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**The Role of Allocation in a Globalized Corporate Income Tax**

Prepared by Jack M. Mintz<sup>1</sup>

Authorized for distribution by Vito Tanzi

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**Abstract**

The internationalization of business activity has created significant pressures on national corporate tax systems. Rather than abandon the corporate tax field, this paper predicts that governments will develop arrangements to further globalize the corporate income tax. The paper assesses the merits and limitations of allocation methods for attributing income to different jurisdictions according to formulas measuring business activity. Such methods are being used as part of transfer pricing regimes and are likely to be enhanced over time. Whatever international arrangements develop in the future, there is a role for new institutions to improve cooperative discussions among governments.

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Author's E-Mail Address: [mintz@mgmt.utoronto.ca](mailto:mintz@mgmt.utoronto.ca)

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<sup>1</sup>Arthur Andersen Professor of Taxation, Rotman School of Business, University of Toronto. The author wishes to thank the Fiscal Affairs Department, International Monetary Fund, for providing support as a Visiting Scholar, February 1998.

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## SUMMARY

This paper considers the development of national corporate tax policies in the context of the internationalization of business activity. The main thesis is that internationalization will push governments to seek new cooperative methods of taxing businesses, including allocation methods for attributing income to different jurisdictions.

The first part examines the economic rationale for taxing corporations and reviews the efficiency rationales for international cooperation in taxing capital. It argues that governments will seek cooperative arrangements as intra-firm trade grows since governments will not want to surrender their ability to tax corporations.

The second part provides a taxonomy of the methods for taxing capital income at the international level for multinationals operating in two countries: revenue sharing, allocation, and transfer pricing regimes. It is shown that certain transfer pricing regimes have characteristics that are similar to allocation methods in the presence of intra-firm trade.

The third part examines issues related to the allocation method for the taxation of corporate income. These issues include the determination of the appropriate jurisdiction for taxation purposes, the measurement of factors used for allocation, the tax base, corporate group concepts, the tax treatment of cross-border capital flows, and the treatment of deductible taxes. Allocation methods are feasible to use at the international level although how difficult technical issues are resolved could have a significant impact on the efficiency of the corporate tax system at the international level.

The fourth part analyzes the merits and limitations of allocation methods, including the impact of such methods on capital tax fiscal spillovers among governments. While allocation methods do not eliminate fiscal spillovers among governments, they would likely reduce the fiscal spillovers associated with the flight of capital from high tax jurisdictions.

The paper concludes with a discussion of the need for new arrangements for cooperative discussions among governments.

## I. INTRODUCTION

The internationalization of business activity has created significant pressures on national corporate income tax systems throughout the world. Uncoordinated national corporate tax policies have resulted in differential rates of corporate income tax, double taxation of income by competing countries, tax holidays, tax havens, and tax-sheltered entities including headquarter regimes and offshore financing regimes. As businesses have globalized their operations, they are faced with a complex myriad of tax rules and regulations at the international level and an inefficient corporate income tax. Businesses have also been able to exploit differences in national tax policies to reduce the payment of corporate income tax such as shifting income from high to low taxed jurisdictions.

As many economists have pointed out, the efficiency cost of taxation, as perceived by a country taxing the mobile factor, can increase as a result of globalization (Slemrod, 1995).<sup>2</sup> Although some economists have therefore predicted the demise of capital income taxation as a source of revenue for governments in favor of taxes on consumption and payroll (Gordon, 1992), the fact is that governments have pursued several policy directions to shore up corporate income tax revenues and arrest their decline. One direction has included national unilateral actions such as broadening the corporate income tax base and reducing tax rates. A second has included bilateral and multilateral attempts to coordinate corporate income tax policies such as limiting treaty benefits to high tax countries and strengthening transfer pricing guidelines and regulations.<sup>3</sup>

Taken together, these unilateral, bilateral, and multilateral actions of nation states have resulted in an informal “globalization” of the corporate income tax. Over time, further attempts will be made to globalize the corporate income tax as business operations continue to be more closely integrated internationally. In this paper, we assess corporate income allocation<sup>4</sup> as a vehicle for further globalizing the corporate income tax regime. Allocation,

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<sup>2</sup>Increased mobility of capital provides opportunities for countries to “export” taxes that fall on income owing to nonresidents. Therefore, for a particular country—especially a capital-importing one—mobility may not necessarily imply a greater national efficiency cost associated with a tax. See Mintz and Tulkens (1996), and Mintz (1994).

<sup>3</sup>In this paper, “coordination” of tax policies implies that governments seek to reduce fiscal spillovers (or externalities as discussed below) that result in less economic welfare compared to cooperative arrangements. “Harmonization” implies that governments try to make the national tax systems more similar (in rate or base, for example). In this paper, harmonization is a possible outcome of coordination.

<sup>4</sup>We use the term “allocation” to refer to a formula approach to allocating corporate income to jurisdictions. Other terms such as formula apportionment and formula allocation will be used  
(continued...)

whereby a company's income is distributed to a country according to its share of economic activity, has been used in federations including the United States, Canada, and Switzerland for the determination of corporate liabilities owing to subnational governments. We will consider whether corporate income allocation is a viable option for a globalized corporate income tax in comparison to the current method of taxing profits at the national level using separate accounting principles and the arm's-length transfer prices for intrafirm transactions.

The next section of this paper will consider some background information regarding the role of corporate income taxes and motivations for the international coordination of corporate income tax policies. The following section provides a taxonomy for comparing allocation with other approaches for governments to share the corporate tax base at the international level. We then consider the operation of the corporate income allocation method and some of the difficulties that arise when applying it to businesses at the international level. The subsequent section will compare allocation to the current practices used by governments to tax corporate income in terms of efficiency, the cost of compliance and administration, and policy autonomy for governments. We then conclude with a discussion as to whether countries should consider allocation as a means of coordinating corporate income tax policies.

## II. BACKGROUND

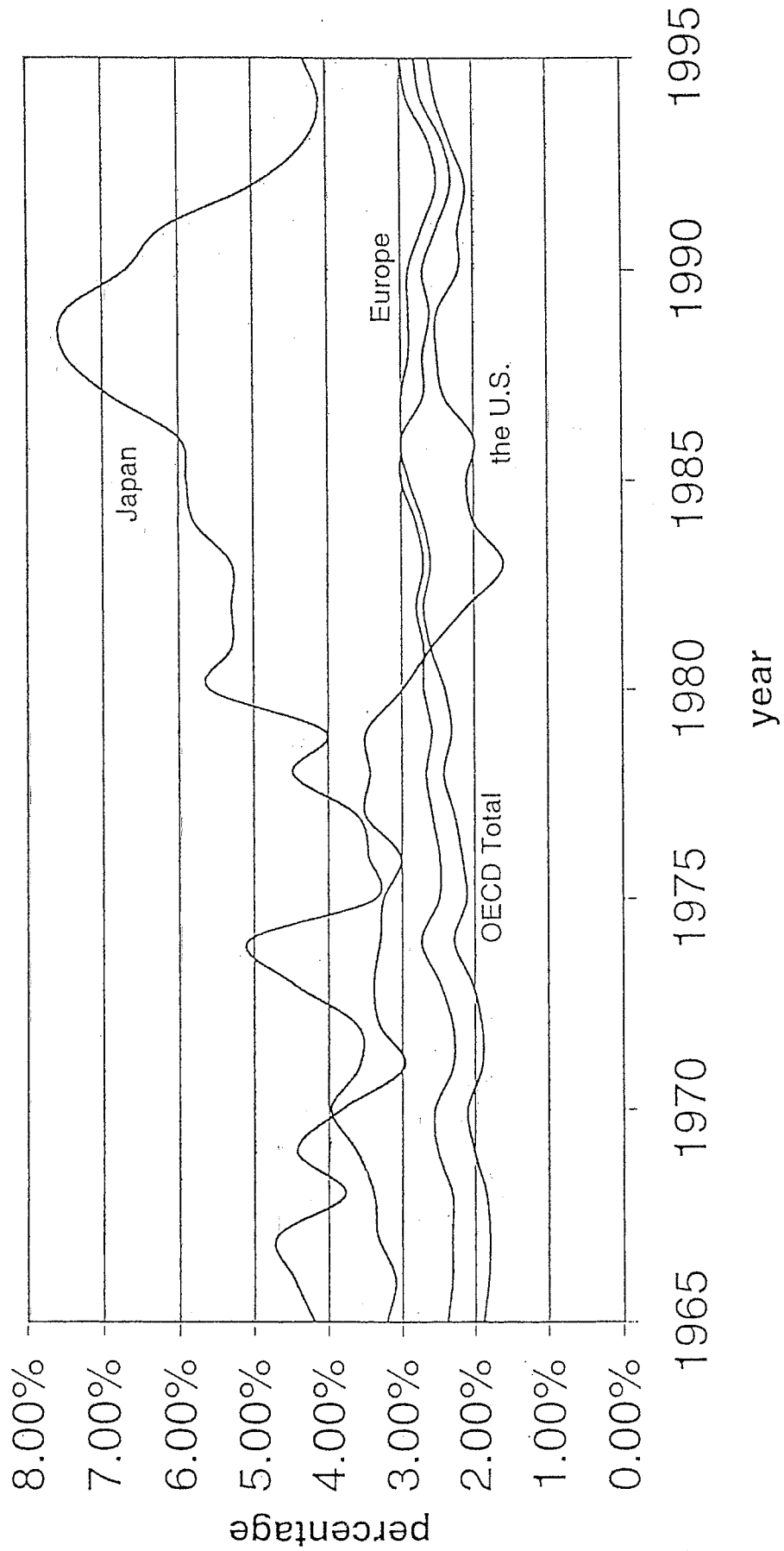
Although it is often argued that global mobility of business operations will result in the eventual shift away from corporate income taxes as a source of revenue, the recent experience of OECD countries has so far proven otherwise. Corporate income tax revenues as a share of total revenues, that declined since the Second World War, slightly increased their share of GDP in the past decade and a half, primarily resulting from tax reforms that have shifted taxes from individuals to businesses (see Chart 1). Moreover, some governments have shifted from corporate income taxes to profit-insensitive taxes on businesses including property, payroll, sales and excise taxes on business inputs and capital or other charges.<sup>5</sup> Little international evidence is available to determine how these taxes have grown relative to the corporate income tax paid by businesses.

