

TAX CREDITS, SOURCE RULES, TRADE AND
ELECTRONIC COMMERCE: BEHAVIORAL MARGINS
AND THE DESIGN OF INTERNATIONAL TAX
SYSTEMS

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Abstract

The paper provides a framework for designing international tax rules by outlining the various behavioral margins they apply to. It then goes on to analyze three specific policy issues in terms of preserving the neutrality of choices along the relevant margins: (1) Which foreign taxes should be credited against home country tax liabilities? (2) Should the income from intangible assets like patents be taxed by the host country or the country in which it was developed? (3) Should the local sales by a foreign company determine the income tax imposed by the consuming country? Should the rules be changed because of electronic commerce? The analysis shows that the current foreign tax credit rules lack any coherent basis, either in terms of efficiency or fairness. For example, a tax on gross assets should be creditable, as well as a tax on gross income that does not allow deductions for interest. The income from intangible assets like patents should be sourced in the country in which the intangible asset was developed and be subject to its tax rate. That preserves the undistorted choice among alternative locations for exploiting an intangible. The analysis of the relationship between income taxes and trade taxes shows that in extreme cases a tax on imports may be justified to offset the distorting effect of income taxes. But electronic commerce is unlikely to create such a case. It is like any other technical change that lowers transactions costs.

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Several components of the system for taxing cross border income seem to lack a coherent conceptual basis. For example, which host country taxes should be creditable against U.S. income tax liabilities? The basic requirement in the current rules seems to be that the foreign tax ‘look’ like the U.S. net income tax, but, as we will see, this does not seem to accomplish any reasonable policy objective, be it ‘fairness’ to comparable taxpayers, investment efficiency or a ‘fair’ division of tax revenues with foreign governments. Source rules, which govern a host government’s ability to tax a given component of income, also suffer from a similar lack of conceptual clarity. This is particularly true in the case of income from intangibles like patents, where host countries claim the right to extract rents derived from operations within their jurisdictions. But this seems inconsistent with the taxation of intangibles embodied in imports, which is another way of exploiting the intangible asset in that market.

This reference to imports brings us to another issue that has recently surfaced, namely the extent to which a foreign company’s local sales, even if simply through imports, should enter into a determination of its income tax liabilities to the host country. The relevance of local sales has recently been suggested by some authorities on international taxation. (See for example Graetz (2001) and McLure (2000a)). McLure has, for example, proposed that the growth of electronic commerce justifies a host country tax even if the foreign company has no local operations. The reason is that electronic commerce makes it unnecessary for the company to have a local selling operation, which allegedly shrinks the local income tax base. But this tax on sales sounds suspiciously like a tariff. It is therefore necessary to clarify the relationship between trade taxes and income taxes.

This paper offers a framework that allows us to sort through these conundrums. To put these questions in a broader analytical context, it first describes the array of behavioral margins that international tax rules have to be addressed to, including the

choice of where to invest tangible and intangible capital, the choice between production at home or abroad, the choice between arms' length transactions or transactions with related parties, etc. The list of behavioral margins also includes government reactions because they should not have a disincentive to adopt measures that promote worldwide efficiency.

One reason for reviewing the comprehensive list of behavioral margins that international tax provisions are directed to is that certain policy instruments are appropriately matched with specific margins or groups of margins. One instrument cannot be expected to solve all distortions but, at least in terms of economic efficiency, it should be judged on how well it deals with the behavior it is assigned to. It must be regarded as part of a comprehensive system in which other instruments are directed at other margins.

Using the three policy issues mentioned at the beginning as examples, the source rule for intangible assets is relevant for the choice of where to locate an intangible asset like a patent, including the choice between exporting a good embodying the intangible asset or licensing its production abroad. The home country's decision on which foreign taxes to credit affects the location of *tangible* capital like machines. Whether the local sales of a foreign company should be taxed affects the choice between domestic and foreign produced goods and also the location of investment.

Similarly, the transfer pricing/income division rules, whether in the form of separate accounts or formula apportionment, directly influence the choice between arms' length and related party transactions. No other instrument is designed to preserve neutrality along this margin. Distorting the choice between arms' length and related party transactions can also distort the export decision and result in the establishment (or liquidation) of subsidiaries and mergers (or splits) between domestic and foreign firms. Any evaluation of a particular set of rules must start with departures from neutrality along this transactions margin and its consequences, although there seems to have been some confusion about this in the literature.¹ (Any policy choice, such as a particular method of

¹ Mintz and Weiner (2003), for example, judge the efficiency of allocation systems in terms of whether the allocation of capital between jurisdictions serves to "to maximize total output" This loads too much onto the income division rules which should not receive credit for offsetting distortions along margins that can be better addressed by other instruments. Mintz and Weiner cite with approval Musgrave's (2000) claim

income allocation, will also have an effect on the compliance-tax planning margin, and might induce taxpayers to expend real resources on tax minimization, but this is part of the evaluation of how much behavior along these margins can be distorted.)

Casting the analysis in terms of behavioral margins is also useful because policy judgments depend on the degree of substitution along them. Efficiency would require that activities, goods or services that are close substitutes should have comparable tax burdens. But as we shall see in the analysis of trade and income taxes, substitutability along *several* margins may be relevant for a particular policy choice. For example, the significance of high substitutability between imported and domestic production depends on how easily labor and capital can flow from one to the other. Simply put, both demand and supply considerations apply.

There seems to be evidence that because of globalization and electronic commerce geographical proximity is becoming less important as a determinant of the substitutability of various products and how easily resources can flow among them. For example, Altshuler, Grubert and Newlon (2001) find that U.S. manufacturing investment has become more sensitive to tax differentials. Conceivably, it might be as easy for capital to flow from a domestic sector to a competing one abroad as it is for it to flow from one domestic sector to another. One of the questions the last section will address is whether this requires a change in the rules governing taxes on income and trade.

After presenting this general framework, the paper then goes on the specific policy issues introduced above. It first looks at the home country's crediting policy and evaluates the 'reaching net gain' requirement in the current foreign tax credit rules in terms of investment efficiency, fairness, and the incentives offered to foreign governments to claim a larger share of revenue. A simple model is presented to explore the implications of the investment efficiency objective. The final section goes on to the design of internationally recognized rules that govern the taxation of cross-border income. In particular, what type of income should the host country have a right to tax? Answering this question involves an examination of the conceptual basis for source rules and the relationship between income taxes and trade taxes such as tariffs. It then

that there is no conceptual basis for dividing income between jurisdictions. This seems to overlook the related-unrelated transactions decision as the obvious basis for an efficiency analysis.

discusses the impact of income taxes on trade patterns and whether a tariff is ever justified as a ‘second best’ policy to offset the trade distorting effect of an income tax.

The analysis of foreign tax crediting policy indicates that the current U.S. rules lack a consistent conceptual basis, either in terms of efficiency or fairness. The requirement that the foreign tax rate should closely resemble the U.S. *net* income tax is overly restrictive. For example, a tax on gross assets should be creditable, and also a tax on gross income that does not permit deductions for interest. Furthermore, allowing credits for these types of taxes would not necessarily encourage host countries to extract a larger share of tax revenue.

The analysis of trade taxes and income taxes shows that it is generally appropriate to tax a foreign company’s local operations but not its sales from offshore. In some extreme cases combining highly capital intensive operations, portfolio capital mobility, and virtually perfect substitutability between foreign and domestic products, a tax on imports may be justified to offset the distorting effect of an income tax. But since all three elements are required, electronic commerce does not by itself seem to provide many candidates for this kind of intervention.

Finally, the income from intangible assets like patents and trademarks should be taxed by the jurisdiction in which they were developed. This preserves undistorted choices along several decision margins including the choice between exporting or producing abroad to exploit an intangible and the choice among alternative foreign locations for production.

1. The Behavioral Margins and Their Importance

Designing the components of an international tax system requires that a number of behavioral margins must be considered. Efficiency considerations would require that tax rules should cause the least distortions of private and government behavior. The particular margins that are relevant will depend on the set of policy options at issue. A policy issue, such as the source rule for intangible income, may however affect several different margins and the policy chosen may depend on how easily firms or individuals can switch among alternatives along one margin compared to another. Note that

government behavior is also included because an international tax system should not discourage home and host governments from taking actions that promote worldwide efficiency. The various margins include:

- (a) Consumers' choice between foreign products and domestic products. This margin is in part governed by WTO rules on tariffs and subsidies, but we will here discuss how income taxes can cause a trade distortion.
- (b) Consumers' choice between the local production of domestic companies and the local production of foreign-controlled companies.
- (c) Companies' choice between exporting a good or service and producing the good or service in a foreign location.
- (d) Companies' choice between exploiting the intangible asset themselves abroad, through a subsidiary, or licensing it to unrelated foreign parties.
- (e) Given that the company has decided on a foreign subsidiary to exploit an intangible asset, the decision on which country it should be in.
- (f) Companies' decision on how much tangible capital to invest in each location.
- (g) The decisions by companies on how much to spend on R&D and other ways of developing intangible assets. Furthermore companies have the choice between targeting R&D to either the domestic or to foreign markets to the extent that local preferences differ.
- (h) Portfolio investors' choice between buying shares in foreign and domestic companies.
- (i) The choice among the alternative ways of financing a foreign investment, including leasing and loans to investors abroad.
- (j) Companies' decisions on how much to spend on compliance and tax planning. Some systems may provide greater opportunities for tax planning.
- (k) Host governments' decision on how much to spend on the enforcement of the rule of law, including the protection of intellectual property, and also on other productivity enhancing public investments.
- (l) Other governments' reaction to a particular policy choice. This is, for example, important in the home government's decision to grant a credit for foreign taxes

paid because it may induce host governments to raise their tax rates on home-country based multinational corporations (MNCs). While this reaction would not generally fall under an efficiency rubric, governments should not be penalized when choosing to promote worldwide efficiency. It is similar in concept to the previous item on encouraging host government to undertake efficiency enhancing activities.

