0	0.01	5.8	5.8	2.2	0.42
Netherlands	0.6	-1.5	0.09	1.9	1.9	0.5	0.03
Portugal	-6.2	13.2	-0.39	-18.4	-18.4	-5.4	-0.29
Spain	-3.6	7.9	-0.46	-11.0	-11.0	-3.2	-0.06
Sweden	2.0	-12.2	0.01	17.7	17.7	6.3	1.64
UK	3.9	-15.6	0.14	21.6	21.6	6.4	1.76
Austria	-3.0	7.5	-0.30	-10.1	0.6	-2.9	-0.09
Belgium	2.6	-4.8	1.11	5.5	-0.7	0.6	-0.61
Denmark	3.4	-9.8	1.05	13.0	-0.7	3.5	0.11
Finland	1.3	-5.2	0.13	7.0	-0.2	1.9	0.26
France	-2.3	5.5	-0.39	-7.5	0.5	-2.1	0.01
Germany	-1.3	3.7	-0.20	-5.0	0.2	-1.3	-0.04
Greece	-12.6	20.6	-0.41	-30.4	1.8	-10.5	-0.28
Ireland	-7.1	19.1	-0.57	-25.1	1.2	-5.6	0.42
Italy	1.3	-4.0	0.01	5.8	-0.1	2.2	0.42
Netherlands	0.6	-1.5	0.09	1.9	-0.1	0.5	0.03
Portugal	-6.2	13.2	-0.39	-18.4	0.6	-5.4	-0.29
Spain	-3.6	7.9	-0.46	-11.0	0.4	-3.2	-0.06
Sweden	2.0	-12.2	0.01	17.7	0.2	6.3	1.64
UK	3.9	-15.6	0.14	21.6	0.1	6.4	1.76
EU average^b	-0.7	0.0	-0.11	+0.0	0.2	0.4	0.35
Australia	+0.0	0.0	+0.0	-0.0	-0.0	+0.0	+0.00
Canada	+0.0	0.0	+0.0	-0.0	-0.0	+0.0	-0.00
Japan	+0.0	0.0	+0.0	-0.0	-0.0	+0.0	0.01
Norway	+0.0	0.0	+0.0	-0.0	-0.0	+0.0	+0.00
Switzerland	+0.0	0.0	+0.0	-0.0	-0.0	+0.0	0.01
US	+0.0	0.0	+0.0	-0.0	-0.0	+0.0	+0.00

Notes: ^a) The capital income tax rate is harmonised at the population-weighted average rate of 30.2 per cent. The calibration of the model is given in Table 2. ^b) Population-weighted average. ^c) In per cent of initial GDP.

Source: Simulations with the EUTAX model.

This estimated gain assumes that the alternative to tax harmonisation would be maintenance of the *status quo*. However, the real alternative might be a process of intensified tax competition which would gradually drive down the level of taxation and public spending. If current public spending is seen to be somehow “optimal”, intensified tax competition would be welfare-reducing, and in this case the EUTAX model will underestimate the gain from a policy of harmonisation which neutralises fiscal competition. On the other hand, if the public sector is deemed to be “too big” due to inefficiencies in the political process, tax competition might produce a welfare gain from a lower overall level of taxation. Since the EUTAX model does not incorporate endogenous public choice mechanisms explaining the potentially beneficial effects of tax competition, it will then overestimate the gains from tax harmonisation.¹³

Furthermore, although harmonisation yields a *potential* Pareto improvement in the sense of producing an aggregate welfare gain for the EU as a whole, individual member states will be affected differently, due to differing initial positions. Countries having to lower their capital income tax rates will experience a capital inflow which will raise their GDPs. At the same time these countries must raise their labour income tax rates and will therefore suffer from an increase in unemployment and a fall in working hours. For countries with low initial capital income tax rates the changes go in the opposite direction. In some countries, like Greece, Ireland, Portugal, Sweden and the UK, we see from Table 3 that the required changes in capital income tax rates are very large, inducing large capital flows and significant long-run changes in GDP. The effects on the welfare of these countries are much more modest, however, since capital mobility breaks the link between national income and domestic product. Indeed, welfare and GDP per capita need not even move in the same direction, as illustrated by the example of Ireland in Table 3: in the initial equilibrium, Ireland subsidises capital imports through a very low capital tax rate (see Table 1), so the country actually *benefits* from the capital outflow caused by tax harmonisation because the initial social (pre-tax) return

¹³ The so-called TAXCOM model presented in Sørensen (2000) does include a political process endogenising the effects of tax competition. The estimated welfare effects of tax harmonisation in that model do not differ significantly from those implied by the EUTAX model.

to investment in Ireland is very low, falling short of the social cost of imported capital.¹⁴

Countries outside the EU are seen to be little affected by EU tax harmonisation, due to the unchanged average EU level of capital taxation.