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<sup>4</sup>(...continued)  
as well.

<sup>5</sup>The shift from income-related to nonincome-related taxes has been noted by Tanzi (1995). In 1989, corporate income taxes in OECD countries accounted for slightly less than one-third of taxes paid by businesses (OECD, 1991). In Canada, corporate income taxes as a share of total taxes paid by businesses has declined from over 60 percent in the 1950s to less than 25 percent in the 1990s. Total business taxes as a percentage of business value added (net of depreciation) increased from 11 percent in the 1950s to 14 percent in the 1990s. See Canada, Department of Finance (1998).

Chart 1. Corporate Tax Income as Percentage of GDP of OECD Countries



### A. Why Tax Corporations on Their Income?

Our underlying assumption throughout this paper is that governments have a continued interest in taxing corporate income, whether for efficiency, fairness, administrative, or simply, political reasons.<sup>6</sup> The salient reasons for assessing corporate income taxes are the following:

- *Administrative—the withholding role of the corporate income tax.* When it is difficult to tax certain components of income at the individual level, such as unrealized capital gains, it is administratively appropriate to impose a corporate income tax to ensure that income is fully subject to tax. Otherwise, individuals can avoid payment of tax on income at the personal level by leaving income in the corporation that would not be subject to tax.
- *Taxation of income paid to nonresidents.* Corporate income taxes levied by a capital importing country withholds income at source but such income may be ultimately owing to nonresidents. Moreover, to the extent that such taxes are credited against foreign taxes payable by the parent, the capital importing country obtains its share of tax revenues that would otherwise be paid to other foreign governments.
- *Benefit-related taxation.* The provision of beneficial public services, such as social insurance and infrastructure, or public resources, such as the rights to exploit natural resources, serves as another basis for the taxation of corporations. The most appropriate charges would be user fees or taxes closely related to the use of the resource—such as property and payroll taxes related to public services or rent taxes or royalties related to the exploitation of resources. However, at times, such taxes may not be possible to impose—for example, only another level of government, such as municipalities, may impose them or there are administrative impracticalities involved with valuation and tax collection. To the extent that it is infeasible to levy benefit-related charges, the corporate income tax may serve as an imperfect surrogate to tax corporations on the use of public resources that would otherwise be provided at little or no charge.

Given the desirability to assess taxes on corporations, it is in the interest of governments to seek ways to ensure that some level of tax is appropriately charged on the profits of the corporation. Not all governments have similar views on how much corporate income tax should be levied. Some governments might prefer to raise other business taxes or to rely more on individual taxes. Others may view that corporate income is a better measure of the ability for a corporation to pay taxes. Generally, most governments prefer to impose some level of tax on corporate income. With the globalization of business activity, pressures are placed on governments to consider how best to tax corporate income within their jurisdiction and for income earned from outbound and inbound investments.

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<sup>6</sup>For a comprehensive discussion of the reasons for taxing corporations see Bird (1996).

## **B. Why Might Governments Coordinate Corporate Income Tax Policies?**

With globalized business operations and integration of national economies, corporate income tax policies pursued by one government can impact on the economies of other jurisdictions. One may term such impacts as “fiscal externalities” (Gordon, 1983; and Mintz and Tulken, 1986). Fiscal externalities arise when a sovereign government chooses a tax policy that affects the welfare of residents of another jurisdiction in terms of their consumption of private and public goods. To the extent that governments do seek to coordinate their tax policies, as illustrated above, what specific objectives would they seek from their own perspectives? In working with other governments, ultimately, a single sovereign jurisdiction seeks to protect its share of corporate tax revenues and to preserve neutrality and competitiveness in the corporate sector.<sup>7</sup>

These two objectives—neutrality and revenue protection—are often in conflict with each other. Nonetheless, with the globalization of business activity, no country can pursue its objectives without working with others. At the international level, jurisdictions must deal with several issues in the pursuit of neutrality and protection of their revenue base. Coordination of tax policies can ameliorate the impact of fiscal externalities and improve economic performance in coordinating countries. With respect to the corporate income tax, three important benefits may be sought in coordinating policies.

### **Facilitating the free flow of business inputs across national boundaries**

Corporate tax policies chosen by independent countries may interfere with the efficiency of the business sector at the international level by creating barriers for the free flow of business inputs across national boundaries. This may arise if policies are implemented that subsidize domestic producers or discriminate against foreign producers. Many countries have agreed to treaties to limit discrimination by providing “national treatment” for nonresidents.

Countries have also attempted to avoid double taxation of cross-border flows of income by providing a credit for foreign taxes to reduce their own taxes or to exempt foreign income from taxation altogether. Despite these attempts, double taxation can arise in several situations as a result of tax authorities attempting to protect their revenue base:

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<sup>7</sup>Governments will choose a structure of taxes on business activities according to various objectives. The economic literature stresses neutrality (see Musgrave, 1969). Neutrality is obtained when foreign and domestic activities or resident multinationals bear the same amount of tax on their income (capital export neutrality) and the taxes paid by a foreign corporation operating in a jurisdiction is the same as that paid by resident corporations (capital import neutrality). What governments actually do may vary from these lofty goals of neutrality. For example, governments might provide favorable treatment for particular industrial activities in their jurisdiction such as, supporting employment in a poorly developed region.



- Transfer pricing rules may differ across countries with the result that arm's-length prices used in valuing revenues and costs in each country may not be the same resulting in double taxation (or, in some cases, such income may not be taxed at all);
- Allocation rules, determining domestic and foreign source income and expenses, may be used by the resident country, which result in domestic expenses being allocated to foreign income earned by a company where such expenses cannot be deductible in the foreign country;
- Withholding taxes are often imposed on interest, royalties, fees, and rents paid to nonresidents; however, these withholding taxes are applied on income gross of costs but such costs are incurred outside of the jurisdiction;
- Thin capitalization or earning stripping rules are used to limit deductions for expenses that would otherwise be deductible domestically but these expenses are treated as income in another country and may be subject to tax in the foreign jurisdiction.

### **Minimizing fiscal externalities**

Given the mobility of business inputs and profits at the international level, tax policies of a jurisdiction can have a significant impact on the welfare of others. Two types of fiscal externalities are particularly important in this respect:

***Tax-exportation:*** Countries have an incentive to tax foreign-owned businesses in their jurisdiction since such revenues can pay for goods and services of benefit only to their residents.<sup>8</sup> Taxes on foreign-owned businesses, however, will reduce the earnings received by foreign investors, or, under tax crediting arrangements, reduce the amount of tax owing to foreign treasuries. Given these actions taken by capital importers to tax foreign businesses, there is a “negative” fiscal externality that results in lower welfare in foreign jurisdictions that is not taken into account when the tax setting jurisdiction chooses its optimal policy. Countries, therefore, may tax capital too highly in this instance. Examples of models in which tax exportation is important are vertical integration models whereby taxes are imposed on subsidiaries importing goods or services from affiliates (Elitzur and Mintz, 1996), taxes on investment that lowers the cost of capital on imported funds (Burgess, 1988), and taxation of origin-based rents earned by foreign firms in a jurisdiction (Mintz and Tulkens, 1996).

***Tax base flight:*** A second fiscal externality arises when corporate taxation in a jurisdiction causes the tax base—either the input itself or its income—to shift to foreign jurisdictions. When a jurisdiction increases its tax rate, the base flees to another jurisdiction, thereby making the recipient better off either in terms of additional tax revenues or a greater amount of

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<sup>8</sup>If taxes on foreign businesses are related to the use of public goods and services that benefit the business directly, no fiscal externality would be involved.

income earned by its residents. With tax base flight as a fiscal externality, other jurisdictions are better off. Since the tax-setting jurisdiction does not take into account the benefits of its policies on other jurisdictions, tax rates are chosen too low. Examples of models that have incorporated tax base flight as a fiscal externality include Zodrow and Meiskowski (1986) and the profit-shifting models of Gordon (1992).

The literature has stressed the importance of tax base flight as a fiscal externality since it results in countries competing to reduce their tax rates on businesses. However, tax exportation can result in taxes on businesses being set too high, offsetting the impact of capital base flight. Unfortunately, there has been no empirical results that have quantified the importance of these externalities. One analysis in Thalman, Goulder, and Delorme (1996) suggests that size of corporate income tax fiscal externalities are small in aggregate. Although not identified by the authors explicitly, the result can be explained by the fact that the tax exportation externality offsets the externality from tax base flight in their model.

One may suspect, however, that tax base flight as a fiscal externality is particularly important in two contexts that have been of concern to many countries in recent years: differential statutory tax rates at the international level and tax planning permitting multinational businesses opportunities to deduct an expense more than once.

