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2003-08

ISSN 0908-7745

The activities of EPRU are financed by a grant from
The National Research Foundation

June 2003

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Abstract: The European Commission recently proposed to move towards a consolidated tax base for European multinational companies, to be allocated across EU member states through a system of formula apportionment. This paper argues that while the Commission's four alternative blueprints for company tax reform may reduce existing problems of transfer pricing, they will also create new distortions as long as existing tax rate differentials are maintained. The paper also analyzes the changes in international tax spillovers which will occur as a result of a switch from the current system of separate accounting to formula apportionment. The final part of the paper discusses whether more conventional corporate tax harmonization should still be a long term policy goal for the EU and presents quantitative estimates of the efficiency gains from harmonization.

Keywords: corporate tax reform in the EU, formula apportionment, tax harmonization

JEL Code: H2, H7

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COMPANY TAX REFORM IN THE EUROPEAN UNION

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1. COORDINATION OF COMPANY TAXES IN THE EU: THE NEVER-ENDING DEBATE

The creation of a level playing field for business competition is a basic goal of the European common market. Does this require a harmonization or at least an approximation of corporate tax systems in the European Union? Almost since the signing of the Treaty of Rome in 1957, European policy makers have been debating this issue.

In the fall of 2001 the European Commission made a new contribution to this perennial debate by issuing its report on "Company Taxation in the Internal Market" (Commission, 2001a). In three ways this report marked an important reorientation of the Commission's strategy in the field of company tax coordination. First, while previous Commission studies of this issue tended to focus on the need for approximation of corporate tax bases and tax rates and on the desirability of adopting a common system of corporate-personal tax integration in the EU, the new Commission report instead stresses the potential benefits of a consolidated tax base for European multinational enterprises, to be allocated across EU member states through a system of formula apportionment. Second, whereas the previous report on European company taxation (the so-called Ruding Report of 1992) was prepared by outside experts, the Commission Services have taken final responsibility for the new report, thereby signaling a greater degree of political commitment to company tax reform. Third, in the policy communication accompanying the report, the Commission (2001b) endorses member state competition in corporate tax rates, thus distancing itself from earlier notions of "harmful" tax competition.

In this paper I will discuss some of the more ambitious proposals made in the recent Commission study. A number of comments on the report have already been published,¹ but the present paper emphasizes two themes which have received relatively little attention in the debate on the Commission's proposals. The first issue is the nature and direction of the international fiscal spillovers arising under a system of formula apportionment versus the current system of separate accounting. The second and related issue

is whether it is really time to give up the more conventional harmonization approaches favoured by the Commission in the past.

The paper is structured as follows. In Part 2 I discuss the rationale for and the problems involved in moving towards a consolidated corporate tax base, to be distributed across member states through formula apportionment. In Part 3 I argue that all of the Commission's proposals in this area suffer from significant shortcomings. Against this background the rest of Part 3 discusses the pros and cons of corporate tax harmonization as a long term strategy for company tax reform and presents some quantitative estimates of the gains from harmonization. Part 4 sums up the main conclusions of the paper.

2. TOWARDS A EUROPEAN SYSTEM OF FORMULA APPORTIONMENT?

2.1. The Commission proposals for a consolidated corporate tax base

The recent EU Commission report on company taxation has already been well summarized by Michael Devereux (2003) in this journal, so the present overview can be very brief. The main policy goal stressed in the report is the removal of company tax obstacles to cross-border economic activity to promote the creation of an integrated single market for doing business in Europe. For this purpose the report proposes a number of targeted tax policy measures, but it also sketches four alternative "comprehensive" approaches aimed at creating a single corporate tax base for all of the EU-wide activities of European multinational enterprises (MNEs).

A consolidated tax base would have several advantages: 1) It would eliminate the need for European MNEs to deal with all of the different national company tax systems within the Union, thereby reducing the costs of tax compliance. 2) It would in principle eliminate the need to identify the "correct" transfer prices for transactions between related European entities within the same multinational group. Again this would reduce the compliance costs of firms as well as the costs of tax administration for governments. 3) A consolidated tax base would automatically allow the offset of losses in one EU member state against profits made in another member state, thereby securing greater tax neutrality between national and multinational groups of companies. 4) A single tax base for all EU activities would eliminate unintended tax obstacles to cross-border mergers and acquisitions arising from the present insufficient coordination of member state capital

gains tax rules.

Without committing to any particular system, the Commission report describes four different blueprints for achieving a single tax base for European multinationals. All of the four systems eliminate the current practice of separate accounting based on the arm's length principle for individual entities within a multinational group. Instead, European multinationals will calculate their EU-wide profits under a consolidated tax base which is allocated among member states according to a common formula reflecting the firm's economic activity in each member state. Under all of the four systems, national governments can still apply their own corporate tax rate to their apportioned share of the tax base. The report envisages that, at least in the beginning, only a *subgroup* of EU member states may wish to adopt a consolidated tax base, in accordance with the new Nice Treaty procedures for Enhanced Cooperation among subsets of member states. In that case the single tax base for the MNEs opting for the system will only cover activities in those countries which have joined the system. However, for convenience the wording below assumes that all member states participate in the system.

The four alternative systems considered in the report are the following. i) Under *Home State Taxation* EU multinationals are allowed to calculate their EU-wide income according to the tax code of their home country where their headquarters are located. The different national tax systems will thus continue to coexist, but for their EU-wide activity multinationals will only have to cope with the single tax code of their home country. The system is optional: multinationals can choose to be taxed under the current system of separate accounting, or they can choose Home State taxation. ii) A *Common Consolidated Tax Base* involves the creation of a common corporate tax base for all EU multinationals opting for the system. Domestic companies and multinationals which do not opt for the system will continue to be taxed under the current national tax systems based on separate accounting for MNEs. iii) A *European Union Company Tax* is economically equivalent to the Common Consolidated Tax Base, but while the latter system is supposed to be administered by national governments, the European Union Company Tax is administered at the EU level, with some or all of the revenue going directly into the EU budget. iv) A *Compulsory Harmonised Corporate Tax Base* implies a single corporate tax base for *all* EU firms, domestic as well as international. The system

is mandatory for all companies, and national rules defining the corporate tax base cease to exist.

2.2. The case for formula apportionment

As already mentioned, all of the above systems of company taxation require that the EU-wide corporate tax base be allocated across member states according to a fixed formula, assumed to be common for all countries. The fact that the EU Commission now seems committed to formula apportionment (henceforth FA) is a remarkable development. A couple of decades ago, European governments were highly critical of FA because they felt that some U.S. states abused the system to "overreach", extending their tax base beyond their natural jurisdiction by apportioning the *worldwide* income of multinational groups doing business in the state. Moreover, the application of FA by national (as opposed to subnational) governments is controversial in the context of the OECD which is committed to the principle of separate accounting based on arm's length pricing of intragroup transactions.

However, because arm's length prices are so hard to identify for specialized products and services traded within multinational groups, taxation based on separate accounting becomes increasingly vulnerable to income shifting via distorted transfer prices as the volume of cross-border direct investment increases relative to total output. In reaction to this, OECD governments have implemented complex rules for the setting of transfer prices. Despite OECD efforts at coordinating these rules, the various national rules are not always consistent with each other, so MNEs sometimes find that the different jurisdictions involved require different transfer prices to be applied to the same intracompany transaction. As a consequence, national tax bases sometimes overlap, generating double taxation, and sometimes the uncoordinated national transfer pricing rules leave gaps in the international tax base. Even apart from this, the difficulties of setting correct transfer prices for products or services without any comparable open market price may cause considerable costs of tax compliance and tax administration.

In principle - but with some important modifications to be discussed below - formula apportionment will eliminate the need to determine transfer prices for the purpose of allocating the corporate tax base across jurisdictions. In a setting of growing economic integration, a switch from separate accounting to formula apportionment therefore seems

increasingly attractive. It is telling that FA is used to allocate the corporate tax base at the subnational level in the highly integrated national markets of federal countries like the United States, Canada, Germany and Switzerland.

2.3. Allocating the corporate tax base: some technical issues

Like separate accounting based on arm's length pricing, FA is a method for allocating the tax base according to the "source" of income. The Commission report mentions a number of technical problems of designing a system of formula apportionment, but it does not commit to any particular set of solutions. Broadly speaking, a system of FA must specify rules for delineating the tax base to be apportioned; the formula for allocating the tax base; and rules for measuring the factors in the formula. Since these design problems have recently been surveyed by leading experts in the field (see McLure and Weiner, 2000; Weiner, 2001; Hellerstein and McLure, 2003), I will only comment on selected issues which seem particularly important.

Delineating the apportionable tax base

The first issue is how to delineate those groups of companies whose incomes should be consolidated and subjected to formula apportionment. Policy makers can either take an economic or a legal approach to this problem. Under the economic approach, a business entity is included in a group for tax purposes if it is deemed to be economically integrated with the other entities in the group. While this makes good sense from a theoretical perspective, in practice it is very hard to find clearcut measures of the degree of economic integration between related companies. As argued by Hellerstein and McLure (2003), it may therefore be safer to rely on a simple legal ownership test specifying that two companies belong to the same group if one company owns at least X percent of the shares in the other company.

EU policy makers must also decide whether they want to apportion the *worldwide* income of EU multinationals, or whether they prefer to stop at the "water's edge", apportioning only the total income from EU sources. Stopping at the water's edge seems appropriate, since this will help to reduce tax coordination problems with countries outside the EU. Yet new coordination problems of a multilateral character may arise. For example, suppose the US tax authorities decide to increase the transfer price of a product delivered from a US affiliate to its French parent company, thereby raising the affiliate's

taxable profits in the US. According to current tax treaty principles, the French authorities should then undertake an offsetting downward adjustment of the taxable profits of the French parent company to prevent international double taxation. Under the present system of separate accounting, this would be a matter solely between the US and France. But under a European system of formula apportionment with a water's edge limitation, a decision by France to reduce the (apportionable) profits of the French parent would also reduce the tax base of *other* EU countries, assuming that the French multinational operates on a European scale. Indeed, the main effect on the tax base may well be felt in the rest of Europe. If European governments wish to protect European multinationals from double taxation when transfer prices vis a vis non-EU countries are adjusted, it seems they will have to live with such fiscal externalities within Europe.