These choices are of course not all independent of each other. For example, (d) and (e) are clearly related. A company's choice between licensing unrelated parties and licensing subsidiaries depends on whether it can find a desirable low-tax location for locating its subsidiary. But they are listed separately because there is not a complete overlap in the relevant policy instruments. The source rule for intangible income would be less relevant for the related-unrelated party choice because either alternative would yield royalties.

Without being exhaustive, we can give examples of how each decision margin is matched with its relevant policy instruments. Item (a), the choice between foreign and domestic goods is affected (distorted) by trade tariffs and subsidies, and as we will see, in some cases by the tax on corporate income. Item (b) is controlled by the relative tax burdens on domestic and foreign-controlled local production. Several policies bear on decision margin (c), the choice between exporting or foreign production, including foreign and domestic tax rates, the transfer pricing system and the foreign tax crediting rules. The transfer pricing rules determine the choice between related and unrelated transactions in item (d). These transfer pricing rules, and how they apply to intangible income, also enter into the next margin, the location of intangible assets. Host country withholding taxes and the home country foreign tax credit rules may also be relevant. The location of tangible capital will depend on country tax rates and the foreign tax credit rules. Investment in R&D depends on how royalties are taxed in addition to domestic provisions such as credits for R&D. Portfolio investors' choice between domestic and foreign shares (item (h)) is affected by withholding taxes, resident country crediting rules, and provisions for the integration of personal and corporate taxes, which frequently deny benefits to foreign shares.

It might be claimed that policy choices should be based on ‘fairness’ in addition to efficiency. To the extent that fairness means horizontal equal treatment of comparable taxpayers, the discussion of crediting policy shows that this tends to lead to the same conclusions as the efficiency criterion. If ‘fairness’ means a concern for inequality among countries or individuals, it is not generally accepted as a legitimate reason for permanent distortions of *trade* such as tariffs, quotas, and export subsidies. Otherwise an importing country might, for example, claim that tariffs are necessary to protect unskilled workers or preserve a revenue base. This rule for trade policy should carry over to international income tax policy because trade and cross-border investment are frequently alternatives ways for supplying a given market.

With this introduction, we will now proceed to review the policy issues referred to at the beginning and see how the behavioral margin(s) that they are linked with can be used as a guide to policy.

2. Which Foreign Taxes Should be Credited Against U.S. Income Liabilities?

The United States, like many other countries such as Japan and the United Kingdom, taxes repatriated foreign income and grants a credit for foreign income taxes paid. Section 901 in the Internal Revenue Code specifies that the credit allowed, subject to the limitation in Section 904 that restricts it to no more than the tentative U.S. tax on the income, is “the amount of any income, war profits and excess profits taxes paid or accrued during the taxable year to any foreign country or any possession of the United States”. Over the years there have been a number of disputes about the foreign taxes that should qualify under this provision. This section attempts to provide a simple conceptual framework for deciding which foreign taxes should be creditable, with particular emphasis on business-level taxes such as the corporate income tax. It shows that not only are there shortcomings in the current regulations, but also that the statute itself may have to be revised to fulfill the goals of a credit system.

The paper by McLure and Zodrow (1998) is one of the few in the Economics literature that has attempted to evaluate the current regulations. Their primary focus was

on the creditability of a corporate cash flow tax (CFT) that Bolivia was then considering, but they did cover some of the issues we discuss. This paper attempts to take a more comprehensive look at the issue and considers a wider range of taxes, such as taxes on total capital and income taxes that do not allow interest expense to be deducted. Furthermore, our analysis of CFTs differs somewhat from theirs.

The current regulations specify that a foreign tax is creditable only if its ‘predominant character is that of an income tax in the U.S. sense’. For this to be true it is necessary that ‘the foreign tax is likely to reach net gain in the normal circumstances in which it applies’. This ‘net gain’ requirement is met ‘if and only if’ it satisfies the ‘realization, gross receipts, and net income requirements set forth...’ Accordingly, the tax must be based on ‘realization events’ similar to those that trigger a tax under the income tax provisions of the Internal Revenue Code. The tax must be imposed on the basis of gross receipts or ‘gross receipts computed under a method that is likely to produce an amount that is not greater than fair market value’. The tax satisfies the net income requirement ‘if the base of the tax is computed by reducing gross receipts to permit recovery of the significant costs and expenses (including significant capital expenditures) attributable, under reasonable principles, to such gross receipts...’.

But it is not clear what these formal requirements are intended to achieve. Why is the “reaching of net gain” a basic principle in the U.S. regulations? Is it that the risk sharing by the government in a net income tax, in which the tax is only due if the investment is successful and yields a net return, is a critical feature that has to be replicated by the foreign tax?² As discussed below, there are three possible considerations in judging the creditability of a tax, the efficient worldwide allocation of U.S. capital, the ‘fair’ treatment of comparable taxpayers, and the effect on the foreign government’s taxing behavior. We will see that insisting on risk sharing by the host government does not serve any useful purpose under either criterion. The difficult conceptual issues that arise in crediting, such as distinguishing between taxes on capital and taxes on land and other natural resources, pertain to net income taxes as well as those that may not reach net gain.

² Any credit must of course be taken against a U.S. *income tax* liability. The taxpayer therefore has to have positive foreign income, either on a per-country or overall basis depending on the crediting system.

Section 903 *does* allow the crediting of a tax that does not meet the requirements for a net income tax if it is imposed ‘*in lieu of*’ a proper income tax. But it must be ‘a tax imposed in substitution for, and not in addition to, an income tax or series of income taxes otherwise generally imposed’. For example, payments to nonresidents such as dividends and interest are frequently taxed on a gross basis because of the administrative problems of determining the taxpayer’s net income. U.S. taxpayers have often been able to use these exceptions to the net income tax requirements. But this *in lieu of* exception is only available if the tax in question is a substitute for the general ‘pure’ net income tax.

It is therefore necessary, first, to consider what objectives the tax credit system should serve. Why offer relief for the potential ‘double tax’ by granting a credit? One possible objective is to preserve the neutral choice between an investment in alternative locations, one of the behavioral margins listed earlier. World output is maximized investment with the highest *pre-tax* return is chosen. This, of course consistent with the doctrine of ‘capital export neutrality’, (CEN), but that does not mean that we are expressing a preference for CEN over ‘capital import neutrality’ (CIN).³ It is unnecessary to enter into this doctrinal dispute for our present purposes, but simply to accept the implications of the choice of a worldwide system. A country that prefers CIN as a basis for international taxation would not tax on a worldwide basis as the United States does. It is even unnecessary to consider the merits of the ‘deferral of tax on unrepatriated income’ within a worldwide system because the crediting issue only arises for repatriated income. (McLure and Zodrow (1998) adopt the CEN criterion.)

For the purpose of the analysis, it might be convenient to assume that the foreign ‘tax burden’, *however determined*, is equal to the U.S. rate. It would therefore be unnecessary for the company to defer repatriation as long as a credit is given for the foreign tax. Under this assumption of equal tax burdens, the goal of allocative efficiency does not require that the strict conditions for CEN to be valid necessarily apply. One condition is that U.S. shareholders can only invest in U.S. companies and are the companies’ only source of capital. An alternative assumption might be that U.S. and foreign companies

³ Under Capital Import Neutrality, there is no residual home country tax on foreign income. The company only pays the host country tax and the crediting issue never arises.

have access to the same worldwide pool of shareholder capital and are bidding for the same investment.⁴ The issue then is the crediting system that would put the companies on an equal footing.

As noted in the introduction, ‘fairness’ might be put forward as a conceptual basis for foreign tax credits as an alternative to allocative efficiency. It might be ‘unfair’ for a taxpayer to pay a ‘double tax’ while a comparable taxpayer with domestic income pays only the single tax. But ‘fairness’ as a concept is not very useful in distinguishing between different types of taxes. Under the fairness criterion, the creditability of a tax would depend on its effect on after-tax income, which would require an investigation of the tax’s ultimate incidence. (As we will see, if the efficiency criterion is used the issue is the increase in tax resulting from an increase in investment purely from the investor’s point of view without regard to any ultimate incidence.) The ultimate incidence of a tax is very difficult to determine, and further it may vary by location. It might lead one to conclude that a tax is creditable in one country but the identical tax is not creditable in another. Taxes on wages might also be judged to be creditable because they may lower after-tax returns to investment.

In any case, ‘fairness’ cannot be used to justify important features of the current regulations such as the ‘reaching net gain’ requirement. It might appear that a foreign tax based on net income has one desirable feature from a fairness perspective---it is based on *ex post* realized income.⁵ (This risk sharing by the government also affects investment allocations because it is risk-adjusted expected after-tax returns that determine company decisions.) But why should the company be penalized because the host government refuses to share risk? A tax on the stock of capital is an example of a tax in which the host government does not share risk; it can reduce after-tax incomes in all *ex post* realizations, favorable or not. But that just means that the tax is more burdensome to the company for any given level of expected revenue. Furthermore, as discussed below, allowing a credit for this tax does not induce the host government to increase its share of tax revenue any more than crediting a net income tax does. Summing up, this paper does

⁴ Grubert and Mutti (1995) consider the case of perfect portfolio mobility. They show that CEN is optimal only under special conditions.