***Differential statutory tax rates:*** To shift income from a high tax to a low tax jurisdiction, a corporation can choose various strategies to reduce taxes. These strategies include increasing the amount of indebtedness, and therefore interest expense, in high tax jurisdictions with concomitant reductions in such indebtedness in the low-tax jurisdiction; choosing transfer prices for intrafirm transactions that would increase costs of operations in high taxed jurisdictions and reported profits in low tax jurisdictions; and leasing assets in jurisdictions with less than favorable writeoffs for capital expenditures and purchasing the assets in jurisdictions with the accelerated depreciation. When a government taxes corporate income at rates above international norms, it invites multinationals to shift profits to low tax jurisdictions.<sup>9</sup>

***Multiple deductions and interaffiliate payments:*** By creating a financing, insurance or service entity in a low-taxed jurisdiction, a corporation can route income through affiliates located in different jurisdictions to effectively increase the number of times that an expense is deducted against corporate income in various countries (these are often referred to as “double-dip” transactions). For example, an affiliate of a Canadian multinational operating in Germany can deduct a royalty or interest payment against German tax; have the income routed through a low tax affiliate (Irish or Barbados international finance corporation or Belgian coordination center); remit the income as a tax-free dividend to the Canadian parent; and deduct a second royalty or expense payment in Canada. In this example, differences in corporate income tax rates among Germany, Canada, and the intermediary country are not

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<sup>9</sup>See Hines (1996) for discussion for empirical evidence of tax shifting.

relevant since the corporation will follow through with this tax planning strategy to take advantage of the opportunity of deducting expenses twice. A country can attempt to limit these opportunities by taxing interaffiliate payments,<sup>10</sup> however, it could put its multinationals at a disadvantage compared to those of other countries where rules are less tight. Cooperative action could be used to mitigate fiscal externalities associated with multiple deductions for expenses. For example, these actions could include encouraging treaty partners to impose withholding taxes on interaffiliate payments or for capital-exporting countries to agree to subject such income to tax.

### **Minimizing costs of compliance and administration**

Coordination can reduce the costs of compliance for taxpayers and administration for governments. The simplest corporate income tax would be one with the same rate and base across all jurisdictions. Without coordination, as businesses become more global, they must face complex tax rules and regulations that vary by jurisdiction. Similarly, governments must deal with a complex set of issues to ensure that the tax can be administered. Examples of complexities faced at the international level are different definitions of income and expenses, currency valuation, treatment of capital gains on the disposal of assets held by foreign investors and migrant taxpayers, electronic commerce (defining permanent establishment or nexus of a business), new forms of financing (treatment of swaps, hedges, and other financial derivatives at the international level), the allocation of headquarter expenses to business activities in different countries and combating tax evasion by investors who do not report foreign-source income. Such circumstances can result in fairly complex rules for the determination of income at the international level and, without coordination, result in a barrier to the international mobility of business inputs.

The desire for coordination of taxes at the international level has naturally given rise to unilateral, bilateral, and multilateral actions that have resulted in countries pursuing actions in formal or informal settings that effectively “globalize” the corporate income tax. The globalization of the corporate income tax, whereby sovereign governments have agreed to a set of principles to limit their actions, is not new—it is rooted in the colonial days when countries began their income taxes. For example, the United Kingdom recognized that taxation of business income in the “host” country where income is earned and in the “home” or investor country where the parent company resides would result in double taxation of income. It introduced the foreign tax credit consistent with the principle of capital export

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<sup>10</sup>The taxation of interaffiliate payments is a complicated issue that goes beyond points raised above. In the absence of full consolidation of affiliate income under the tax regime of the home country, the exemption of interaffiliate payments allows corporations to shift funds from one affiliate to another in foreign jurisdictions without attracting tax in their resident country. For example, this would be an issue for corporations with a network of affiliates operating in the United States or the European Union.

neutrality so that foreign and domestic activities of the U.K. company in the British Empire would be subject to the same rate of tax.

When income taxes were introduced in the early part of the twentieth century, other countries, including the United States, introduced provisions in income tax legislation or treaties that would result in a tacit worldwide acceptance of certain legal principles for the taxation of outbound and inbound investments (see Warren, 1998). These principles include nondiscrimination for foreign investors; neutrality by avoiding double taxation of income (the home country allowing foreign taxes to be credited against domestic taxes or exempting foreign-source income from home country taxes); and reciprocity (a reduction in withholding taxes on income remitted to residents in treaty countries on a reciprocal basis). Bilateral relations have also led to the use of “competent authority” to settle transfer pricing disputes between countries and “exchange of information” agreements to combat tax evasion. Finally, multilateral discussions have resulted in the development of the OECD and the United Nations model tax treaties for the taxation of income and capital, OECD transfer pricing guidelines and recent OECD discussions on “harmful tax competition,” and European Union discussions of a “code of conduct for business taxation.”

It is well recognized that there are other important issues—and constraints—faced by governments when considering attempts to coordinate taxes at the international level.

- Each sovereign government seeks sufficient autonomy so that it can choose the tax structure that best meets its own aims. In general, a government would avoid coordination so long as the international constraints are not important in determining its policies (as, for example, the taxation of immobile labor). However, when business activities are global, autonomous choices for governments are constrained by the mobility of business inputs—cooperative actions can increase rather than reduce autonomy if such coordination provides an opportunity to improve the taxation of business income.
- Coordination involves negotiations to share the corporate income tax base between the source and resident countries. Agreement is reached to the extent that the participants in the negotiation can better their position compared to the absence of agreement (in game theory terminology, the agreement must provide a payoff that is better than payoff associated with not participating in the game).
- Some countries may take the view that tax competition would be preferable since governments are more accountable to the electorate in terms of their willingness to trade off public for private goods. However, in the presence of fiscal externalities, the

“tax price” of producing public goods and services is distorted and governments are therefore less accountable to the electorate as a result.<sup>11</sup>

### III. A TAXONOMY OF COORDINATION REGIMES

As discussed above, there are some important motivations for governments to tax businesses and to coordinate such taxes with other governments at the international level. As the main intent of this paper is to consider how corporate income allocation methods might contribute to coordination, it would be appropriate to consider, at this juncture, what types of regimes could be candidates for harmonization. One could consider three types of schemes that are possible for coordination: (i) revenue sharing whereby each jurisdiction obtains some share of the revenue with members agreeing to a common rate and base for the corporate income, (ii) allocation whereby the income of each multinational is allocated to a jurisdiction according to a specific formula, such as a share of sales, payroll or capital, and (iii) separate accounting with a pricing regime for intrafirm transactions based on arm’s-length prices, as currently practiced among countries.

The problem faced by governments is that the measurement of the profits of a company in a jurisdiction is not easy to determine when there are joint costs (headquarter expenses or interest expense) or unobservable comparable arm’s-length prices for determining the value of intra-firm transactions of a multinational company (such as in the case of intangibles such as research and development or tangibles with different degrees of quality).

To gain an understanding of how allocation compares to revenue-sharing and transfer-pricing rules, consider a simple case of identical multinationals<sup>12</sup> that produce output,  $f[y_i, x]$ , with the following inputs—capital,  $y_i$ , financed by equity, and a public intangible factor,  $x$ , the latter “held” in the parent company (with  $i$  denoting country  $i = 1, 2$ ). Prices of the output are normalized to be equal to one unit in both countries. The multinational parent, in country 2, charges its affiliate, in country 1, a transfer fee,  $k$ , for each unit of the public factor,  $x$ , that it supplies at the cost per unit of  $c$  to be used by both the parent and affiliate in each jurisdiction. The problem for each government is that transfer fee,  $k$ , can be used to manipulate profits to minimize tax payments since there is no comparable arm’s-length price to determine its value.

In each country, 1 and 2, pretax profits,  $\pi_1$  and  $\pi_2$ , respectively are the following:

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<sup>11</sup>The important exception, however, arises when governments impose lump-sum taxes to finance public goods as in Tiebout (1956) or when taxes operate as user charges and are related to the costs of providing the public goods or service.

<sup>12</sup>One could allow for differentiation among multinationals in terms of the cost of providing the public factor or the production functions.

$$\pi_1 = f_1[y_1, x] - ry_1 - kx \quad (1.a)$$

$$\pi_2 = f_2[y_2, x] - ry_2 + (k-c)x. \quad (1.b)$$

The combined profits of the multinational is  $\Pi = \pi_1 + \pi_2 = f_1[y_1, x] + f_2[y_2, x] - r(y_1 + y_2) - cx$ . The cost of capital is the interest rate,  $r$ , which is the imputed cost of equity finance.<sup>14</sup>

If governments are to tax the multinational,<sup>15</sup> they may consider three possible regimes.

### A. Revenue Sharing

Revenue sharing is used by some federations, such as Germany, Argentina, and Brazil, to allocate corporate income taxes to subnational governments. Under revenue sharing, the two governments agree to a common tax rate,  $t$ , on income (gross of the imputed cost of equity finance) and agree to allocate revenue to each according to a formula that would be based on some measure of economic activity (e.g., GDP and/or population).<sup>16</sup> Let  $\alpha$  be the share of the tax base that is allocated to country 1 (the share,  $1-\alpha$ , is allocated to country 2), then tax revenue paid to each government is the following:

$$T_1 = t\alpha (f_1 + f_2 - cx) \quad (2.a)$$

$$T_2 = t(1-\alpha)(f_1 + f_2 - cx) \quad (2.b)$$

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<sup>13</sup>Conceptually, the parent could operate two separate operations by creating a separate operation that provides the factor  $x$  to both parent and the affiliate. A fee,  $m$ , would then be charged to the parent for the use of  $x$  (thereby reducing its income by  $mx$  for that part of the operation), and the total income received by the parent on its public factor would be  $(m+k)x - cx$ . However, the sum of the profits would be the same as that indicated in equation (1.b).

<sup>14</sup>For simplicity, we do not consider indebtedness in this model. Thus, in this model, taxes fall on the return to equity in the model.

<sup>15</sup>At this point, we shall assume in the discussion below that the country, where the parent resides, exempts the affiliate's foreign-source income from taxation rather than levying a tax with a foreign tax credit for taxes paid by the affiliate to the foreign government. The issue of tax crediting is discussed further in the next section.

<sup>16</sup>Factors could be chosen using any measure such as aggregate capital stock in a country or capital stock of all firms in which income is being allocated. Moreover, in theory, governments could choose shares that do not sum to one but this would either lead to overtaxation (shares add to more than one) or undertaxation (shares add to less than one).

so that after-tax profits of the multinational yields:  $\Pi = (\pi_1 + \pi_2 - T_1 - T_2) = (1-t)\{f_1 + f_2 - cx\} - r(y_1 + y_2)$ .