Moreover, when separate accounts and arm's length pricing are maintained for transactions with non-European countries, companies and tax administrators in the EU will still have to master separate accounting with its intricate transfer pricing rules as well as the new system of formula apportionment.

Choosing a formula

The effect of FA on private incentives and on the interjurisdictional distribution of tax revenue depends crucially on the formula for apportionment of the tax base. Under the three-factor formula applied by many US states, the taxable profit in EU country i (Π_i) would be given by

$$\Pi_i = \left[\alpha_K \left(\frac{K_i}{K} \right) + \alpha_W \left(\frac{W_i}{W} \right) + \alpha_S \left(\frac{S_i}{S} \right) \right] \Pi, \quad \alpha_K + \alpha_W + \alpha_S = 1 \quad (1)$$

where K_i , W_i and S_i are the firm's assets, payroll and sales in country i , respectively, K , W and S are the corresponding EU-wide aggregates, and Π is the total EU-wide profit to be apportioned. The α -weights must sum to one, and under the famous "Massachusetts formula" they are all equal to 1/3. According to formula (1) the tax base allocated to a jurisdiction reflects the firm's business activity in that jurisdiction, as measured by the (weighted average of the) proportions of the firm's total assets, payroll and sales located in the jurisdiction. As shown by McLure (1980), the application of a formula like (1) means that local corporate income taxes are essentially turned into taxes on or subsidies to the factors entering the formula. As a simplified example, suppose that only assets and

payroll are included in the formula ($\alpha_S = 0$) and that there are only two jurisdictions. Let w_i and L_i denote the real wage rate and the firm's labour input in jurisdiction i , so that W_i/W is $w_i L_i / (w_1 L_1 + w_2 L_2)$, $i = 1, 2$. If r is the non-deductible international cost of equity finance (assumed here to be the only source of finance), and if $F(K_1, L_1)$ is the firm's real revenue from production in jurisdiction 1, the first-order conditions for the optimal inputs of capital and labour in that jurisdiction may then be written as

$$F_K = \frac{r}{1-t} + \alpha_K \left(\frac{K_2}{K} \right) \left(\frac{t_1 - t_2}{1-t} \right) \left(\frac{\Pi}{K} \right) \quad (2)$$

$$F_L = w_1 \left[1 + \alpha_W \left(\frac{W_2}{W} \right) \left(\frac{t_1 - t_2}{1-t} \right) \left(\frac{\Pi}{W} \right) \right] \quad (3)$$

$$t \equiv t_1 \left[\alpha_K \left(\frac{K_1}{K} \right) + \alpha_W \left(\frac{W_1}{W} \right) \right] + t_2 \left[\alpha_K \left(\frac{K_2}{K} \right) + \alpha_W \left(\frac{W_2}{W} \right) \right] \quad (4)$$

where F_K and F_L are the marginal revenue products of capital and labour, respectively, t_i is the corporate tax rate in jurisdiction i , and t is the weighted average tax rate across the two jurisdictions. Equation (2) shows that a high-tax (low-tax) country will have a cost of capital (F_K) above (below) the average international cost of equity finance, $r/(1-t)$, to the extent that assets enter the apportionment formula ($\alpha_K > 0$). Equation (3) is more remarkable, showing that the corporation tax will distort the demand for labour when payroll is included in the formula ($\alpha_W > 0$). In a high-tax (low-tax) country the corporation tax will work in part like a local tax on (subsidy to) the use of labour, because an increase in local employment will shift more of the worldwide corporate tax bill towards the high-tax (low-tax) country. Assuming that the corporation tax is really intended as a tax on the return to capital and not as an intransparent tax on/subsidy to other factors, it therefore seems most appropriate to set $\alpha_W = \alpha_S = 0$ and $\alpha_K = 1$.

As a way of avoiding distortions to factor location under FA, one might use *industry* weights rather than firm-specific weights in the apportionment formula. For example, the fractions K_i/K , W_i/W and S_i/S in formula (1) could be the industry average for country i rather than the specific figures for the individual taxpaying firm in a given industry. Assuming that the individual firm is small relative to its industry, such an approach would have two important advantages. First, companies would not be able to shift taxable income towards low-tax jurisdictions by manipulating the firm-specific measures of their

factor use. Second, and more fundamentally, the apportionment of taxable profits would no longer distort decisions on factor location. When the individual firm can no longer influence the allocation of its tax base by changing the location of its factors, the last terms on the right-hand sides of (2) and (3) disappear, and for all firms in a given industry in the EU the weighted average corporate tax rate t becomes identical. Hence the required marginal pre-tax return to capital would tend to be equalized across EU member states for all firms in the industry. On the other hand, this method of apportionment would raise the difficult administrative problem of determining the industry to which each individual firm belongs. In practice, many multinationals operate in several different industries, so for these companies tax administrators would have to allocate the EU-wide taxable income across the different sectors with different apportionment formulas. One can easily imagine the uncertainties and legal disputes which might be caused by such a system.

To avoid these problems, one might go further and use common *macro* weights for all firms in all EU countries. For instance, exploiting the fact that the VAT bases are already harmonized in the EU, the corporate tax base could be allocated across member states in accordance with each country's share of the aggregate EU VAT base. Even though member states would retain the right to set their own corporate tax rates, this macro approach to FA would imply that all multinationals in all industries would face the same corporate tax rate throughout the EU. From the viewpoint of MNEs, the corporate tax rate would be harmonized at the VAT-base weighted average of the tax rates in each member state. Hence the required marginal pre-tax rates of return would be equalized across the EU, thus ensuring EU-wide production efficiency. The system would put an end to corporate tax competition in the EU.² Indeed, a small member state with an insignificant share of the aggregate EU VAT base would be able to raise its corporate tax rate without having to fear a (noticeable) reduction of investment by European MNEs in the country. Previous concerns over a "race to the bottom" might therefore give way to concerns over a "race to the top" in corporate tax rates, since a rise in an individual country's corporate tax rate would have a negative spillover on all other member states by raising the cost of capital throughout the EU. Another controversial implication is that an FA system based on macro weights would break the link between the individual firm's activity in a member country and its tax payment to that country. Each member state

would be entitled to tax a share of the profits of all MNEs operating in Europe, even those without any operations in the country. If taxpayers and policy makers do not appreciate the system for what it is - essentially a harmonized European corporation tax with revenue sharing among member states - this decoupling between tax payments and the location of individual firm activities may well make the system politically unacceptable. Given the current lack of enthusiasm for far-reaching harmonization, the discussion below will therefore assume that a European system of formula apportionment will have to be based on firm-specific measures of the location of the factors in the formula.

Measuring the factors in the formula

This raises the question how the factors are to be measured. The analysis above showed that assets should be the only factor in the formula if the corporation tax is really intended to be a tax on the return to capital. Since assets are already recorded in the firm's tax accounts, it seems natural to use this measure in the formula for apportioning profits. However, as pointed out by McLure and Weiner (2000, pp. 269-70), intangible assets constitute an important part of the total assets of many multinationals, and it is inherently difficult to measure intangibles and to assign a *situs* to them. In principle, one could calculate the value of a patented intangible asset by discounting the royalties paid for its use. But intra-company royalties and the associated asset values in the formula may be distorted as multinationals try to shift taxable profits from high-tax to low-tax jurisdictions. Thus, if intangibles are included, a system of FA based on asset values will be subject to some of the same transfer pricing problems as the current system of separate accounting. Moreover, intangibles do not always yield royalties which may be used to calculate their value, and some intangibles may arise from the synergy effects generated by the interaction of all the affiliates in a corporate group, making it unclear how the asset value should be allocated across affiliates. In reaction to these problems, one might exclude intangibles from the asset base in the formula, but this procedure could distort the choice between the development of tangible and intangible assets and would probably impute an unduly low share of the tax base to corporate headquarters where intangibles are often developed.

As a possible way out of these difficulties, one might use the firm's *VAT accounts* as the point of departure for measuring its use of capital in each jurisdiction. Starting

from the current destination-based measure of value-added under the European VAT systems, one would add back export sales and deduct imports to obtain value added at origin. Then one would add capital investment and subtract depreciation allowances as well as labour costs to arrive at that part of local value-added which accrues to the capital invested in the jurisdiction. This would then serve as the basis for the allocation of taxable profits across jurisdictions. Although Hellerstein and McLure (2003) appear to support such a solution, they also stress that apportionment based on (part of) value added at origin will be vulnerable to transfer pricing, since multinationals may manipulate the prices of intracompany sales to shift the value added within the company towards low-tax jurisdictions. To be sure, multinationals would no longer be able to shift income across jurisdictions through intracompany debt shifting, so in principle thin capitalization rules would no longer be needed for companies subject to profit allocation based on VAT accounts. But for other intracompany transactions the problem of transfer pricing regulation would essentially remain the same as under the current system of separate accounting. Since the alleviation of transfer pricing problems is usually cited as the main purpose of FA, it would seem paradoxical to reintroduce these problems via the method for measuring the factor(s) in the formula.

In summary, if policy makers wish to maintain the corporation tax as a tax on capital, the apportionment of profits should be based on some measure of capital input, but then the apportionment formula would perpetuate some of the current problems of transfer pricing if intangible assets are included in the measure of capital, or if capital input is measured by value added at origin minus labour costs. Thus the belief found in the theoretical literature that FA solves the transfer pricing problem may be far too optimistic.

2.4. Fiscal externalities under separate accounting and formula apportionment

Assuming that an acceptable solution to the technical design problems of FA can be found, a fundamental question is how a switch from separate accounting to formula apportionment would change the character and strength of cross-border fiscal externalities? How would such a reform change the impact of one country's tax policy on economic activity, public revenue and social welfare in other countries? For example, would a

switch to formula apportionment intensify corporate tax competition in Europe, thereby increasing the likelihood of a race to the bottom in corporate tax rates? The theoretical analysis of Gordon and Wilson (1986) suggests that the answer is "Yes!". Their model implies that the underprovision of public goods caused by interjurisdictional fiscal competition will be more severe under formula apportionment than under separate accounting. The intuition for their result is the following: assuming perfect competition and free entry, the after-tax profits of firms are driven to zero in long-run equilibrium. If a country raises the marginal tax burden on capital invested in its jurisdiction, taxable pre-tax profits earned in the country will therefore have to rise by a similar amount in the long run. Under separate accounting, all of this rise in pre-tax profits will increase the local tax base. By contrast, under formula apportionment part of the increase in local pre-tax profits will be allocated to other countries. For any given increase in the local marginal tax burden, and hence for any given increase in the disincentive to local investment, the rise in local tax revenue will thus be higher under separate accounting than under formula apportionment. At the margin it is therefore more costly for local governments to raise revenue under FA, and hence the underprovision of public goods is more pronounced under this tax regime.

