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INTERNATIONAL TAXATION

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Abstract

We consider various systems for taxing international income (source vs. residency systems) and international transactions (origin vs. destination systems) and the empirical literature that has addressed issues related to such systems. The optimal taxation literature finds a conflict between static and dynamic efficiency considerations but fails to consider such important aspects of taxation as the benefits arising from public goods and services, compliance costs and administrative costs. Empirical work finds that the level of taxation significantly affects the location of investment and the way in which investment is financed. However, estimates of the magnitude of these effects of taxation are varied. Non-tax considerations (for example, political and economic stability) often dominate tax considerations in firm decision making. Firms use intra-company prices (for example, transfer prices) to reduce the total amount of taxes paid, but the magnitude of this type of evasion does not appear to be large. Countries often use their tax systems to encourage exports and to attract investment. Many tax treaties between developed and developing countries have tax sparing provisions that allow firms to credit unpaid taxes due to 'tax holidays'. We suggest that future research on international taxation consider second-best worlds, incorporate administrative considerations and consider the effect of regulatory as well as tax regimes. This research could also usefully incorporate equity considerations and such non-tax aspects of international decision making as the availability of skilled labor, infrastructure and legal and regulatory environments.

JEL classification: F2, F3, H2, K3, M4, O0

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1. Systems of International Taxation

International taxation generally refers to the tax treatment of cross-national transactions. Since each nation has its own tax rules and the rules of one nation are rarely perfectly meshed with those of another, it is possible that income will be taxed more than once (sometimes referred to as double taxation) or that it will go untaxed by any jurisdiction. To prevent this, countries employ different methods. In principal, two methods of taxation have been distinguished for direct taxes such as personal and corporate income taxes: the territorial (or source) system of taxation and the worldwide (or residence) system. Under a pure source system, all income earned in a country is taxed by that country regardless of whether the earner is deemed to be foreign. A pure residence system taxes income regardless of where it was earned as long as the earner is deemed to be a resident of the country. An analogy to the familiar distinction between gross domestic product (GDP) and gross national product (GNP) may be helpful. GDP includes all income produced domestically, whether by domestic or foreign nationals, and is analogous to income taxed under the source method. GNP includes all income produced by nationals, whether at home or abroad, and is analogous to income taxed under the residence method.

As long as those receiving income are classified by all countries in the same mutually exclusive way as residents or nonresidents, and all countries use the same method of taxation, there is no problem of double taxation. (However, there are efficiency issues, which we address in the next section.) Double taxation problems arise because countries have different residency rules and tax systems. For example, some countries use a territorial system when defining income while others use a residence basis for determining what income is taxable. Further, no country uses the pure form of either of these systems. All countries claim the right to tax all income generated within that country's border; that is, all countries begin with a source basis for taxation. This is reasonable in terms of both tax administration and tax compliance. It is always easier to assess and collect taxes on income earned in the taxing jurisdiction. Source taxation also accords with the widely accepted principle of taxing individuals who receive benefits from public expenditures (the benefit principle of taxation). For the most part, the government of the country in which that taxpayer is physically present provides the public goods and services consumed by a taxpayer. Both efficiency and common concepts of fairness dictate that those who benefit from government should help to pay for it.

However, most nations try to tax at least some of the foreign income of their residents. These attempts to tax the foreign income of residents result in a mixed source and residence basis for taxation. For instance, the US Government claims the right to tax all income earned in the US, a source system of taxation. However, it also claims the right to tax some of the income

that its permanent residents and citizens earn abroad, a residence basis of taxation. Countries that tax such foreign-source income normally provide a credit for foreign taxes paid (up to a limit discussed below). Other countries such as France come closer to a true source/territorial basis for taxation. These countries generally exclude the foreign income of their residents from domestic taxation.

Regardless of which method of direct taxation is used, the tax code must provide a set of rules determining residency. For individuals, residency is usually determined by a test based on the number of days an individual is present in a country. Unlike other countries, US citizenship also triggers the definition of a resident for US tax purposes. For corporations, this may be triggered by incorporation (as in the US) or by the place of management and control. The UK relied exclusively on the place of management and control until 1988. Since 1988, UK residency for a corporation may be triggered either by incorporation, or by the place of management and control.

A second question in countries that tax foreign source income is the timing of such taxation. For a business, the way in which foreign operations are set up can influence when taxes are paid. For instance, a US corporation can set up an overseas operation as a branch, which is not separately incorporated. The income (or loss) of a foreign branch is combined with domestic income and taxed currently. The companies that tend to set up foreign operations as branches are concentrated in the banking and petroleum industries (Goodspeed and Frisch, 1989). Alternatively, the foreign operation can be set up as a controlled foreign corporation (CFC). CFCs are incorporated in the foreign country, but a controlling share of their stock (over 50 percent for the US) is owned by domestic shareholders. Except for certain types of income (described below), the income of a CFC is only subject to domestic taxation when it is repatriated. Since a CFC can delay subjecting its income to tax by not repatriating income, this feature of international tax law is commonly referred to as 'deferral'. Many countries (for example, the US, Germany and Japan) allow deferral on undistributed income. These countries also generally have 'anti-deferral' regimes that restrict the types of income on which taxation may be deferred until repatriation. The US anti-deferral regime began with the addition of Subpart F to the US Internal Revenue Code by the US Revenue Act of 1962. Subpart F provides for current taxation of certain types of unrepatriated income of US CFCs. Unrepatriated income subject to Subpart F is treated as if it had been repatriated as a dividend. The income subject to Subpart F provisions has been broadened over the years and the US has enacted other anti-deferral rules. However, deferral remains important. The US Treasury estimates that deferral cost \$2 billion in lost tax revenue in 1997 (OMB, 1996). See Ault (1997) or Gramwell, Merrill and Dubert (1996) for a detailed discussion of anti-deferral regimes in a number of countries.

Residents of countries that tax on a worldwide basis will have their foreign source income taxed twice, first in the foreign country where the income is earned and next in the home country. Most countries that attempt to tax the worldwide income of their residents allow a credit or deduction for taxes paid to foreign countries. To avoid giving refunds for high foreign taxes, the credit is limited to the tax that would have been paid had the income been earned in the home country (usually given both the home country tax rate and the home country definition of the tax base). This creates two types of resident taxpayers; those that receive full credit for foreign taxes paid and those that do not. Taxpayers who are not able to credit all taxes paid abroad against taxes in their home country are said to be in an 'excess credit' position. Taxpayers who do receive full credit are said to be in a 'deficit of credit' or 'excess limitation' position.

Two methods are used to determine the foreign tax credit. One method treats income in each foreign country separately in determining the credit. The second method determines the credit on a worldwide basis. Income and taxes from all countries are added to determine whether the limitation applies; thus, the taxpayer will be in excess credit if its (weighted) average foreign tax rate is greater than the home country tax rate. Consequently, a taxpayer may be able to reduce its home country tax liability because of the averaging of high and low taxed income. Consider, for instance, a multinational with a large proportion of income coming from investments in high-tax countries and a small proportion of income coming from investments in low-tax foreign countries. The multinational will not obtain full credit for foreign taxes paid; that is, it will be in an excess credit position. This firm would then have an incentive (absent under a per-country limitation) to try to shift income from high-tax to low-tax foreign countries so that the average foreign tax rate falls below the home country rate. The multinational will thereby obtain credit for all foreign taxes paid. (The shifting of income may not require actually shifting production facilities; it could be accomplished through paper transactions - see the later section on transfer pricing.)