⁵ The significance of the government risk sharing aspect of a net income tax is discussed in greater detail below.

not emphasize the ‘fairness’ standard because it offers neither a solution to the creditability conundrum nor a justification for the current system. Nevertheless many of the objections to the current system under the efficiency criterion also hold for the fairness criterion.

To be sure, worldwide efficiency of private decision-making, or fairness to equivalent taxpayers, cannot be the *only* considerations. The division of tax revenues between the home and host governments, which has been alluded to, must also be considered. A tax credit system should not give foreign governments an incentive to raise their tax rate and simply transfer revenue from the home country Treasury. Otherwise, home countries would be reluctant to adopt a system that is consistent with worldwide efficiency. That is the motivation for the foreign tax credit limitation, which prevents foreign taxes from being credited against taxes on U.S. *domestic* income. In the present context, it obviously means that a ‘soak-up’ tax, i.e., a tax that is only imposed if the home country grants a credit, should not be creditable. This is recognized in the current U.S. regulations, and in our discussion of foreign taxes we will assume that none are of the soak-up variety.

But there may be other features of a crediting system that affect foreign government behavior beyond the cliff at the foreign tax credit limitation. Accordingly, taxes that are rejected by the net income requirements in the current regime will be examined to see if they provide host governments any greater incentives to raid the U.S. Treasury than a pure net income tax. In addition, some of the features of the current rules, such as the limitations on credits for taxes paid on ‘foreign mineral income’, will be considered to see if they can be justified as discouraging rent extraction by host governments. In general, the home government has to balance two goals, worldwide efficiency (or fairness) on the one hand and revenue on the other. The clear incentive for the host government to raise its taxes if there is an unlimited foreign tax credit outweighs any small sacrifice in efficiency that the limitation may entail.⁶ But there may be cases almost as extreme where the host government has a strong incentive to extract revenue.

⁶ It is of course possible to contemplate alternatives to the present foreign tax credit limitation cliff. For example, a more general form would a credit disqualification rate that rises with the foreign tax rate and reaches 100 percent at the U.S. rate.

Another conceptual issue, already mentioned above, is whether the creditability of a tax should depend on its ultimate incidence if the efficiency criterion is chosen. What if, for example, in a small open economy, the burden of the local corporate income tax falls on labor because capital is highly mobile? Conversely, what if a wage tax falls on capital because the supply of labor happens to be very elastic? Should the corporate income tax not be creditable in the first case while the labor tax *is* creditable in the second case? The discussion below shows that the question of ultimate incidence is generally an irrelevant consideration under the efficient allocation of capital criterion. What matters is the direct (partial) increase in capital income, and the tax thereon, when the company increases its investment in a location, *holding existing factor prices constant*, because that is what the typical company will assume in making its investment decision.

Consider, for example, the case of a foreign tax on corporate income in which pre-tax returns may rise to fully offset the tax because local capital is very mobile and can escape. But that just means that plant and equipment is very productive abroad on the margin. In order for U.S. capital to be allocated most efficiently, the prospective U.S. investor should be able to compare actual pre-tax returns at home and abroad that already reflect any change in factor prices that has occurred.

As mentioned earlier, McLure and Zodrow (1998) addressed the creditability of the corporate-level cash flow consumption tax that Bolivia was then considering. Grubert and Newlon (1995) also provided a brief discussion of credits for consumption taxes and stressed the distinction between origin and destination based taxes. In the case of destination taxes, it is clear that no credit should be given because there is *no* tax, even on infra-marginal rents. The rebate of the tax on exports means that foreign investors can take out all of their real returns tax-free. The proposed Bolivian tax was in fact origin based, so McLure and Zodrow (1998) argued that the burden of the tax on infra-marginal rents justified a credit.

The analysis below departs somewhat from McLure and Zodrow and points to the importance of distinguishing between locational and mobile rents in this context. Locational rents are those arising from the nature of the particular host country, e.g., from the ability to sell in the local market or hire its skilled labor. In contrast, mobile rents derive from an intangible asset like a patent that can be exploited in many alternative

locations while the resulting products can be sold on the worldwide market. The role of taxes in the company's investment decision will differ in the two cases because there are differing opportunities for earning the rents in an alternative location. As explained below, this distinction leads to the conclusion that not granting a credit to the proposed Bolivian tax probably would *not* have distorted investment choices.⁷

This section now proceeds with a simple model of the multinational company's investment decision. The conceptual framework will be used to analyze various types of taxes that present crediting issues. In the analysis of any particular tax, there are two questions. First, should it be creditable? Second, if it is potentially creditable, how much of the tax can be credited. For example, if a tax on gross assets is found to be creditable at least in part, should the credit be limited to the portion of the tax that applies to company net equity after deducting debt on the grounds that the U.S. corporate tax is a tax on net equity income?

Basic Economics

The issue is the credit policy that will preserve neutrality in the company's choice of production locations. For example, it could be the choice between two foreign locations with differing tax systems. We assume that the U.S. company in a given location abroad produces output Q using tangible capital K , W workers paid a wage rate w , and natural resources including land, N , paid a rent or royalty rate of n .

The company has a total revenue function $R(Q)$ which may reflect some market power because of an existing intangible asset and need not simply be pQ where p is the competitive market price. Q is in turn a function of K . The tangible capital K is financed with a mix of parent equity and debt in fixed proportions. The constant debt-asset ratio is L . (A fixed debt-asset ratio is assumed for simplicity and reflects rising bankruptcy costs as leverage increases.) The interest cost of debt is i and r is the required after-corporate-tax return that has to be paid to equity investors.

⁷ McLure and Zodrow (1998) also address the deductibility of interest issue, largely in the context of the cash flow consumption tax.

Pre-tax equity income is subject to the U.S. corporate income tax, at a rate t_{US} , net of any credits for foreign tax. (We assume no deferral of U.S. tax on income retained abroad because the crediting issue only arises for repatriated taxable income.) The total foreign tax is T_F , and at this stage we do not specify what it depends on because this framework can be used to analyze a variety of taxes. T_F can include net income taxes, taxes on wages and other inputs, taxes on gross assets, taxes on value added, etc. Finally, the United States grants a credit for T_F at a rate c .

Accordingly, the company's net economic profits after paying lenders and equity investors as well as the two governments are:

$$R(Q) - wW - nN - t_{US}(R(Q) - wW - nN - iLK) - T_F + cT_F - r(1-L)K - iLK$$

The U.S. company abroad will choose K , W and N in order to maximize net profits. We focus on the investment decision while assuming that W and N are chosen optimally. Maximizing net profits with respect to K yields:

$$R^K = \{r(1-L) + i(1-t_{US})L + T_F^K - cT_F^K\} / (1-t_{US})$$

where the superscript K on a variable refers to its partial derivative with respect to K . In addition, there is a total profits condition requiring that total economic profits have to be nonnegative or the company will not choose to invest at all. Similarly, if the company is choosing between two mutually exclusive locations, it will select the one with the highest *total* net profits at its optimal level of K . But first we examine the implications of the marginal condition before going on to look at the further implications of the total profit condition.

Under the efficient allocation of investment criterion, a credit system should make the tax in any foreign location depend *only* on the U.S. rate so that the company is indifferent between two equally productive locations. That simply means that the credit rate c for T_F^K should be equal to one. That would leave the cost of capital on the foreign investment equal to $iL + r(1-L)r / (1-t_{US})$ which is the domestic U.S. cost of capital. *Any increase in foreign tax associated with an increase in investment should be credited.*⁸ These credits should of course be subject to the foreign tax credit limitation that applies

⁸ The case of 'special industry taxes', such as higher taxes on petroleum income, will be discussed below.

to all creditable taxes and is designed to prevent foreign governments from taxing U.S. domestic income. At this stage, we assume that a full credit for T_F^K will not create any excess credits.

Before proceeding to consider the implications of the simple condition above for specific types of taxes, we can make some more general observations. First, we should clarify what is potentially included in T_F^K . It does not include taxes on labor or any inputs other than tangible and intangible capital. It is true that as the company makes a marginal increase in its capital stock it may also hire more labor. But in the above marginal profit condition, only the *partial* derivative of revenue and costs with respect to K are relevant. When capital increases on the margin, the changes in net profits associated with inputs other than capital are all zero *assuming that these inputs have been chosen optimally to start with*. (This is just the envelope theorem.) T_F^K , therefore, only includes taxes directly associated with an increase in gross or net income as a result of extra K *and* the tax on the increase in K itself.

One might wonder why we have not paid any attention to the marginal conditions for inputs other than capital. Does the foreign tax on wages not affect the cost of labor abroad? Yes, possibly, but that is irrelevant for the question at issue. It is the efficient worldwide allocation of *mobile* capital that is at issue. If labor happens to be mobile, that might raise separate questions on how it should be taxed or subsidized apart from how corporate level capital income is taxed. A labor tax may also affect the return to capital because it may increase real wages, but this brings us to the relevance of the ultimate incidence of a tax.