Sunley (2002) has suggested another reason why a switch to FA may intensify tax competition. Under separate accounting countries compete to attract the marginal investment, which brings into the country's tax base the marginal return to capital. Under a system of FA where profits are apportioned according to the amount of capital invested in each jurisdiction, the tax base allocated to country i is $(K_i/K)\Pi$, where K_i is the capital invested in country i , K is the firm's global capital stock, and Π is the global pre-tax profit. If country i succeeds in attracting a unit of investment from other countries (so that K_i rises by one unit while K and Π stay constant), its tax base will increase by the *average* return to capital Π/K , which is usually higher than the *marginal* return. According to Sunley, the incentive to attract capital from other jurisdictions may therefore be stronger under formula apportionment than under separate accounting.

Plausible though they may sound, these arguments why FA would strengthen tax competition may not hold under more general assumptions. The Gordon-Wilson result mentioned above is driven by the assumption that firms are competitive, earning zero

net profits. However, multinational companies often possess market power enabling them to make positive economic profits even in the long run. Moreover, the model set up by Gordon and Wilson does not allow for income shifting via transfer-pricing. Since the possibilities for income shifting are weaker (in theory non-existent) under formula apportionment than under separate accounting, a switch to FA will weaken the incentives for governments to set a low corporate tax rate in order to attract "paper profits". Furthermore, the argument by Sunley explained above seems to be too partial: in order to relocate investment towards its jurisdiction, a government will have to lower its tax rate, and under FA the effects of a unit reduction in the local tax rate on local tax revenue and local investment will be different from the corresponding effects under separate accounting.

Against this background, the appendix to this paper sets up a formal model to study the cross-border spillover effects of corporate tax policies under separate accounting and formula apportionment. The model is inspired by the one developed by Nielsen et al. (2001), but it imposes more structure on production technologies, thereby generating sharper results. I consider two countries embedded in a world economy with a given international cost of equity finance. Each country is the host of a multinational parent company with a foreign subsidiary in the other country. For each unit of capital invested in the foreign subsidiary, the parent company must deliver a certain amount of an essential input, say, a patented technology or a headquarter service needed to operate the subsidiary's capital stock. Via its choice of the transfer price of this input, the MNE may shift income between the parent and the subsidiary. Because it is costly to justify distorted transfer prices vis á vis the tax authorities, and since distorted intracompany price signals may generate internal organizational inefficiencies, the parent company incurs a cost which rises with the deviation between the transfer price and the true resource cost of the input delivered to the subsidiary. Under separate accounting, each MNE balances the costs of distorted transfer prices against the gain from shifting income towards the lower-taxed entity in the multinational group.

Within this setting the appendix analyzes how an increase in one country's corporate tax rate affects economic activity, tax revenue and social welfare in the other country. Consider first the spillover effects on foreign economic activity, assuming that the corpo-

ration tax is levied on a source basis, with the "source" of income determined by *separate accounting* (SA). If country 1 has a higher corporate tax rate than country 2, a further rise in country 1's tax rate will increase outward foreign direct investment from country 1 into country 2. To understand why, recall that additional investment abroad increases the scope for income shifting between the parent and the subsidiary by increasing the volume of intracompany transactions. Thus, as the tax rate on the parent company in country 1 rises further above the tax rate on the subsidiary in country 2, it becomes profitable to increase investment in the foreign subsidiary to allow more income shifting towards country 2. But suppose instead that country 1's tax rate is initially *below* that of country 2. In that case a rise country 1's tax rate will *reduce* that country's outward FDI into country 2, because the smaller tax rate differential between the two countries reduces the value of foreign investment as a vehicle for income shifting. The point is that a further rise in the tax rate of a high-tax country will tend to increase the international *dispersion* of tax rates, thereby increasing the attractiveness of cross-border investment as a means of exploiting tax rate differentials through income shifting. By contrast, a rise in the corporate tax rate of a low-tax country will tend to reduce the international dispersion of tax rates, thus reducing the incentive to invest abroad in order to take advantage of tax rate differentials. Under SA the effect on outward FDI of a rise in a country's corporate tax rate therefore depends on the initial tax position of that country. In the benchmark case where initial tax rates are identical across countries, the effect of a rise in one country's tax rate rate on the incentive for outward FDI will only be of second-order magnitude. To a first-order approximation, a marginal increase in one country's corporate tax rate will then have no effect on outward FDI.

Because of the uncertain effect on outward FDI, and hence on foreign economic activity, the spillover effect of a rise in one country's tax rate on the other country's tax revenue is generally ambiguous under SA. However, if initial tax rates are identical, we noted that there are no (first-order) spillover effects on outward FDI, but an increase in country 1's tax rate will still induce MNEs in both countries to shift taxable income towards country 2, generating an increase in that country's tax revenue. By continuity, if initial tax rates are not too dispersed, we may thus expect a positive international spillover effect on public revenue under separate accounting.

If policy makers are only interested in public revenues, we would then expect that corporate tax rates will be *too low* under SA, because each individual country neglects the fact that a rise in its own corporate tax rate will increase the tax revenue of other countries. But if policy makers are benevolent, they will seek to maximize social welfare rather than just tax revenues. In the model set up in the appendix, it is natural to define a country's social welfare as the after-tax income of its residents plus its tax revenue, appropriately adjusted for any deviation of the marginal cost of public funds from unity (see equation (A.30) in the appendix). With this social welfare function, the international spillover effect of a rise in a country's corporate tax rate is ambiguous under separate accounting, because the positive effect on foreign tax revenues will be offset by a tax exporting effect, as the higher domestic tax rate reduces the after-tax return to foreign-owned capital invested in the domestic economy.

Under *formula apportionment*, the cross-border spillover effects of corporate tax policy are somewhat different. According to the model in the appendix, a switch to FA will eliminate the scope for income shifting through transfer-pricing, so there are no spillover effects via this channel (although the provisos mentioned in the previous section should be kept in mind). The effect of a rise in one country's tax rate on the level of investment in other countries are generally quite complex, as suggested by equation (2) above. However, if the initial corporate tax rates are identical across countries, the appendix shows that a higher domestic tax rate will *reduce* investment in the foreign country under FA, because the rise in the domestic tax rate drives up the weighted average tax rate imposed on global profits, which include profits earned abroad. The appendix also shows that foreign tax revenue will be affected through two channels. First, because it reduces investment in both countries, the higher domestic tax reduces the taxable global profits of multinationals. Second, the rise in the domestic tax rate may affect the fraction of the global profits tax base which is allocated to the foreign country. Assuming that profits are apportioned according to the amount of capital invested in each country, this effect on the foreign tax base will be positive if the domestic capital stock has a higher numerical elasticity with respect to the domestic tax rate than the foreign capital stock. If this condition is met, the fraction of the global capital stock invested in the foreign country will go up. While one might expect that the domestic capital stock is more elastic with

respect to the domestic tax rate than the capital stock invested abroad, the appendix shows that this is not necessarily the case under formula apportionment. In the benchmark case where the two elasticities are identical, there is no effect on the international allocation of the profits tax base, and a rise in the domestic tax rate will then surely reduce the foreign tax base, due to the fall in global profits stemming from lower global investment.

Thus the spillover effect on foreign tax revenue may well be *negative* under FA. The spillover effect on foreign social welfare would then also be negative, since the higher domestic tax rate reduces the after-tax profit incomes of all investors, including foreigners. With a negative cross-border spillover effect on social welfare, corporate tax rates would tend to be *inefficiently high* under formula apportionment in a non-cooperative equilibrium where national policy makers neglect the international spillovers.

In summary, the analysis in the appendix indicates that whereas domestic corporate tax policy will tend to have offsetting effects on foreign private income and foreign tax revenue under separate accounting, it is quite possible that a rise in the domestic tax rate will have a *negative* impact on both of these foreign variables under formula apportionment. Rather than intensifying a race to the bottom in corporate tax rates, a switch from separate accounting to formula apportionment may thus lead to inoptimally high tax rates in the absence of international tax coordination.³

3. ALTERNATIVE ROADS TO EUROPEAN COMPANY TAX REFORM

3.1. The Commission's blueprints: some critical comments

The sections above have discussed some aspects of formula apportionment which are common to all of the Commission's different blueprints for a consolidated corporate tax base summarized in section 2.1. I will now offer some comments on the specific features of the various proposed designs for a single tax base for European multinational enterprises.⁴

The system of *Home State Taxation* (HST) implies that EU multinationals are allowed to calculate the consolidated profits on their EU-wide activities according to the tax code of the residence country of the parent company. From the perspective of national policy makers eager to maintain autonomy in matters of tax policy, the main advantage of HST is that it does not require any harmonization. All that is needed is that member states mutually recognize the company tax systems of the other countries participating in the

system. From the perspective of the business community, one attractive feature of HST is that it is optional: no company will be forced to switch to the system, but those that make the switch are likely to experience lower tax compliance costs, since they will no longer have to adhere to the different and sometimes conflicting national rules for the setting of transfer prices. Switching to a consolidated tax base will also enable companies to offset losses on operations in one member state against profits made in another member state, and corporate restructuring within a consolidated group will meet with fewer tax obstacles.

At the same time the attractive flexibility of HST is also the main weakness of the system, since the existing differences across national tax systems will continue to create distortions, as emphasized by Mintz and Weiner (2001). Apart from the fact that national differences in statutory tax rates will remain, members of different multinational groups operating in any given EU country will be subject to different tax base rules if their parent companies are headquartered in different member states, thus violating capital import neutrality. Indeed, the analysis in the Commission report indicates that the introduction of HST would increase the dispersion of effective corporate tax rates across the EU.

In auditing the foreign affiliates of the domestic parent company, the tax authorities of the Home State will also depend on the assistance of the foreign tax administrators who may not be familiar with the Home State tax code. Moreover, HST would invite member states to compete by offering generous tax base rules in order to attract corporate headquarters. Such competition would generate negative revenue spillovers, since a more narrow tax base definition in any member state would apply not only to income from activity in the Home State, but to income earned throughout the EU area. Any laxity in the auditing and enforcement effort of the Home State tax administration would also have a negative external effect by reducing the revenues accruing to other member states. Finally, the fact that companies may freely choose between HST and the existing tax regime is bound to create some revenue loss as firms opt for the system promising the lowest tax bill.