To combat this tendency of the worldwide credit system, some countries force multinational companies to make separate credit calculations for particularly high- or low-tax categories called 'baskets' of income. The US basket classification system is particularly complex. Prior to the US Tax Reform Act of 1986 (TRA86), there were five baskets. TRA86 substantially increased the number of baskets by expanding the Internal Revenue Code Section 904(b) interest income basket to include all passive income and adding four new baskets: (1) high withholding tax on interest (defined as 5 percent or more), (2) financial services income, (3) shipping income, and (4) dividends from each uncontrolled foreign corporation. This last basket potentially created a large number of new baskets since the credit on dividends from *each*

uncontrolled foreign corporation had to be computed separately. The basket system is designed to prevent US taxpayers from combining high-taxed and low-taxed foreign income in order to receive a credit for taxes paid in excess of the US rate on one portion of income.

To some extent, countries can be classified on the basis of whether their foreign tax credit systems are per-country or worldwide. The US, Japan and Iceland provide credits on a worldwide basis; Canada, Germany, Greece, Ireland, Italy, the Netherlands, New Zealand, Norway, Portugal, Spain, Turkey, and the United Kingdom use a per country limit in determining the foreign tax credit. However, as Ault (1997) notes, this division is somewhat misleading. In the UK, for instance, the per-country credit limitation can be avoided by routing income through a nonresident holding company. The income going through this 'mixer' company is considered all from one source, and hence averaged and the per-country limitation avoided. (There are no 'pass-thru' rules in the UK as there are in the US.) Ault suggests that the use of such companies is common.

In principal, the resident system taxes individuals on their worldwide income. However, since most countries determine resident status by a test based on the number of days one is in a country, most expatriates are not residents of their home country for tax purposes. The US is an exception. Since US citizens are considered US residents, US expatriates are required to file US tax returns as well as tax returns for the country in which they reside. However, if a US citizen is not in the United States for 11 out of 12 consecutive months, the individual can exempt \$70,000 of income earned abroad from US personal income taxation. Self-employed US citizens working abroad will still owe the 15 percent US payroll tax for Social Security, but this is often overridden by treaty if the US citizen pays the foreign social security tax, and the foreign social security tax otherwise qualifies for the foreign tax credit.

Lower-level governments that form a federation sometimes use a somewhat different arrangement for apportioning the tax base of firms with operations in a number of different taxing jurisdictions. The approach used is called formula apportionment. The US states that belong to the Multi-State Tax Compact, Canadian provinces, and Swiss cantons use formula apportionment to tax corporations (Daly and Weiner, 1993). Formula apportionment can be considered a source-based approach to taxation. The formula used under a formula apportionment system divides the entire tax base of the corporation (for example, the worldwide base) among a participating set of taxing authorities. Each authority taxes only that portion of the tax base attributed to it. If all regions use the same formula and the same definition of profits, the portions are mutually exclusive and exhaustive, and the 'worldwide' base is taxed only once. Formula apportionment begins by selecting a set of indicators (for example, sales, property value, and wage payments of a corporation in the case of US states) to reflect the level of economic activity of a taxable economic

entity in a tax jurisdiction. It then weights these indicators to form an index of economic activity in a jurisdiction. The jurisdictions split the taxable base on the basis of this index. In practice, one problem that this method encounters in the US is that states use different weights in determining the index so that the base ends up being taxed more than once. The economic effects of formula apportionment have been explored by McLure (1980, 1981), and have even been discussed in the context of the European Union (Daly and Weiner, 1993). On a broader international basis, formula apportionment is rarely used because of difficulty agreeing to the 'formula' and enforcing its use.

A second set of taxes on foreign income, both for wage and capital income, are termed 'withholding taxes'. These taxes are applied at source, usually on gross income. For instance, interest income received by a British citizen holding money in an Italian bank would have taxes withheld prior to remittance to the British citizen. The same holds for wage income: a US citizen working in Spain for a few months is subject to a 15 percent withholding tax. The income is also subject to US tax, although the individual can get credit for the 15 percent Spanish withholding tax. The reason for withholding tax on the income of nonresidents is principally for compliance purposes. Without withholding, individuals may fail to report such income in both home and source country. Bilateral treaties generally reduce withholding taxes on dividends and interest. In addition, the US has unilaterally eliminated its withholding tax on interest income (both for individuals and corporations). For a summary of reductions see Gramwell, Merrill and Dubert, 1996. Countries may also enter into information exchange agreements and other cooperative arrangements.

Since tax treaties are bilateral and only cover selective countries, withholding tax rates can vary widely. This creates incentives to funnel income through third countries that have a low withholding tax rate. (See Giovannini, 1989, for an example.) As described in Hufbauer, Elliott, and Maldonado (1988), tax treaties grew out of recommendations by the League of Nations in 1927 as a way to reduce double and zero taxation, and to reduce withholding taxes. They also serve the purpose of stimulating international investment and structuring cooperation among different national taxing authorities. 'Model' tax treaties were developed by the OECD in 1963 and the UN in 1979. The OECD issued its most recent model treaty in 1994. These model treaties are meant to serve as general guidelines. The US has from time to time issued its own model treaty. The most recent US model was issued in 1996. Countries do not have tax treaties with all other countries. For example, France has treaties with approximately 90 countries while the US has treaties with approximately 50 countries (see Gramwell, Merill and Dubert, 1996 for a summary).

Indirect taxes, such as sales and value-added taxes, also suffer from problems of double taxation. As with direct tax systems, international indirect tax systems can in principal be of two types: a destination system or an origin

system. The destination system taxes goods where they are consumed and is analogous to resident taxation; the origin system taxes goods where they are produced and is analogous to source taxation. International trade agreements have set rules for indirect taxation so that taxes cannot be used to favor domestically produced goods. Under the General Agreement on Tariffs and Trade (GATT) indirect taxes can be imposed on import and rebated on export. This is consistent with the destination system of indirect taxation.

2. Theory: Equilibrium, Efficiency and Tax Competition

Having outlined various systems of taxation, we turn to the nature of the equilibrium under various forms of taxation and the relative efficiency of different systems. While the residence and source principles of taxation apply to labor as well as capital taxation, most of the literature discussing these concepts relates to capital taxation, and our discussion will therefore proceed in terms of capital taxation. The standard view is that pure residence taxation promotes efficiency in investment decisions while pure source taxation promotes efficiency in savings decisions. To understand why, we must first consider the nature of the equilibrium under source and residence taxation.

Recent discussions of equilibrium in international taxation can be found in Keen (1992); we follow the notation of Keen. Consider two countries, A and B. Each country can be characterized by a representative investor who can earn a pre-tax return r_k in country k . Each investor faces two possibly different tax rates, one on domestic income and one on foreign income. Denoting the foreign income tax rate with an asterisk, this means that there are potentially four different tax rates: T_A, T_B, T_A^*, T_B^* . T_k is the tax rate of an investor from k investing in k , while T_k^* is the tax rate of an investor from k investing abroad. An equilibrium is characterized by a lack of arbitrage possibilities for each investor. Hence, for the investor from A, equilibrium requires equality of after tax returns in each country: $r_A(1 - T_A) = r_B(1 - T_A^*)$. Similarly for the investor from B, $r_A(1 - T_B^*) = r_B(1 - T_B)$. Dividing the arbitrage condition for the investor from A by that for the investor from B yields $(1 - T_A)/(1 - T_B^*) = (1 - T_A^*)/(1 - T_B)$. Since we have four possible variables for only one equilibrium condition, existence of a unique equilibrium is far from guaranteed. Despite these possible problems in the existence of an equilibrium, both pure source taxation by both countries ($T_A = T_B^*$ and $T_B = T_A^*$) or pure residence taxation by both countries ($T_A = T_A^*$ and $T_B = T_B^*$) present no existence problems.

We now consider the implications of an equilibrium under pure source and pure residence taxation. Consider first the case of pure source taxation with differential tax rates so that $T_A \dots T_A^*$ (and similarly for B). Given the equilibrium condition for the investor from A, differential tax rates imply that

$r_A \dots r_B$. That is, the before-tax return in A is not equal to that in B. Since factors are paid their marginal product, this implies that the marginal product of capital in A is not equal to that in B. If $T_A > T_A^*$, then $r_A < r_B$, and we could therefore reallocate capital from A to B and increase total production. Another way to think of this is that differential tax rates have set up a fiscal incentive to locate capital in the low-tax country so that too much capital will flow to the low-tax country. Source taxation therefore is said to distort the location of capital and investment decisions.