The Ultimate Incidence of the Tax

The marginal condition for company investment shows that the ultimate incidence of the foreign tax is irrelevant under the allocative efficiency criterion. Foreign taxes may have an effect on local factor prices and the marginal product of capital. But it is the effect of the U.S. company's *own* investment decision on worldwide efficiency that is relevant. It is presumably too small to have any effect on country factor prices such as wages by itself. Even if the foreign tax causes the company to cut back on its investment and raise its pre-tax return, that return indicates the local productivity of capital on the

margin. Existing market factor prices determine the starting point for the company's decision, which is based on the marginal product of *it own* investment. It is, therefore, the *partial* derivative of revenues and taxes with respect to K, *given the factor prices the company faces*, which tells us what foreign taxes should be credited to promote worldwide efficiency.⁹

This is entirely analogous to the normal efficiency conditions in optimal tax problems. Any tax system can affect factor returns but decisions should always be locally optimal. According to the well known Diamond-Mirlees result there should always be productive efficiency whatever the optimal commodity taxes are. In the present case, for example, a host country corporate tax may raise expected pre-tax rates of return because some of the locally owned capital flows abroad. But that is the expected return relevant for the company when making its socially optimal (from the world's point of view) investment decision.

Different Types of Taxes

The creditability of a 'pure' U.S.-type income tax is immediately clear from the result that all of T_F^K should be credited. In this case T_F is $t_F\pi$, where t_F is the corporate tax rate and π is net corporate profits under U.S. concepts, and T_F^K is $t_F\pi^K$. But the optimizing condition also shows that a variety of other taxes should be creditable to the extent that they contribute to T_F^K .

Asset Taxes

A tax on the *stock* of capital K is one type of tax that should be credited. T_F^K in that case is simply the asset tax rate. A tax on the stock of capital is a tax on capital on the

⁹ Even apart from the foreign tax credit limitation, the home country's crediting policy may effect host country tax rates. Gordon (1992) gives one example of the kind of strategic interaction. But the same possibility holds for pure U.S type income taxes, the creditability of which is not in question.

margin. Note that *all* of the capital tax should be credited, not just the portion attributable to equity. All of the increase in the tax is included in T_F^K .

A general tax on gross assets may of course fall on property such as land or other natural resources. This raises the issue of ultimate incidence of the tax that we have already discussed. The asset tax may be born completely by the initial property owner in the form of a lower price on the property. However, the income that is now taxed under a 'pure' creditable income tax may derive from property, as in the case of real estate investments. *For any type of income there is a type of asset linked to it, including property, intangible assets, plant and equipment, etc.* A generally applicable tax on all gross assets should therefore be as eligible for crediting as the equivalent generally applicable income tax. A conceptual problem *does* arise in the case of a tax on certain specific types of assets like petroleum reserves. But this is similar to the issue of industry specific *net income* taxes, in particular taxes on petroleum extraction and other natural resource income, which are discussed below. It brings the incentives provided to host governments to raise taxes at the expense of the home government back into consideration. In terms purely of productive *efficiency*, the specific industry tax on capital income should be credited because it permits the most efficient user of the property to acquire it.

If an asset tax is creditable, there may be a question as to how the foreign tax credit limitation would work. First, like net income taxes, the asset taxes would be included in the grossed up dividend. Then the asset taxes would be added to income and other creditable taxes for the purpose of the limitation. As in current law, the limitation would be based on the amount of grossed up foreign source *income* because the credit against the tentative U.S. *income* tax is the issue.

Income Taxes in Which Interest is Not Deductible

The condition that all of T_F^K should be credited also implies that an income tax that disallows interest deductions should be credited against U.S. income tax liability. If the tax rate is t_G and G is income before interest deductions, then T_F^K is $t_G G^K$. Furthermore, as in the capital tax, all of the tax should be creditable, not just the portion attributable to

‘true’ net income after deductions for interest. Why should a pure net income tax at a rate of 40 percent be creditable while a tax rate of 10 percent on income before interest deductions is not?

Does that mean that *all* of a sales tax should be creditable? No, because gross sales are the product of inputs in addition to capital such as labor and materials. G above is net of all deductions for these non-capital inputs so that only capital income, irrespective of how it is distributed between interest and equity income, is left. An example of this kind of tax that should be creditable is the Comprehensive Business Income Tax (CBIT), which was one of the integration alternatives presented in the U.S. Treasury’s 1992 report on integration. CBIT is identical to a corporate income tax except that interest is not deductible. (Sales taxes and value added taxes (VATs) are discussed in greater detail below.)

In these taxes on capital that are not pure net income taxes, it is straightforward, at least in a certain world, to translate them into net income taxes with the same marginal effective, i.e. King- Fullerton, tax rates or costs of capital.

Reaching Net Gain and the Government as Risk Sharer in the Income Tax

The evaluation of capital taxes and income taxes that don’t allow the deduction of interest expense brings us back to the ‘reach net gain’ requirement in the current U.S. regulations. Do these taxes lack a fundamental feature of ‘pure’ income taxes, risk sharing by the government? The government collects no tax if the investment turns out to be unprofitable and the tax increases with profitability. Does granting a credit for a tax without this feature violate the criteria for creditability introduced at the beginning of the paper, allocative efficiency (or fairness) and the incentives offered to host governments to extract an ‘unfair’ amount of revenue? Is the foreign government being unfair by insisting on a more stable revenue stream while leaving a more risky stream to the United States?

First, with regard to allocative efficiency, the taxes in question are taxes on capital on the margin. *Ex ante*, the company must expect a positive return. As in the ‘pure’ income tax, the taxes reduce the expected return *ex ante*, when the investment decision is made. In a perfectly certain world, income and other taxes on capital are equivalent from the

company's point of view in its investment decision. They reduce the company's after-tax return on investment on the margin. In other words, the hurdle pre-tax return the company has to earn to offer shareholders the after-tax return they require goes up. In a risky world, the burden on the company of a given level of *expected* tax payments is, if anything, higher for a gross assets tax, or any other tax not tied to net income, because the company has to bear more risk. Compared to an income tax with the same expected revenue, the company has lower after-tax income in the unfavorable states of the world. Even if the tax were creditable, it might not be able to fully credit the tax when it has little or no income and is bound by the foreign tax credit limitation.

It is true that the foreign government might be giving the United States the riskier part of the revenue stream because the Treasury may only collect a residual tax when times are good and profits are high. This would lower the risk-adjusted value of its share. But that is no different from the case in which the host government has a higher net income tax, leaving the United States a smaller share of the revenue. Creditability is not generally rejected on those grounds. Furthermore, if the company earns a premium for incurring greater risk, the U.S. Treasury will share in this premium by collecting a greater expected level of residual taxes after credits.

If a capital tax were creditable, would it encourage the foreign government to claim a larger share of the revenue? Making any tax, including a U.S. style income tax, creditable, encourages the host government to increase its tax rate. The question is whether a gross asset or similar tax creates a greater incentive than a creditable net income tax. To answer this question it is convenient to reintroduce the deferral of tax on unrepatriated income because, otherwise, the host government has no incentive to set a tax below the U.S. rate. Assume the host government enacts a capital tax and it chooses a tax rate designed to attract U.S. companies. In order to have an attractive power as great as a comparable 'pure' income tax, the gross asset tax would have to have *lower* expected revenues because of the additional risk it imposes on the company and its shareholders. As noted above, the company pays a larger share of its income in tax when its income turns out to be depressed, and it is more likely to be bound by the tax credit limitation if it chooses to repatriate in comparison with a net income tax that declines with income. In other words, the host government therefore has less of an incentive to raise its revenue

take at U.S. companies' expense because any increase has a greater discouraging effect on investment. The United States is not disadvantaged if another country chooses a low risk method for taxing resident capital.

Now it is conceivable that a host country would alter its mix of taxes in response to a change in U.S. crediting policy. For example a tax on gross assets may be more administrable and less susceptible to evasion than a net income tax and that it becomes more attractive if the U.S. government makes it creditable. But that does not mean that it will increase overall tax rates. Because of the greater yield because of lower evasion, overall tax rates may decline.

Summing up, the 'reach net gain' requirement in the current regulations serves no useful purpose and seems to be conceptually in error.

The Total Conditions and Infra-Marginal Returns

Up to now, the analysis has focused on the marginal conditions for optimal investment. But the company will also pay attention to its overall or total returns in a country when deciding whether to locate there. In some cases it is necessary to examine the total conditions because the marginal conditions may not be definitive in determining the creditability of the tax. Also, a tax system may offer neutrality for investments on the margin but not for overall, total returns. As discussed below, there is no tax on marginal capital income under a corporate level cash flow consumption tax but there may be a tax on infra-marginal rents. Therefore, it may be that denying a credit based exclusively on the marginal condition results in an inefficient choice of locations. (Presumably, to prevent investment decisions from being distorted by taxes, a credit is justified if it acts to satisfy either the marginal condition or the total condition or both.)

The company will in the first instance require that its overall operation in a location is profitable. It is conceivable that the host government imposes a large fixed tax on entering firms, the creditability of which might affect the company's decision to locate in the jurisdiction. The logic of the argument based on the marginal conditions would suggest that it too should be creditable. The tax paid is conditional on the company locating there.