Table 3 suggests why it has been very difficult to mobilise political support for harmonisation of capital income taxes within the EU. For some member states the required changes in tax policy would be substantial. Moreover, to turn the potential Pareto improvement from harmonisation into an actual Pareto improvement, the losing member states would have to be compensated via international transfers, say, via the common EU budget. Finally, the aggregate welfare gain from harmonisation (0.35 per cent of GDP) seems disappointingly small. However, it should be recalled that the switch to a single EU corporate tax system could imply a significant drop in the costs of tax compliance and tax administration. Since the EUTAX model does not capture this benefit, it probably underestimates the gain from corporate tax harmonisation.

4.4. Shifting taxes from labour to capital

In a recent empirical study which has attracted much attention, Daveri and Tabellini (2000) have argued that the increased tax burden on labour in continental Europe since the mid-1960s has been very harmful to employment and growth. Given the high tax burden on labour income relative to capital income in most European countries, the analysis of Daveri and Tabellini suggests that shifting some of the tax burden from labour to capital might boost employment and welfare. Fear of capital flight is undoubtedly a major reason why individual EU countries have hesitated to undertake a unilateral shift of taxes away from labour towards more mobile capital. The quantitative estimates in Sørensen (2000) indicate that competition for increasingly mobile capital may have generated an inefficient European tax structure characterised by excessive reliance on labour taxes. If EU countries could implement a *coordinated* increase in taxes on capital with the purpose of lowering taxes on labour, the problem of capital flight

¹⁴ Many Irish policy makers might object to this analysis, arguing that the tax-induced inflow of capital to Ireland has generated positive externalities via 'agglomeration forces'. For a recent analysis of tax harmonisation in the context of such externalities, see Baldwin and Krugman (2000).

would be significantly reduced, since there is ample evidence that capital mobility within Europe is substantially higher than capital mobility between Europe and the rest of the world (see Devereux and Griffith, 1998; Hines, 1999; Gorter, 2000; and Portes and Rey, 2000). The EUTAX model is well suited to analyse whether such a policy might nevertheless backfire on Europe, since it explicitly allows for capital flows between the EU and the rest of the world.

Against this background, Table 4 summarises the effects of a coordinated 10 percentage point increase in the effective capital income tax rate in all EU countries, serving to finance a cut in labour taxes, with public revenue net of unemployment benefits kept constant. Despite the sharp increase in capital taxes, the drop in average EU unemployment made possible by lower labour taxes is only a modest 0.6 percentage points. This should come as no surprise, since the capital income tax base is rather narrow compared to the tax base for labour income. By coincidence, the average EU welfare gain from the tax shift is roughly identical to the EU gain from capital income tax harmonisation, i.e. 0.33 per cent of GDP. However, there are fewer losers from the present policy experiment: whereas five countries stand to lose from capital tax harmonisation, only three countries would lose from the tax shifting experiment, according to Tables 3 and 4. Not surprisingly, the losers from a rise in the relative tax burden on capital would be those countries where initial capital income tax rates are already very high, i.e. the UK, Sweden, and Italy (see Table 1). All other EU member countries would gain from the fall in involuntary unemployment and the rise in working hours induced by lower labour taxes, despite the fact that higher capital taxes would drive capital out of Europe, causing a drop in EU output. As shown in Table 3, the outflow of capital from Europe would raise economic activity and welfare in the rest of the world.

In summary, although a tax shift from labour to capital is certainly not *the* solution to the European unemployment problem, it does seem to promise a modest employment and welfare gain. Further, since relatively few EU member states would lose from such a policy, it should not be too difficult to design a compensation package ensuring that the gain to the EU area as a whole could be shared by all countries.