In contrast to Home State Taxation, the *Consolidated Common Tax Base* (CCTB) relies on a harmonized set of rules defining the tax base for those companies opting for consolidation of their EU-wide profits. This will eliminate tax base competition for cor-

porate headquarters. CCTB will also create a higher degree of capital import neutrality than HST where multinationals operating in the same member state will be subject to 15 different Home State tax regimes (assuming that all EU countries participate in the system). Of course, the price to be paid for these advantages of CCTB is the loss of national autonomy implied by tax base harmonization. Moreover, the fact that the harmonized tax base would apply only to multinationals could create distortions between large and small firms within each member state, since small firms without international operations would still be subject to the domestic tax rules. The co-existence of two different tax regimes could also create opportunities for tax arbitrage and generate artificial incentives for investment abroad. To illustrate, suppose the domestic tax base rules of Member State 1 allow less generous deductions than the CCTB tax base definition. A company in Member State 1 without any foreign operations might then find it profitable to start up a branch or subsidiary in another member state, since this would enable the company to switch to the more liberal CCTB rules for taxation of its pre-existing domestic activities. Obviously such behaviour would imply real investment distortions as well as public revenue losses.

In addition to these distortions implied by CCTB, it would be a clear disadvantage that each national tax administration would have to deal with two different tax systems, that is, the new Consolidated Common Tax Base applying to multinationals, and the existing national tax rules for domestic firms. Since the main responsibility for the auditing of a multinational group would presumably rest with the tax administration of the home state, CCTB would also have the same weakness as HST that laxity in tax enforcement would generate negative revenue spillovers on other member states.

The *European Union Company Tax* (EUCT) would eliminate the incentive problem caused by the fact that, under HST and CCTB, national governments would only receive a fraction of the revenue gain from more effective enforcement of tax rules. Under the EUCT the (optional) tax system for European multinationals would be administered at the EU level, and the revenue would accrue to the EU budget. Apart from this "federal" aspect of the EUCT - which makes it highly controversial in member states opposed to the idea of Europe as a federation - the EUCT would have the same features, and hence the same weaknesses, as the CCTB.

The fourth alternative considered in the Commission report is the *Compulsory Harmonized Tax Base* (CHTB). Under this system a single corporate tax base applies to all firms - domestic as well as international - in *all* member states. This will level the playing field between domestic and multinational firms and eliminate the need for national tax administrations to deal with two different tax systems. Clearly the CHTB will also eliminate tax base competition, and since the system is compulsory, firms will have no possibility to minimize their tax bills by switching between different optional tax regimes. On the other hand, because it also harmonizes the tax rules for small domestic firms, the CHTB involves a greater loss of national tax autonomy. Furthermore, given the current differences in statutory corporate tax rates, a harmonization of the corporate tax base might well lead to *larger* cross-country variations in effective tax rates, since a relatively high statutory tax rate is often compensated by relatively generous deductions from taxable profits.

3.2. European reactions to the Commission proposals⁵

Despite the problems mentioned in the previous section, important European interest groups have taken a fairly positive attitude towards the Commission's proposal to move towards a consolidated corporate tax base for EU multinationals. In particular, the Union of Industrial and Employer's Confederations of Europe (UNICE) supports a common consolidated tax base with formula apportionment as the ultimate goal of EU company tax policy, provided that the system is optional for companies, and provided that member states can still freely compete against each other in the setting of corporate tax rates. Perhaps it is not surprising that the business community supports a tax policy which enables companies to opt for the most favourable tax regime without restraining tax competition. Nor is it any surprise that member state tax administrators have expressed strong reservations against a system which would allow companies to choose between a consolidated tax base and the existing tax regime. They point out that such optionality will generate revenue losses and that administering two different tax systems at the same time is an added burden.

The reactions of European tax experts to the Commission report have been somewhat mixed. On the one hand most observers recognize that as the European economies become ever more integrated, the case for formula apportionment as a potential solution to the

transfer pricing problem is becoming stronger, even though FA may generate new types of distortion. On the other hand many tax experts find it paradoxical that the Commission emphatically rejects any form of coordination of corporate tax rates, despite the finding in the report that about three fourths of the current dispersion of effective corporate tax rates in the EU are due to differences in statutory tax rates. If the policy goal is to reduce the tax distortions to the pattern of cross-border investment in Europe, it would therefore seem necessary to bring statutory corporate tax rates more into line.

3.3. Is there a case for competition in tax rates?

Historically, the European Commission has in fact tended to favour a harmonization or at least a gradual approximation of corporate tax rates as well as tax bases in Europe. An approximation of rates and bases was also the approach recommended by the Ruding Committee (1992). The Commission's newly acquired hostility to tax rate coordination reflects a recent shift in the dominant European view of tax competition. Only a few years ago, the European Commission (1997) expressed concern that international tax competition is shifting the tax burden from mobile capital onto unemployment-ridden labour. However, more recently the Commission has expressed the view that "...a reasonable degree of tax competition within the EU is healthy and should be allowed to operate. Tax competition may strengthen fiscal discipline to the extent that it encourages Member States to streamline their public expenditure, thus allowing a reduction in the overall tax burden." (European Commission, 2001c, p. 4).

Whether tax competition is good or bad is a major issue which will continue to be the subject of intense research and controversy.⁶ If one believes (as the Commission now seems to do) that there is an inherent tendency for the public sector to overexpand, because of pressures from special interest groups, and because the interests of politicians and bureaucrats tend to be promoted through larger public budgets, one may see tax competition as the taxpayer's safeguard against exploitation from a revenue-maximizing Leviathan government. By contrast, if one sees the level and structure of the public budget as the outcome of a well-functioning democratic process reflecting the preferences of (the majority of) the citizens, one will tend to see tax competition as a beggar-thy-neighbour policy involving the futile and disruptive attempts of governments to encroach upon each others' mobile tax bases.

Because it involves two fundamentally different views of government, the controversy on the vices and virtues of tax competition can easily degenerate into an unproductive exchange of political articles of faith. Edwards and Keen (1996) made a constructive attempt to impose more intellectual discipline on participants in this debate. To allow for both of the contrasting views of tax competition, they assumed that some fraction of marginal public spending is wasted on rent-seeking activities, whereas the remaining part generates welfare for the representative citizen. Using an otherwise standard model of capital tax competition, they then showed that international tax competition increases consumer welfare if the elasticity of the tax base with respect to the tax rate is lower than the fraction of marginal public spending which is wasted. This analytical approach seems useful since it forces participants in the tax competition debate to be more specific about their assumptions: how large do they consider the tax base elasticity to be? How large is the fraction of marginal public spending which they consider to be pure waste? The Edwards-Keen model of tax competition has an interesting long-run implication: as international economic integration proceeds, the elasticity of the tax base will go up, thereby increasing the likelihood that tax competition is harmful, unless political rent-seeking is also systematically increasing with the degree of economic integration. From this perspective it is far from obvious why the European Commission should suddenly adopt a more favourable view of tax competition in a era of increasing tax base mobility.

Given the various imperfections in the political process, it would be naive to deny that public funds are sometimes used inefficiently. Yet the question remains whether unfettered tax competition is the appropriate answer to this problem. Tax competition may certainly lead to cuts in public spending, but won't these spending cuts take place in areas where political resistance and lobbying effort is the weakest, rather than in those areas where the public sector is most inefficient? And how do we know that tax competition will discipline public spending rather than amplify the well-known "deficit-bias" in political decision-making?⁷ If rent seeking and public sector inefficiency is the problem, the natural policy response is to reform the political and public sector institutions which give disproportionate power to special interest groups. Tax competition seems a very indirect and poorly targeted instrument for countering rent seeking.

As suggested by these remarks, I believe that the normative case for tax competition

as an appropriate institutional response to public sector inefficiency is rather weak. The previous sections have identified a number of problems with the Commission proposals for a consolidated tax base with formula apportionment. If the alleged benefits of tax competition do not provide a convincing argument against corporate tax harmonization, it is relevant to ask whether harmonization could be a preferable alternative to the type of company tax reform proposed in the recent Commission report? To avoid misunderstandings, let me stress that formula apportionment deserves serious scrutiny as a potential policy response to the problems of transfer pricing, given that corporate tax rate differentials will surely persist for many years to come. However, since these differentials create a number of obvious problems under FA as well as under SA, it is still a legitimate question for a normative analysis whether corporate tax harmonization should remain a long run goal for the European Union. Under the current unanimity principle for tax policy making in the EU, harmonization across all member states is undoubtedly politically infeasible, but under the new institution of Enhanced Cooperation enshrined in the Nice Treaty, a subgroup of member states could proceed with tax harmonization if they find such a policy desirable.

3.4. Harmonization after all?

A harmonization of corporate tax rates and tax bases could achieve the basic goals set up in the Commission report. First, the harmonization of tax bases would ensure that European companies would only have to deal with one corporate tax system, thus reducing compliance costs. By also allowing cross-border loss offsets, as already practiced by Denmark, the EU would then come close to the common consolidated tax base advocated by the Commission. Second, the harmonization of statutory corporate tax rates would eliminate the tax incentives for transfer pricing, reducing the need for complex transfer pricing regulation.⁸ In addition, the harmonization of rates as well as bases would improve the allocation of capital across Europe, as elaborated in the next section.

In the current area of euro-scepticism it may seem quite radical and utterly unrealistic to propose a harmonization of the rate as well as the base of the corporation tax. However, the distribution of the tax burden across taxpayers depends on the *total* tax burden on income from capital. Apart from the corporation tax, this burden also includes personal taxes on income and wealth. An effective exchange of information among national tax

administrations - as intended by the so-called Savings Directive recently adopted by EU member states - will improve the ability of member countries to enforce personal taxes on the interest and dividends paid out by the corporate sector, as well as personal taxes on capital gains on shares. If information exchange provides member states with more room for manoeuvre in the field of personal income taxation, they may be more willing to give up autonomy in the area of corporate taxation to eliminate the many distortions to the Single Market created by the current corporate tax differentials.