The potential infra-marginal rents that could be taxed under various bases are of particular interest. (The lump sum tax above presumably falls on infra-marginal rents as well.) What should be the criteria for determining the creditability of the taxes on these infra-marginal rents? To answer this question, it is necessary to look more closely at the source of these rents and their role in the company's investment decision. For this purpose, it is important to distinguish between rents that are locational, which accrue because of some feature of the host country, and rents that are mobile, which reflect the parent company's contribution and could be earned in any alternative location. Rents from the ability to sell a branded product in the local market or employ local skilled labor are examples of the locational type. Rents from a parent-developed patent that can be used to produce goods for a worldwide market are an example of the mobile type.

The company response to a given host-country tax will differ in the two cases. In the case of locational rents, how they are taxed is basically irrelevant for the company's investment decision. It will locate in the jurisdiction as long as it can earn its 'normal' cost of capital on its *tangible* investment. It does not have the option of earning *these* rents in another location. (It might set up in another location and sell the branded product there but that is a separate decision assuming a fixed cost of finance to the company.) The allocation of capital will be efficient even without a credit for the tax on the rent as long as the host government extracts less than 100 percent of it.

That leaves us with mobile rents to consider. If they have been developed by the parent, as a result of its R&D for example, then the parent should be paid a *royalty* to reflect the value of its contribution. Since royalties are normally deductible in the host country, the question as to whether the local tax on these rents should be credited does not arise. (If the host country imposes a withholding tax on the royalty payments, it would be creditable under the current regulations.

A Tax that is the Equivalent of a Royalty on a Natural Resource and Special Industry Taxes

This analysis of locational rents is related to one of the most contentious issues in the 1970s and 1980s, the creditability of special petroleum extraction taxes imposed by some oil producing countries. Some host governments were the effective owners of all oil producing properties and there was the question as to whether petroleum taxes were in fact the equivalent of a rent or royalty that would not be creditable if paid to a private owner. However, even if the government is not the nominal owner of the property it could always extract all of the rent by imposing very high taxes on the industry. The fact of government ownership is therefore not very significant in itself. The issue here is a higher than ‘normal’ tax on extractive industries, whether the government is the owner of the property or not.

In the current U.S. regulations, companies may be classified as ‘dual capacity taxpayers’ because they may be receiving a benefit from the host government, in this case the use of government owned oil producing property. This classification may arise in particular when a higher tax rate applies than the one generally applicable to taxpayers in other industries. Companies who are classified as dual capacity taxpayers can avail themselves of a ‘safe harbor’, in which they are allowed a credit up to the U.S. corporate rate. Otherwise, they have the burden of proving that the tax payment is not in return for any economic benefit provided by the government.

The current regulations also address the case of high host country taxes on natural resource industries. The current regulations limit the potential foreign tax credit on ‘foreign mineral income’ to the amount that would be paid at the U.S. corporate rate. ‘Foreign mineral income’ is defined as the income from the extraction, processing and shipping of minerals including petroleum. How does this rule affect investment? The taxation of the infra-marginal locational rents should have no effect on the company’s choice of location. It will choose to produce in the host country as long as it can earn its after-tax cost of capital on its tangible assets. But the limitation may affect *how much* the company invests in the location because the local tax increases the company’s *marginal*

cost of capital. On any incremental investment, it will have to earn enough to pay the host government and the returns required by shareholders.

The ‘foreign mineral income’ rule may therefore appear to cause an inefficient allocation of capital. But efficiency is not the only consideration. As noted earlier, the incentives provided to foreign governments in imposing taxes on U.S. companies is one of the considerations in judging a crediting system. The home government will balance these revenue concerns with the efficiency considerations. In the case of taxes on extractive industries, the large prospective locational rents reduce the elasticity of investment by foreign companies, increasing the ‘optimal’ tax rate from the host country’s point of view. The ‘foreign mineral income’ rule may therefore be interpreted as discouraging this rent extraction by the host government.

The foreign mineral income rule can also be interpreted as a specific application of a per-country foreign tax credit limitation. Per-country systems are very complicated to implement in general even though they may be conceptually correct.¹⁰ But natural resource industries may be a case in which the complications are worth undertaking because host countries frequently try to extract all the rents from local production.

Consumption Taxes

The first, threshold question in determining whether all or a portion of a business level consumption tax should be considered for crediting is how it treats exports and imports. Is it destination or origin based? A destination principle tax is a pure tax on domestic consumption, and, as discussed in Grubert and Newlon (1995), there is no tax on inbound investment in real terms. One can think of the foreign investor as bringing in real goods that finance the investment. The tax on imports at the border is just offset by the expensing (or credit for the earlier tax) of the investment. Further, any returns on the investment, including infra-marginal rents, are in effect exempt from tax because of the rebate on exports at the border. The investor can buy as many local goods with his investment return as he could in the absence of a tax.

¹⁰ Lyon and Haag (2000) compare per-country and overall systems in terms of allocative efficiency, but they do not consider the reason for instituting a limitation in the first place, i.e., the impact on host government behavior.

But there are consumption or cash flow taxes that, in concept at least, are origin based. The Hall-Rabushka Flat Tax is an example. In origin principle taxes, the inbound investor pays no tax on imports on the way in and gets a deduction for the real investment. But all of the investment return, including infra-marginal rents, will be taxed and there is no rebate on the exports going out. The fact that the origin basis tax falls on infra-marginal returns is the basic justification given by McLure and Zodrow (1998) for making the tax creditable.

But as the discussion of infra-marginal rents above shows, the fact that an origin principle tax falls on infra-marginal rents does not justify a credit. If the rents are locational, whether or not a credit is given will not affect the company's choice of location as long as the host government's tax rate is less than 100 percent. If the rents are mobile, as in the case of a patent that can be used to supply a worldwide market, a royalty should be paid to the parent under normal arms' length principles for the contribution of the intangible asset it developed. The rents would not be taxed in the host country apart from a possible withholding tax on the royalty that would be creditable under the current statute. McLure and Zodrow agree that the 'normal' return is not taxed under the CFT or Flat Tax. Accordingly, not granting a credit for the tax would not seem to distort the allocation of capital.

It is perhaps necessary to qualify this strong conclusion, however. It is conceivable that the parent would share some of its mobile rents with the subsidiary to ensure effective exploitation of the intangible asset. The parent may only receive the full value of its contribution in a world without uncertainty or principal-agent problems. It is also possible that the subsidiary earns rents from its self-developed intangibles, as a result of its own R&D for example. Still, the importance that McLure and Zodrow attach to infra-marginal rents appears to be overstated.

Sales Taxes and Income VATs

An income VAT is like the normal European VAT except that the taxpayer can only deduct economic depreciation on its capital instead of expensing purchases of capital (or getting a full credit). It is therefore the equivalent of a uniform tax on all factor incomes. The government could just as well impose a separate tax on labor income,

capital income, etc. The tax on the capital income component of the total tax should be creditable. It is just a matter of deducting the factor incomes other than capital income.¹¹ (The irrelevance of the nondeductibility of interest has already been discussed earlier.)

A retail sales tax is simply another version of a consumption tax. It is intrinsically a destination based tax because imports are taxed and exports are not. There is no tax on foreign investors, even on infra-marginal rents. No credits should be given.

3. Source Rules, Trade and Income Taxes, and Electronic Commerce¹²

The previous section addressed the home country's rules for the creditability of foreign taxes against the income tax liabilities of its resident individuals and corporations. This section now goes on to discuss the design of other internationally recognized rules for the host and home country taxation of cross-border income. Several unresolved issues in the design of the international system have become more significant because of globalization, the increasing importance of intangible assets and of electronic commerce. One is the source rule for intangible income such as license fees and royalties. In particular, should intangible income be taxed by the country in which the intangible asset is employed or by the country in which the asset was developed? Is the current widely adopted rule sourcing intangible income where the intangible asset is used the 'correct' one? Does it cause intangible assets to be exploited in the most efficient location? More generally, what should be the principles guiding international source rules.

Another issue that has recently arisen is how the host country's tax on a foreign company should be determined. In particular, should the country's tax burden on a foreign company depend at least in part on its sales in the local market even if the company employs no labor or capital within its borders? (This issue is linked to the source of intangible income issue because the products sold in the local market may embody an intangible.) As noted at the beginning of the paper, several very distinguished authorities on international taxation have recently made proposals along these lines. Michael Graetz, in his Tillinghast Lecture (2001), proposed that sales in the United States

¹¹ The issue of origin versus destination basis taxes does not arise in an income VAT. A foreign investor bears a tax on the margin even if the tax is destination based because the initial investment cannot be expensed.

¹² An earlier version of this section appeared in the Australian journal *Economic Analysis and Policy* in September 2003.

should be one of the bases on which foreign companies are taxed. Charles McLure (2000a, 2000b), in his analysis of the impact of electronic commerce on the U.S. tax base, suggested the possibility of new international rules of the game in which host countries tax foreign companies on the basis of ‘entitlement’. The implication was that the foreign company should be taxed on the basis of sales into the local market even if the company had no physical presence here. The justification was that electronic commerce would make it unnecessary to have a local physical presence. These proposals sound suspiciously like a tariff on imports. Is that true, and is the equivalent of a tariff ever appropriate to offset distortions created by income taxes? It is therefore useful to start with a delineation of the relationship between trade and income taxes.

