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# ISSUES IN THE TAXATION OF FOREIGN SOURCE INCOME

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# ISSUES IN THE TAXATION OF FOREIGN SOURCE INCOME

Daniel J. Frisch

## Abstract

This paper examines some aspects of the tax treatment of U.S. multinational corporations. The emphasis is on problems of coordination of the different tax systems faced by the firms. The U.S. corporate income tax must take account of the fact that the firms' overseas income is taxed by the host governments, in a variety of ways. Currently, the foreign tax credit is the principle mechanism for making these adjustments; it is examined, along with alternative methods such as territorial treatment and a deduction for foreign taxes. The paper also considers the closely related question of coordinating measures of taxable income. The most common method, the arm's length rule, is examined. Alternatives to it, including allocation by shares and a partial case involving allocation of research and development expenses, are also considered.

First, the revenue effects of these tax regimes are simulated, with no behavioral responses considered. Responses in location of investment decisions are then included. The data are taken from the corporations' U.S. tax returns, cross-tabulated into approximately 240 industry and country cells.

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This paper is a simulation study of the international aspects of U.S. corporate taxation. Recently, international operations of U.S. corporations have accounted for a fifth of total profits and a quarter of total investments.[1] Taxes on these activities may have important effects on the international and domestic investment decisions of the firms. For these reasons, analysis of the taxation of U.S. corporations is incomplete unless international aspects are considered.

Recent attempts to reform the U.S. tax structure have not ignored international aspects. President Carter's 1978 proposals included some major changes in this area. Although these suggestions went the way of most of the other elements in his package, the issues they raised are likely to reappear in future calls for reform. For example, President Carter's package called for the ending of "deferral," an aspect of U.S. tax law that is discussed below.

In 1977, the I.R.S. issued a set of regulations that made a potentially important change in the way overseas income is to be defined for tax purposes.[2] These "861 regulations", which are also discussed below, have been the subject of considerable controversy, since they may affect investment decisions in a number of important ways. A major goal of this study is to analyze methods of defining foreign taxable income, especially methods for deciding what part of total profits are to be taxed as domestic income, and what part as foreign income. The issues raised by the "861 regulations" are discussed in this context.

This study extends previous work in three ways.[3] The analysis of methods for allocating income between domestic and foreign sources is the first extension. Although a previous work did consider the 861 regulations in isolation, no general treatment of the revenue impact of these methods seems to exist.[4]

The second extension involves the level of aggregation of the analysis. This study uses data which contain information cross-tabulated by industry of the U.S. firm and by country where the income was earned. The impact of many aspects of international tax law turn on the precise alignment of U.S. and foreign tax parameters. Therefore, the availability of data from a number of countries is potentially of great value, since a range of foreign tax situations may be included.

Previous studies, in contrast, have had to rely on information tabulated by the industry of the U.S. firm, with totals of domestic and overseas income reported for each industry. Aggregating across countries in this way may obscure important effects, since firms operating in one set of countries may be affected in one way by a tax change, while firms in other countries may be affected not at all or in the opposite direction.

The third extension concerns responses that the firms might make to changes in tax law. Any such change will in general alter the structure of investment incentives, and the firms' investment decisions can be expected to change. Responses of this kind may have sizeable consequences for the firms and for evaluation of tax policies toward them.

Section I of the paper lays out the issues to be considered. First, issues involving the current U.S. tax structure, given the measures of taxable income, are discussed. Then the issues involving definition of domestic and foreign income are described. A list of nine reform proposals that illustrate these issues is formulated.

The next section describes the development of INTERSIM, the tax calculator used in performing the simulations. Data used by it and techniques used to calibrate it are discussed.

Section III presents the simulations of changes in tax revenues, given that the firms do not change their behavior. First a baseline simulation is defined and results for it are displayed. Then the results of simulating each of the nine proposals are presented.

Section IV extends the analysis to cover behavioral responses by the firms. Responses that can and cannot be included are outlined. Methods to implement those that can be included, and assumptions required by those that cannot, are discussed.

The next section discusses the effects of each of the reform proposals on behavior in more detail. It also presents the results of rerunning the simulations with behavioral responses built in.

There is a brief concluding section.

## I. Issues to be Considered

### A. The Foreign Tax Credit Mechanism

By convention, each country is given the primary right to tax income earned within its borders. The U.S., like many other countries, claims the further right to tax the income of its "persons," including corporations, earned abroad. U.S. law recognizes the primary right of the host countries through the foreign tax credit mechanism.