The point is the classical one that the corporation tax is just a withholding tax, serving as a prepayment of the final taxes on the capital income originating in the corporate sector. The final tax burden is determined by the personal taxes levied on interest, dividends and capital gains, and these taxes will remain under the control of member state governments even if the corporation tax were harmonized. If a member state finds that the harmonized corporation tax implies an inappropriately low level of tax on corporate-source equity income, it can rectify the situation by adding personal taxes on dividends and capital gains at the shareholder level. If it finds that the harmonized corporation tax is too high, it can use part of its corporate tax revenue to finance tax credits to shareholders.

It might be argued that if the corporation tax is really just a backstop serving as prepayment of the shareholder's personal income tax, national corporate tax rates should be allowed to vary in accordance with the variations in national personal tax rates. However, in practice EU member states do not seem to prefer a tight link between corporate and personal tax rates, as illustrated in Figure 1. Using data for 2001, the figure plots the statutory corporate income tax rates against the top marginal personal income tax rates in the EU-19, defined as the 15 current member states plus the four largest countries in the group of new Eastern European member states soon to be added to the Union. The slope of the estimated OLS regression line in Figure 1 is not significantly different from zero, and the variation in personal tax rates explains almost none of the variation in corporate tax rates. This suggests that member countries could easily live with some delinking of corporate and personal tax rates, as would be implied by a harmonized corporation tax.⁹

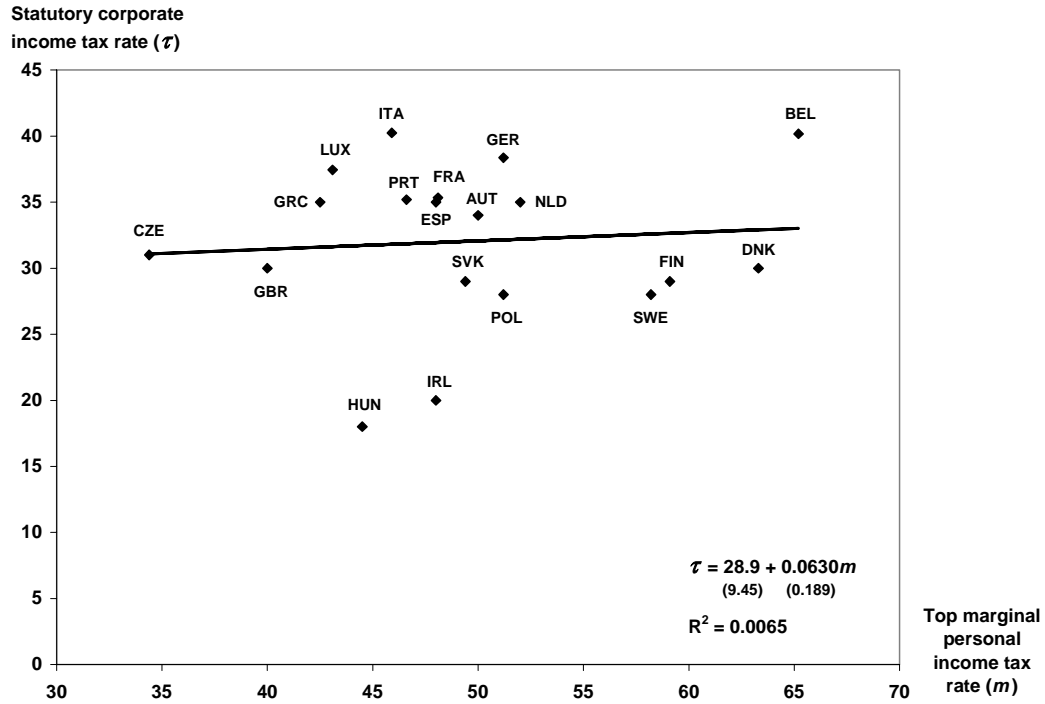


Figure 1. Corporate and personal income tax rates in the EU-19.

Note: Corporate tax rates per 1st of January 2001; personal tax rates for 2001. The data set consists of the Czech Republic, Hungary, Poland, and the Slovak Republic in addition to the existing 15 EU member states.

Source: OECD Tax Data Base and KPMG's Corporate Tax Rate Survey.

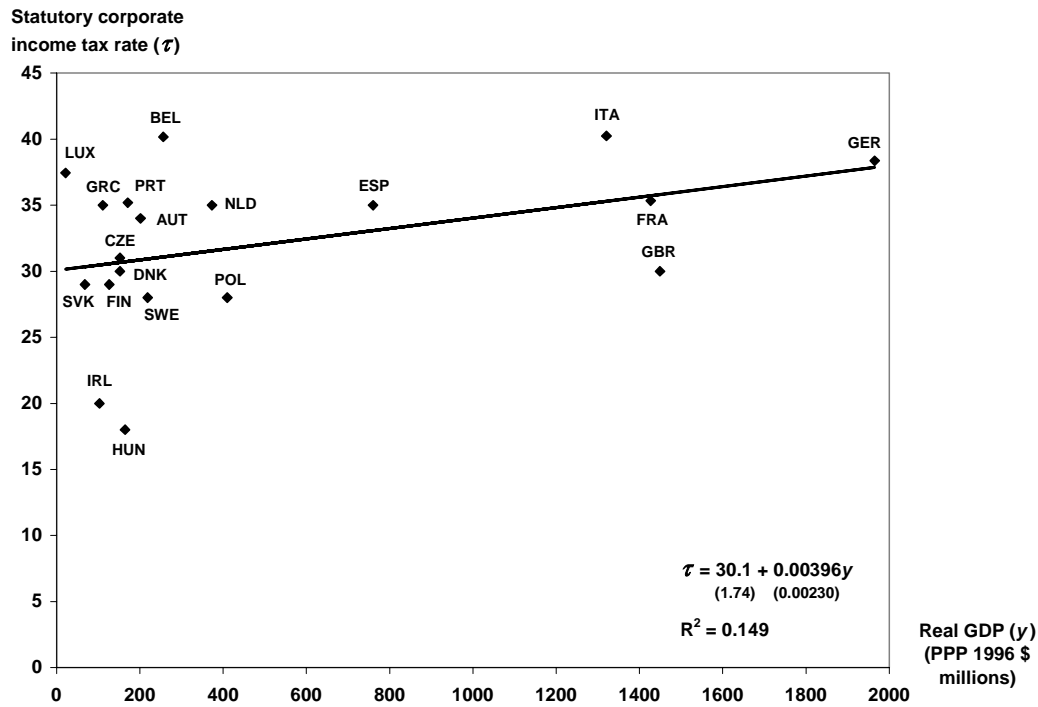


Figure 2. Corporate income tax rates and real GDP in the EU-19.

Note: Corporate tax rates per 1st of January 2001. Purchasing power corrected GDP from the year 2000. The data set consists of the Czech Republic, Hungary, Poland, and the Slovak Republic in addition to the existing 15 EU member states.

Source: KPMG's Corporate Tax Rate Survey and Penn World Table 6.1.

Another economic argument against corporate tax harmonization is provided by the theoretical analysis of Baldwin and Krugman (2002) who set up a model of tax competition with agglomeration forces. With agglomeration forces operating, industry is not indifferent to location, and mobile capital becomes a quasi-fixed factor. Under tax competition advanced "core" nations with strong agglomeration forces set their corporate tax rates at a level which is above the tax rates chosen by less advanced "periphery" countries, but just sufficiently low to prevent a migration of industry towards the periphery. In this setting Baldwin and Krugman show that tax harmonization will always hurt at least one country, whereas a minimum tax rate set at the lowest equilibrium tax rate would lead to a weak Pareto improvement.

What is the empirical relevance of this analysis? Finding reliable proxies for agglomeration forces is very difficult, but one would expect that the external agglomeration benefits in a country are positively related to the absolute size of its GDP, since absolute GDP reflects the size of the local market as well as the local level of technology and productivity. Figure 2 plots corporate tax rates in the EU-19 against the absolute PPP-adjusted levels of real GDP in the various countries. Again the estimated slope of the regression line is insignificantly different from zero. Although absolute GDP is an imperfect indicator of agglomeration benefits, Figure 2 does not support the view that agglomeration forces induce EU countries to choose very different corporate tax rates. However, in a multiple regression analysis including several explanatory variables, Krogstrup (2002, ch.2) did find some evidence of agglomeration effects on effective corporate tax rates. Thus there may be an economic geography case for allowing peripheral member states to choose a lower level of taxation in the early stage of their catching-up process. Under a harmonized EU corporation tax, this could be done by allowing peripheral countries meeting certain objective criteria to grant special investment tax credits for a limited time period, subject to approval by the European Commission.

3.5. How big are the gains from harmonization?

From a normative pan-European standpoint, the case for corporate tax harmonization should be evaluated in the light of two basic principles of the European Union. One guideline is the goal of an undistorted common market with a level playing field for

business competition. This goal of economic efficiency is well served by corporate tax harmonization. The other basic principle is subsidiarity, requiring as little centralized decision-making as possible. Clearly the subsidiarity principle works against tax harmonization. Trading off the efficiency gain from corporate tax harmonization against the resulting loss of national autonomy is a matter for politicians, but the economic analyst may help them to make informed decisions by offering estimates of the likely magnitude of the efficiency gains from harmonization. Armed with such estimates, policy makers are in a better position to decide whether the allocational gains from harmonization are sufficiently large to justify the loss of national sovereignty.