The Difference Between Income Taxes and Trade Taxes

The introduction to this paper listed a number of behavioral margins that might be affected by one feature of the international tax system or another. It noted that policy choices depend on assumptions made about substitution possibilities along certain margins. As an illustration of the assumptions made in current practice, it is useful to consider the straightforward reason that a foreign-controlled operation, using ‘standard’ labor and capital without any involvement of ‘unique’ intangible assets, is taxed by the host country at the same rate as comparable domestic production. Without any unique intangible such as a trademark, foreign controlled production and domestic production can potentially be close substitutes because they both occur in the same location. Consumers regard the respective products as close substitutes and labor and capital can easily flow from one to the other. Furthermore, even if exchange rate or terms of trade risk prevents portfolio capital from being very mobile between countries, this would not apply to alternative owners of production facilities in a given location. Shareholders would regard investments in domestically controlled or foreign controlled owners of the facilities as very close substitutes and require the same *after-tax* return from each.¹³ If foreign based production is not taxed, as is recommended in some small-open-economy models, its cost of capital would be lower. (See, for example, the small open economy

¹³ One simple possibility is that a foreign based leasing company simply leases capital to domestic companies.

model in Gordon (1986).) Because local consumers regard domestic and foreign-controlled products as close substitutes, they would switch to the lower cost alternative and resources would flow to the foreign controlled sector even though domestic firms might be more efficient.

But this case for the taxation of foreign controlled local production raises the question as to how foreign produced goods sold in the local market are taxed. The issue is: why is it all right to tax the local production of a foreign company but not its sales into the local market? Don't domestic companies that compete with foreign production bear the weight of local taxes? Furthermore, don't the internet and globalization eliminate the importance of geographical proximity in determining which products and services are close substitutes?

To answer these questions, it is helpful to start with the basic Ricardian trade model. Trade depends on the costs in a particular domestic sector relative to other *domestic* sectors and how this compares with the costs in the comparable sector abroad relative to other *foreign* sectors. In other words, on Ricardian comparative advantage. The local tax does not interfere with comparative advantage and alter the trade equilibrium if it falls equally on *all* domestic production. Relative domestic prices will then be unchanged and also the terms of trade offered by local companies. But a tax (tariff) on a foreign good changes the price of imports *relative* to the price of domestic goods and distorts consumption and production behavior.

To be more specific, consider a simple Ricardian world with two countries trading with each other but no flows of capital between them. (We will see below how capital mobility affects the analysis.) Further assume also, to begin with, that in each country all industries have equal capital intensity. (Capital intensity can differ between the two countries however.) There are also flat business-level income taxes in each country, equal in all sectors in a given country but different between countries.

Under these assumptions, the income taxes do not distort trade, and further, there is no tax or subsidy on trade that can raise rates of return and reduce any distortion caused by the income tax. Even if the income taxes raised the required pre-tax return in each country, costs would increase by the same proportion in all sectors. Therefore, the relative cost of export goods and import-competing goods would remain unchanged.

Ricardian comparative advantage would remain unchanged and each country would continue to make the same offers to its trading partners. Furthermore, each country's offers reflect true relative costs in its domestic sectors because taxes are equal in relation to prices of all domestic products.

In this case of uniform factor intensities, a tariff that raises the price of import-competing goods does not change the return to capital because the labor and capital flowing into the import-competing sector exactly match the capital and labor released by the export sector. Capital-labor ratios and therefore factor productivities remain the same. There is no possible benefit from attempting to change prices with a trade tax in order to raise rates of return and reduce any savings or other distortion attributable to the income tax. As discussed in greater detail below, if import-competing products happened to be capital intensive, a tariff would increase their price relative to other domestic production and increase the return to capital in order to preserve the price-cost equilibrium. (This discussion of the relation between goods prices and factor returns is just a brief summary of the basic Heckscher-Ohlin-Samuelson-Lerner model of trade.)

If we now reintroduce capital mobility into this model and retain the equal capital-labor intensity assumptions, the high tax country still derives no benefit from taxing imports even if it cannot reduce its general tax on capital income. Its high tax drives out some of its capital, from industries that may be relatively efficient internationally, but the only way of bringing it back is to raise capital's pre-tax rate of return. Increasing the cost of imports cannot accomplish that as long as capital intensities remain uniform across sectors. (All sectors will now be somewhat less capital intensive because some of the capital has left.) As in the pure trade case of equal capital-labor ratios across sectors above, when capital and labor move from the export sector to the import competing sector as a result of the tariff, capital-labor intensities do not change in either one because the capital and labor released by one sector just match the expansion needs of the other. So the productivity of capital, the pre-tax return, cannot increase in either sector because it doesn't have more labor per unit of capital to work with.

Note that under these assumptions the terms of trade or international price equilibrium does not change from the no-tax case. Even if some domestic goods are highly substitutable with foreign goods, there is no reason for domestic consumers to

switch to foreign goods because relative prices have not changed. The main result of the uniform tax on capital is that all domestic production is slightly less capital intensive.

With this brief introduction, we can see how changing the ‘standard’ assumptions may complicate these basic cases. One important change in the standard model above is the introduction of intangible assets into the production process. An intangible asset such as a patent or a trademark presumably reflects some ‘unique’ feature which reduces the substitutability between the foreign based production and other local production. Unlike standard labor and capital, intangible capital will not easily move between domestic and foreign-controlled companies if intangible income is taxed differently in the two sectors. It cannot be accomplished by a simple flow of portfolio capital from domestic to foreign shares. Worldwide mobility of portfolio capital cannot therefore be used to justify taxation at the host country rate, as it might be for investment in ‘standard’ tangible capital.¹⁴ For one thing, multinational companies tend not to license highly valuable intangibles to third parties because they want to control them in their own production.¹⁵ Accordingly, if the host country tax on the foreign-developed intangible is increased, it may be more likely that it is shifted to other production locations where the developer has facilities rather than to domestic companies. As discussed below, it will therefore be more efficient to remove distortions on other decision margins, such as the choice of where to exploit an intangible asset, rather than consumers’ choice between different goods that happen to be produced in geographical proximity.

Another change to the basic trade model above is to introduce differences in capital-labor intensity across domestic sectors, which can create opportunities for ‘second-best’ trade taxes or subsidies to offset the negative effect of taxes on capital income. As we have already suggested, in the classic Heckscher-Ohlin-Samuelson-Lerner trade model with differing capital-labor intensities for exports and import competing goods, there is a relationship between relative prices and *pre-tax* rates of return. The pre-tax return to capital will increase if the relative price of the capital intensive good increases. That is the only way to assure an equilibrium in which prices equal costs.

¹⁴ Grubert and Mutti (1995), referred to in footnote 4, discuss portfolio mobility and ‘Capital Import Neutrality’.

¹⁵ U.S. Commerce department data for 2001 indicate that royalties from related parties account for 68 percent of all foreign royalties. The significance of related party royalties tends to be much higher than this in manufacturing because software sales to unrelated parties are frequently classified as royalties.

If the high-tax country imports the capital intensive good, a tariff will increase the domestic relative price of these goods and increase the return to capital. A positive tariff can therefore offset a distortion attributable to the capital income tax, such as lower domestic saving or an inefficient international distribution of capital. In the second-best optimum, the effect of an increase in the tariff in reducing the capital income distortion is just balanced by distortion created in the choice between domestic and foreign goods. *But note that if the imported good is relatively labor intensive, exports (or imports) should be subsidized in order to increase the relative price of the capital intensive export good.*

This possibility that second best tariffs or subsidies can offset distortions created by income taxes is unlikely to be empirically very important in most industries. But it may be important in cases where the foreign and domestic goods are virtually perfect substitutes and they are produced with a great deal of capital in relation to other inputs. If portfolio capital is highly mobile, investors will insist on the same after-tax return in foreign and local production. The combination of extreme capital intensity and the mobility of portfolio capital mean that a domestic tax on capital income will cause a large increase in the price of the domestic product compared to the foreign product. If the products are very close substitutes, much of the domestic industry will disappear even though it may be an efficient user of internationally mobile capital.

This can be illustrated more specifically with an extreme example. Consider, therefore, a domestic product that is a perfect substitute for a good produced in a low-tax country. Also, to make matters completely simple, assume that in both countries (tangible) capital is the only input needed to produce the good but efficiency can differ between countries. The high-tax location, the United States, is more efficient in this industry, with a requirement of x units of capital per unit of output. The low-tax country requirement is y units per unit of output with $y > x$. The low-tax location may, however, have an overall cost advantage when taxes are considered. If t_1 is the U.S. rate and t_2 is the foreign rate, then the foreign location will produce the good if $xr/(1-t_1) > yr/(1-t_2)$, where r is the *worldwide* required after-corporate-tax return.¹⁶ (The required after-tax return r is identical in both countries because portfolio capital is perfectly mobile.) If the

¹⁶ We assume no depreciation, and no investment credits, so that $r/(1-t)$ is the cost of capital.

above inequality holds, all production of the good will take place in the low-tax country, some of which will be exported to the high-tax country.

Furthermore, this can also be consistent with a trade-capital account equilibrium. There is no reason why the increased imports have to be matched with U.S. exports after the capital has flowed out of the United States. The flow of capital out of the United States as a result of the higher taxes will generate investment income that can finance the imports. Indeed, under our assumptions, the investment income would be enough to buy all of the imports except for the part of the import price accounted for by the low-tax country's revenue take.

This equilibrium is clearly inefficient from both a national and world perspective. The capital is more productive in the United States. *If the business-level capital income tax cannot be lowered*, a tariff on the commodity in question can bring capital back to its more productive location because consumers would switch back to the local goods that can be produced more efficiently. (We ignore any WTO problem.)