The revenue-sharing method achieves a limited notion of neutrality in that the corporate income tax would not affect the location of investment in jurisdictions participating in the revenue-sharing agreement. This can be illustrated as follows. As the shares of revenue are independent of decisions made by the multinational (e.g., the shares are based on GDP or population), the use of factors will be determined by the condition that the after-tax marginal product is equal to the cost of using the capital. Denoting  $f_{y1}$ ,  $f_{y2}$ , and  $f_{ix}$  ( $i=1,2$ ) the marginal products for use of capital and the public factor in each jurisdiction, maximization of profits,  $\Pi$ , yields the following:

$$f_{y1} = r/(1-t) \quad (3.a)$$

$$f_{y2} = r/(1-t) \quad (3.b)$$

$$f_{1x} + f_{2x} = c \quad (3.c)$$

Under revenue sharing, taxes create an intertemporal distortion in discouraging the use of capital but does not discourage the choice of where to locate capital or the use of the intangible public factor of which its costs are assumed to be deductible. This benchmark for neutrality will be used below.

We note that the transfer fee for the public factor is irrelevant to the determination of profits and corporate income taxes allocated to each jurisdiction. In more general problems that would include allocable expenses, such as interest expense, there would be no need to determine how they are shared between the parent and affiliate under revenue-sharing methods.

## B. Allocation<sup>17</sup>

An alternative to revenue sharing is for governments to agree to a common base for measuring corporate income and shares for allocating the corporation's income to each jurisdiction where a permanent establishment resides. Tax rates, however, could differ. This approach for determining corporate income has been used by subnational governments in the United States and Canada. A primary difference between the U.S. and Canadian approaches is that, in the former, states may not agree to the same base or factors for apportioning income

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<sup>17</sup>The term "apportionment" is used in the United States to refer to business income being divided across states while "allocation" refers to nonbusiness income being assigned to a particular state. In Canada, "allocation" refers to the division of corporate income across provinces. As mentioned in the introduction, the term "allocation" will be generally used.

while, in the latter, there is a common allocation formula and, to a significant extent, common base. Under allocation, revenues accruing to governments would be equal to the following:

$$T_1 = t_1 \alpha (f_1 + f_2 - cx) \quad (4.a)$$

$$T_2 = t_2(1-\alpha)(f_1 + f_2 - cx) \quad (4.b)$$

After-tax profits of the multinational yields:  $\Pi = (1-\tau)(f_1 + f_2 - cx) - r(y_1+y_2)$  with the average tax rate,  $\tau = t_1 \alpha + t_2(1-\alpha)$ . Further discussion on the use of factors for production is provided below when the implementation of formula allocation is considered.

The use of allocation methods in federations provides more autonomy for governments since they can choose their own rates for revenue reasons. If governments do not agree with the shares (as in the United States), then over- or undertaxation may result. In the United States, unitary taxation has been attempted in some states whereby a state government taxes worldwide profits of the corporation based on the share of activities performed in the state. The share is based on the current approach used to apportion income in the United States.<sup>18</sup>

### C. Transfer Pricing Regimes

At the present time, countries generally tax the pretax profits of multinationals based on separating accounting principles with an arm's-length pricing standard. This entails taxing corporations on the income earned in a jurisdiction by a permanent establishment. With intra-firm transactions (sales between establishments) where there is no observable price except for the transfer price reported by the corporation, a price will be estimated to determine the value of the transaction. Under existing practice, the comparable price may be determined in five ways: (a) comparable arm's-length prices for other similar transactions, (b) cost-plus (a measure of profits is added to the cost of the product), (c) resale price (a measure of profits is subtracted from the sale price), (d) split profit (profits are shared between the vendor and purchaser), and (e) comparable profit measures (an industry-wide estimate of the profit for determining prices is computed).<sup>19</sup> As governments might use different methodologies for determining transfer pricing, different prices may be used by countries to assess income. To avoid such conflicts, governments have increasingly resorted to "competent authority"

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<sup>18</sup>The U.S. Supreme Court has permitted states to levy unitary taxes on corporations that would result in a worldwide combination of income. However, most states acting under the threat of federal legislation and objections of multinationals do not require mandatory worldwide apportionment as under a unitary tax except for Alaska (Duncan, 1996). See also McIntyre (1995) for a discussion on formula apportionment under unitary taxation compare to separate accounting with the arm's-length standard for pricing.

<sup>19</sup>For a detailed discussion of these methods for establishing transfer prices, see Eden (1998).



procedures whereby disputes can be resolved at the international level between governments when determining transfer prices.

In addition to establishing transfer prices, governments may also use allocation rules to determine income of affiliates on a worldwide basis such as the allocation of headquarter expenses, R and D expenditures, and interest on borrowed funds. In some cases, the costs for transactions may be determined by tracing methods (Arnold, Li, and Sandler, 1996).

With the transfer pricing regime, therefore, governments choose their own tax rates and determine the base used for taxing income. The key point is that neither government will use the transfer fee,  $k$ , that would be used by the multinational for determining the value of providing the public factor,  $x$ , to the affiliate. Let  $\phi$  be the transfer price established by authorities for the fee charged by a parent to the affiliate for the use of the public factor  $x$ . The transfer fee for the use of each unit of  $x$  could be proxied as the cost of producing  $x$  plus a markup ( $\zeta$ ) for profits attributed to the use of  $x$  by the affiliate in country 1. A central issue is setting the transfer price: should it be set so that the income accruing to the public factor is part of the tax base of country 1 where the affiliate is located or of country 2 where the parent is located?

If profits from the use of  $x$  is attributed to the foreign affiliate, the transfer price paid to the parent would be equal to the incremental net revenues for each unit of  $x$ :  $f_{1x}$ <sup>20</sup> ( $f_{1x}$  denoting the marginal product of  $x$  for the affiliate located in country 1). Under profit maximization, the marginal product of factor  $x$  is equal to the gross-of-tax cost of using  $x$ , which is  $c/(1-t_1)$ .

The above implies that the transfer price will be equal to affiliate's share of profits, gross of the cost of producing the public factor, as seen from the following:  $\phi = c(1 + \zeta)x$  with  $\zeta = f_{1x} - c$  so that  $\phi = f_{1x}$ . The marginal return to the use of  $x$  in the affiliate can be calculated according to various methods, including some that may be based on an industry-wide average profit rate. The taxes that each government receives under a transfer pricing regime is the following:

$$T_1 = t_1\{f_1 - \phi x\} = t_1\{f_1 - f_{1x} x\} \quad (5.a)$$

$$T_2 = t_2\{f_2 + (\phi - c)x\} = t_2\{f_2 + (f_{1x} - c)x\}. \quad (5.b)$$

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<sup>20</sup>In principle, the return to the public factor is based on the Samuelson rule for public goods: the sum of marginal revenue products of each firm for the public factor as shown in equation (4.c).

The second approach is to set the transfer fee so that the income including rents solely accrues to the multinational parent.<sup>21</sup> In this case, the income earned by the parent in the affiliate from providing the public factor,  $x$ , is equal to  $f_1 - y_1 f_{y_1}$ . Setting the transfer price,  $\phi$ , equal to this value divided by  $x$ , the tax base in each country would be the following:

$$T_1 = t_1 \{f_1 - \phi x\} = t_1 f_{y_1} y_1 \quad (6.a)$$

$$T_2 = t_2 \{f_2 + (\phi - c)x\} = t_2 \{f_2 + f_1 - y_1 f_{y_1} - cx\}. \quad (6.b)$$

Note that the marginal product of capital for the affiliate,  $f_{y_1}$ , is equal to the cost of capital, gross of taxes:  $r/(1-t_1)$ . The tax base in country 1 is therefore only the marginal return on capital.

Instead of rents from the public factor going solely to only one government or the other, the governments may agree to split profits from the public factor according to some allocation method. For example, suppose that countries 1 and 2 assess the transfer price to be  $\phi = c + \zeta$ . The profit rate  $\zeta$  is the profit that accrues to investment in country 1, gross of the cost of using  $x$ , divided by expenditure on  $x$ . It is therefore equal to  $\alpha[f_1 + f_2 - r(y_1 + y_2)]/x$ , with  $\alpha$  being the share of rents attributed to the public factor used by the affiliate in country 1. Taxes paid to each country will be equal to

$$T_1 = t_1 \{f_1 - \phi x\} = t_1 \{f_1 - \alpha [f_1 + f_2 - r(y_1 + y_2)]\} \quad (7.a)$$

$$T_2 = t_2 \{f_2 + (\phi - c)x\} = t_2 \{f_2 + \alpha [f_1 + f_2 - r(y_1 + y_2)] - cx\}. \quad (7.b)$$

Depending on how the profit rates are determined for the transfer price,  $\phi$ , the transfer pricing regime begins to resemble a complex allocation method for determining income in each jurisdiction.

#### IV. IMPLEMENTATION OF CORPORATE INCOME ALLOCATION

The current experience with allocation is found in the United States, Canada, and Switzerland.<sup>22</sup> In the United States, the 46 states that levy corporate income taxes use a factor

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<sup>21</sup>This is the position often taken by the United States with respect to transfer pricing of domestic R and D expenditures for U.S. companies. For example, see Grubert and Mutti (1995).

<sup>22</sup>For a comprehensive review of formula apportionment in the United States, see Weiner (1996a). The Canadian and Swiss systems are briefly reviewed in Daly and Weiner (1993).

(continued...)

formula to apportion income to its jurisdiction.<sup>23</sup> The factors generally include sales, property, and payroll factors but they vary by state. Many states use an equally weighted average of payroll, sales, and property (the Massachusetts formula) but almost half of the states use some other variant, most often by putting twice the weight on the sales factor. Corporate income is measured by adjusting the federal definition for specific state provisions. Maximum rates of corporate income tax at the state level vary from 3.4 percent (Indiana) to 12.25 percent (Pennsylvania), the average being about 7 percent. State taxes are deductible from the federal corporate income tax.