In Sørensen (2002b, 2002c) I have developed an applied general equilibrium model designed to quantify the effects of various forms of international tax competition and tax coordination. The current version of the model - called the OECDTAX model - is calibrated to a data set for 24 OECD countries, including the 15 current EU member states. The model is static, depicting a long run equilibrium. It allows for a considerable amount of institutional detail by distinguishing between foreign direct investment and foreign portfolio investment; between household investors and institutional investors; between different asset types like stocks, bonds, and real estate; between debt and equity, etc. The model also includes international profit-shifting via transfer-pricing by multinational corporations (assuming separate accounting), and it allows for domestic and international tax evasion by assuming that only a fraction of the capital income of portfolio investors can be monitored and taxed. Wages and working hours are assumed to be set by trade unions whose market power generates involuntary unemployment. Labour is immobile across countries and capital is imperfectly mobile. The international supply of capital to any country is thus an increasing function of the net rate of return offered in that country. By varying the elasticity of substitution between assets invested in different countries, one can vary the degree of capital mobility and approximate a situation of perfect 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 OECDTAX model and its calibration is described in more detail in Sørensen (2001c, 2002b). In Table 1 I have used the model to simulate the long run effects of a complete harmonization of the statutory corporate tax rate as well as the corporate tax

base in the EU, starting from the tax rules prevailing in 2000. The broadness of the corporate tax base in the model is determined by the rate of capital allowance. In the initial equilibrium this parameter has been calibrated to generate a realistic corporate tax revenue relative to GDP, given the statutory corporate tax rate. Harmonization is assumed to take place around the unweighted average corporate tax rate of 33.7 percent and around the unweighted average rate of depreciation for tax purposes. I consider harmonization around unweighted rather than weighted averages because the unanimity rule for tax policy decisions in the EU implicitly gives equal weight to large and small countries. On the other hand, the EU averages reported in columns 3 through 8 in Table 1 are population-weighted averages, to allow a utilitarian social welfare interpretation of the welfare effects for the EU as a whole, in line with the utilitarian social welfare figures for the individual member states given in columns 5 and 8. The first two columns in Table 1 show the changes in each country's tax parameters implied by harmonization. If the figures in both of these columns have a negative (positive) sign, the country combines a relatively high (low) statutory tax rate with a relatively narrow (broad) tax base in the initial equilibrium. For these countries the change in the corporate tax rate and the change in the tax base will have offsetting effects on domestic investment and output. For countries where the numbers in columns 1 and 2 have opposite signs, the changes in the rate and in the base work in the same direction.

The simulation summarized in columns 3 through 5 assumes that the change in tax revenue is offset by a corresponding change in lump sum transfers to households to keep the government budget balanced. The table records the changes in real GDP, public revenue, and consumer welfare.¹⁰ The simulation reported in columns 6 through 8 assumes instead that government budget balance is maintained through adjustment in the tax rate on labour income. Since the labour income tax rate affects structural unemployment via its impact on union wage setting, the resulting changes in the unemployment rate are also indicated. The economic effects on countries outside the EU are not shown in the table, since they are generally quite small.

Because of uncertainty regarding many of the model parameters, the results in Table 1 should not be taken too literally. With this proviso, the table suggests the following conclusions:

Country	Finance through adjustment of public transfers				Finance through adjustment of tax rates			
	1. Change in statutory corporate tax rate (percentage points)	2. Change in capital allowance rate ¹ (%)	3. Change in GDP (%)	4. Change in tax revenue (% of GDP)	5. Change in welfare (% of GDP)	6. Change in GDP (%)	7. Change in unemployment rate (percentage points)	8. Change in welfare (% of GDP)
Austria	-0.3	-38.8	-1.54	0.34	-0.10	-1.02	-0.24	0.11
Belgium	-6.5	29.4	2.34	-0.14	0.49	1.89	0.28	0.28
Denmark	1.7	3.7	-0.10	-0.01	-0.03	-0.14	0.02	-0.04
Finland	4.7	-8.5	-0.60	0.14	-0.11	-0.42	-0.07	-0.03
France	-10.0	-15.5	0.08	0.24	0.32	0.65	-0.33	0.56
Germany	-4.9	-45.3	-1.70	0.42	-0.03	-1.13	-0.31	0.22
Greece	-6.3	-36.9	-1.33	0.46	0.05	-0.94	-0.10	0.17
Ireland	23.7	24.3	-1.08	0.91	-0.21	-0.05	-0.47	0.22
Italy	-3.3	50.7	2.10	-0.72	0.21	1.48	0.04	0.00
Luxembourg	-5.9	133.1	3.75	-1.20	0.55	3.0	0.16	0.30
Netherlands	-1.3	24.2	1.04	-0.20	0.12	0.75	0.08	0.01
Portugal	-1.5	17.7	0.66	-0.27	0.09	0.43	0.10	0.00
Spain	-2.1	-28.3	-1.18	0.32	-0.04	-0.72	-0.25	0.16
Sweden	5.7	72.9	0.84	-0.21	0.03	0.61	0.00	-0.04
United Kingdom	3.7	142.6	2.04	-0.63	0.22	1.64	0.11	0.09
EU average ²	0	0	0.22	-0.04	0.12	0.32	-0.12	0.18

Table 1. Effects of corporate tax harmonization in the EU

¹ A negative (positive) figure indicates a broadening (narrowing) of the corporate income tax base.

² Simple averages in columns 1. and 2.; population-weighted averages in columns 3. through 8.

Source: Simulations with the OECDTAX model.

1) While most member states will gain from corporate tax harmonization, some countries will actually lose. However, there is an aggregate welfare gain for the EU as a whole, since harmonization of the source-based corporation tax reduces cross-country differences in required pre-tax rates of return, leading to a more efficient allocation of capital across Europe. In principle, it should thus be possible for the winners to compensate the losing countries, say, through transfers via the EU budget.

2) The overall welfare gain from corporate tax harmonization seems to be quite small. The recorded gain is of the same order of magnitude as the estimated savings on transaction costs due to the introduction of the euro. The small size of the gain reflects several factors. First, a considerable part of the total capital stock is invested outside the corporate sector. In particular, housing capital accounts for a large fraction of the aggregate capital stock in the model. Second, corporate tax harmonization is not sufficient to equalize the cost of corporate capital across the EU, since capital costs are also affected by the non-harmonized tax rules for household and institutional investors. In particular, because of ineffective enforcement of taxes on foreign source income, the existing personal capital income taxes tend to work like another layer of source-based taxation on top of the corporate income tax, interfering with production efficiency. Third, assets are not perfectly substitutable across EU countries, as indicated by the observed home bias in investor portfolios, and corporations earn location-specific rents. The imperfect mobility of capital and the fact that the corporation tax is partly a tax on pure rents tend to limit the distortionary effects of existing corporate tax differentials.

3) The changes in GDP are typically much larger than the changes in consumer welfare, and not always of the same sign. In part this reflects that an increase in GDP requires an increase in factor inputs which is costly in terms of welfare, but it also reflects that capital mobility breaks the link between national income and domestic product, i.e., part of the changes in GDP are achieved through capital imports or capital exports.

4) The effects of corporate tax harmonization will differ, sometimes by non-trivial amounts, depending on the fiscal instrument used to balance the public budget. It may seem surprising that unemployment and GDP generally change in the same direction when the budget is balanced via adjustment of the labour income tax rate. The reason is

that countries which are forced to raise their effective corporate tax rate will experience a fall in output as a result of lower domestic investment, but at the same time they will gain corporate tax revenue. This allows a cut in the distortionary tax on labour which in turn reduces structural unemployment, although not enough to reverse the fall in GDP. Through analogous mechanisms, countries which are forced to reduce their effective corporate tax rate will tend to experience a simultaneous rise in GDP and unemployment.

Perhaps the most important implication of the OECDTAX model is the small magnitude of the aggregate gain from corporate tax harmonization. Taken at face value, the simulation results strongly suggest that the static efficiency gains from harmonization do not justify the loss of national tax autonomy, especially if the international transfers needed to compensate the losing countries generate deadweight losses. 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. This benefit is not captured by the OECDTAX model.

Nor does the model capture the social welfare gain which will arise if corporate tax harmonization enables governments with egalitarian preferences to implement more redistributive policies than would be possible under unfettered tax competition. To highlight this gain, I have developed an alternative simulation model with endogenous policy making where tax competition forces a reduction in redistributive transfers (see Sørensen, 2000, 2001a). The government's aversion to inequality is calibrated to ensure that the initial model equilibrium reproduces the level of redistributive transfers observed in the data. On this basis I find that tax harmonization in the EU would raise social welfare by about 0.1-0.4 percent of GDP, depending on the assumed degree of capital mobility between the EU and the rest of the world. This is not an efficiency gain, but rather a social welfare gain from a more equitable income distribution. Thus, if one acknowledges that the existing tax-transfer systems reflect a social preference for equity, the gain from EU corporate tax harmonization could well be more than twice as large as the pure efficiency gain reported in Table 1.¹¹ Still, the estimated gain remains relatively small, because the mobility of capital between the EU and the rest of the world limits the scope for redistributive capital taxes in Europe.

4. CONCLUDING REMARKS

With its recent endorsement of formula apportionment of a consolidated corporate tax base, and its simultaneous rejection of restraints on competition in corporate tax rates, the European Commission has abandoned historical positions and adopted a new and radically different approach to company taxation in Europe. This paper has criticized several aspects of the Commission's blueprints, such as the possibility for firms to opt for the most liberal tax regime; the need to administer several different tax systems at the same time, and the distortions caused by the preservation of large tax rate differentials. But in fairness to the Commission, one should acknowledge that the current political mood in the EU is hostile to far-reaching tax coordination, let alone harmonization, and the unanimity rule for tax policy decisions is a serious obstacle to progress in this area. To make some headway, the Commission apparently hopes that its new rather business-friendly approach to corporate taxation will induce the influential European business community to lobby for more coordination. Yet the analysis in this paper suggests that those features of the Commission blueprints which make them most attractive to business are also likely to create new distortions. Hence it is not obvious that blueprints based on optionality will significantly improve the workings of the EU single market.

Nevertheless, with growing economic integration, a consolidated corporate tax base with formula apportionment is an interesting reform option which deserves serious attention. This paper attempted to contribute to the understanding of the fiscal spillover effects likely to emanate from such a tax system. One implication of the model developed in the appendix is that formula apportionment may well lead to inefficiently high rates of corporate income tax, contrary to claims made by previous writers.

The paper went on to argue that traditional corporate tax harmonization may still be a legitimate long term goal for the European Union if it is combined with more effective enforcement of the residence principle in personal capital income taxation, allowing member states to choose their own preferred overall level of capital taxation, and reducing the interference of personal taxes with production efficiency. With corporate tax rate harmonization, the difficulties associated with separate accounting as well as formula apportionment would become much more manageable. However, the simulation exercises in this paper suggest that the aggregate static efficiency gain from corporate tax harmo-

nization would be quite small, because much of the capital stock is invested outside the corporate sector, because the corporation tax is not the only element of the tax system influencing the cost of corporate capital, and because capital mobility between Europe and the rest of the world limits the scope for intra-European coordination. The case for corporate tax harmonization would therefore have to rest mainly on the reduction in the costs of tax compliance and tax administration emphasized in the recent Commission report, and perhaps also on the improved ability of governments to maintain a redistributive welfare state.