In its pure form, the residence approach leads to production efficiency. To see this, note that the definition of residence taxation ($T_A = T_A^*$) implies from the equilibrium condition that $r_A = r_B$. There is no tax-induced incentive for capital to locate in one country over another with residence-based taxation. While residence based taxation therefore eliminates the incentive for capital to move from high-to low-tax jurisdictions, it may induce the owners of factors to change their residence. (The effect of such migration incentives are apparent in the decision of high income individuals to locate across the border in Greenwich, Connecticut rather than New York (avoiding taxes on capital income) or the migration of high income individuals from high tax countries such as Sweden.) Moreover, since $T_A \dots T_B^*$, the after-tax return of an investor from A will differ from the after-tax return of an investor from B. Since saving depends on the after-tax return, a given level of world savings will be misallocated between investors from A and B. If $T_A > T_B^*$, investors from A realize a lower after-tax return and will save too little, while investors from B will save too much. Since the value of an extra dollar of savings is greater for investors from A than for investors from B, we could increase welfare by transferring some of the future consumption generated from the savings of investors from B to investors from A. In contrast, source taxation leads to an efficient allocation of savings since investors from A and B face the same after-tax return.

To summarize, source taxation leads capital to locate inefficiently (production inefficiency) but leads to intertemporal exchange efficiency. Resident taxation leads to efficiency in capital location but violates intertemporal exchange efficiency. In a first-best world (that is, when we can raise revenue without distortions), both efficiency conditions are required. These two efficiency concepts have often been captured in the literature by the terms 'capital export neutrality' and 'capital import neutrality'. Capital export neutrality is associated with pure residence taxation: facing the same tax consequences at home or abroad, capital is neutral as to its location. (As mentioned above, it is not neutral as to its choice of residence.) Capital import neutrality is associated with pure source taxation: capital from abroad is taxed the same as domestic capital, so there is no tax discrimination for or against foreign capital.

Horst (1980) and Dutton (1982) suggest that the optimal tax on foreign income will balance these two efficiency concerns; the proper balance, they

suggest, depends on the elasticities of capital demand and supply. For instance, Horst shows that if the elasticity of supply of capital is zero and the combined tax on international income is equal to the tax on domestic income in the capital exporting country, the optimal tax on foreign source income results in capital export neutrality. Intuitively, there is no saving distortion for this case. To ensure an efficient allocation of capital, the capital exporting country should tax the worldwide income of its residents and provide an *unlimited* credit for taxes paid abroad. Horst also shows that when the elasticity of demand for capital is zero and the combined tax on international income is equal to the tax on domestic income in the capital-importing country, the optimal tax on foreign source income results in capital import neutrality. To ensure an efficient allocation of capital, the capital-exporting country should exempt foreign source income from tax. It is sometimes argued that capital export neutrality is more important, possibly because savings elasticities are often thought to be low and the elasticity of the demand for capital relatively high.

Gordon (1986) points out an interesting parallel to the ‘production efficiency lemma’ of Diamond and Mirrlees (1971) that also supports capital export neutrality. Diamond and Mirrlees showed (under some rather stringent assumptions) that the optimal commodity tax system will lead to productive efficiency; that is, no input taxes should be used if commodity tax rates are set optimally. Gordon shows that it will be optimal for a small open economy to set its tax rate on capital equal to zero. As Gordon explains, since capital supply is perfectly elastic for the small open economy, a tax on capital will be borne by labor and hence will create the same labor market distortion as a direct tax on labor; in addition, however, the tax on capital will reduce capital investment in the small open economy, and will therefore be dominated by a direct tax on labor. The implication is that capital export neutrality will be part of the optimal tax system for small open economies.

We suggest below some possible new directions for the literature on the optimal tax on foreign source income. First, given the reality that for administrative reasons all countries start from source taxation, it may be worthwhile for the theoretical literature to incorporate this important institutional detail that turns the problem into one of second-best. An interesting question to analyze is whether it is better to augment the initial source taxation by further source taxation (excluding foreign-source income from tax), by residence-based taxation (using a credit system to avoid double taxation), or perhaps by some combination of the two. Perhaps the difficulties in establishing an equilibrium has precluded this sort of discussion in the past, and this is a formidable problem to overcome; still, one might be able to use the approach of Slemrod (1988), for instance, to model an equilibrium and gain some insight into the efficiency consequences of current practices. Second, the optimal tax should incorporate administrative issues (for example,

administrative costs, enforceability) as well as more traditional efficiency issues. (See Slemrod, 1990a, for an excellent and very readable discussion of optimal taxation that also incorporates administrative concerns.) Third, since no country has an unlimited foreign tax credit, the limitation is another institutional constraint that should be incorporated in the theoretical problem. Fourth, the literature tends to ignore benefits provided by the government that tax payments support; presumably owners of capital would willingly pay for government expenditures that enhance capital investments (for example, infrastructure investment). Fifth, externalities generated by capital location decisions have not been dealt with, and would presumably alter optimal taxation rules.

As a normative concept, economic efficiency naturally refers to the maximization of world welfare. Positive issues of why tax systems develop in certain ways presents another set of issues. One of the first issues of a positive nature to be raised concerns the sort of tax system that maximizes national welfare. Musgrave (1969) (also clearly discussed in Caves, 1982) raises the point that a capital exporting country (that is large enough to alter the return on capital) will maximize national income by using a deduction system rather than a tax-credit system. This conclusion has a number of qualifications discussed in Hartman (1980), but still raises the question of why a large capital exporting country like the US relies on a tax-credit system.

While international taxation naturally involves more than one country, analysis until recently has considered the situation of a single country under the assumption that other countries' tax systems do not matter. Several recent papers, however, use game theoretic frameworks to analyze strategic decisions between countries that use a corporate income tax. One of the first is Feldstein and Hartman (1979), who find that if one takes into account the reaction of the (small) capital importer, the optimal tax from the large capital exporter's perspective is even higher than otherwise, which seems to add to the puzzle of why the US has a tax-credit system. A more recent paper Bond and Samuelson (1989), finds that the only Nash equilibrium for two countries under a tax credit system is zero tax rates on capital. This is also found by Razin and Sadka (1991c). Bond and Samuelson find that a deduction system yields positive tax rates on capital, again adding to the puzzle of why we do not typically observe the deduction system in practice. In an interesting variation on strategic behavior, Gordon (1992) finds that if one country (for example, the US) acts as a Stackelberg leader, and countries use tax crediting systems, positive tax rates on capital income emerges as the equilibrium solution.

Strategic considerations have also been a recent focus of international commodity taxation. In an early study, Mintz and Tulkens (1986) analyze the inefficiencies liable to arise from duopolistic competition in commodity taxes. One problem with these early studies is that no equilibrium in pure strategies exists because of discontinuities in reaction functions. More recently, Kanbur

and Keen (1993) use a simpler model, in which an equilibrium exists, to examine the merits of cooperative tax agreements versus tax competition. They find that two countries with different tax rates may be worse off if both countries are forced to set an average tax rate, while both may be better off if a minimum tax rate is imposed.

The literature on tax competition and international taxation is closely related to the fiscal federalism and local public finance literatures, a point made by Gordon (1990) and Goodspeed (forthcoming). A seminal treatise on fiscal federalism and local public finance is Oates (1972). Since there are several surveys for the reader (Wildasin, 1986; Zodrow and Mieszkowski, 1986; Rubinfeld, 1987; Oates, 1994) and since the focus of this entry is international taxation, we do not undertake an exhaustive survey. Rather, we briefly point out some similarities and differences, and suggest some ways that research on international taxation can benefit from the local public finance/fiscal federalism perspective.