The assumptions we have made are intentionally very extreme: perfect portfolio mobility, perfect substitutability from consumers' perspective, and a simple linear technology with capital the only input. But there is, at least, one case in which these assumptions are not far from reality, and which is in fact recognized in the U.S. Internal Revenue Code. It is the insurance excise tax in Section 4371 imposed on premiums for insurance issued by foreign insurers. (This tax is frequently reduced or waived in tax treaties.) The insurer's taxable income is largely attributable to the return on its capital or surplus that it has to maintain. This is almost exclusively in the form of highly liquid assets that are very mobile. Investment in foreign and domestic insurance companies can be close substitutes as far as portfolio investors are concerned. (Indeed the foreign companies are frequently 'inversions' of erstwhile U.S. companies.) In this case the tax law seems to have arrived at the correct answer. At least on conceptual grounds, a tariff is sometimes needed to offset the distorting effect of an income tax.

Taxes on Imports and the Role of Electronic Commerce

The question then is whether electronic commerce and other modes of transmitting information efficiently create one of these cases in which a 'tariff' may in fact be

appropriate. Electronic commerce loosens the link between geographical proximity and product substitutability, and may make it as easy to buy a foreign product or service over the internet as a domestic product. Further, with globalization, capital can more easily move to the foreign provider. Is that enough to establish the case for a trade tax on electronic commerce?

The only part of the electronic commerce production process that seems to fit the example above are the servers and other physical capital that can easily be located in a tax haven and presumably require little local labor to maintain them. In other words, electronic commerce or the internet generally makes certain types of capital very mobile. But the skilled programmers, designers, etc., are still presumably in their original locations. The intangible assets such as copyrights, etc, were also presumably created in these locations. Furthermore, the domestic goods that become close substitutes for foreign goods because of the convenience of electronic commerce may not be particularly capital intensive compared to other domestic products. The business level income tax may not therefore raise the relative *domestic* price of the goods that can be purchased on the internet. *High substitutability and capital mobility are not enough.*¹⁷ A difference in capital intensity is also required. It therefore appears that the case for a tax on imports does not apply to most of the labor and capital affected by electronic commerce.

Now, professors McLure and Graetz do not rely on this type of analysis, which would provide some support, however strained, for their views. Both seem to have an income tax in mind, so the taxes on imports in a destination basis consumption tax do not apply. (This is discussed below.) McLure seems to be concerned that electronic commerce will make it unnecessary for foreign producers to have a distribution arm in the United States. If the foreign companies no longer need a distribution arm in the United States, they would be out of the U.S. income tax net under the current rules. McLure therefore claims that the U.S. tax base would shrink. He offers for consideration a new international rule that would permit taxing foreign companies by ‘entitlement’, a concept he adopts from Peggy Musgrave (1984). (McLure concedes that it is a ‘squishy’ concept.) The importing country should therefore be able to tax the foreign company even though it employs no

¹⁷ If all domestic products are equally capital intensive, and input prices are constant in nominal terms, a change in exchange rates would restore the initial no-tax equilibrium.

labor or capital in the local economy. Presumably the tax on the company would be based on the value of its sales in the jurisdiction.

There are two obvious problems with the McLure analysis. First, the premise is incorrect. There is no reason why the importing country's tax base should shrink as a result of electronic commerce. The labor and capital previously employed by the foreign-owned distributor may just flow into some other domestic activity. To be sure, electronic commerce, *like any technical change*, can be capital saving, and capital could flow out of the United States because demand for it locally has fallen. *This is not usually regarded as a basis for new government policies*. In any case, the demand for capital in the United States may *not* decrease. In order to estimate the net effect of electronic commerce on the tax base, it is necessary to trace all the adjustments that occur, including what consumers do as a result of the cost savings in electronic transactions. Beyond that, the infrastructure required to support electronic commerce, in the form of cable and other transmission facilities, servers, etc., seems very extensive. If anything, electronic commerce seems to be capital using in the ultimate consumer's location.

The internet may cause an increased demand for foreign products because it becomes easier to learn about them and buy them. It is conceivable that the importing country could suffer a terms of trade loss as a result. By the same token, however, potential foreign buyers may increase their demands for domestic goods. There seems no reason to expect any particularly asymmetric effect. In any case, terms of trade losses are not usually regarded as legitimate grounds for taxes on imports. The internet may also have an impact by making it much easier for labor and capital to move abroad while continuing to supply the local market. For example, inventors and other developers of intangible assets may find it easier to communicate with their collaborators when they move offshore. But this is a topic we will return to at the end of the section on source rules for intangibles.

In attempting to put some operational content on taxing by 'entitlement', McLure suggests that the tax on a foreign company would be based on the economic benefits it derives locally, including "the benefits of exploiting a market". The tax therefore attempts to extract a portion of the company's gain from selling in the local market. Extracting the *full* gain would indeed be what is called the 'optimum tariff' in the trade

literature. The ‘entitlement’ tax would have the same effects. Professor McLure concedes that it would have to be based on gross sales because the foreign company may have no presence in the importing jurisdiction. It is therefore a tariff on imported goods, pure and simple, and distorts the choice between foreign and domestically produced goods.

Now McLure might claim that his ‘entitlement’ tax falls only on pure ‘rents’, and therefore has no effect on worldwide efficiency. But economists have not been very successful in devising such a tax, mainly because rents are so difficult to identify. For example, the United States may import a very high priced drug that is the product of the foreign company’s costly R&D program. Moreover, an income tax falls on the marginal equity capital required in production and can have a significant effect on marginal costs, reducing the company’s scale of production. That is, if r is the after-tax return required by shareholders, companies will have to earn $r/(1-t)$ pre-tax on the marginal equity capital they employ, even if they make infra-marginal rents. In any case, since the McLure tax will necessarily have to be based on gross sales it will fall on all productive factors abroad and will simply be a tariff. Finally, as shown below, if the rents are attributable to an intangible asset like a patent or trademark developed by the exporter, it is generally optimal for them to be taxed in the developer’s jurisdiction.

McLure and Graetz could justify their tax on imports as part of a destination principle income tax. Neither of them relies on that argument, however. Indeed, McLure is the recent co-author of a paper that is based on their interpretation of the GATT as rejecting a destination principle income tax. (Hellerstein and McLure (2002)). Furthermore, a destination principle tax would not achieve the objective they are seeking. Except for any difference in the way they tax infra-marginal rents from local production, the destination and origin basis taxes are equivalent in present value terms. (See, for example, Grubert and Newlon (1995).)

Which Country Should tax Intangible Income?

The discussion above suggested that the presence of intangible assets developed in the home country weaken the case for host company taxation for all of the income derived from local production. The issue then is: How does taxing intangible income in the home country rather than taxing it in the host country affect choices along the

behavioral margins outlined at the beginning of the paper? In this paper, ‘source’ is used in this specific sense: who taxes the income, or at least, whose tax matters on the margin. That is, should the host country allow a deduction for royalty payments without a withholding tax or should it be free to tax the intangible income.

The source rule for intangible income has an additional implication in worldwide tax systems. Making royalties and other intangible income domestic source in a worldwide system means that they cannot be shielded by foreign tax credits. The question of foreign tax credit baskets is a related issue. In the U.S. context, royalties might be classified as foreign source but, in contrast to current law, they could be put in a separate basket where they cannot absorb excess credits originating with dividends and other highly taxed income. That decision should be based on the same considerations as the decision as to source, i.e., which alternative leads to the most efficient worldwide use of the intangible asset?

Before considering the source rule for royalties, it might be useful to start with a source rule that is completely uncontroversial: income from the purely domestic production of goods sold to local consumers should be domestic source and taxed locally. If we agree on that starting point, then the question of source for more difficult cases rests on the extent they involve activities that are equivalent or highly substitutable with these purely domestic activities.

Consider, therefore, an intangible asset that has been developed in the home country by R&D or other means. The intangible was developed by the parent company and the development expenses were presumably deducted against home taxable income. If the intangible asset is sold for use abroad in exchange for an up front payment, it would be the equivalent of the export of a machine produced in the home country. The export sales revenue is normally taxed where it is produced. Otherwise, the choice between producing exports and producing goods for the domestic market would be distorted.¹⁸ The fact that intangible assets are generally licensed for a periodic royalty and not sold for an up front payment should not alter this equivalence between the export of tangible and intangible capital goods. The expected royalty stream is equal to the up front price in present value terms. The form in which an intangible is paid for should not determine how it is taxed.

¹⁸ We ignore the sales-source title passage rule in section 863 (b), which has no conceptual basis.

Rather than appealing to the basic equivalence demonstrated above between the sale of a machine, an upfront sale of an intangible and periodic royalties, let us proceed through the various behavioral margins to see how home and host country taxation can lead to different choices. Two cases will be compared. One is home country taxation exclusively. The other is host country tax, possibly in the form of withholding taxes on royalties, with no home country tax. Tax rates are such that the tax burden differs in the two cases.

The choice between exporting and licensing foreign production

The intangible asset is eventually embodied in a product or service, such as a particular drug. The developer can choose either to manufacture the final product at home and export it or to license its production abroad. To achieve worldwide efficiency, the choice should depend on relative manufacturing costs. If the intangible income is subject to the identical tax rate wherever production takes place, the choice will not be affected by tax considerations. Only home country taxation assures that result.

In which foreign location should an intangible asset be exploited?