The first step in this mechanism is to define the total income of U.S. corporations, including income earned abroad, and tax it at a standard rate (now 46 percent). Then, a credit is allowed for foreign taxes paid, except that if the foreign tax rate is greater, credits only up to the domestic rate may be claimed. In effect, if the foreign government taxes at the U.S. rate or higher, then income earned there is not taxed further at home. But if the foreign government chooses to tax at less than the standard rate, the U.S. collects a tax equal to the difference. Of course, this describes a simple foreign tax credit mechanism; actual practice in the U.S. is subject to several compromises and difficulties.[5]

It should be noted that even a pure foreign tax credit mechanism may not be the tax structure that maximizes welfare. It would insure that U.S. firms would not have a tax incentive to invest in low-tax countries rather than in the U.S., since low tax rates would be brought up to the U.S. level. In this sense, it would bring the world closer to "capital export neutrality," defined as the situation where U.S. owned capital pays the same corporate tax rate no matter

where employed. The incentive to avoid high-tax countries would still exist, however, unless an unlimited credit for foreign taxes is allowed. But then the pernicious incentive would exist for foreign governments to raise their tax rates on U.S. firms almost without limit, since the revenue would be at the expense of the U.S. Treasury. A further point is that "capital export neutrality" may improve world-wide welfare by removing distortions in the location of capital, but U.S. welfare may not be improved. Still further, the presence of other taxes, including the taxes on domestic capital, makes the question of taxes on foreign source income a second best one. For these reasons, welfare evaluation of the tax schemes is beyond the scope of this study.[6]

One departure of current U.S. practice from a pure foreign tax credit mechanism concerns pooling the tax situations of several countries. A U.S. firm may operate in two other countries, one with a tax rate less than in the U.S., and one with a tax rate higher. It would seem that the firm should pay additional tax on income earned in the low-tax country and not on the other income. The firm should, in effect, calculate a separate foreign tax credit for each country and then use the sum. This type of structure is known as a foreign tax credit with a "per country limitation."

The U.S. structure uses, instead, an "overall limitation" for most firms.[7] A firm with operations in two or more countries adds its income earned and taxes paid abroad. If total foreign taxes are less than 46 percent of total foreign income, then the difference is

owed to the U.S. government. Only 46 percent of foreign income can be claimed as a credit if total foreign taxes are greater than this amount.

An example illustrates how the presence of the overall limitation complicates the foreign tax structure. A firm may be operating in a country with a 40 percent tax rate. The firm would then owe an additional 6 percent to the U.S. on income earned there, so that its final rate of tax on this income is 46 percent. Now the firm opens up an operation of equal size in a country with a 54 percent tax rate. The overall foreign tax rate is now 47 percent, so that the firm now owes no tax to the U.S. on any foreign income. The effective tax rate on income from the first country thus falls from 46 percent to 40 percent, for reasons unrelated to anything happening in that country. It is clear that incentives are different under the per-country limitation vs. the overall limitation. For this reason, imposition of the per-country limitation is one of the reforms analyzed in this study.

Note that this analysis makes use of the availability of data by country. Data aggregated up to the industry level already have the overall limitation built into them, in effect. Therefore, analysis of the per-country limitation would be impossible with it.

The second departure from a pure foreign tax credit is the issue of "deferral." Simply put, not all income from foreign operations is subjected to the foreign tax credit mechanism. Profits earned abroad by foreign subsidiaries of U.S. firms are included only if repatriated to the

parent as dividends. If retained abroad, they are left out of the U.S.'s definition of worldwide income until and unless the subsidiary is dissolved. In 1972, foreign subsidiaries as a whole repatriated 40.9 percent of their income. Since pre-tax profits were $15.356 billion, $9.075 billion were "deferred." U.S. firms earned another $9.893 billion overseas from operations not separately incorporated ("branch" operations) and from receipts of interest, royalties, and other fees. This income is not affected by deferral in any way. Thus, repealing deferral would have increased taxable foreign source income of U.S. firms by 56 percent.[8]

It is not clear, of course, how much additional tax revenue would have been raised. For example, if all countries in the world had tax rates greater than the U.S. rate, no extra revenue would accrue. It is therefore worthwhile to include plans that end deferral in the reforms to be studied.

There are two approaches to ending deferral that should be mentioned. One would tax the U.S. firms as if their subsidiaries repatriate 100 percent of their profits. The second would treat subsidiaries like branches; in other words, this method would consolidate foreign subsidiaries for tax purposes much as domestic subsidiaries are. One difference between them would arise from foreign subsidiaries with losses. Under the first method, they would be ignored, since dividends cannot be negative. Under the second, their losses would be allowed to decrease the firm's worldwide income. Both methods are considered in this study. However, data limitations will force the difference between them to be understated. Subsidiaries with losses cannot be treated separately if they appear in the same industry-country cell as

subsidiaries with positive profits. Since some cells do show losses, however, the two methods for ending deferral do show different results.

Two more reforms to the basic foreign tax structure are considered. They are the major alternatives to the foreign tax credit mechanism. The first is the "territorial" system. Under it, basically no attempt is made to collect taxes on income from activities abroad. The tax systems of France and the Netherlands are closest to this approach.