Table 4. Effects of a cut in labour taxes in the EU, financed by a 10 percentage point increase in the effective capital income tax rate^a

	Change in percentage points			Change in per cent			Welfare change ^c
	Labour income tax rate	Capital income tax rate	Unemployment	Capital stock per worker	Working hours	GDP per capita	
Austria	-6.7	10.0	-0.58	-5.4	2.2	-0.2	1.03
Belgium	-6.2	10.0	-1.80	-7.4	1.8	0.1	1.18
Denmark	-5.0	10.0	-1.09	-10.1	1.5	-1.6	0.42
Finland	-4.0	10.0	-0.34	-8.9	1.2	-1.4	0.34
France	-7.1	10.0	-1.02	-5.5	2.4	0.2	1.29
Germany	-5.6	10.0	-0.75	-6.2	1.6	-0.4	0.82
Greece	-8.9	10.0	-0.31	-3.6	2.5	0.0	0.57
Ireland	-5.5	10.0	-0.46	-3.5	1.7	0.4	1.61
Italy	-5.3	10.0	-0.04	-9.5	1.3	-2.6	-0.30
Netherlands	-6.0	10.0	-0.74	-7.5	2.0	-0.8	0.60
Portugal	-6.4	10.0	-0.40	-4.9	1.5	-0.5	0.36
Spain	-6.5	10.0	-0.78	-5.6	1.6	-0.4	0.79
Sweden	-3.0	10.0	-0.01	-12.5	0.7	-3.5	-0.86
UK	-2.9	10.0	-0.09	-13.6	0.2	-3.4	-1.30
EU average ^b	-5.5	10.0	-0.56	-7.4	1.5	-1.2	0.33
Australia	-0.8	0.0	-0.05	3.8	0.4	1.6	0.57
Canada	-0.8	0.0	-0.03	3.8	0.4	1.4	0.62
Japan	-0.6	0.0	-0.0	3.6	0.4	1.2	0.01
Norway	-1.0	0.0	-0.01	3.6	0.6	1.5	0.37
Switzerland	-0.7	0.0	-0.01	3.6	0.4	1.2	0.02
US	-0.7	0.0	-0.01	3.7	0.4	1.4	0.36

Notes: ^a) The calibration of the model is given in Table 2. ^b) Population-weighted average. ^c) In per cent of initial GDP.

Source: Simulations with the EUTAX model.

The suggestion that a coordinated shift of the tax burden towards capital may be welfare-improving goes against some of the recent literature on economic growth which has popularised the idea of Chamley (1986) that the optimal long-run rate of capital income tax is zero. However, this literature is built on models of the so-called Ramsey type, where long-run equilibrium requires equality between the after-tax real interest rate and the exogenous consumer rate of time preference. The postulate that the after-tax real interest rate is fixed in the long-run is equivalent to claiming that the long-run interest elasticity of saving is infinitely high. It is well known from the theory of taxation that it is inoptimal to tax a factor with an infinite supply elasticity, but empirical studies do not seem to support the assumption of an

infinite saving elasticity. The EUTAX model is more in line with overlapping generations models of growth where the interest elasticity of saving is finite, and where the optimal mix between labour taxes and capital income taxes are found by trading off labour market distortions against capital market distortions.¹⁵

4.5. Sensitivity analysis

The estimated effects of the policy experiments discussed in Sections 4.3 and 4.4 are based on the parameter values reported in Table 2. Table 5 shows the sensitivity of the policy effects to changes in the strategic parameter values of the EUTAX model. The upper part of the table illustrates the importance of the degree of capital mobility. As already mentioned, the evidence provided by Hines (1999) and Gorter (2000) suggests that the degree of capital mobility within Europe is about twice as high as capital mobility between Europe and the rest of the world (ROW). In varying the degree of capital mobility, I have therefore maintained this assumption regarding the degree of intra-EU capital mobility relative to the degree of capital mobility between the EU and ROW.

Judging from Table 5, the effects of capital income tax harmonisation within the EU are not very sensitive to the degree of capital mobility. As one would expect, higher capital mobility implies a slightly higher welfare gain from EU tax harmonisation, since higher mobility means that capital allocation within the EU becomes more responsive to (and hence more distorted by) national tax rate differentials. However, for the range of asset substitution elasticities considered, the quantitative difference seems to be limited.