The company may have a patent or other intangible that can be exploited in many foreign locations, with the final product sold on the worldwide market. Tax rates in the various alternative foreign locations may vary over a wide range. Only home country taxation will offer a neutral choice not distorted by tax considerations.¹⁹

The development decision

Intangible assets are usually the product of some sort of development effort, in the form of R&D, marketing, etc. These expenses will generally be deductible in the home country. If the intangible income generated in various locations is subjected to various tax rates, which could be higher or lower than the home country rate, the asymmetry between the tax rates applying to the deduction and the inclusion could lead to a very haphazard pattern of development decisions.

What about Locational Rents?

As discussed above in the first section on foreign tax credits, some intangible rents are not mobile, unlike the case of a computer chip or a drug that can be produced in a

¹⁹ The income tax in a location may of course raise the cost of tangible capital, but that is true of all tangible capital in that location.

wide number of alternative locations to serve a worldwide market. But these immobile rents can arise for various reasons, which have to be examined in turn. At issue here are rents that have to be paid to the developer as a royalty or other form of compensation. They do not include rents that the foreign company may earn because it has acquired some particularly valuable natural resource.

(a) The locational rents may result from the fact that the final product is not transportable and has to be produced where it is consumed. Extreme examples are hamburgers or soda with worldwide reputations that have to be produced close to the consumer. But, this immobility of the intangible does not justify host country taxation. First, subjecting these immobile rents to host country tax would make the international rule depend on this technical limitation. What if a technological change made shipping much easier? Should the tax rule change? Second, the intangible asset, such as the patent or copyright, may be the result of R&D or other spending that was tax deductible in the home country. If the tax rate that applies to the deduction differs from the tax rate on the subsequent income, there will be under or over investment in R&D.

(b) Some locational rents may be attributable to agglomeration benefits accruing in highly industrialized areas. (See for example Baldwin and Krugman (2000).) However, this just means that an intangible asset may be more productive, on the margin, in some locations than others. The choice among locations should nevertheless not be biased by subjecting the prospective returns to differing tax rates.

(c) A company's intangible may be more valuable or productive in a location because of the efforts of the host government. It may, for example, do more to protect intellectual property. In this case, it seems appropriate that the host government finance the 'public good' by imposing a service or user charge on the return from intellectual property. But the taxes justified by this host government activity should yield revenues no larger than the actual government costs. (Incidentally, this charge should not be creditable in the home country because it is the payment for a benefit.)

Education that produces skilled workers who can employ an advanced technology is another example of a government service that might justify a service charge because it increases the value of intangibles. Workers' wages would be higher but the owners of the intangible assets may share in the national gain. Note, however, that in both the

protection of intellectual property and the training of skilled workers, this argument could be used to justify a tariff on high-tech imports because their value to the importer depends on the same government activities.

We can contrast royalties derived from a self-developed intangible with lease payments derived from buying U.S. made equipment and renting it to a foreign user. The value of the equipment has presumably been included in the U.S. tax base because it is reflected in the price paid to the manufacturer. The lease payments should therefore be foreign source because they are equivalent to an investment abroad by the U.S. lessor. Similarly, if a U.S. person lends to an investor located abroad, the interest payments should also be foreign source because the transaction is equivalent to leasing the equipment or investing it abroad. The form in which an investment in a given location is structured or financed should not determine source. The comparable case for intangibles would be when the licensor buys the intangible from an unrelated U.S. developer. The market value of the intangible has been included in the U.S. tax base and is equal to the royalties in present value. The purchaser-licensor is basically just financing the foreign user's investment and receiving the equivalent of an interest return.

Now some may argue that all rents are intrinsically locational because they derive from the ultimate consumer. The rent wouldn't exist if there weren't a consumer willing to pay the price. But this argument applies equally to royalty payments *and* imports of goods and services that embody intangible assets. It seems to justify the 'optimum tariff' discussed above, in which the importing country attempts to extract all the gains from trade by turning the terms of trade in its favor. This gets us close to McLure's concept of taxing by 'entitlement', and to Graetz's view that local sales should be one of the bases for taxing foreign companies, which we have already discussed.

Those that claim that all value depends on the ultimate consumer may implicitly be supporting a tax on consumption rather than on income since an income tax is intrinsically a tax on net local production. A consumption tax would in this context have the merit of preserving the neutral choice between imported and domestic products. But again the consumption tax does not necessarily extract the rent that the proponents of taxing sales are seeking. The only way the importing country can benefit, i.e. 'export' the

tax, is by somehow turning the terms of trade in its favor, which a consumption tax does not do.

Now it is conceivable that globalization and the internet are changing the assumptions about substitutability along various margins. For example it may be that R&D and other intangible development is becoming more mobile. If it is taxed highly in the United States it might move to Ireland or some other low-tax location. But at this stage, the most recent National Science Foundation data do not seem to support this possibility. The share of their worldwide R&D performed abroad by U.S. companies in 2000 was about the level it had been in the early 1980s. (National Science Foundation (2002)). Investment in intangibles seems less mobile than other types of investment. Furthermore, the concern about the location of R&D depends on the assumption that it provides externalities in the location where it is undertaken and that the current tax benefits to R&D such as the research credit do not adequately reflect these externalities.

Nevertheless it may be that in the future creators of intangible assets will become highly mobile themselves. For example, if authors are highly taxed in the United States, they may choose to expatriate to Monaco or some other low-tax location. If they do in fact become highly mobile, then the analysis above on trade and tariffs would apply. One could think of creators of specific intangibles as a specific 'unique' type of labor or human capital, which the end products embody very intensively in the same way that insurance depends heavily on financial capital. But at this stage, this is entirely speculative and a tax on such intangible imports would be very difficult to implement. It would also of course violate WTO obligations.

The foregoing discussion shows that the current distinction in the U.S. source rules between a sale of a good, a royalty, and a service is highly artificial and serves no policy objective. The 861-18 regulations on the source rules for software exemplify this confusion. If the transaction involves the transfer of the right to copy and distribute a copyrighted program, the proceeds are classified as a royalty and are foreign source. If a copyrighted program is transferred without the right to copy, it is a sale, half of which can be classified as foreign source. Otherwise it is simply the provision of services for the development or improvement of software, which is entirely U.S. source. But these are highly substitutable activities from the software developer's point of view. The same

programmer has the choice between providing a service or developing copyrighted software. For example, the program may be very specialized with no other potential users in the foreign location, so that the right to reproduce the software is irrelevant. Furthermore, tax considerations should not distort the choice between exporting a copyrighted item and using a foreign company that copies and distributes the program.

4. Conclusions

This paper has demonstrated the importance of designing international tax rules in the light of how each component affects the economic behavior it is linked with. This requires a consideration first of which behavioral margins each policy instrument should be assigned to. Then it requires judgments on how easily companies and consumer can move along these margins of choice and how these various reactions combine to determine efficient or inefficient outcomes. The analysis of the specific issues addressed has shown that:

The current U.S. statutes and regulations that govern the creditability of foreign taxes do not seem to have any coherent conceptual basis. They are consistent neither with a ‘neutrality of investment choice’ or a ‘fairness’ criterion. Although capital export neutrality seems to be a basic principle of U.S. international taxation, at least for repatriated income where the credit issue arises, it is not embodied in the current system. The current rules seem to be based entirely on the form of an income tax and not on its substantive effect on investment. The basic question in determining the creditability of a tax under our preferred efficiency standard is the extent the (actual or expected) tax payment increases when a company’s investment expands.

This basic criterion that assures the neutrality of investment choice shows that the requirement in the current system that a creditable tax closely resemble the U.S. net income tax is misdirected. A tax on capital or a tax on operating income that does not allow deductions of interest expense should be creditable. They are both taxes on capital even though they may not ‘reach net gain’. Furthermore, the entire amount of these taxes should be creditable (subject to the foreign tax credit limitation), not just the portion associated with equity assets or equity income.

We also conclude that the ‘ultimate’ incidence of the tax is irrelevant. Any tax may affect local factor prices as labor and capital respond to it. But a typical company will be a price taker in local factor markets and will assume factor prices are fixed in making its investment decision. If each company faces a neutral investment choice under these circumstances, investment will be allocated efficiently.

The analysis of the creditability of cash flow consumption taxes departs somewhat from McLure and Zodrow (1998). The possible tax on infra-marginal rents, which McLure and Zodrow emphasize, turns out to not be very important in the multinational company’s choice of location. If the rents are mobile and can be obtained in an alternative location, they should be paid to the parent in the form of a deductible royalty. If they are locational, how they are taxed is irrelevant for the choice of location because the company does not have the option of earning them somewhere else.

Only relatively extreme circumstances would justify imposing a tax on imports to offset distortions created by an income tax, even apart from WTO concerns. It requires a case in which domestic and foreign products are highly substitutable and highly capital intensive. In addition, portfolio capital has to be highly mobile internationally.

In the context of an income tax, electronic commerce does not justify a tax on local sales by foreign suppliers. For one thing, the goods or services that become highly substitutable over the internet need not be particularly capital intensive. Conceptually, electronic commerce is no different from any other technical change. (Greater compliance problems may be created, particularly for consumption taxes.)

Royalties and license fees paid by users of intangible assets in one country to developers of the patents, trademarks, etc., in another should be taxed in the developers’ country. This will lead to more efficient choices of where the intangible asset is exploited. It preserves neutrality in the choice between embodying the intangible in exports or producing the good abroad, and also the choice between alternative foreign locations.

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