In contrast, the Canadian system is based on a more harmonized approach for determining the amount of corporate income allocated to provinces. In part, this is driven by the tax collection agreements that the federal government has with seven provinces whereby the federal government collects provincial corporate income taxes (at no charge) and the provinces agree to use the federal corporate base for determining income. The provinces can set their own rates of tax and federal government will administer on their behalf tax credits (e.g., investment tax credits for manufacturing equipment or R and D) that reduce the amount of provincial tax owing to the province. Three provinces, Ontario, Quebec, and Alberta, collect their own corporate income tax.<sup>24</sup> All provinces, including those that collect their own corporate income tax, use a common factor formula (equal weights on sales and payroll to determine the shares). Even those provinces that collect their own tax, use a base similar to federal base except for a few adjustments.

While the experience with the U.S. and Canada provides a useful basis for considering issues of corporate income allocation at the international level, it is by no means clear that their approaches would necessarily be used for international developments. However, we shall provide a discussion of the major concerns that arise with formula allocation in terms of its implementation, using the U.S. and Canadian experience as background.

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<sup>22</sup>(...continued)

The Swiss system is not covered below. It can be noted that the Swiss cantons levy corporate income taxes on a progressive basis subject to minimum and maximum rates. Swiss cantons may use their own factor formula and there is no consolidation of returns in Switzerland. The importance of these issues is further explored below.

<sup>23</sup>Nonbusiness income such as capital gains, royalties, dividends, interest, and rents may be taxed separately by the state if the income is earned in the jurisdiction. However, some states apportion all sources of business and nonbusiness income.

<sup>24</sup>These three provinces, however, account for nearly 75 percent of the provincial corporate income tax base in Canada. See Canada, Department of Finance (1998).

### A. What Corporations are Presumed to be in a Jurisdiction for Allocation?

Corporate allocation methods would require rules to determine whether any income should be allocated to a particular jurisdiction. In the United States and Canada, a “nexus” to a jurisdiction is established based on a concept that the firm operates in the jurisdiction. The U.S. rule is based on a threshold whereby no nexus is established if business solicits a marginal amount of business for delivery from another state (Weiner, 1996a). The Canadian rule uses the concept of permanent establishment to determine whether the corporation has a link to the jurisdiction.

If an international allocation system were to be created, the concept of permanent establishment that currently operates for determining whether a corporation should be subject to tax in a jurisdiction would necessarily apply to allocation systems as well. One may note that some of the difficulties related to electronic commerce and financial derivatives that affect the determination of income according to permanent establishment rules would still remain under an allocation system.

### B. Measurement of Factors

The common approach so far has been to use sales, payroll, and/or property for allocating corporate income although, in special cases such as transportation and finance, other factors may be used instead such as passenger miles or financial assets. Both Canada and the United States have special allocation rules for certain industries—these rules add to complexity since lines must be drawn to determine whether a business belongs to a particular industry or not.

An insight can be gained by considering the model presented in the previous section. The share,  $\alpha$ , from equations (2.a) and (2.b) is equal to  $\sum w_i a_i$ ,  $i$  denoting state,  $w_i$  denoting the weight placed on the factor (e.g., one-third for equal weighting) and  $a_i$  denoting the share of factor (payroll, sales or property) allocated to the  $i$ th state. For simplicity, let property be the basis for splitting income so  $w = 1$  and  $\alpha = y_1/(y_1+y_2)$  (the factor  $x$  is an intangible expenditure that is not related to property). Tax revenue raised by each government under formula allocation would be:

$$T_1 = t_1\alpha(f_1 + f_2 - cx) \quad (8.a)$$

$$T_2 = t_2(1-\alpha)(f_1 + f_2 - cx) \quad (8.b)$$

with  $\alpha = y_1/(y_1 + y_2)$ .

After-tax profits of the multinational yields:  $\Pi = (1-\tau)((f_1 + f_2 - cx) - r(y_1 + y_2))$ , with the average tax rate,  $\tau = t_1\alpha + t_2(1-\alpha) = [t_1y_1 + t_2y_2]/(y_1 + y_2)$ . The average tax rate depends on property held by the firm in each jurisdiction.

We note that profit maximization of profits would imply the following in terms of the use of capital in each jurisdiction:<sup>25</sup>

$$f_{y1} = \{r + (1-\alpha)R(t_1-t_2)\}/(1-\tau) \quad (9.a)$$

$$f_{y2} = \{r - \alpha R(t_1-t_2)\}/(1-\tau) \quad (9.b)$$

$$f_{1x} + f_{2x} = c \quad (9.c)$$

with  $R = (f_1 + f_2 - cx)/(y_1 + y_2)$  serving as the average pretax rate of return on capital. Comparing equations (9.a) to (9.c) for formula allocation with equations (4.a) to (4.c) for revenue sharing, we see that there is an additional term related to the differences in tax rates across jurisdictions in equations (9.a) and (9.b). In the case that the tax rate in country 1 is greater than that in country 2 ( $t_1 > t_2$ ), investment is discouraged in country 1 since the weight on high taxed profits in country 1 increases with investment. In contrast, investment in country 2 is encouraged in the low taxed country 2 since the weight on profits in country 1 is reduced with more investment in country 2. The converse will hold when the tax rate in country 1 is less than in country 2.

If other weights were used, such as payroll or sales, similar incentive effects would arise with formula allocation whereby shares could be affected by the location of industrial activity (see Gordon and Wilson, 1986 for further discussion). Of course, if industry wide, rather than firm specific factors are used to define shares, then firms have less scope to manipulate tax payments and the marginal return on capital would be equal to the cost of capital, gross of taxes:  $r/(1-\tau)$ .

In the United States and Canada, gross revenues from sales, net of discounts and other adjustments have been measured on a destination basis (at the point of consumption) as long as the corporation has a permanent establishment in the jurisdiction to which there is an allocation. Revenues from exports is usually allocated to jurisdictions on an origin basis—that is, where the good or service is produced. Revenues do not include financial income. Payroll is measured to include wages, salaries, and other taxable amounts of labor compensation. Property includes fixed assets and, in some U.S. states, inventories. Property in the sum of the historical cost of investment (no adjustment is made for depreciation).<sup>26</sup>

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<sup>25</sup>As noted by Gordon and Wilson (1986), it is by no means certain that second order conditions for profit maximization are satisfied under formula allocation. It is well possible for there to be multiple maxima, including capital being invested in only one jurisdiction—the low tax jurisdiction.

<sup>26</sup>As Weiner (1996a) points out, property is measured in the United States according to historical value but without consideration of depreciation. It would not seem difficult,

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In principle, countries considering allocation methods could consider a variety of factors to determine income. It would seem, as a general principle, that corporate income should be allocated consistent with the purpose of levying corporate income taxes as discussed above.<sup>27</sup> This would lead to a consideration of two issues. First, corporate income taxes are intended to impose taxes at source or the origin of production—therefore an origin-based principle would be more appropriate than the destination-based principle for sharing the tax base. Second, corporate income reflects the return to capital (specifically shareholders' equity) so capital would be a more appropriate measure for this purpose.

It would thus seem that countries considering formula allocation may prefer to use capital on an origin basis. However, other factors may play into the determination of revenue shares such as administrative practicalities and revenue sharing<sup>28</sup> under formula allocation. There are several issues that would need to be sorted out:

- If property were to be used in the formula, there are issues of valuation and ease of administration. Market values would be nearly impossible to use since so many assets may not have a price that is determined by market trading. However, one could use the historical basis of assets, depreciated according to tax rules, and if desired, indexed by a rate of inflation. Given that currencies fluctuate over time, asset values may need to be converted into a single currency for measuring property weights. Finally, some types of property may not be included in the formula, such as inventory, since the asset may be easily moved from one jurisdiction to another to reduce the average tax payment.

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<sup>26</sup>(...continued)

however, to consider an allocation based on property measured using the undepreciated cost basis assets calculated by corporations for determining depreciation costs for tax purposes. If there is a desire to shift from historical values, it would be a simple matter to index the capital cost base for inflation to calculate the weight.

<sup>27</sup>See Shackelford and Slemrod (1998) for a recent analysis on the revenue effects of allocation methods for U.S. companies. They estimate that U.S. tax liabilities would rise by almost 40 percent for 46 large publicly traded companies for the 1989–93 period, ignoring behavioral impacts. Other countries, of course, may be resistant to formula allocation methods if they lose revenue. However, if aggregate revenues increase, once accounting for behavior, many other countries besides the United States may be interested in formula allocation. See also Schadeewald (1996) for a similar set of calculations.

<sup>28</sup>Canada decided not to use property in the revenue-sharing formula in part because it would result in more revenue being allocated to Ontario and Quebec and less to the rest of the country. See Smith (1976).

- If sales are used in the formula, they may be based on revenues on an origin basis (at the point of production or distribution) or on a destination basis (consumption). The development of electronic commerce raises issues related to the determination of either destination or origin basis for sales. Moreover, with new forms of financial instruments, the treatment of financial income to be distributed across countries would also raise some issues regarding the appropriate factors to be used.
- If payroll is to be used to determine shares, there are issues related to the treatment of different forms of labor compensation (e.g., employer provided insurance, pensions, and other benefits) as well as contract employment (which is used in the Canadian formula).

A significant issue at the international level is whether governments should be free to choose their own factors, as in the United States, or agree to a common allocation formula, as in Canada. The Canadian system is clearly superior in ensuring that corporate income is neither over- or undertaxed since the allocation factors add up to one across provinces. The U.S. system allows for more autonomy among states since they choose different factors but this system results in either over- or undertaxation since factors for corporate income may add up to less or more than one across states. However, given the low tax rates and the deductibility of such taxes from federal tax in the United States, the lack of agreement on factors is not too serious. However, an agreement at the international level would preferably result in a common formula used by all agreeing countries since tax rates are relatively high (in the range between 25 percent and 55 percent for most countries). Without a common formula, the corporate income tax system will have some quite undesirable features of over- or undertaxation. It might be more efficient to continue dealing with the current system of separate accounting with transfer pricing regimes instead.