The second alternative would replace the foreign tax credit with a deduction for foreign taxes paid. This approach was contained in the Burke-Hartke Bill, debated by Congress in 1971. Just as a foreign tax credit is supposed to help attain "capital export neutrality," a deduction system is supposed to attain "national neutrality." This is the situation under which U.S. firms are led to equalize social rates of return on capital used at home and abroad, where social rates of return are defined from the U.S. perspective. Let:

$r$ = rate of return to capital in the U.S.;

$t$ = tax rate in the U.S.;

$r^*$ = rate of return abroad, and

$t^*$ = tax rate abroad.

Then social rates of return, defined as income accruing to either U.S. shareholders or the U.S. government, are equal to r for capital used at home, and $r^* (1-t^*)$ for capital used abroad. Private rates of return are equal to $r (1-t)$ for domestically used capital, and

$r^*(1-t^*)(1-t)$ for foreign capital when a deduction system applies. Since the firms equate private rates of return,

$$r(1-t) = r^*(1-t^*)(1-t)$$

Thus, $r = r^*(1-t^*)$ so that social rates of return are also equalized. As Feldstein and Hartman (1977), Horst (1980), and Dutton (1980) show, this reasoning is far from a satisfactory welfare analysis of the deduction system. Still, the claims made for it render it an interesting addition to the list of reforms to be studied.

B. Methods for Allocating Income

It is useful at this point to summarize some of the tax structures described so far. Total taxes paid by a U.S. firm operating in one other country are, in general:

$$T_{TOTAL} = T + T^* \tag{1}$$

Taxes paid to the foreign government, $T^*$, are, in general:

$$T^* = t^* Y^* \tag{2}$$

where $Y^*$ is the foreign country's measure of taxable income from the firm's activities there, and $t^*$ is the foreign tax rate. Under a foreign tax credit mechanism, U.S. taxes are:

$$T = t(Y + zY^*) - C \tag{3}$$

where Y is the U.S. government's measure of taxable income of domestic operations and t is the corporate tax rate. z is the payout ratio for the firm's foreign subsidiary, the ratio of dividends paid over total after-tax earnings of the subsidiary.[9] C is the foreign tax credit. It equals:

$$C = \text{Min} \left[ {}^{zt^* \; Y^*}_{zt \quad Y^*} \right. \tag{4}$$

It is easy to see how the reforms mentioned so far could be incorporated into this structure. For example, ending deferral could be modelled as setting z to unity (with possibly an adjustment for subsidiaries with losses). A territorial system would set z to zero. A deduction system, with deferral left intact, would replace (3) with:

$$T = t(Y + zY^* - zt^* Y^*) \tag{5}$$

More countries would have to be added to these simple equations before the per-country limitation could be modelled.

The remaining questions all concern Y and $Y^*$, the measures of taxable income. It is useful first to specify their sum, worldwide income of the firm, in a simple way:

$$Y_{TOTAL} = Y + Y^* = P(S + S^*) - D_{TOTAL} \tag{6}$$

where P is the world price of the firm's one product, and S and $S^*$ are quantities sold to customers at home and abroad; $P(S + S^*)$ thus equals worldwide sales revenues. $D_{TOTAL}$ are worldwide deductions, and include cost of materials, payments to factors, depreciation allowances, and the like. Except for issues concerning exchange rates, defining

$Y_{TOTAL}$ is conceptually neither easier nor harder than defining taxable income for a purely domestic firm; all the same issues appear. For this reason, problems in defining $Y_{TOTAL}$ are neglected and a measure of it is assumed known and constant.

How should $Y_{TOTAL}$ be split up between Y and $Y^*$? Most governments have agreed to use the "arm's length" system.[10] The fundamental idea is to ask how market forces would make the split. This rule asks the firm to pretend, for tax purposes, that its domestic and overseas operations are independent economic entities, operating at arm's length from each other. Profits of each entity would be naturally defined as its sales minus deductions.

Intrafirm flows of goods must be measured when defining sales revenues of each part. Let E (for exports) represent sales of the home office to foreigners, net of sales of the foreign operation in the home market. Alternatively, one may assume that each entity carries on all sales to local customers. Then E represents net intrafirm flows of the product between the U.S. firm and its foreign subsidiary. Since there is a single world price for all transactions, sales revenue of the domestic part of the firm would be $P(S + E)$, which equals its revenue from sales to local customers and from exports. "Net" revenues of the foreign part would be $P(S^* - E)$, which equals its sales to its local customers minus what it had to pay for imports from the domestic part.

How should total deductions of the firm be split up? In the market, each producer has to pay for the factors it uses. Therefore, each part of the firm should deduct the cost of factors used for what is produced locally. Let D be the cost of factors (and related

deductions) used in the U.S., and $D^*$ be the cost of factors used abroad. If factors can be used in only one place, then $D + D^*$ will equal $D_{TOTAL}$. The incomes of domestic and foreign operations may then be defined as:

$$Y = P(S + E) - D \tag{7}$$

$$Y^* = P(S^* - E) - D^* \tag{8}$$

These two equations represent the simplest form of the arm's length rule for allocation of incomes. Note that $Y + Y^* = Y_{TOTAL}$, as required.