Most likely, economic integration will have to proceed much further before European politicians decide that the gains from harmonization are worth the cost of giving up the corporation tax as an instrument of national industrial policy.

APPENDIX

Fiscal externalities under separate accounting and formula apportionment

This appendix describes the model underlying the discussion of fiscal externalities in section 2.4 of the main text. We consider a setting with two countries 1 and 2 facing a given international cost of equity finance r determined in the world capital market. Each country is the headquarter of a multinational enterprise producing in both countries. Variables in upper-case letters refer to the multinational headquartered in country 1 (MNE1), while variables in lower-case letter relate to the multinational with headquarter in country 2 (MNE2).

For MNE1, the real revenue from production in country 1 is given by $F(K_1)$, where K_1 is the capital invested in the parent company in country 1, and $F' > 0$, $F'' < 0$. For each unit of capital K_2 invested in the subsidiary in country 2, the parent company in MNE1 delivers S units of an essential service (say, a trademark or a patented technology) to the subsidiary. Using the combined input SK_2 , where S is exogenous, the foreign subsidiary generates real revenue $\widehat{F}(SK_2)$, $\widehat{F}' > 0$, $\widehat{F}'' < 0$. The parent's resource cost of providing a unit of service is equal to 1, but for tax reasons it may charge the subsidiary a transfer price P which differs from the true resource cost. Because it is costly to defend distorted transfer prices vis á vis the tax authorities, and since distorted intra-company price signals may generate internal organizational inefficiencies, the parent incurs real costs of transfer pricing given by the convex function $C(P)$ with properties

$$C(1) = C'(1) = 0, \quad C'(P) > 0 \text{ for } P > 1, \quad C'(P) < 0 \text{ for } P < 1, \quad C''(P) > 0 \quad (\text{A.1})$$

With these assumptions, the global after-tax profit Π^{ai} of MNE1 is

$$\Pi^{ai} = \overbrace{F(K_1) + [P - 1 - C(P)]SK_2 - rK_1}^{\text{pre-tax profit of parent company}} + \overbrace{\widehat{F}(SK_2) - PSK_2 - rK_2 - T^i}^{\text{pre-tax profit of foreign subsidiary}}, \quad i = s, f \quad (\text{A.2})$$

where T^i is the firm's global tax bill which will differ under separate accounting ($i = s$) and formula apportionment ($i = f$). By analogy, the global net profit of MNE2 is

$$\pi^{ai} = f(k_2) + [p - 1 - c(p)]sk_1 - rk_2 + \widehat{f}(sk_1) - psk_1 - rk_1 - t^i, \quad i = s, f \quad (\text{A.3})$$

where the revenue and cost functions have the same properties as those assumed for MNE1.

Separate accounting

Under separate accounting and source-based taxation, the total tax bills of the two companies are

$$T^s = t_1 \{F(K_1) + [P - 1 - C(P)]SK_2\} + t_2 \left\{ \widehat{F}(SK_2) - PSK_2 \right\} \quad (\text{A.4.a})$$

$$t^s = t_2 \{f(k_2) + [p - 1 - c(p)]sk_1\} + t_1 \left\{ \widehat{f}(sk_1) - psk_1 \right\} \quad (\text{A.4.b})$$

where t_1 and t_2 are the corporate tax rates in the two countries. (A.4) assumes that the costs of transfer pricing (e.g., the remuneration of tax lawyers and accountants etc.) are deductible, whereas the cost of equity finance is not. Inserting (A.4.a) into (A.2) and maximizing with respect to K_1 , K_2 and P , one finds that the first-order conditions for the optimal investment and transfer-pricing behaviour of MNE1 are given by

$$F'(K_1) = \frac{r}{1 - t_1} \quad (\text{A.5})$$

$$C'(P) = \frac{t_2 - t_1}{1 - t_1} \quad (\text{A.6})$$

$$S \cdot \widehat{F}'(SK_2) = \frac{r}{1 - t_2} + \left(\frac{1 - t_1}{1 - t_2} \right) [1 + C(P)]S + PS \left(\frac{t_1 - t_2}{1 - t_2} \right) \quad (\text{A.7})$$

(A.5) is a standard expression for the cost of capital. (A.6) and (A.1) imply that the transfer price P will be set higher or lower than the cost-based price of unity according as the tax rate in country 2 is higher or lower than the tax rate in country 1. (A.7) shows that the required marginal pre-tax return on investment in the subsidiary in country 2 includes three components. The first term on the right-hand side of (A.7) is the tax-adjusted cost of equity finance. The second term is the after-tax resource cost of providing the extra services from the parent needed to support an extra unit of capital in the subsidiary. The third term reflects that the provision of these extra services shifts taxable income from the subsidiary to the parent. This will reduce (increase) the global tax bill if the tax rate of the parent is lower (higher) than the tax rate of the subsidiary, making investment in the latter more (less) attractive.

Following a similar procedure, one may derive analogous optimum conditions for MNE2:

$$f'(k_2) = \frac{r}{1 - t_2} \quad (\text{A.8})$$

$$c'(p) = \frac{t_1 - t_2}{1 - t_2} \quad (\text{A.9})$$

$$s \cdot \widehat{f}'(sk_1) = \frac{r}{1 - t_1} + \left(\frac{1 - t_2}{1 - t_1} \right) [1 + c(p)]s + ps \left(\frac{t_2 - t_1}{1 - t_1} \right) \quad (\text{A.10})$$

Let us now investigate the international fiscal spillovers in our model. The corporate tax rate chosen by country 1 will affect economic activity and tax revenue in country 2 via its impact on K_2 , P , k_1 , and p . Using the relevant first-order conditions, we find that

$$\frac{\partial K_2}{\partial t_1} = \frac{P - 1 - C(P)}{(1 - t_2) S \widehat{F}''(SK_2)} \quad (\text{A.11})$$

$$\frac{\partial P}{\partial t_1} = -\frac{(1 - t_2)}{(1 - t_1)^2 C''(P)} < 0 \quad (\text{A.12})$$

$$\frac{\partial k_1}{\partial t_1} = \frac{r(1 - t_1)^{-1} - (1 - t_2)[p - 1 - c(p)]}{(1 - t_1) s \widehat{f}''(sk_1)} \quad (\text{A.13})$$

$$\frac{\partial p}{\partial t_1} = \frac{1}{(1 - t_2) c''(p)} > 0 \quad (\text{A.14})$$

The sign of the numerator in (A.11) will tend to follow the sign of $t_2 - t_1$. Indeed, this will certainly be the case if the C -function is quadratic. This is the basis for the claim made in the text that a rise in the domestic tax rate will tend to have a positive (negative) effect on outward FDI in a high-tax (low-tax) country.

Consider next the effect on country 2's tax revenue b^s , given by

$$b^s = t_2 \left\{ f(k_2) + [p - 1 - c(p)] sk_1 + \widehat{F}(SK_2) - P SK_2 \right\} \quad (\text{A.15})$$

Using (A.15) and (A.9) and noting from (A.8) that $\partial k_2 / \partial t_1 = 0$, we obtain

$$\begin{aligned} \frac{\partial b^s}{\partial t_1} = t_2 s \left\{ [p - 1 - c(p)] \left(\frac{\partial k_1}{\partial t_1} \right) + k_1 \left(\frac{1 - t_1}{1 - t_2} \right) \left(\frac{\partial p}{\partial t_1} \right) \right\} \\ + t_2 S \left\{ \left[\widehat{F}'(SK_2) - P \right] \left(\frac{\partial K_2}{\partial t_1} \right) - K_2 \left(\frac{\partial P}{\partial t_1} \right) \right\} \end{aligned} \quad (\text{A.16})$$

The sign of this derivative is generally indeterminate. However, if the initial tax rates are the same in the two countries, we have $p - 1 - c(p) = P - 1 - C(P) = 0$ according to (A.1), (A.6), and (A.9). It then follows from (A.16), (A.11), (A.12) and (A.14) that

$$\frac{\partial b^s}{\partial t_1} = t_2 \left\{ sk_1 \left(\frac{1 - t_1}{1 - t_2} \right) \left(\frac{\partial p}{\partial t_1} \right) - SK_2 \left(\frac{\partial P}{\partial t_1} \right) \right\} > 0 \quad (\text{A.17})$$

Starting out from $t_1 = t_2$, a rise in one country's tax rate is therefore sure to boost tax revenue in the other country, as multinationals adjust their transfer prices to shift income out of the country which has raised its tax rate.

Formula apportionment

Under formula apportionment, the starting point for calculating the tax liability of MNE1 in each country is the company's global taxable profit (Π) which is given by

$$\begin{aligned}\Pi &= F(K_1) + [P - 1 - C(P)]SK_2 + \widehat{F}(SK_2) - PSK_2 \\ &= F(K_1) - [1 + C(P)]SK_2 + \widehat{F}(SK_2)\end{aligned}\quad (\text{A.18})$$

Assuming that the two countries have agreed to apportion the tax base in accordance with the proportion of the firm's total capital stock invested in the two jurisdictions, the global tax bill of MNE1 will be

$$T^f = t_1^* \Pi, \quad t_1^* \equiv t_1 \left(\frac{K_1}{K} \right) + t_2 \left(\frac{K_2}{K} \right), \quad K \equiv K_1 + K_2 \quad (\text{A.19})$$

where t_1^* is the weighted average tax rate levied on the global profit of MNE1, and K_i/K is the proportion of global profit which is taxed in country i . MNE1 will choose K_1 , K_2 and P so as to maximize its net global profit $\Pi^f = \Pi - rK - T^f$. The first-order conditions for the solution to this problem can be written as

$$C'(P) = 0 \implies P = 1 \quad \text{and} \quad C(P) = 0 \quad (\text{A.20})$$

$$F'(K_1) = \frac{r}{1 - t_1^*} + \left(\frac{K_2}{K} \right) \left(\frac{t_1 - t_2}{1 - t_1^*} \right) \left(\frac{\Pi}{K} \right) \quad (\text{A.21})$$

$$S \cdot \widehat{F}'(SK_2) = \frac{r}{1 - t_1^*} + S + \left(\frac{K_1}{K} \right) \left(\frac{t_2 - t_1}{1 - t_1^*} \right) \left(\frac{\Pi}{K} \right) \quad (\text{A.22})$$

Equation (A.20) shows that the firm will not engage in transfer pricing under FA, since distorted transfer prices would only generate organizational costs without reducing the global tax bill, given that the apportionment of taxable profit is unaffected by P . The unconventional final terms on the right-hand sides of equations (A.21) and (A.22) reflect the impact of a rise in investment on the allocation of taxable profits: additional investment in a high-tax (low-tax) country will drive up (down) the weighted average tax rate on global profit by causing more of that profit to be allocated to the high-tax (low-tax) country.