### **C. The Tax Base**

Perhaps the most difficult issue to resolve at the international level is an agreement on the appropriate tax base to be used for allocating income. A central feature of both the Canadian and U.S. systems is that the tax base of each subnational government has a starting point—the federal corporate income tax base. Each state or province may make adjustments to the base—in the Canadian case this is largely done through the tax credits that are calculated from use of a common corporate income tax base. As discussed above, many U.S. states make a cumbersome distinction between business and nonbusiness income to determine apportionment. Such a distinction is unnecessary—several states have moved to full apportionment of both business and nonbusiness income (Weiner, 1996a). Any international system should incorporate full apportionment.

At the international level, countries do follow certain principles in taxing corporate income. Generally, income is measured on an accrued basis except for capital gains. Revenues from the sale of goods and services and financial income (interest and rents) are taxable while intercorporate dividends are exempt (except in some jurisdictions like the United States they

may be subject to tax). Certain expenditures are deductible from corporate income: labor compensation, depreciation, interest, and purchased goods and services.

Although these features of corporate income taxes are common across countries, there are a wide-ranging number of differences in determining corporate income. These differences include calculations of costs (e.g., depreciation, inventory costs, and employee benefits), treatment of partnerships and other entities, consolidation, rollovers of the sale of assets, exempt forms of income (e.g., municipal bond interest), and the treatment of foreign-source income (which is further discussed below). Moreover, accounting standards vary by country (see Collins and Shackelford, 1995) and these can influence the tax law in a particular country.

Another set of problems arises with the auditing of taxes under formula allocation. In Canada, the administration of the allocation formula is generally done by the federal government on behalf of the provinces, although the three provinces that collect their own corporate income tax may administer provisions specific to their tax. At the international level, however, there is no central government. Without coordination at the international level, each country may want to examine not only the domestic accounts of the corporations operating in its jurisdiction, but also the accounts for income earned in foreign jurisdictions. Thus, for example, a Belgian parent's books may be examined by U.S. authorities, raising issues of privacy and sovereignty. However, these kinds of issues are already being faced, to a lesser extent, in transfer pricing cases.

As daunting as it is to determine a common corporate income tax base for formula allocation, two facts should be remembered. First, as found in the United States and Canada, it is possible for governments to choose different tax bases under formula allocation with adjustments made to some common base (the use of tax credits in Canada facilitates a simple method of allocating corporate income to provinces with a reduction in provincial tax done separately). Second, similar issues arise with the current system of separate accounting and arm's-length pricing. As discussed above, the globalization of business activities that gives rise to intra-firm transactions requires governments to consider transaction values that reflect an agreement as to the share of profits that should accrue to each government. Already, in the case of international financial trading corporations, globalization has resulted in the use of formula allocation to determine how much profit should accrue to a jurisdiction.

#### **D. Corporate Groups**

Another issue is whether corporations in a group should be consolidated for the purposes of allocation of their corporate income. Without consolidation, separate corporate entities may operate in each jurisdiction with the income of each entity being allocated solely to the jurisdiction where the entity resides. Given that unconsolidated corporations operating in separate jurisdictions would still be closely related, it would be necessary to continue current practices of separate accounting and arm's-length pricing for these corporations (see also McLure and Weiner (1997) on a similar point).



In the United States, consolidation of corporations is required for federal income tax purposes when a parent owns at least 80 percent of votes and value of the shareholders' equity. For apportionment, states may use the concept of a "unitary business" that would require the inclusion of related companies for apportionment of income of the group. In Canada, consolidation is not required which allows corporations flexibility to set up separate entities in each province. Only 45 percent of corporate income is allocated in Canada (see, Canada, Department of Finance, 1998).

A corporate group concept for the inclusion of related businesses for allocation purposes would be appropriate in the international context if the goal is to minimize the use of separate accounting and the arm's-length pricing standard. There are, however, some important issues that would need to be resolved, especially determining the test for relatedness. Relatedness could be based on the concept of ownership, control, participation or all three. There could be objective tests such as a threshold of 50 percent of votes and value of corporation's equity or subjective tests as used in the United States such as "flow of value" or "activity" tests (see Weiner, 1996a).

If consolidation were not required, then the formula allocation would only apply to businesses with permanent establishments (e.g., branches and partnerships) in foreign jurisdictions. This may not be a bad starting point for the development of a system of formula allocation but it is not the best result in the long run.

### **E. Cross-Border Capital Flows**

At the international level, three important issues arise with respect to the treatment of cross-border capital flows. The first is that a capital importer may apply withholding taxes to income remitted to nonresidents. The second is that a country may tax foreign-source income earned by residents, allowing for a credit for foreign income taxes paid to host countries. The third is that integration systems that reduce double taxation of equity income at the corporate and personal level often apply to the ownership of domestic companies held by resident shareholders—no similar application may apply to income earned from foreign jurisdictions or for nonresident shareholders.

The Canadian and U.S. experience with formula allocation provides little assistance in understanding these issues. In a federation, investors are taxed under the federal income tax system (state or provincial income taxes are applied on a base, similar, if not identical, to that used by the federal government). There are no withholding taxes on income remitted to investors from out of state or out of province investors (thus only the state or province where the investor resides receives personal income tax revenues). There is no necessity to develop rules for the taxation of out of state or out of province income earned by a corporation since formula allocation applies to all sources of income earned in the federation. Moreover, it is possible to tax foreign-source income earned outside the United States or Canada by the state or province by applying allocation factors to such income separately. Finally, the United States does not try to integrate personal and corporate income tax except for specific flow-through

entities (in particular, Sub-chapter-S-corporations). Canada, including the provinces, achieves partial integration by providing a dividend tax credit and a partial exclusion of capital gains at the personal level which is available to all Canadian shareholders. Provincial governments provide integration relief based on the federal measures—this implies that the provincial relief is provided even if the corporation resides in another province.

At the international level, given the absence of a federal personal income tax, the above issues would need to be carefully considered. Some form of agreement may be necessary to deal with certain issues.

- *Withholding taxes*: In principle, governments could maintain the same withholding tax regimes that are currently in place. Withholding taxes are assessed on income remitted to nonresidents and credit may be given for foreign taxes paid by the capital exporting country. Withholding taxes on dividends are levied without regard to the amount of corporate income tax paid prior to the distribution. Should a corporation be paying taxes at an average tax rate based on formula allocation, there is no reason that withholding tax regimes could not continue to apply, especially to payments that are deductible from corporate income tax. However, countries may prefer, instead, to eliminate withholding taxes to encourage capital mobility as well as generate greater acceptance by the business community for the allocation method.
- *Foreign-source income*: Under formula allocation, there is little need for countries to develop a foreign tax credit regime although there is no reason, in principle, that income could not be taxed on a worldwide basis by a country. Leaving aside issues related to the potential endogeneity of formula factors as discussed above, the corporation pays the same amount of tax on income earned from domestic and foreign investments, thereby resulting in capital export neutrality. On the other hand, individual corporations may face different average tax rates on domestic and foreign investments depending on the firm specific weights applied to income earned in different jurisdictions. Competitiveness among corporations will thus be affected since they can face different average tax rates. If industry-wide weights were used for allocation, then the corporate income tax under allocation would have less impact on competitive conditions in an industry.
- *Integration of corporate and personal income taxes*: Formula allocation at the international level could facilitate better integration measures rather than impede them. The concept of most imputation systems has been to provide personal tax relief for amounts of corporate income tax levied on income prior to distribution. The most common form of integration is the imputation systems of Europe<sup>29</sup> whereby dividends

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<sup>29</sup>The Australian and New Zealand systems use a variable dividend tax credit which is based on the amount of corporate income tax paid by the corporation. The system works best when  
(continued...)

paid to shareholders are grossed-up to reflect a standard payment of corporate income tax—personal income taxes and a credit at the personal level are based on the grossed-up value of dividends received. Most countries do not provide a credit for nonresident shareholders and some, such as France and Germany, do not provide a credit for foreign-source dividends, including those paid through resident corporations. Many European countries have imposed minimum taxes on distributions to ensure that the credit is funded by taxes at the corporate level (Devereux, 1996). If formula allocation were to be implemented, a country that wishes to continue integration regimes would need to be willing to give a tax credit for corporate income taxes paid to the domestic or foreign governments and no longer segregate dividends paid from domestic or foreign sources. It would be difficult to give a credit that would exactly match the amount of tax paid by corporations. Instead, a credit may be based on some standard amount of tax paid by the corporation (say the average tax rate for all corporations), or instead, a minimum tax on dividends could be applied by a country as part of the integration system (the minimum tax would be offset by the amount of corporate income taxes paid by the company to all governments). Governments could also continue the existing practice of providing no dividend tax credit to nonresidents with the anticipation that the foreign government would provide the credit if they wish.<sup>30</sup>

#### **F. Other Deductible Taxes**

The general approach used in the United States and Canada is to allocate income, net of taxes that are deductible from income. Thus, payroll, sales and excise taxes on business inputs, property and capital taxes reduce amounts of income allocated to states or provinces.

The deductibility of taxes raises several important issues for corporate allocation methods. If such taxes are assessed to cover the cost of public resources provided to businesses, then it would seem appropriate to treat such taxes as similar to other deductible expenses. Public goods or services improve the profitability of corporations—such income would be subject to tax and, with appropriation of the corporate income tax, improve the revenue yield for other governments. Thus, so long as the benefit of the public program is equal to the tax, there is no reason to be concerned about deductibility of these taxes from corporate income.

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<sup>29</sup>(...continued)

there is a single corporate income tax rate since special accounts would otherwise have to be created for each source of income taxed at a particular rate. With formula allocation, the Australian and New Zealand dividend tax credit regimes could not be administrated since corporations would face different tax rates depending on the location of their activity. Australia is considering the replacement of the variable dividend tax credit system with the European style of dividend taxation.

<sup>30</sup>In the European Union, integration systems have come under attack because nonresidents in some European countries do not qualify for credits.