Although the basic conception seems simple, the above description of the arm's length approach may leave the reader somewhat uneasy. There are many heroic assumptions and loose ends. What if intra-firm flows take more complicated forms than exports of a single final good, with its easily observable world price? What if a factor of production acts like a "public good" within the firm, so that all parts of the firm benefit if one part hires it? These problems have of course occurred to other experts in this field, and the response has been the suggestion of an entirely different approach.[11]

This approach begins by recognizing that measuring $Y_{TOTAL}$ directly avoids many of the problems with measuring Y and $Y^*$ using the arm's length rule. Why not, then, just split up $Y_{TOTAL}$ on some sort of reasonable basis to get Y and $Y^*$? If domestic operations seem to account for 75 percent of the firm's total activities, then Y should be set to 75 percent of $Y_{TOTAL}$. Similarly, $Y^*$ should be set to 25 percent of $Y_{TOTAL}$. Of course, a rule must be formulated to decide for what share each part of the firm accounts. The prime requirement for this

rule that sets the shares is that it depends on something easy to measure. In symbols, this "shares allocation" approach would set:

$$Y = s \cdot Y_{TOTAL}, \text{ and} \tag{9}$$

$$Y^* = (1 - s) \cdot Y_{total}, \text{ with} \tag{10}$$

$$s = X/(X + X^*), \tag{11}$$

where X and $X^*$ are attributes of the firm that are easily observable in both countries.

Domestic and foreign taxable income may be recomputed in this way in order to simulate the effects of adopting a shares allocation approach. Note that such a simulation does not necessitate any change in the foreign tax credit mechanism. Once the new taxable income measures are defined, the original mechanism, described in eqs. (1)-(4), may be applied to them.

U.S. states that levy a corporate income tax face the same problems in taxing national firms as national governments do in taxing multinational ones. Although the arm's length approach is the rule among national governments, the shares allocation approach is typically used by the states. They usually use a weighted average of three attributes, sales, assets, and employment, to define the shares of taxable incomes.[12]

The data to be used in this study do not contain information on employment. Therefore, the following definition of s will be used in simulation of the shares allocation system:

$$s = a\left(\frac{S}{S+S^*}\right) + (1-a)\left(\frac{A}{A+A^*}\right) \qquad (12)$$

$S$ and $S^*$ are local sales, and $A$ and $A^*$ are local assets. Proxies used to measure them are discussed in Section II below. A value of .5 is used for $a$ in the simulations presented in Sections III and V.

It should be noted that $z$ in eqs. (3) and (4), the fraction of foreign income in U.S. tax base, now has a different interpretation. This fraction is, implicitly, the ratio of actual intrafirm dividends to measured foreign taxable income. Up to this point, firms do not change their behavior when tax laws change; in particular, intrafirm dividends do not change. Thus $z$ and $Y^*$ move in precisely offsetting directions and the quantity of foreign income in the U.S. tax base, $zY^*$, does not change. Note that domestic tax base, $Y$, and foreign taxes paid, $T^*$, do change.

In sum, there are at least two ways for governments to define $Y$ and $Y^*$. What happens if different governments adopt different methods? The country that hosts the subsidiaries of U.S. firms need concern itself only with $Y^*$. The U.S., however, needs to define taxable income both at home and abroad. It is possible for the foreign government's measure of local taxable income and the U.S.'s measure of income in that country to differ. We need to complicate the basic specification of taxes as follows:

$$T_{TOTAL} = T + T^* \qquad (1)$$

$$T^* = t^* Y^* \qquad (2)$$

$$T = t(Y + z\hat{Y}^*) - C \qquad (3')$$

$$C = \text{Min} \begin{bmatrix} zt^* \hat{Y}^* \\ zt\ \hat{Y}^* \end{bmatrix} \qquad (4')$$

Equations (1) and (2) are repeated for convenience. $Y^*$ should now be interpreted as the foreign government's measure of taxable income arising out of a U.S. firm's activities in its country. $\hat{Y}^*$ is defined as the U.S. government's measure of income from the same activities.

Note that the top line of eq. (4') contains $Y^*$. $t^* Y^*$ equals the taxes paid by the firm to the foreign government; this is an observable quantity. Therefore, this actual tax liability is used in the U.S. foreign tax credit computation. A separate measure of foreign taxable income is needed in the computation of C only to insure that too much credit is not taken.

Tax treaties between governments usually specify that both signatories will strive to coordinate their treatment of multinational firms.[13] In our symbols, it is deemed desirable that $Y^* = \hat{Y}^*$. However, if one government decides that a shares allocation approach should be substituted for arm's length, there would certainly be a long lag before all other governments concurred. Therefore, simulation of both a "coordinated" reform, in which both $Y^*$ and $\hat{Y}^*$ will be altered, and a "noncoordinated" one, in which only $\hat{Y}^*$ will be altered, will be considered.