The key similarity of the literatures on international taxation and local public finance/fiscal federalism is that both study the taxation of mobile factors of production. The heart of the fiscal federalism/local public finance literature begins with the Tiebout (1956) model, which postulates many communities offering different tax-expenditure packages. The basic message from the Tiebout literature is that, given the proper type of financing (that is, given that consumers of publicly provided goods face 'prices' that reflect marginal social cost), individuals and firms will sort themselves among communities in an efficient manner. Tax bills (or effective tax rates) may differ across communities, but this will simply reflect differing demands for public services.

An efficient locational equilibrium in the Tiebout model is therefore characterized by tax rates that differ across regions. This may at first seem in stark contrast to the international tax literature, but the similarity is evident upon further reflection. Two differences are particularly noteworthy. First, the Tiebout model considers both the expenditure and tax sides of a government's budget. In contrast, the international taxation literature ignores the expenditure side, or, equivalently, assumes that the taxed factor gains no benefit from public goods and services that are provided by tax revenues. Secondly, a crucial aspect of locational efficiency in the Tiebout model is the method of taxation. Efficiency requires taxes that reflect the marginal social cost of a resident. However, as suggested by Oates (1972) and others, taxes such as income or property taxes may create externalities so that tax-prices diverge from social marginal cost. If externalities are present, incentives for inefficient location decisions are created. In addition to these problems, taxation in an open economy can result in several other sorts of externalities (for example, benefit spillovers); Gordon (1983) provides an elegant and concise derivation of the many types of externalities that may arise from local (as opposed to national) taxation.

The local public finance literature has focused on cases in which efficiency is achieved in small open economies. Some, such as Hamilton (1976), argue that zoning laws in the US effectively convert the property tax (the major source of locally raised revenue in the US) into a benefit tax. If this is the case, and there are enough jurisdictions to satisfy different preferences both for housing and public goods, the taxation of mobile individuals will lead them to choose their place of residence efficiently. Moreover, a modification of Hamilton's argument made by Fischel (1975) suggests that local property taxes on businesses may represent payment for disamenities suffered by residents from business location. Incidentally, the zoning argument is quite general. If one could zone on the basis of income, income taxes could also be converted to benefit taxes, at least for jurisdictions within a country. Such zoning is generally rejected on the grounds of equity and social stability. However, many immigration laws suggest that countries are well aware of the benefits of wealthy immigrants and the costs of poor ones.

As international taxes may not represent benefit taxes, they may lead to location distortions. However, one of the first studies to measure the efficiency loss that results from income taxes in a general equilibrium model of an open economy (Goodspeed, 1989), finds relatively small differences in the way individuals allocate themselves under a head tax and under an income tax. Consequently, he finds a small welfare loss resulting from income taxation of mobile individuals. This suggests that the magnitude of the welfare loss from income taxes in an open economy may not be very large.

The international tax literature tends to ignore the link between taxes and benefits that is the focus of the Tiebout model. Moreover, Wilson (1993) suggests that such benefits may be as important as taxes in multinational planning decisions. As Hubbard (1993) notes in his comment on Wilson's paper, 'part of the apparent insensitivity to tax considerations could reflect the link between taxes paid and the provision of important infrastructure (for example, in education and transportation support)'. This would be an important area to develop in further studies of international taxation.

The fiscal federalism literature on tax competition has revolved around the type of financing that is used for public services. One of the first modern formulations of tax competition in local public finance is Zodrow and Mieszkowski (1986), who show that if communities rely exclusively on taxes on mobile capital, an externality is created by the tax system, and competition leads to an underprovision of public goods. Closer to results obtained in the international tax literature is the finding of Oates and Schwab (1988) that if both benefit taxes and non-benefit taxes on capital are available, efficiency will result if governments choose a zero non-benefit tax on capital and finance entirely from benefit taxes. Goodspeed (1995) shows that political considerations are important for this result to hold. He shows that an

asymmetric income distribution may lead to a median voter who chooses to finance via non-benefit taxes despite the inefficiency that results from the mobility of the taxed entity. This work suggests that political considerations could also be used to explain equilibrium outcomes of international tax systems.

3. International Taxation and Corporate Behavior

A key question in the study of any tax is the extent to which the tax distorts behavior and thereby creates economic inefficiencies and alters the revenue potential of the tax. Broadly speaking, one can think of the effects of taxation on the multinational firm as affecting (i) the location of investment, (ii) the method of financing an investment, and (iii) intra-multinational transfer pricing decisions. We begin by discussing two opposing theoretical hypotheses about the effects of the tax system on multinational decisions concerning the location of investment and the method of finance. We then discuss the empirical literature on the effect of taxation on the location of investment, followed by a discussion of the empirical literature on financing decisions. Hines (1996b) provides a thorough review of the empirical literature on the effect of taxation on foreign investment and financial decisions, which we have relied upon. Finally, we discuss tax-related issues concerning transfer pricing and review the empirical literature on the prevalence of tax avoidance by judicious use of transfer prices. We have relied on Goodspeed's (1997) review of the empirical transfer pricing literature. For a comprehensive treatment of transfer pricing issues see Lowell, Burge and Briger (1994).

A starting point for understanding the empirical literature on investment and financial decisions are the theoretical works of Horst (1977) and Hartman (1985). Somewhat surprisingly, these two works come to different conclusions about the incentive effects of a foreign tax credit system.

The traditional view, laid out by Horst (1977), is that incentives are different for excess credit and deficit of credit firms. The excess credit firm faces the tax rate of the country in which it invests on the margin; the deficit of credit firm faces the tax rate of the home country no matter where it invests. One way to interpret this in terms of our previous discussion of source versus resident taxation is that once a firm has hit the limit of creditable taxes (as is the case for an excess credit firm), the marginal return on an investment faces a source tax system, and the firm should compare the home and foreign after-tax returns when deciding where to invest. If a firm has not yet hit the limit of creditable taxes (the case of a deficit of credit firm), the marginal return on an investment faces a resident tax system and hence faces the tax rate of the home country no matter where the investment takes place.

In contrast, Hartman argues that deferral combined with the fact that mature firms finance investment from retained earnings that are already abroad implies that the foreign tax credit position of the multinational is irrelevant for investment decisions. Both deferral and an investment financed from retained earnings that are already abroad are necessary for Hartman's result. These two conditions essentially convert the tax-credit system of the home country into a source-based system; hence, the firm should compare the home and foreign after-tax returns when deciding where to invest, and the tax-credit position of the multinational is irrelevant.

The Hartman result is often explained by reference to an analogy relating to the debate on the effect of dividend taxes in a closed economy setting. The 'old view' of dividend taxes assumes that dividends have some intrinsic value as either a signal (Bhattacharya, 1979) or as a control on managers (Jensen and Meckling, 1976). Hence, there will be an optimal dividend payout rate that balances the intrinsic benefit of dividends and their tax cost. But this implies that dividend taxes matter: a higher tax on dividends leads to a lower optimal dividend payout rate. The 'new view' of dividend taxes (King, 1974; Bradford, 1981; Auerbach, 1983) disputes this and suggests that dividend taxes are irrelevant. In the new view, dividends are ultimately the only way that the returns to equity-financed investment can be distributed to shareholders. Hence, according to the new view, dividend taxes are lump-sum taxes that cannot be avoided; consequently, they have no effect on the dividend payout rate. (See, for instance, Zodrow, 1991, for a nice summary and further discussion of these views.) The Hartman scenario is similar to the new view of dividend taxation. In Hartman's case, deferral does not help firms that invest funds that are already abroad and must eventually be repatriated; the return on those funds must eventually absorb the home country tax. Hence, the investment rule for excess-credit and deficit of credit firms is the same: invest abroad if the after-foreign-tax return is higher than the after-domestic-tax return.