However, if the taxes are levied for general purposes, the deductibility of such taxes from corporate income prior to allocation reduces the amount of corporate income allocated to other governments. Thus, the burden of deductible taxes is, in part, shifted to other jurisdictions<sup>31</sup> and a negative fiscal externality results, which is often greater for smaller jurisdictions. Allocation can therefore encourage governments to levy deductible taxes rather than the corporate income tax.<sup>32</sup>

At the international level, countries may wish to avoid the fiscal externality associated with taxes deductible from corporate income by agreeing to allocate corporate income prior to the deduction of those taxes that are not used to cover the costs of public resources provided to the firm. This would remove the fiscal externality that would otherwise arise.

A similar point may be made with respect to the taxation of government assistance provided to businesses. When a subsidy provided by the jurisdiction is subject to corporate income tax, the amount is allocated to other countries that gain revenue as a result. Thus, the cost to a government in providing subsidies to businesses increases, if such subsidies are subject to corporate income tax.

## **V. FORMULA ALLOCATION: MERITS AND LIMITATIONS**

The primary question is whether formula allocation is a sensible approach for interested governments to implement at the international level. To evaluate this question, we consider three criteria: (a) the efficiency of the corporate income tax, (b) administration and compliance costs, and (c) flexibility and autonomy for national governments.

### **A. Efficiency of the Corporate Income Tax**

The efficiency of the corporate tax under formula allocation may be considered in two parts. The first is how the corporate income tax under formula allocation affects the efficient allocation of capital in the world economy and the second is how formula allocation affects fiscal externalities among countries.

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<sup>31</sup>The incentive to impose deductible taxes because some of the burden falls on other governments applies as well in a federation with two or more levels of governments since the taxes are also deductible from federal corporate income taxes.

<sup>32</sup>Gordon and Wilson (1986) make a similar point that there is a preference to levy deductible property taxes under formula allocation. However, they assume that property taxes are payments unrelated to municipal services provided to businesses. The municipal services could improve the profitability of businesses and increase the amount of income subject to corporate income tax to the benefit of other jurisdictions.

## **Global allocation of capital**

A globally efficient allocation of capital would imply that the pretax rates of return on capital would be the same across all countries, regardless of the ownership of the corporation. Under global efficiency, all else being equal, the tax system would not influence the allocation of capital and would not impair the free flow of capital across national boundaries. Under revenue-sharing formulas, as discussed earlier, limited global efficiency would be fulfilled so long as corporations have the same cost of capital, gross of personal taxes, regardless of the country in which they operate. In a world with arbitrage whereby individuals choose assets according to their preferences for risk and personal tax attributes, this condition can be fulfilled (see Boadway and Bruce, 1992; and Devereux and Freeman, 1995).

Existing tax policies at the international level clearly do not achieve global efficiency. As discussed above, corporations may be more differentially taxed on foreign compared to domestic investments when countries have different corporate income tax rates and bases. Moreover, foreign investment may be more highly taxed than domestic investment for a corporation if there is double taxation of income resulting from allocation rules; differences in transfer pricing regimes or restrictions on costs such as thin capitalization; differential rates or bases for foreign compared to domestic investment; or the absence of a credit for foreign taxes such as under some imputation systems. Finally, domestic investment may be more highly taxed than foreign investment if corporations pay less tax in some countries with tax holidays or special regimes or when corporations are able to use tax planning opportunities that reduce or eliminate taxes such as in the case of multiple deductions for investments as income is routed through several countries.

How would formula allocation methods compare to the existing system? Given that the corporation's average tax rate is the same across all countries, efficiency is enhanced since capital bears the same rate of tax across countries. However, as shown above earlier in Section III, capital would not be allocated efficiently across countries so long as tax rates differ. Depending on the formula used, a company would find that the cost of capital or labor is lower for a jurisdiction with a low tax rate since increased production in the jurisdiction increases the weight on income attributed to the low tax jurisdiction.

However, in other respects, the formula allocation could potentially improve the efficiency of the corporate income tax in several ways:

- If countries agree to a similar base, then the corporate income tax would be less distorting. However, under allocation methods, it is still possible for countries to choose tax credits that would result in some differentiation in the tax base but perhaps at a smaller scale compared to the current system.
- There would be less scope for shifting income from one jurisdiction to another. The location of indebtedness and other means such as transfer pricing used for shifting income under the current system would be curtailed for income that is allocated across

jurisdictions. On the other hand, there will remain some incentive to shift income by manipulating the weights used for allocating income and, with the absence of a corporate group concept, there would be opportunities to shift income for nonconsolidated entities resulting in inefficiency.

- Double taxation and income sheltered from taxation would be lessened for income that is allocated so long as countries agree to a similar base and weights (as in Canada). However, if countries do not agree to a similar base and weights or some countries do not participate in the system, then the corporate income tax could substantially distort the allocation of capital across jurisdictions, especially when tax rates are well above 25 percent, unlike state tax rates in the United States that are about 7 percent (after deductibility) or provincial rates in Canada (generally lower than 15 percent).

On balance, the formula allocation method can improve the efficiency of the corporate income tax compared to the existing system. However, it will not achieve global efficiency as would be found with a revenue-sharing method for corporate income taxation.

### **Fiscal externalities**

Another aspect of efficiency is related to fiscal externalities as discussed in Section II: tax exportation and tax base flight. When fiscal externalities are negative, as in the case of tax exportation, governments choose tax rates that are too high since they do not take into account the impact of their policies on the economic welfare of other jurisdictions. The converse will hold for positive fiscal externalities as in the case of tax base flight: tax rates are chosen too low since the benefit of tax policies that improve the level of economic welfare in other jurisdictions is not taken into account.

Under a revenue-sharing formula, fiscal externalities associated with the corporate income tax would not be possible. As governments effectively agree on the same rate and base for tax, they lose the ability of choosing independent corporate income tax measures. However, they could choose other tax policies that affect business capital investments so limitations on corporate income taxes alone do not deal with all aspects of the tax system as they affect businesses.

Under the existing corporate income tax system, both fiscal externalities—tax exportation and tax base flight—operate as discussed above. The size of fiscal externalities, including both tax exportation and tax base flight, are expected to be significant since capital, as a tax base, is highly mobile.

How would formula allocation affect these fiscal externalities? To evaluate this issue, it is important to take note that the evaluation of fiscal externalities depends on the objectives pursued by governments such as welfare or tax revenue maximization. For simplicity, we consider the case of tax revenue maximization under a Nash equilibrium whereby each

government chooses its tax rate to maximize its own revenues, given the best strategic tax rate chosen by the other government.

Using the model discussed above, each government would therefore choose a tax rate,  $t_i$  (i denoting either country a or b) to maximize revenue which is the tax rate times the share,  $\alpha_i$ , of the tax base, corporate profits (gross of equity costs),  $f_1 + f_2 - cx$  (recall that the pretax profit rate on capital is  $R = (f_1 + f_2 - cx)/(y_a + y_b)$ ):

$$T_i = t_i \alpha_i \{f_1 + f_2 - cx\} \quad (10)$$

Each government's choice of the tax rate,  $t_i$ , is contingent on the tax rate,  $t_j$ , (j denoting the other government). The fiscal externality can be derived by differentiating equation (10) with respect to  $t_j$ , allowing for the fact that the country i chooses its tax rate optimally.<sup>33</sup>

$$\partial T_i / \partial t_j = t_i [\{\alpha_i f_{y_i} + (1 - \alpha_i)R\} \partial y_i / \partial t_j + \alpha_i \{f_{y_j} - R\} \partial y_j / \partial t_j] \quad (11)$$

The effect of country j's tax rate on the tax revenue of country i relates to the impact of the tax rate on investment in each country, and therefore the tax base.

Before evaluating the terms, it would be useful to know how tax rates affect capital investment in both jurisdictions when the tax rate increases in one jurisdiction. The impact of  $t_j$  on capital in each country involves rather complex terms but fortunately, an intuitive explanation can be offered here. If country j increases its tax rate, it will directly reduce investment in its own jurisdiction ( $\partial y_j / \partial t_j < 0$ ) for two reasons: (i) the average tax rate on income earned in country j will rise and therefore reduce the demand for capital, and (ii) the firm would like to shift capital out of country j in order to reduce the weight placed on income in country j. With respect to investment in country i, an increase in the tax rate in country j will have two opposing impacts ( $\partial y_i / \partial t_j$  is ambiguous in sign): (i) the average corporate income tax rate will rise for country i investments and therefore reduce the demand for capital in that jurisdiction, and (ii) the firm will wish to shift more income to country i by increasing the weight on profits in country i where income is relatively less highly taxed compared to country j.

Now to evaluate the fiscal externalities, the terms in the bracket may be classified as follows:

**Own tax rate exportation:** When a country increases its tax rate and thereby reduces investment in its own jurisdiction, some of the burden of the tax will be borne by other jurisdictions that receive less revenue. In the last term of expression 11,  $t_j$  will reduce investment in its jurisdiction and the amount of taxes received by country i from investment in country j,  $t_i \alpha_i \{f_{y_j} - R\}$ . The change in the tax base for country i related to the marginal productivity of capital, net of the average profit rate on capital for both jurisdictions. The

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<sup>33</sup>Note that the envelope theorem is used to solve for the fiscal externality.

latter term is associated with a reduction in the weight on profits being attributed to country j with a reduction in investment in country j.

*Cross tax rate fiscal externality:* A country that raises its tax rate will affect the tax revenue earned on capital invested in other jurisdictions. An increase in country j's tax will either increase or reduce revenue in country i depending on the effect on investment in country i. Assuming that investment decreases, country i will have less tax revenue since capital investment will decline, causing output to decline, and the weight on profits attributed to country i will also decline. If investment increases, the converse will hold.