Another modification must be made to equations (1) through (4) in order to analyze the 861 regulations.

$$T_{TOTAL} = T + T^* \qquad (1)$$

$$T^* = t^* Y^* \qquad (2)$$

$$T = t(Y + z\hat{Y}^*) - C \qquad (3')$$

$$C = \text{Min} \begin{bmatrix} zt^* & \tilde{Y}^* \\ zt & Y^* \end{bmatrix} \qquad (4'')$$

The only change is the appearance of a new measure of taxable income abroad, $\tilde{Y}^*$, in the bottom line of the credit computation. It is needed because this measure need not equal $\hat{Y}^*$, in eq. (3'), the measure of taxable income earned abroad that is subjected to the basic U.S. tax rate, t.

$\hat{Y}^*$ is governed by Section 482 of the Internal Revenue Code, which deals with the division of income of related parties. Defining $\tilde{Y}^*$, for purposes of the foreign tax credit, is not seen as a matter of dividing income of related parties; rather, it is seen as a matter of defining foreign as opposed to domestic income. This distinction has meaning in situations that are much more complex than those considered in this paper. For example, consider a purely domestic firm which receives income from abroad that is somehow subjected to a foreign tax. Since there is no related party abroad, there is no $\hat{Y}^*$. Yet the firm gets to claim a credit for the foreign taxes; therefore, a $\tilde{Y}^*$ must be computed. For this reason, a separate part of the Internal Revenue Code, Sections 861 - 864, governs the definition of income used in the foreign tax credit computation.

In short, there are administrative reasons why $\hat{Y}^*$ and $\tilde{Y}^*$ need not be identical. As mentioned above, the I.R.S. recently issued a set of regulations that affect the latter concept and not the former. It should be stated at the outset that this study is not intended as an exhaustive analysis of these regulations. They are much too complex to be included fully in the simple model developed here. In

particular, they list many alternative solutions for each of the problems they raise. It is not clear that the solutions singled out here are the ones enforced most frequently; indeed, it is not clear they are or ever will be the ones enforced. This study is intended rather as a discussion of the implications of certain principles that seem to underlie the regulations.

The major reason new regulations were issued in 1977 was the problem of accounting for factors of production that operate like public goods within the firm. Many expenses are typically incurred by the head office of a multinational firm, yet benefit all parts of it. Examples cited in the regulation include administrative costs and research and development expenses. Perhaps a little more hard to see as a public good is the renting of capital. Yet interest expenses are also included. This reasoning

> ...is based on the approach that money is fungible and that interest expense is attributable to all activities and property regardless of any specific purposes for incurring an obligation on which interest is paid.[14]

If these "head office charges" benefit all parts of the firm, then a fair share should be charged to foreign source income. The effect is to reduce $\hat{Y}^*$ in the bottom line of eq. (4"), and, if this line applies, reduce the foreign tax credit and raise U.S. tax liability.

How should $\hat{Y}^*$ be computed, according to the 861 regulations? Arm's length, since it is the basic principle, should be used for most

aspects of revenue and costs. Yet for the factors singled out as head-office charges, an additional allocation must be done. The regulations suggest, as one alternative, that the shares allocation approach be used to compute this additional piece.

This option would split D, domestic deductions in eq. (7), into ordinary deductions, $D_{NHO}$ and head-office deduction, $D_{HO}$:

$$D = D_{NHO} + D_{HO} \tag{13}$$

Income for the purpose of computing the credit limitation is then:

$$\tilde{Y}^* = P(S^* - E) - D^* - (1 - s')\, D_{HO} \tag{14}$$

$$s' = a'\left(\frac{S}{S+S^*}\right) + (1 - a')\left(\frac{A}{A+A^*}\right) \tag{15}$$

s' and a' are the weights that perform the special shares allocation of $D_{HO}$.

The baseline for the study is tax law as of 1972, which did not include these regulations. Therefore, this computation may be considered a reform package which may be simulated. Two simulations are performed. The first sets a' to .5, the same value used for a in the shares allocation reforms. The second sets a' to zero, so that only assets are used to perform the allocation of the headoffice deductions.

To summarize, nine simulations are to be performed. They are:

1) Imposition of the per-country limitation.

2) Repeal deferral, complete payout method.

3) Repeal deferral, consolidation method.

4) Territorial treatment given all foreign source income.

5) Deduction for foreign taxes paid substituted for foreign tax credit.

6) Shares allocation substituted for arm's length method, by all countries.

7) Shares allocation substituted for arm's length method, by U.S. only.

8) 861 regulations allocation, with a' = .5.

9) 861 regulations allocation, with a' = 0.

## II. Data and Techniques

### A. Data

The basic source of data is a file of 1972 tax returns of U.S. multinational companies maintained by the Treasury Department. Specifically, each firm files an "information return" (form 2952) for each of its "controlled foreign corporations." The Office of International Tax Affairs at the Treasury kindly made information from these forms available to me.