While the Hartman result depends on an unchanging home tax rate (Altshuler and Fulghieri, 1994; Keen, 1990) among other things, it has become a focal point in many studies. Nevertheless, the difference between the traditional and Hartman views may not be of much consequence in terms of economic efficiency. As detailed in Goodspeed and Frisch (1989), there is little difference between the traditional and Hartman views in terms of the amount of US earnings abroad that face the foreign tax rate on the margin. While the Hartman view is that 100 percent of earnings abroad (of mature firms that finance from retained earnings) face the foreign tax rate, data from 1984 indicate that in that year the traditional view implied that 82 percent of foreign earnings faced the foreign tax rate on the margin. Under either view, therefore, most foreign earnings faced the foreign tax rate on the margin, as would be the case for a source-based tax system.

Most studies of the effect of international taxation on investment location have concentrated on the United States, examining both US investment abroad and foreign investment in the US. These studies have used time-series data, cross-sectional data, and a pooled approach that combines cross-sectional and time-series data. We first examine the time-series studies, then the cross-sectional studies, and finally the studies that pool cross-sectional and time-series data.

Time-series studies typically use aggregate annual data on direct investment collected by the Bureau of Economic Analysis (BEA), US Department of Commerce Department. Early time-series studies are based on the seminal work of Hartman (1981, 1984), and include Boskin and Gale (1987), Newlon (1987), and Young (1988). These early studies ignore the tax credit position of the parent, and so implicitly assume that the Hartman (1985) model is correct.

More recent time-series studies have used somewhat more disaggregated BEA data. Swenson (1994) disaggregates the BEA data by using 18 industries, and tries to gain insight into the reactions to the Tax Reform Act of 1986. Slemrod (1990b), in the first study to actually attempt to test some implications of Hartman's (1985) model for investment decisions, is able to use information on the tax systems (exemption versus foreign tax-credit) of seven countries that invest in the US. He does not, however, find much evidence that allows him to differentiate between the Hartman and traditional views for foreign firms investing in the US.

Cross-sectional studies have also been able to tap into the BEA data by using country information; for instance, Hines and Rice (1994) use data from 1982 for 73 countries while Grubert and Mutti (1991) use the 1982 data for 33 countries. Hines (1996c) is able to generate enough data points for a meaningful regression using a cross-section of 1987 BEA data for 7 countries by exploiting differences in US state taxes. In contrast to Slemrod's (1990b) study, Hines (1996c), does find evidence of differences in the choice of high- or low-tax US states by foreign firms depending on whether the firm comes from an exemption or a foreign tax credit country, which contradicts the Hartman view (if the investment coming from foreign tax credit countries is financed by retained earnings already in the US). Data from tax returns have also been used in cross-sectional studies, either aggregated from the Statistics of Income (SOI) such as in Frisch and Hartman (1983), or at the firm level as in Grubert and Slemrod (1994).

Several studies that use pooled time-series and cross-sectional data have used Compustat as a data source. Studies using pooled data include Harris (1993), Auerbach and Hassett (1993) and Cummins and Hubbard (1995). Other pooled data sources are Labor Department Surveys, utilized by Bond (1981), and Commerce Department Surveys, utilized by Ondrich and Wasylenko (1993). The time-series estimates that use BEA data tend to find an elasticity

of investment with respect to the after-tax return in the vicinity of 1. This is true even through the most recent study of Swenson (1994), who investigates the effect of the Tax Reform Act of 1986. Cross-sectional results are more varied. Hines and Rice (1994) find an elasticity of the demand for capital with respect to the tax rate of about -3 while Grubert and Mutti (1991) find an elasticity of only -0.11. Cummins and Hubbard (1995), using an unbalanced panel of foreign subsidiaries of US firms, find an elasticity of investment with respect to the after-tax cost of capital of between -1 and -2. Hines (1996c) finds a large impact of taxes on FDI coming from tax-credit as opposed to exemption countries. While his elasticity is not quite comparable to those mentioned, his finding that a 1 percent reduction in tax results in a 9-11 percent increase in the share of investment coming from tax-credit countries suggests a large tax impact.

The overall conclusion of this literature is that taxes play a statistically significant role in determining the location of foreign direct investment, but the magnitude of the impact of taxes remains uncertain. While time-series studies seem to produce similar elasticities of about 1, the rather large range of elasticity estimates that result from cross-sectional estimates indicates some uncertainty about the magnitude of the effect that taxes have on foreign investment. Additional panel studies that control for unobserved heterogeneity across firms, such as that of Cummins and Hubbard, may provide additional confidence concerning the range of estimates. One possible reason for the large effect found by Hines is that, by studying investment in a single country and using state dummies, he has effectively controlled for some unobserved heterogeneity that cross-country regressions lack.

One aspect that a firm needs to consider as it evaluates an investment project is how that project will be financed. In general, a project can be financed from debt or equity; the way in which a multinational finances a project will have different tax consequences. For instance, as discussed earlier, those profits of a CFC of a US multinational (or the CFC equivalent of a non-US multinational) that are financed by equity (and not subject to Subpart F in the US or equivalent rules in other countries) are not taxable by the home country until repatriated as dividends. If the CFC is instead financed by debt issued by the parent, the interest paid by the CFC is taxable foreign source income for the parent. The interest payments are (usually) deductible in the country in which the CFC is located. As mentioned previously, withholding taxes (often reduced by treaty) are also usually owed to the host country for interest (as well as dividend and royalty) payments.

If interest paid by a CFC is deductible and interest received by the parent is taxable foreign source income, a multinational that has a CFC located in a high-tax (including withholding taxes) country would do better to finance the CFC's investment by debt since it will save money by deducting the interest in the high-tax country and paying tax at home. Countries tend to restrict the use

of debt to some extent by using 'thin-capitalization' rules that specify certain limits in terms of a debt-to-asset ratio.

The financing decision of the multinational is a bit more complex for the case of a subsidiary located in a low-tax country because of the Hartman (1985) argument. Traditionally, the argument is that an excess credit multinational might prefer to finance an investment project by equity since it could use deferral to avoid paying the high home country tax for a while. As explained above, however, the implication of Hartman (1985) is that deferral has no value because the present value of the deferred dividend will equal that of the repatriated dividend. Since after-tax returns are equated in equilibrium, there is no advantage to deferral in this view.

One of the first studies to examine the dividend decisions of multinationals is Kopits (1972), who uses aggregate country-level data. Mutti (1981) is able to take advantage of tax return data for subsidiaries and finds that higher US taxes reduce dividend payments. Hines and Hubbard's (1990) paper is the first in a series of modern studies on the dividend repatriation decision. They are able to take advantage of a data set constructed using three separate US tax forms filed by multinationals in 1984: the basic corporate Form 1120, the foreign tax credit Form 1118, and the controlled foreign corporation Form 5471. This data set details information on the parent company (including whether the parent is in excess or deficit of credit) and the repatriations of the parent CFCs. They not only find that higher taxes on dividends reduce dividend payments, but also that the excess credit position of the parent matters in the repatriation decision; excess credit firms tend to have a higher dividend pay-out ratio. This is inconsistent with the Hartman (1985) hypothesis. Two studies, the first by Altshuler and Newlon (1993) and the second by Altshuler, Newlon, and Randolph (1995), extend the Hines and Hubbard study. The first of these studies uses 1986 tax return data and specifies somewhat more completely the tax price of dividend repatriations. The second study uses a panel of tax data for the years 1980, 1982, 1984 and 1986 to investigate the effect of transitory versus permanent tax changes. Transitory changes are found to influence dividend repatriations, while permanent changes do not. This is consistent with Hartman's view of dividend repatriation.

One other study of dividend behavior focuses on a slightly different issue. Hines (1996a) compares dividend payout rates of foreign and domestic subsidiaries. He finds that foreign subsidiaries tend to have a much higher dividend payout rate than domestic subsidiaries; the additional personal tax that is owed on these dividends implies that the cost of capital from foreign investment may be higher than previously thought.

As noted above, a multinational with subsidiaries in high-tax locations will normally do better (from a tax perspective) by financing an investment project by debt so that it can deduct the interest payments in the high-tax location.