The general expressions for the derivatives of K_1 and K_2 with respect to the tax rates are quite complex. However, if the initial tax rates in the two countries are identical, one can show from (A.20) through (A.22) that

$$\frac{\partial K_1}{\partial t_1} = \frac{r(K_1/K)}{(1-t_1^*)^2 F''(K_1)} < 0 \quad (\text{A.23})$$

$$\frac{\partial K_2}{\partial t_1} = \frac{r(K_1/K)}{(1-t_1^*)^2 S\widehat{F}''(SK_2)} < 0 \quad (\text{A.24})$$

Thus a rise in country 1's tax rate will reduce domestic investment as well as outward FDI, by raising the weighted average tax rate imposed on global profits. From the first-order conditions for MNE2 one can also show that

$$\frac{\partial k_1}{\partial t_1} = \frac{r(k_1/k)}{(1-t_2^*)^2 s\widehat{f}''(sk_1)} < 0 \quad (\text{A.25})$$

$$\frac{\partial k_2}{\partial t_1} = \frac{r(k_1/k)}{(1-t_2^*)^2 f''(k_2)} < 0 \quad (\text{A.26})$$

when $t_1 = t_2$ initially.

Let us now turn to the effect of country 1's tax policy on country 2's revenue. Recalling that $C(P) = c(p) = 0$, the total tax revenue in country 2 is

$$b^f = t_2 \left\{ \alpha \left[F(K_1) - SK_2 + \widehat{F}(SK_2) \right] + \beta \left[f(k_2) - sk_1 + \widehat{f}(sk_1) \right] \right\}, \quad (\text{A.27})$$

$$\alpha \equiv \frac{K_2}{K}, \quad \beta \equiv \frac{k_2}{k}$$

Using (A.27), (A.22), and the analogous first-order condition for MNE2, and setting $t_1 = t_2$ initially, one can show that

$$\begin{aligned} \frac{\partial b^f}{\partial t_1} = t_2 & \left\{ \overbrace{\alpha \left(\frac{r}{1-t_1^*} \right) \left[\frac{\partial K_1}{\partial t_1} + \frac{\partial K_2}{\partial t_1} \right]}^{\text{effect on } \Pi (<0)} + \overbrace{\beta \left(\frac{r}{1-t_2^*} \right) \left[\frac{\partial k_2}{\partial t_1} + \frac{\partial k_1}{\partial t_1} \right]}^{\text{effect on } \pi (<0)} \right\} \\ & + \underbrace{\left(\frac{K_1 K_2}{K^2} \right) \left[\frac{\partial K_2}{\partial t_1} \frac{t_1}{K_2} - \frac{\partial K_1}{\partial t_1} \frac{t_1}{K_1} \right]}_{\text{effect on } \alpha} \Pi + \underbrace{\left(\frac{k_1 k_2}{k^2} \right) \left[\frac{\partial k_2}{\partial t_1} \frac{t_1}{k_2} - \frac{\partial k_1}{\partial t_1} \frac{t_1}{k_1} \right]}_{\text{effect on } \beta} \pi \end{aligned} \quad (\text{A.28})$$

where Π is the taxable global profit of MNE1 defined in (A.18), and π is the taxable global profit of MNE2, defined analogously. Equation (A.28) confirms the claim made in section 2.4 that

$$\frac{\partial K_2}{\partial t_1} \frac{t_1}{K_2} \leq \frac{\partial K_1}{\partial t_1} \frac{t_1}{K_1} \quad \text{and} \quad \frac{\partial k_2}{\partial t_1} \frac{t_1}{k_2} \leq \frac{\partial k_1}{\partial t_1} \frac{t_1}{k_1} \quad (\text{A.29})$$

is *sufficient* to ensure that a rise in country 1's corporate tax rate will have a negative impact on country 2's revenue. However, (A.23) through (A.26) provide no guarantee that this condition will be met.

Spillover effects on social welfare

Recalling that Π^{ai} and π^{ai} are the after-tax global profits of the two multinationals, we may define the social welfare of country 2 (SW_2) as

$$SW_2 = a_1 \Pi^{ai} + a_2 \pi^{ai} + mb^i, \quad i = s, f \quad (\text{A.30})$$

where a_1 and a_2 are the respective shares of MNE1 and MNE2 owned by residents of country 2, and m is the marginal cost of public funds in country 2, introduced to transform the country's tax revenue b^i into comparable units of private income. For simplicity, we take a_1 , a_2 and m to be exogenous. By the envelope theorem, the changes in capital stocks induced by a marginal change in t_1 will not affect Π^{ai} and π^{ai} when companies have maximized their after-tax profits. Hence SW_2 will only be affected by the direct impact of the change in t_1 on Π^{ai} and π^{ai} , and by the impact on b^i . Under separate accounting it then follows from (A.4) and (A.30) that

$$\frac{\partial SW_2}{\partial t_1} = -a_1 \Pi^p - a_2 \hat{\pi} + m \cdot \frac{\partial b^s}{\partial t_1} \quad (\text{A.31})$$

where $\Pi^p \equiv F(K_1) + [P - 1 - C(P)]SK_2$ and $\hat{\pi} \equiv \hat{f}(sk_1) - psk_1$ are the profits subject to country 1's tax rate. Since we have seen that $\partial b^s / \partial t_1$ is likely to be positive because of income shifting towards country 2, we conclude that the net impact of a higher corporate tax rate in country 1 on the welfare of country 2 is ambiguous.

Under formula apportionment where $\Pi^{af} = [1 - t_1(1 - \alpha) - t_2\alpha] \Pi$ and $\pi^{af} = [1 - t_1(1 - \beta) - t_2\beta] \pi$, we get

$$\frac{\partial SW_2}{\partial t_1} = -a_1(1 - \alpha) \Pi - a_2(1 - \beta) \pi + m \cdot \frac{\partial b^f}{\partial t_1} \quad (\text{A.32})$$

Again we see that the sign of the fiscal spillover effect is uncertain, but if condition (A.29) is met (so that $\partial b^f / \partial t_1 < 0$), we can be sure that the spillover effect will be negative under formula apportionment.

Of course, analogous spillover effects on country 1 will arise in case of an increase in the tax rate of country 2.

NOTES

* In preparing this paper, I have benefited from correspondence with Joann Weiner. I am also grateful to Jens Brøchner who programmed the simulation model described in section 3.5, and to Cathrine Marie Gruno and Jes Winther Hansen for competent research assistance. Any remaining errors are my own responsibility. The activities of the Economic Policy Research Unit (EPRU) are supported by grants from the Danish National Research Foundation and from the Danish economic ministries and the Danish central bank.

1. See, for example, Cnossen (2001, section 6.2), Gerard (2002), Giannini (2002), Mintz (2002), Sørensen (2001b, sections 3.4 and 3.5; 2002a), Sunley (2002), and Weiner (2001, 2002a, 2002b, 2002c).

2. Whether this is good or bad is discussed in section 3.3.

3. This conclusion is derived from a model which abstracts from uncertainty. In a setting with uncertainty where profits fluctuate, the switch to formula apportionment of an international profits tax base may provide governments with (partial) insurance against revenue losses from negative country-specific shocks, since each government will be entitled to a share in the global profits tax base. Because of this international risk sharing mechanism, governments may become more eager to attract inward FDI by multinational companies under FA, and for this reason a switch to formula apportionment may indeed tend to increase international tax competition, as pointed out by Gerard and Weiner (2003). In a rather different setting, Eggert and Schjelderup (2003) find that tax competition under separate accounting leads to a constrained efficient outcome, given the available tax instruments, whereas tax competition with formula apportionment generates a welfare loss. However, these results are derived from a model where governments must collect a fixed amount of public revenue and where they can implement residence-based as well as source-based capital income taxes.

4. This section draws on Sørensen (2002a).

5. For a more detailed review of interest group reactions to the Commission report, see Weiner (2002c).

6. See Zodrow (1991) for a recent survey of this debate.
7. Several European governments have recently enacted tax cuts without cutting public expenditure, even though prevailing estimates indicate that their current systems of public finance are quite unsustainable in the long run due to demographic developments, and despite the fact that some of these countries already violate the so-called Stability Pact according to which members of the EMU should not run budget deficits in excess of 3 percent of GDP. In national policy debates in Europe, it is often argued that international economic integration "necessitates" a domestic tax cut to preserve the "competitiveness" of the domestic economy. It is much less common to hear politicians argue that economic integration requires a cut in public spending in order to finance the "necessary" tax cuts.
8. It may be too optimistic to expect that transfer pricing regulation would become totally superfluous, since companies may have non-tax incentives to use distorted transfer prices. For example, in oligopolistic markets a parent company may have a strategic motive to deliver inputs to its foreign affiliates at a low transfer price, since this will enable the affiliates to act aggressively vis a vis competitors, thereby forcing the latter to go for a smaller share of the world market. In these circumstances, transfer prices will reflect a compromise between the desire to minimize tax and the strategic desire to deter oligopolistic competitors. See Schjelderup and Sørsgard (1997) and Nielsen et al. (2003) for an elaboration of this view.
9. The absence of a significant statistical link between corporate and personal tax rates may be sample-specific. Using data for (almost) all the countries in the world, Slemrod (2001) does in fact find a significant relationship between the *levels* of the corporate and the top marginal personal tax rate, although there is no significant link between the *changes* over time in the two tax rates.
10. Because the labour supply schedules and the savings schedules in the OECDTAX model are derived from a quasi-linear utility function which eliminates income effects, the measure of consumer welfare corresponds to the equivalent as well as the compensating variation. The welfare figures are averages across the population, which consists of involuntarily unemployed as well as employed consumers. With a constant population, this is

equivalent to adopting a utilitarian social welfare function where all individual utilities are given equal weight.

11. As demonstrated in Sørensen (2001a), the model may also be given a political economy interpretation in which the simulated welfare gain represents the utility gain of the median voter who prefers some redistribution because his level of wealth is below the average wealth per capita, given the unequal initial wealth distribution.

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