In order to preserve the confidentiality of the tax returns, the Treasury had to crosstabulate the data before releasing them. Fifteen

manufacturing industry groups and seventeen countries were chosen; see Table 1. Cells with information drawn from less than three tax returns were suppressed, and the amounts placed in the seventeenth country column ("all other countries"). 246 cells of data resulted.

The variables included in the data set are: subsidiaries' assets, business receipts ( the measure of sales), earnings and profits, dividends, payments of interest and royalties to the parents, and income taxes paid to foreign governments. Taxes are divided into ordinary corporate income taxes and so-called "withholding taxes" paid on flows of dividends, interest, and royalties to the parents. The firms are required to calculate all quantities according to U.S. tax definitions, except that accelerated depreciation may not be used. Note that assets are therefore based on historic costs.[15] Tables 2, 3, and 4 present selections of the data. They display foreign subsidiaries' assets, taxable income, and tax paid to foreign governments, respectively.

TABLES 2,3,4 HERE

Supplementary data are taken from I.R.S., Statistics of Income: 1968 - 1972, Foreign Tax Credit, Corporations. They provide information about the domestic activities of the fifteen industries. Also they are used to calibrate the simulation program. The volume contains data on various intermediate quantities calculated as part of the foreign tax credit structure. An example is worldwide taxable income, corresponding to eq. (3) of the last section. Only industry totals are given.

The simulator can calculate the same concepts from the basic data and aggregate across countries. When these figures do not agree, a residual variable is created and spread out over the countries in proportion to income. In this way, the basic data are not changed,

but industry totals from the simulator can be brought into conformity with the published numbers.

An example of the ways in which the numbers can diverge is carryovers of foreign tax credits. Firms that operate in high-tax countries are allowed to carryover excess foreign tax credits. These quantities are included in the Statistics of Income volume and not in the basic data. The simulator spreads them out over countries as it does the residuals, but in proportion to excess credits generated in 1972. Since excess credits in prior years generated the carryovers, this seems the most reasonable way.

Headoffice deductions are needed for the simulations involving the 861 regulations. Data were collected on the two major types, interest deductions and research and development expenses. The former are taken from I.R.S., Statistics of Income, Corporations, 1972. The National Science Foundation's measure of "funds for R & D" is used for the latter; see NSF (1978), Table B-3. Since these sources include all U.S. firms in the industries, these two variables are scaled down by the ratio of domestic income of the M.N.C.s to total domestic income. These ratios are computed from the I.R.S. volumes.

B. Techniques and Assumptions

The presence of the overall credit limitation creates a problem in calculating foreign tax credits using aggregated data. Firms operating in one country may or may not be operating in other countries

simultaneously. The more countries they operate in, the more advantage they can take of the overall limitation. The U.S. would collect more tax if every firm operated in only one other country than if every firm operated in every country, for given amounts of income. Without micro data, there is no way to tell how completely the present structure of U.S. firms takes advantage of the overall limitation. Therefore, there is no way to calculate credits after limitation precisely.

The Statistics of Income book presents the actual level of credits allowed after limitation in 1972, by industry. The following procedure allows one to use this information to skirt this problem.

It is assumed that there are only eighteen (types of) firms in each industry. Seventeen operate in the U.S. and one other country only; they are called "binational" firms. The last firm in each industry is assumed to operate in every country; it is an "omninational" firm. The last assumption is that the omninational firm accounts for a constant proportion of the industry's activities in each country. This proportion may be called $\alpha_1$ for the first industry, and so forth through $\alpha_{15}$.

Given the $\alpha_i$'s, the simulator can calculate final credits. Foreign income taxes are split in two in each industry-country cell; $\alpha_i$ go to the omninational and $(1-\alpha_i)$ to the binational. The limitation is immediately calculated for the binational, and its final credit computed. The sum of credits for all binationals is then computed by adding over countries. The omninational's credit is computed by first adding its shares of income and taxes over the countries; then its

limitation is computed and imposed. The total credits for the industry are then the sum of the binationals' credits and the omninational's.

The larger is $\alpha_i$, the larger the total credit will be for the industry. This is so because the overall credit limitation does more "good" the closer the industry is to complete omninationality. There will be one value of $\alpha_i$, for each industry, that causes credits computed by the calculator to match credits reported in Statistics of Income. Once they are known, calibration of the simulator is complete. They may be used whenever limitations need to be calculated.