Grubert (1995) confirms this pattern. Hines (1994a) develops a model in which the opposite (a positive correlation between greater use of debt finance and lower tax locations) may result over a certain range. This is confirmed in his empirical work in which he finds a quadratic relationship between tax rates and debt levels across countries.

Although most studies concentrate on the effect of taxes on one form of finance, taxes may cause substitution among different sources of finance. For instance, the 1986 Tax Reform Act (TRA86) restricted the deductibility of interest expenses. Interest expenses deemed to be 'foreign' are only allowed to be deducted against foreign, not US, income. The consequence of this is that foreign interest expense will benefit a firm in a deficit of credit position, but not one in an excess credit position. The deficit of credit firm will reduce its taxable income (and maximum credit) by the amount of interest expense; since it has not reached the limit of its foreign tax credit this means that it will reduce its US tax liability. An excess credit firm reduces its taxable income, but also its foreign tax credit by the amount of interest expense; hence, this type of firm does not benefit from foreign interest expense. Two studies (Collins and Shackelford, 1992, and Altshuler and Mintz, 1995) find that firms tended to substitute debt-like instruments for debt after TRA86.

Grubert (1995) and Grubert (forthcoming) are the first studies to jointly estimate separate equations for dividend, interest, and royalty payments. Grubert (forthcoming) finds that taxes have a large effect on the composition of repatriations. That is, differential tax treatment of interest, dividends, and royalties is found to influence the form in which income is repatriated. Similarly, Altshuler and Grubert (1996) examine the complex incentives created when repatriation can flow through several entities. Rather than repatriating through different forms of income, however, they examine the flows between a multinational's CFCs and find that tax incentives have significant effects.

Finally, with respect to repatriation decisions, the role of exchange rate gains and losses should be mentioned. As the world moved from an era of fixed to flexible exchange rates, issues of how and when transactions would be translated into the home currency became relevant. One of the first discussions of the issues involved is Musgrave (1975). As she describes, the taxpayer was given much latitude in the translation of profits into the home currency. This can create problems for the taxing authority because the taxpayer will naturally attempt to time the translation so as to minimize taxes. Wahl (1989) notes that TRA86 in the United States tightened up on translation rules so that most hedging transactions are taxed on accrual, leaving the taxpayer little latitude to time the transactions. However, some transactions are still taxed on realization, which may lead to some loss in revenue through judicious timing of the translation.

Although most empirical studies tend to confirm that multinationals are sensitive to tax considerations in their financial decisions, Hines (1996b), after a thorough survey of the literature, suggests that a more complete analysis would consider the fact that taxes influence financial and investment decisions simultaneously. This is one avenue for further study. In addition, nontax considerations may also play a major role in financial and investment decisions. As we have noted, the local public finance literature suggests that consideration of the expenditure side of the budget is important. This suggests that such factors as road and transportation networks, communications facilities, the quality of the local workforce (and hence investment in schools), and other public infrastructure investments may be important. Other regulatory issues, such as bankruptcy or bank secrecy laws, may also be a reason that firms willingly pay taxes when deciding where to invest. Finally, a country's economic and political stability may also be an important consideration.

We next turn to issues in intra-multinational transfer pricing. Multinational corporations, usually organized as a set of separate entities, typically involve a parent corporation and a set of subsidiaries. The parent is typically the major stockholder in its subsidiaries, often controlling 100 percent of a subsidiary's stock. Various transactions may occur between the parent and subsidiary companies within the multinational, such as the sale by a subsidiary of an input that is used in the parent's production process or sale of a trademark by the parent to a subsidiary. The prices attached to these transactions that occur between corporations within a multinational are referred to as 'transfer prices'. While transfer pricing occurs (implicitly or explicitly) with any intrafirm transfer, the feature that has made transfer pricing so important and controversial is its possible use to avoid taxes. For instance, suppose that the parent is located in a high-tax country while the subsidiary is located in a low-tax country. Assuming that the multinational is trying to minimize its total tax payments, the multinational will try to price transfers so that most of its profits appear in the low-tax country. For example, if the subsidiary is providing the parent with an input, there is an incentive to charge a very high price for the input. Since this will result in high revenue in the low-tax country and high costs in the high-tax country, the effect will be to transfer profits from the high-tax to the low-tax country. The multinational's taxes will be lower and its after-tax profits higher than would otherwise be the case.

Transfers between entities that make up a multinational firm can be bi-directional. We first consider the transfer pricing decisions of a home country multinational that invests abroad (outbound investment), and then the transfer pricing decision of a foreign multinational that owns a corporation in a home country (inbound investment). For each category, we discuss the general nature of the problem and the empirical literature. Finally, we discuss some solutions that governments have implemented to try to reduce tax

avoidance and tax evasion by means of transfer pricing.

Transfer pricing can be used to reduce taxes for either the source/territorial or the resident/worldwide tax system. The simplest cases can be illustrated for a multinational that has foreign profits generated in a single foreign country as well as profits generated at home. Abuses under the territorial system are perhaps the most obvious: taxes can be reduced by transferring profits out of the high-tax country and into the low-tax country.

A purported advantage of the worldwide system is that this incentive disappears for a multinational that invests in a single foreign country with a tax rate lower than the home country. In this case, income derived from the foreign investment will be taxed at the home country tax rate and the incentive to shift income is eliminated.

However, several complications of the tax systems of countries that purport to use the worldwide system of taxation allow multinationals to use transfer pricing to reduce taxes. First, consider a multinational in a low-tax country that invests in a single high-tax country. By definition, this firm would be in an excess credit position. The multinational will not receive a credit in its home country for some of the taxes paid in the high-tax country unless it is able to shift some income back to its low-tax home. The multinational can use transfer prices to shift profits to the home country. Second, since multinationals typically have investments in a variety of foreign countries, the way in which the credit is computed is important. As mentioned above, some countries aggregate income over all foreign countries in determining the limit. In addition, the use of 'mixer' companies in countries that use a per-country limitation can also result in income averaging. For these countries, a multinational with a large proportion of income coming from investments in high-tax countries and a small proportion of income coming from investments in low-tax foreign countries will not obtain full credit for foreign taxes paid. This firm would then have an incentive to use transfer prices to shift income from high-tax to low-tax foreign countries and thereby obtain credit for all foreign taxes paid. Third, the use of deferral effectively converts a worldwide tax system into a territorial system, at least until profits are repatriated. Although Subpart F provisions in the United States have limited deferral, the transfer pricing problems associated with territorial tax systems become relevant when a worldwide system incorporates deferral.

The evidence on the use of transfer pricing is consistent with tax-minimizing behavior, although the magnitude of abusive transfer pricing appears to be moderate. Outbound investment by US multinationals has been investigated by Harris, et al. (1993), who use Compustat data to investigate whether taxes paid to the US are influenced by the location of the multinational's profits overseas. Since the US taxes multinationals based on a worldwide system and computes the foreign tax credit by aggregating on a worldwide basis, the multinational can get credit for income tax paid in a

country with a tax rate higher than the US rate by judicious use of transfer pricing. It simply needs to shift income from a high tax to a low tax location so as to avoid hitting the credit limit. Harris, et al. find that a multinational that has a subsidiary in a low (high) tax country has a lower (higher) than average ratio of US tax to US assets. This is consistent with the use of transfer pricing to minimize worldwide taxes, although they find that the aggregate effect on US tax revenues is moderate. Hines and Rice (1994) investigate transfer pricing of outbound investment by concentrating on the use of 'tax havens' (a set of very low-tax foreign countries) by US multinationals. They find that reported profit rates are sensitive to local tax rates, although they note that this may not be bad for US revenue since the US is now a relatively low-tax country. A US multinational whose foreign source income comes primarily from a high tax country will not be subject to additional US tax. If however, the multinational is able to shift income so that its foreign source income appears to come primarily from a low tax country, the US will gain tax revenue equal to the difference between taxes paid and what would be paid in the US

We next consider transfer prices used by foreign corporations operating in the home country (that is, inbound investment) to transfer profits out and so avoid home country taxes. This has become an important topic, particularly in the United States, because the aggregate rate of return for foreign-controlled companies in the US is observed to be much lower than the rate of return of domestically controlled companies. A concern expressed by the US Congress is that foreign-controlled US corporations are not paying their fair share of US taxes. The suggested culprit is transfer pricing.