Thus, in the presence of formula allocation, increases in tax rates of other jurisdictions can result in either positive or negative fiscal externalities. The fiscal externalities will be negative to the extent that one jurisdiction's tax rate will cause the tax base in country i to decline, even taking into account the increased weight placed on profits in country i. However, the fiscal externality could be positive if country i's tax base increases as a result of country j's tax rate rising. Thus, in the presence of formula allocation, tax rates may be chosen either too high or low.

In contrast to the existing system, the formula allocation method can either exaggerate or temper fiscal externalities compared to the existing tax regime. However, it is more likely that tax exportation externality would be greater since the burden of changes in tax rates would more likely fall on other jurisdiction. Tax base flight is less important since an increase in the tax rate in one jurisdiction, raises the average tax rate and can therefore reduce the amount of investment in another jurisdiction under formula allocation. There is some empirical support for this latter point. Weiner (1996b) suggests that the U.S. apportionment system (with consolidation) has reduced if not eliminated the impact of a state corporate income tax rates on investment while, in Canada, where there is no required consolidation for allocation, corporate income tax rates do affect investment.

## **B. Administrative and Compliance Costs**

Perhaps the most significant gains to countries under formula allocation arise in connection with improvements in compliance and reductions in both compliance and administrative costs under the corporate income tax. Not many studies have been undertaken at the international level to analyze how much compliance and administrative costs could be saved under a formula allocation system but there are some results in the United States and Canada that provide at least some basis for future estimation.

In Slemrod and Blumenthal (1996), large businesses reported that the current lack of harmonization of U.S. state corporate tax bases is one of the most important factors that result in higher compliance costs. Compliance costs associated with state level taxation were 5.6 percent of total state revenue, over twice the level for the federal income tax.



Erard (1997) finds that Canadian compliance costs per large business of the same size and type are about half of those found in the United States, in part related to greater harmonization of provincial tax policies. Variations in provincial corporate income taxes have only a small impact on compliance costs and are less important as a factor in explaining compliance costs compared to others, such as the tax treatment of oil and gas and mining companies or foreign asset reporting requirements.

While compliance costs can be significant under formula allocation, especially if countries do not harmonize the tax base and formulas as in the Canadian case, they may very well be less than the compliance costs found under existing tax systems with respect to the treatment of foreign source income. Indeed, as discussed in Blumenthal and Slemrod (1995), 40 percent of large business compliance costs may be associated with the taxation of foreign-source income in the United States, a percentage much greater than the share of foreign to worldwide assets for U.S. businesses. Compliance costs associated with the treatment of foreign-source income are 8.5 percent of revenues although this amount might be much higher.

The gains that can possibly be achieved, however, are maximized if countries agree to a generally common tax base and formula, as in the Canadian case. If, however, countries choose their own base and weights, as in the U.S. case, the system can be fairly complex and result in high compliance and administrative costs.

An important issue is whether governments should agree to a corporate group concept. Without some concept of corporate group, corporations can operate separate legal entities in each country even though the entities may be related in substance—transfer pricing regimes would need to be continued with the resulting compliance and administrative costs associated with them. On the other hand, corporate group concepts result in some complexity in the tax system since it requires computation of financial income and assets at the international level on a consolidated basis and a determination of when an entity enters or exits part of a group.

### **C. Flexibility and Autonomy**

While there can be gains in efficiency and reduction in compliance and administrative costs with formula allocation methods, the critical issue is the degree of harmonization being sought by countries for the corporate income tax. To the extent the governments agree to a common corporate income tax base and formula to maximize efficiency gains and minimize compliance and administrative costs, the impact of such harmonization is to reduce their autonomy and flexibility in determining the appropriate tax structure.

To evaluate how autonomy and flexibility are affected by formula allocation, it would be appropriate to recall a comment made in the introduction. As businesses become increasingly globalized, it is unclear that countries can achieve autonomous and flexible corporate income tax policies without being constrained by what other governments do. The fiscal externalities involved with mobile business inputs are sufficiently large that flexibility and autonomous policies for any one country operating on its own are difficult to pursue anyway. Moreover, as

governments increase their cooperation in developing an informal globalized corporate income tax, they begin adopting rules that are common to them—formula allocation is an approach that extends the cooperative approach now being ensued.

Despite the need to harmonize corporate income tax policies at the international level, which can be facilitated by allocation methods, there are differing industrial structures, public policy priorities, and institutional features that vary across countries. Each country will not want to fully harmonize their corporate income tax system to address their specific needs.

Formula allocation methods can provide a sufficient degree of autonomy and flexibility to provinces while achieving much of the efficiency gains and reduce compliance and administrative costs as discussed above. First, governments can choose their own corporate income tax rates. Second, a formula allocation system could facilitate independent policies by providing mechanisms whereby governments would adjust corporate income tax payments in their jurisdictions by tax credits or surcharges that would not affect the common base, which is generally followed in the Canadian system. Considerable autonomy and flexibility can be afforded to countries although, as discussed above, such autonomy and flexibility would affect other jurisdictions since the tax base and weights used to allocate revenue can be affected by country-specific tax policies.

Nor, as pointed out above, should it be exaggerated that formula allocation will eliminate all other forms of tax competition among governments for business activities. As discussed above, there is an incentive for governments to pursue other taxes, that may be deductible from corporate income, to influence business activities in their jurisdiction with some of the burden of the tax being shifted to other jurisdictions with less allocated corporate income.<sup>34</sup>

## VI. CONCLUSIONS: HOW TO GO FROM HERE TO THERE

While one should not overstate the case for formula allocation methods, neither should one underestimate the necessity of using formula allocation at the international level as businesses become increasingly global in their operations. The existing corporate income tax regimes have been introducing allocation methods on a piecemeal basis—the necessity of doing so will only become stronger overtime as governments maintain their desire to levy income taxes on

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<sup>34</sup>As Gordon and Wilson (1986) point out, deductible taxes levied on businesses may be used to avoid corporate income taxation altogether. However, deductible taxes, such as property or capital taxes, are not perfect substitutes with the corporate income tax in terms of their role or impact. There has been little empirical evidence to suggest that state or provincial governments have shifted from corporate income taxes to other forms of business taxation for federal countries with formula allocation compared to other countries that do not use formula allocation.

business activity. To summarize, the use of formula allocation at the international level raises several issues:

- Formula allocation methods can improve the efficiency of the corporate income tax compared to the existing system that relies on separate accounting and arm's-length pricing principles. However, one should not overstate the case. Formula allocation methods can create incentives for businesses to shift activities from high to low tax jurisdictions in order to increase the share of income allocated to the low taxed jurisdiction. To avoid these incentives, a formula based on weights that are independent of the firm's decisions could be used, such as an industry-wide measure of weights. However, the use of weights that are not specific to the firm would raise issues of fairness among governments and businesses in terms of the distribution of the revenue and burden of the corporate income tax.
- Under formula allocation, fiscal externalities will result, particularly tax exportation, when governments are able to choose their own tax rates, credits or surcharges, and other deductible taxes levied on businesses. Therefore, governments may still choose to levy inappropriate amounts of corporate income tax on businesses in the presence of fiscal externalities.
- Formula allocation methods can reduce compliance and administrative costs for businesses and governments, respectively. To achieve the lowest compliance and administrative costs, countries would need to agree to a similar base and formula for allocation purposes. Also, a corporate group concept would be appropriate to limit the need for existing treaty regimes to be applied to related companies in the absence of a corporate group concept.
- Formula allocation methods limit autonomy and flexibility of governments although such autonomy may be more apparent than real for corporate income taxation. Formula allocation can accommodate independent tax policies of countries if governments can still choose their own corporate income tax rates, tax credits, surtaxes, and other business taxes.

Even though there are limitations to allocation methods, it is expected that continued international integration of business activities with new forms of organization and transactions will force governments to cooperatively seek a new arrangement for corporate income taxation. Allocation methods may facilitate such cooperation by providing a desirable tradeoff between allocative and cost efficiencies with national autonomy and flexibility.

How can governments move further toward allocation? From the U.S. and Canadian experience, it is important that countries participating in allocation would need to agree to a reasonably common base for determining corporate income. In the Canadian and U.S. context, the federal government's corporate income tax base serves as a reasonable starting point for determining state or provincial government tax bases. At the international level, no similar

institution would provide an opportunity to generate a common method of defining corporate income. However, the development of tax treaties and other international tax arrangements provide an important lesson for policymakers. Under these various arrangements such as multilateral discussions at the OECD, governments adopt some common rules as in the case of transfer pricing guidelines or principles for avoiding the double taxation of income.

For the development of a “globalized corporate income tax,” it would be useful to create a formal body such as a World Tax Organization (Tanzi, 1996) or provide powers to an existing international organization that would facilitate multilateral cooperation for developed and developing countries. The purpose of the coordinating body would not be to collect taxes but instead put in place a mechanism to achieve global cooperation in tax policy.<sup>35</sup> The coordinating body could have the following responsibilities:

- Develop a code for a “model” corporate income tax that governments could use as a starting point for determining their own corporate tax.
- Develop weights to be used for the allocation of corporate income to each country.
- Develop a code of conduct that would place some criteria as to circumstances when the tax credits or surtaxes can be applied by governments in pursuit of their own aims.
- Provide information and statistics on the corporate income tax at the international level.
- Provide a forum for further development of tax policy initiatives requiring international cooperation.

To start the process, a smaller group of countries could provide leadership to encourage the development of multilateral discussions that would ultimately lead to new arrangements for tax coordination. This could be facilitated by the G-7 countries, which account for a significant share of multilateral trade, to initiate discussions and develop a broad set of criteria as basis for multilateral negotiations among developed and developing countries.

The above discussion of process goes well beyond our evaluation of allocation methods, and perhaps, prejudices an outcome. However, a discussion of process provides an understanding that, if allocation is to be the basis for future cooperation in establishing a globalized corporate income tax, such ideas could be implemented even though they may seem far-fetched at this time.

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<sup>35</sup>The body would not only deal with corporate income taxes but also other taxes, such as the value-added taxes that require international cooperation.

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