The $\alpha_i$'s that satisfy this condition are as follows:

| | | |
|---|---|---|
| 1) | Food products: | 0.6680 |
| 2) | Textiles and Apparels: | 0.2118 |
| 3) | Lumber and Paper: | 0.4908 |
| 4) | Printing and Publishing: | 0.5000 |
| 5) | Chemicals: | 0.4544 |
| 6) | Rubber Products: | 0.9593 |
| 7) | Stone, Clay, and Glass: | 0.7152 |
| 8) | Primary Metal Products: | 0.1929 |
| 9) | Fabricated Metal Products: | 0.0023 |
| 10) | Machinery, Except Electrical: | 0.2520 |
| 11) | Electrical Machinery: | 0.1291 |
| 12) | Motor Vehicles: | 0.4199 |
| 13) | Aircraft and Other Transportation Equipment: | 0.8989 |

| | | |
|---|---|---|
| 14) | Scientific Instruments, Etc.: | 0.6924 |
| 15) | Other Manufacturing: | 0.7196 |

Two adjustments were made. First, there never are excess credits in the fourth industry, printing and publishing. Thus the problem of how to compute the limitation never arises. All values of $\alpha_4$ would yield the same answer for this industry; therefore, a value of 0.5 is arbitrarily chosen. The simulator calculated credits of $24.17 million; the published number of $24.00 million. These are off by less than 1 percent. A residual equal to the difference will be subtracted from credits for the seventeenth country class in all runs.

The other problem concerns industry 9, fabricated metal products. Even when $\alpha_9$ is set to zero, calculated credits exceed reported credits. There may be an error in the data or method. Or the aggregation done to compute the seventeenth country group may not allow a strict enough limitation to be imposed. With $\alpha_9$ set to 0.0023, computed credits are $61.73 million. Reported credits are $61.29 million; the computation is off by 0.72 percent. Again, a residual equal to the difference will be subtracted from the seventeenth country class in all runs.

## III. Simulation Results

With the calculation of the proper $\alpha_i$'s, the calibration stage is complete. The simulation package, INTERSIM, is therefore able to analyze the tax issues discussed in Section I.

In order to facilitate comparisons among the reform proposals, a baseline proposal is defined first. It simulates the effect of two minor changes in actual 1972 experience. These changes are also included in the simulation of each reform proposal, and the final results from each are expressed relative to the baseline. The first of these changes is that carrovers of excess foreign tax credits from prior years are neglected. Without a series of years of data, there would be no way to simulate how the carryovers would change when the laws were changed. By dropping them in the baseline, the analysis may consistently neglect them for the whole analysis. Second, dividends received from less developed countries were taxed in a special way until 1976; this "no gross up" provision is taken out in the baseline and all other simulations.

The data show that total assets of foreign subsidiaries of U.S. manufacturing firms were equal to $100.250 billion in 1972. Total U.S. corporate income tax paid by these firms was $11.810 billion. Note that only taxes paid by U.S. multinational companies are included in this number; also, it is net of foreign tax credits and investment tax credits. These firms and their subsidiaries paid $5.087 billion in taxes to foreign governments. Thus, their total tax liabilities were $16.897 billion.

Table 5, line 1 displays the changes caused by the baseline simulation. U.S. tax revenues increase by $96 million, in 1972 dollars. Foreign tax revenues are not affected. Thus, except for rounding errors, the change in total tax liabilities equals the U.S. change. The possibility that assets of the firm could change is considered in the next section.

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The results of imposing the per country limitations are presented in line 2. This reform would seem to have little effect. Foreign tax credits are reduced, and thus U.S. taxes increased, by $70 million over the baseline. Again, except for rounding, this change equals the increase in total tax liabilities, since foreign taxes are unaffected.

The two proposals that eliminate deferral show more of an effect. The consolidation method causes an increase in U.S. tax revenues of $344 million over the baseline. For the reasons described above, the complete payout method causes a slightly larger increase in tax, $354 million.

Eliminating all U.S. taxation of income earned abroad, the territorial approach, would reduce U.S. taxes by $815 million, relative to the baseline. Line 6 shows that substituting a deduction for the foreign tax credit would raise U.S. tax revenues by $1.366 billion. Dismantling the foreign tax credit system in favor of a deduction would be an important change in U.S. tax policy toward international income.

A coordinated, worldwide, move to a shares allocation approach would also have major repercussions. The firms' overall tax liabilities would increase by $544 million. This is the net effect of increasing U.S. taxes by $2.387 billion and decreasing taxes paid to foreign governments by $1.842 billion (except for rounding errors). The current arm's length approach allocates more income to the foreign subsidiaries than would an approach based on shares of sales and especially assets. Substantial redistributions of worldwide tax revenues are implied.

Countries that show especially large ratios of income to sales and assets suffer the largest decreases in tax revenues. Since the INTERSIM package is able to calculate results by industry and country, it is possible to break down the aggregate change in foreign tax revenue shown in the third column, line 7, of Table 5. Table 6 displays foreign tax liabilities by country, before and after world-wide adoption of a shares allocation approach.

TABLE 6 HERE

Undoubtably, many foreign governments would balk at a move to a shares allocation system. Line 8 of Table 5 presents the results if only the U.S. used the shares allocation approach in computing taxable incomes. Foreign tax revenues are preserved. U.S., and thus total, tax liabilities rise by approximately $2.059 billion. This rise is smaller than the one for U.S. taxes in the worldwide reform because higher levels of foreign tax imply higher foreign tax credits. Still, the rise in U.S. revenues is substantial. Now, however, instead of foreign governments bearing the cost, the firms do. In fact, this reform would cause a larger change in total tax liabilities of the firms than any other reform simulated.