There are several reasons other than transfer pricing that might explain low rates of return of foreign-controlled companies operating in a home country. First, foreign companies may at first experience a lower than average rate of return because of the revaluation of the assets of new acquisitions or because of the start-up costs of a new business. Second, a low average rate of return in any one year may not be indicative of a long-run trend. That is, although foreign companies may have difficulty in adjusting to the nuances of a foreign market at first, one would expect this to change over time as the firms mature. Finally, unexpected changes in exchange rates can have a large effect on profits. An unexpected fall in the dollar, for instance, would increase the cost of components imported into the US and therefore temporarily decrease the profits of a foreign-controlled company in the US. This effect also would be expected to diminish over time.

Inbound investment in the US is investigated by Grubert, Goodspeed and Swenson (1993) using both a 1987 cross-section and a 1980-87 panel data set. They use data from the tax returns of US corporations to investigate the difference in taxes paid by foreign-controlled as opposed to US-controlled corporations. The aggregate data suggests a much lower ratio of taxable income

to assets for foreign-controlled corporations. However, the authors find that the revaluation of assets after merger or acquisition (captured by an age effect), exchange rate changes and a maturation effect account for about half of the difference. The remaining difference could be due to transfer pricing, and the authors present some evidence that indicates that foreign-controlled companies tend to be more concentrated at zero taxable income than domestic companies. They also remain in the zero-profit state longer than domestic companies. This suggests that transfer pricing may be used to some extent to reduce taxes, although less than feared when the transfer pricing issue first arose in the US Congress.

Grubert (1997) updates the study of Grubert, Goodspeed and Swenson by repeating the previous analysis (with some modifications) for a 1993 cross-section and a 1987-1993 panel. He finds that for some specifications purely cross-sectional variables can explain almost 50 percent of the difference in rates of return, rather than the 25 percent explained in the previous study. This appears to be partly due to the fact that US companies are receiving more income from foreign dividends. The panel estimation corroborates the earlier finding of a maturation effect. Overall, Grubert is able to explain somewhat more than the earlier 50 percent (up to 75 percent) of the difference between foreign-controlled and US-controlled corporate returns in the US.

Since transfer pricing can be used to evade taxes, governments have naturally developed a set of rules to try to minimize this potential source of tax evasion. The problem is to find an 'objective' way of valuing tangible and intangible assets transferred across national boundaries by multinational corporations. The widely accepted international standard is that such transfers be assigned the prices that would have been charged if the transactions had occurred between independent entities. Such prices are referred to as 'arm's length' prices. The basic notion is that a transaction between a parent and its subsidiary should be priced as if it had occurred between two unrelated parties in a competitive market.

However, arm's length transfer prices are not always easy to calculate because comparable transactions by unrelated parties may not exist. This issue is pervasive for intangible assets because the value of most intangible asset arises from market power generated by the intangible. For example, how should McDonald's price the right to use its golden arches? McDonald's does not sell use of its golden arches to unrelated parties. The value of the golden arches arises from the rents that the use of this trademark generates. There are no comparable arm's length prices and alternative methods for pricing this type of transfer must be used.

A general framework and some specific standards for transfer pricing are suggested in OECD (1979). Revisions have recently been proposed in OECD (1995). Specific rules that are acceptable to a country's taxing authority

generally vary from country to country but, in general, the prices charged in comparable arm's length transactions are preferred. (See Ault, 1997, for a discussion of practices in several countries, and Molina Gómez-Arnáu, 1997, for the case of Spain.) When exactly comparable transactions do not exist, the government often provides some guidance in the form of regulations or case law (usually based on OECD, 1979) on the range of transfer prices that will be deemed acceptable. Such guidance may include a cost-plus calculation, reference to some industry average such as a rate of return on assets or a margin on sales, or attempts to adjust 'inexact' comparables to obtain transfer prices. Profit-based methods (for example, 'comparable profits') as opposed to transactions methods tend to be the most controversial. Some countries do not allow comparable profits methods.

The methodology used to determine the proper transfer price has become increasingly sophisticated. Frisch (1989) and Witte and Chipty (1990) suggest the use of the capital asset pricing model to determine a proper return for a project. Appropriate transfer prices are then calculated as the prices necessary for the project to have that rate of return. Horst (1993) suggests using regression analysis to determine an appropriate rate of return.

The US Internal Revenue Service (IRS) has adopted an open approach on the methods used to obtain transfer prices. Multinational companies may now propose a method for determining transfer prices. The IRS examines the proposed method and determines whether or not the methodology is acceptable. If the methodology is acceptable, the IRS enters into an 'advanced pricing agreement' (APA) with the multinational. The agreement allows the multinational to use the mutually agreed upon methodology to set transfer prices for the firm for a period of 3 to 5 years. The APA may involve the other countries impacted by the agreed transfer price. APAs are also possible in some other countries (for example, Germany and The Netherlands).

One of the more subtle elements of corporate international taxation is that the tax system can be used to create subsidies. Although the thrust of the General Agreement on Tariffs and Trade (GATT) is to prohibit discrimination between domestic and foreign produced goods, corporate tax systems have been used to subsidize exports and investment. We consider below two specific US tax provisions (foreign sales corporations and sales source rules) that provide subsidies for goods exported from the US. We then consider the general concept of tax holidays, and its relation to tax sparing in tax treaties.

The US Congress created Domestic International Sales Corporations (DISCs) in 1971. DISCs were essentially conduits through which export transactions could be recorded. Exports carried out through DISCs received favorable tax treatment. This subsidy was found to be in violation of GATT's prohibition of export subsidies in 1976. The reaction of the US was to replace DISCs by Foreign Sales Corporations (FSCs), which perform much the same

function, but are able to pass muster under GATT rules. As long as title is passed overseas, a portion of FSC income is exempt from US tax; hence, a subsidy is created for a product to be produced domestically and exported rather than manufactured and sold abroad.

A second type of export incentive in the US tax code is that produced by the sales source rules (Section 863(b) of the US Internal Revenue Code). These rules allow a multinational to reclassify part of its export income as foreign source. If a multinational is in an excess credit position, the US tax rate times foreign source income is the binding constraint on the foreign tax credit. Hence, each dollar that an excess credit firm is able to reclassify as foreign rather than domestic source will result in extra foreign tax credit equal to the US tax rate. For example, if a multinational is in an excess credit position and faces a US tax rate of 35 percent, each dollar that it is able to reclassify as foreign rather than domestic source will result in savings of \$0.35. The rules thus provide an incentive for US excess credit multinationals to export rather than produce abroad.

While the US Treasury issues periodic reports on FSCs, little academic literature has investigated the export incentives hidden in corporate tax codes. An early exception is Horst and Pugel (1977). One recent study is Rousslang and Tokarick (1994), who use a general equilibrium model to examine the consequences of the tax-based export incentives. They find that the tax provisions increase the volume of trade but that domestic welfare is worsened because the terms of trade are worsened for the US.

Apart from export incentives, a second set of tax subsidies arise because of developing countries' efforts to attract multinational investment. Many developing countries give multinationals 'tax holidays'. During periods of tax holiday, multinationals may pay no taxes or, at a minimum, lower taxes than would otherwise be due. Such tax breaks only provide incentives for multinationals to invest in the developing country if the multinational's home country taxes on a source basis. For countries that tax on a worldwide basis, tax holidays provide no incentive to locate in the developing country since the income of the multinational will be taxed at the home country rate. Recognizing this, some countries (for example, Germany and Japan) that tax on a worldwide basis allow their multinationals credit for such tax holidays; that is, they allow credit for taxes that have not actually been paid. This is often referred to as 'tax sparing'. Tax sparing provisions are often written into tax treaties between a developed and a developing country.