In case of a coordinated shift from labour taxes to capital taxes within the EU, the degree of capital mobility is more important. A higher degree of capital mobility means that a rise in the EU level of capital taxes drives more capital out of the EU area. For example, if the substitution elasticity between EU assets and ROW assets increases from 1.5 to 4, the effect of the tax shift on average EU welfare changes significantly from a *gain* of almost 0.6 per cent of GDP to a *loss* of roughly 0.5 per cent of GDP. Considering the uncertainty regarding the actual degree of capital mobility, one has to conclude that a tax shift from labour to capital within the EU is a high-risk pol-

¹⁵ See Sørensen (1990) for an analysis of optimal factor income taxation in an overlapping generations context.

icy if such a policy cannot be coordinated with the rest of the OECD (notably the US).

Table 5. Employment and welfare effects of tax harmonisation and tax coordination: sensitivity analysis^a

	Capital tax harmonisation ^b		Coordinated tax shift from labour to capital ^c	
	Change in EU unemployment (percentage points)	Change in EU welfare (per cent of initial GDP)	Change in EU unemployment (percentage points)	Change in EU welfare (per cent of initial GDP)
Low capital mobility ($\sigma = \zeta = 1.5$, $\omega = 3$)	-0.11	0.31	-0.58	0.56
High capital mobility ($\sigma = \zeta = 4$, $\omega = 6$)	-0.11	0.37	-0.48	-0.49
Low labour supply elasticity ($1/\varepsilon = 0.1$)	-0.08	0.31	-0.34	-0.07
High labour supply elasticity ($1/\varepsilon = 0.25$)	-0.14	0.38	-0.71	0.57
Low capital supply elasticity ($1/\varphi = 0.1$)	-0.11	0.35	-0.58	0.45
High capital supply elasticity ($1/\varphi = 0.3$)	-0.11	0.35	-0.55	0.22

Notes: ^a The Greek letters refer to the parameters listed in Table 2. All figures are population-weighted averages across EU countries. ^b Same policy experiment as in Table 3. ^c Same policy experiment as in Table 4.

Source: Simulations with the EUTAX model.

The middle part of Table 5 illustrates the sensitivity of policy effects to the net wage elasticity of working hours. To understand the importance of this parameter in the context of capital tax harmonisation, recall that EU tax harmonisation increases the tax base of the average EU country through an improved allocation of capital, thereby paving the way for a (slight) fall in the tax rate on labour income. Obviously, the lower the labour supply elasticity, the lower will be the resulting increase in working hours and welfare, but the quanti-

tative significance of the labour supply elasticity for the welfare effect does not appear dramatic.

The labour supply elasticity seems much more important for the welfare effect of a tax shift from labour to capital. This is not surprising, since a large part of the gain from this policy experiment stems from the fact that lower labour taxes imply smaller tax distortions to working hours. The smaller the labour supply elasticity, the smaller the welfare gain from lower labour taxes. Indeed, when the labour supply elasticity increases from 0.1 to 0.25, the EUTAX model implies that the welfare effect of the tax shift increases significantly from a loss of about 0.1 per cent of GDP to a gain of almost 0.6 per cent of GDP. Again, in the light of parameter uncertainty this suggests that the tax shift policy is a risky strategy.

The importance of the net interest elasticity of capital supply is indicated in the bottom part of Table 5. In the scenario with capital tax harmonisation, this elasticity is of no significance for the EU as a whole, since harmonisation does not change the average level of capital taxation. However, in the case of a tax shift from labour to capital, the welfare effect will obviously depend on the elasticity of savings with respect to the after-tax rate of return to capital. When this elasticity increases from 0.1 to 0.3, the average EU welfare gain from the tax shift is seen to be roughly cut in half from 0.45 to 0.22 per cent of GDP. This is yet another indication of the uncertainties attached to the tax shifting policy.

To sum up, the aggregate EU welfare gain from capital income tax harmonisation seems to be rather robust to changes in key parameter values, whereas the estimated aggregate gain from shifting the tax burden from labour towards capital is much more sensitive to assumptions regarding factor supply elasticities and the degree of asset substitutability.