Although most countries grant tax sparing in treaties with many developing countries, the US does not. However, the US has had a set of rules (contained in Section 936 of the US Internal Revenue Code) that provide tax subsidies for corporations that locate in US Possessions (the primary beneficiary being Puerto Rico). In part, Section 936 allows tax sparing, and since Puerto Rico

offers tax holidays, US multinationals received tax credits for taxes that were not actually paid to Puerto Rico. The 936 rules were tightened in 1993, however, through a limitation on the allowable tax credit. Further, 1996 legislation began a phase out of Section 936. It is scheduled to be eliminated completely by 2005. While the US Treasury provides periodic reports on the tax treatment of Possessions' corporations, the academic literature on the effect of Section 936 is sparse. One older study is that of Bond (1981). Grubert and Slemrod (1994) provide a more recent study of the effect of Section 936 in Puerto Rico. Grubert and Slemrod's findings suggest that firms with high levels of intangible assets (for example, drug companies) located in Puerto Rico because it was relatively easy, through transfer pricing, to shift profits to Puerto Rico. The profits thus shifted gained the tax advantage provided by Section 936.

4. Issues in International Indirect Taxation

The destination and origin principles for indirect taxation are analogous to the source and resident principles for direct taxation. The difference between the destination and origin principles is that the destination principle imposes tax where consumption takes place whereas the origin principle imposes tax where production takes place. As with source taxation, one might argue that the origin principle distorts the location of production. As with resident taxation, one might argue that the destination principle causes distortions in relative savings decisions across countries.

Despite the analogy of the destination and origin principles for indirect taxation and the source and resident principles for direct taxation, and our previous discussion of the efficiency differences of the source and resident principles for direct taxation, much has been made of the fact that the destination and origin principles of indirect taxation are, under certain conditions, equivalent. This is noted in Cnossen and Shoup (1987) and demonstrated formally in Lockwood, de Meza and Myles (1994a). The equivalence comes from the fact that balanced trade implies that aggregate production and aggregate consumption are the same. Consequently, a destination based tax (on aggregate consumption) and an origin-based tax (on aggregate production) are equivalent.

However, this result requires some very strong assumptions, and there are several models, outlined in Keen and Smith (1996), in which the equivalence result fails to hold. One such model is an overlapping generations model of Bovenberg (1994) in which the two principles can have different intergenerational effects. A second situation in which equivalence fails is when countries do not tax all commodities at a uniform rate. See Sinn (1990) and Feldstein and Krugman (1990).

Assuming that the equivalence result does not hold brings us back to our discussion concerning efficiency for direct taxation and the trade-off between production efficiency and exchange efficiency. Again appeal might be made to the Diamond and Mirrlees (1971) result that the optimal commodity tax system is characterized by production efficiency, which would suggest a preference for the destination principle. However, the Diamond-Mirrlees framework is one of perfect competition and 100 percent taxation of pure profits. Some interesting new work relaxes some of these assumptions and indicates some scope for origin taxation in an optimal tax system. For instance, Keen and Lahiri (1996) consider a model of Cournot duopolists. As noted in Keen and Smith (1996), part of the difference in this type of setting is that, unlike the Diamond-Mirrlees framework, it is recognized that countries have their own distinct revenue constraints. Again, the relevance of the fiscal federalism literature, which studies the relationship between jurisdictions with distinct revenue constraints, is evident. A somewhat different tact would be to investigate models of illegal activity. For instance, there may be an incentive under destination taxes to bypass legal rules and smuggle goods from low-tax/low-enforcement countries to countries with high and well enforced consumption taxes.

Much of the recent interest in these issues has arisen because of the elimination of controls on the movement of both capital and labor in the European Union. (But see also Grubert and Newlon, 1995 for an examination of recent proposals in the US to replace the income tax with a consumption tax.) European countries typically raise a substantial portion of revenue through value-added taxes (VATs). As these countries eliminate controls on the movement of both capital and labor, there is increasing concern about the possibility of cross-border shopping that could result from VAT systems that have different tax rates applied to the same products. A good review of some of the early concerns can be found in Cnossen and Shoup (1987) and Lee, Pearson and Smith (1988); a more recent treatment is that of Keen and Smith (1996). The issues here are whether consumers would engage in cross-border shopping to avoid high taxes, whether competition would force these taxes to some common rate, and the welfare impacts of these possibilities. These issues are directly related to the tax competition literature mentioned earlier, and some papers mentioned there (for example, Mintz and Tulkens, 1986; Kanbur and Keen, 1993) explicitly address tax competition for indirect rather than direct taxes.

One practical set of issues for the European Union's concerns how countries can best make 'border adjustments', that is, the rebate of VAT on export and its imposition on import. The required tax adjustments have been made at the border and, hence, the term border adjustments. Cnossen (1983) has proposed that a 'clearinghouse' be set up to handle border adjustments. Under the clearinghouse proposal, a country would, in the aggregate, either be net owners or receivers of VAT revenue depending on their trade balance and VAT rates.

The function of the clearinghouse would be to determine the net position of each country rather than have countries give or receive VAT on a transaction by transaction basis. The European Commission has considered this proposal, but has not been able to come to agreement. Instead, they moved in 1993 to a transitional system. This system has eliminated border adjustments for consumer purchases for personal use (so that personal consumption purchases are now taxed on the origin principle), although border adjustments are still made for transactions between firms.

Keen and Smith (1996) point out a number of problems with the transitional system, and propose an alternative, which they call a Viable Integrated VAT (VIVAT). They compare the VIVAT to the transitional system as well as other systems (including a clearinghouse mechanism), and suggest that the VIVAT is superior. VIVAT, as described by them, is a combination of harmonized VAT rates and different retail sales tax rates. Their proposal combines the origin and destination principles, and offers the advantage of national autonomy in setting taxes (emphasized in the fiscal federalism literature) with the self-policing advantages often ascribed to VAT.

5. Some Suggestions for Future Research

To date, work on the efficiency effects of various methods of international taxation have assumed a first-best world. The complexity and many distortions present in the international arena suggest that work that considers a world with distortions other than those caused by the international tax regime would be useful.

The administration of international taxes has received relatively little attention. Careful examination of the administrative provisions of tax treaties might provide a useful base for thinking about administrative issues. Application of the arm's length standard often involves very high transaction costs. Tax agencies experiences with Advanced Pricing Agreements might provide some guidance for alternative systems. It would be important to estimate and compare both the efficiency and transactions costs of the arm's length standard and other proposed systems.

To date most work on international taxation has considered only efficiency effects. Interesting new insights might be obtained by examining equity and public choice considerations. In this context examinations of tax sparing provision might be interesting. Comparisons of the US that does not have tax sparing provisions (except with Possessions) with European countries and Japan that have tax sparing provisions with many developing countries could be revealing.

Increases in the flow of financial services and the opening of telecommunication markets raise important new issues regarding the way in which international tax and regulatory regimes interact. While research that introduces regulations as well as taxation would be difficult, such work could provide important new insights.

Trade blocks have become increasingly important and, yet, we have no work that tells us the implication of such blocks for international taxation. Close examination of the development of the tax systems of the European Union as the Union becomes more closely integrated would be valuable. Work that considers both the implications of changes for the Union, and for other countries and trading blocks would be informative.

To date the literatures on foreign investment and international taxation have been largely distinct. Integration of insights from the two literatures would enhance our understanding of the way in which multinational corporations operate.

Models used to discern the effects of international taxes have generally assumed perfect information and abstracted from risk. Such assumptions do not well characterize the international arena. Relaxation of these assumptions would be fruitful.

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