5. Policy conclusions

In principle it is not necessary to harmonise tax policies in the EU to avoid tax distortions to the location of economic activity within the single market. If indirect taxes were always collected in the country of final consumption (the destination principle) and if income taxes were always levied by the taxpayer's country of residence (the residence principle), producer prices of tradable outputs and inputs would tend to be equated across EU countries even if member states choose dif-

ferent levels of taxation. However, because of practical obstacles to the implementation of the residence principle, capital income taxes in the EU are mainly levied by the source countries from where the income originates, and cross-border consumer shopping means that some consumer goods are taxed in the country of origin rather than in the country of destination. As a consequence, national tax rate differentials distort producer prices within the EU, including the cost of capital. This means that production and investment may sometimes be located where it is most lightly taxed and not where it can be undertaken most efficiently. The existence of source-based and origin-based taxation also enables member states to “export” some of the domestic tax burden to the taxpayers of other countries and to “steal” tax bases from one another by undercutting each others’ tax rates on mobile activities. Furthermore, deepening economic integration makes it increasingly difficult to undertake a “correct” division of the international tax base among source countries, and the coexistence of many uncoordinated national tax systems increases the tax compliance costs associated with cross-border activity. In some cases the return to such activity may be undertaxed due to international tax evasion or tax competition, whereas in other cases it may be subject to international double taxation.

Because of this variety of problems, there is a good case for improved tax coordination within the EU. In this paper I surveyed some of the current attempts by EU policy makers to deal with these problems as well as some proposals for future tax reform. In the field of indirect taxation, I pointed out that free cross-border shopping inevitably introduces an element of origin-based taxation which is bound to create trade distortions as long as member states maintain significant differences in their levels and structures of indirect taxation. Moreover, if the EU wishes to eliminate the difference between the VAT treatment of domestic sales and the treatment of sales to other member states without redistributing VAT revenues, the necessary clearing mechanism may undermine the incentive for effective tax enforcement. Hence it may be better to seek a once-and-for all compensation for the expected revenue redistribution.

In the area of capital income taxation I argued that a fully harmonised corporation tax with formula-based apportionment of the revenue across member states should be a long-term goal for EU policy. The harmonised corporation tax should be combined with systematic intra-EU exchange of information enabling member states to enforce

the residence principle of personal income taxation. Such a reform would bring several advantages: (1) The cost of corporate capital would no longer be distorted by national tax differentials; (2) EU companies would only have to comply with a single corporate tax system; (3) Governments would no longer need to enforce complex transfer pricing rules and thin capitalisation rules; (4) Beggar-thy-neighbour tax competition in the field of corporate taxation would be put to an end; and (5) With effective exchange of information to enforce residence-based personal income taxes, the harmonised corporation tax would serve only as a preliminary withholding tax, and each member state would be able to choose its own preferred level of total tax on capital income.

The paper presented an applied general equilibrium model (the EUTAX model) of the OECD economy designed to evaluate the economic effects of tax coordination within the EU. The EUTAX model allows for unemployment and for the fact that the EU economies are more integrated with each other than with other OECD economies. According to the model a complete harmonisation of capital income taxes within the EU would generate a welfare gain of about 0.4 per cent of GDP for the EU as a whole, due to an improved intra-European allocation of capital. The estimated aggregate welfare gain from harmonisation was found to be fairly robust to changes in strategic parameter values. However, several member states would lose from capital tax harmonisation and would therefore most likely oppose such a policy unless compensating transfers from the other member states could be arranged.

The EUTAX model was also used to estimate the effects of a coordinated 10 percentage point increase in effective capital income tax rates in all EU countries, serving to finance a cut in taxes on labour income. Even though this policy would drive some investment out of Europe, it was estimated to benefit all but three EU member states and to pave the way for a 0.6 percentage point drop in European unemployment, as lower labour taxes reduce union wage pressure. Unfortunately, sensitivity analysis suggested that the welfare gain from such a shift of the tax burden from labour towards capital could be rather sensitive to the degree of capital mobility and to factor supply elasticities. With high capital mobility between the EU and the rest of the world, and/or with a low labour supply elasticity, the tax shift could generate a welfare loss and should therefore be seen as a high-risk policy.

The current view of the European Commission (2001, pp. 3-4) is that whereas selective tax competition targeted at particularly mobile business activities is “harmful”, a “reasonable” degree of broad-based general tax competition is “healthy”. Such a policy position may seem a convenient political compromise between opponents and adherents of tax competition, but it hardly has any analytical foundation. As argued in this paper, elimination of preferential tax regimes for particularly mobile activities may well intensify broad-based tax competition, turning it from “reasonable” into “unreasonable”, since a general business tax cut will then be the only fiscal means by which a government can attract mobile activities. In the long term we may thus need more tax coordination than the EU Commission is currently willing to press for.

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