The last two lines present the results of simulating the special allocation mentioned in the 861 regulations. They imply that foreign tax credits will decline, since foreign tax base used in computing the credit limitation must be reduced. When sales and assets are used in the required allocation, credits decline, and total taxes rise, by $888 million. Using assets alone causes a slightly larger allocation of headoffice deductions; therefore, taxes rise slightly more, by $921 million, approximately.

To summarize, the largest changes in tax revenues would be produced by the deduction for foreign taxes paid and by the shares allocation approach. If a shares allocation system is instituted worldwide simultaneously, it would affect the distribution of tax revenues more than the total burden on the firms. The territorial system would also produce a large change in U.S. and total taxes, in the opposite direction. Finally, the aspects of the 861 regulations that are simulated produce sizeable changes in tax liabilities.

## IV. Behavioral Responses

The simulation results presented so far assume that the firms' decisions are fixed. This assumption is unwarranted; the firms may respond to the tax reform proposals in ways that could affect the results substantially. This section considers two sets of responses the firms might make and ways to include them in the simulations.

### A. Responses in Financial Decisions

Accounting for changes in intrafirm financial flows can have substantial impacts on the simulation results. Bergsten, Horst, and Moran (1978) present a model aimed at dealing with this issue in considerable detail. Partly because their analysis is so complete, this question is handled in a much more cursory fashion here.

The deferral provision of U.S. law emphasizes the importance of financial variables. If all firms made full use of deferral, by having their subsidiaries retain all profits, they could avoid paying any tax to the U.S. Note that this policy would not place substantial

limits on the firms' movements of capital. They could use intrafirm loans and changes in the subsidiaries' equity structure to reallocate retained funds for investment purposes.

Of course, full use of definal would place some restrictions on the firms. If all funds are retained abroad, they do not show up in the parent corporations' incomes. Since dividends paid out by the parents cannot exceed their profits, it is possible that complete deferral could restrict payouts by the corporations to their ultimate shareholders. It seems that in order to understand why the firms do not use intrafirm flows to minimize taxes, one must answer the question, why do the U.S. firms pay dividends? The difficulty others have had in answering this question is the second reason financial responses are given cursory treatment here.[16]

The simplest treatment for intrafirm dividends is to assume that the subsidiaries keep their payout rates constant. This is done, with two adjustments. In the simulation of shares allocation with coordination, dividends are assumed proportional to net income as measured by the present "arm's length" method. In other words, dividends do not change just because the way of measuring net income for tax purposes changes.

The second adjustment concerns measuring payout rates with the cross-tabulated data. Cells containing subsidiaries with both positive and negative profits could pose problems. The cells may show positive dividends, since the firms with losses will not pay dividends and the others may, but total profits could easily be negative. Spurious negative payout rates would result. The Treasury computed a special

tabulation, which excluded firms with losses, in order to solve this problem. Payout rates are computed from the dividends and profits reported by this tabulation.

Interest, royalties, and other fees also flow between the subsidiaries and parents. It is assumed that the ratios of these variables to gross income are kept constant.

B. Responses in Investment Decisions

The focus of concern with behavioral responses is the firms' investment decisions. Frisch (1980) presents evidence about the sensitivity of location of investment to rate of return and tax rates. Using much the same data as is used here, it relates changes in assets between 1968 and 1972 to gross and net rates of return. A significant relationship seems to exist. Specifically, a one percent decrease in rate of return, accounting for taxes, in one country seems to cause a decrease in assets there of between .1 and .2 percent over the next four years.

The partial equilibrium nature of this approach should be stressed. Some of the tax reform proposals raise effective tax rates, and thus reduce net rates of return, in almost every situation. The empirical results in Frisch (1980) imply that these reforms would reduce assets of U.S. firms in almost every country. Where would this capital go? Some might be invested by the firms in the U.S., some might be bid away by local firms in the countries, and some might be consumed in the long run as investment opportunities are worsened. Of course, all of these mechanisms would have repercussions, and a complete analysis would have to include these general equilibrium effects. Unfortunately

they are beyond the scope of this paper, since they require the construction of a general equilibrium model of the world economy.

The basic approach, in short, is to assume that firms change their overseas assets in response to net rates of return, which change as tax rates change. The reform proposals thus influence behavior through their effects on tax rates on investment. Computation of these tax rates and the effects that the reforms would have on them are discussed below and in more detail in the next section.

Applying an elasticity to changes in net rates of return yields changes in assets. A set of assumptions is needed to translate these changes into changes in income flows and tax liabilities. The simplest assumption is that gross income is proportional to assets; in other words, that gross rates of return are constant The special tabulation mentioned above allows one improvement. Presumably, a firm losing money in a country is not likely to expand assets there in the expectation that it will lose even more money. Only positive gross rates of return should be used. Thus, ratios of gross income to assets are computed from the tabulation which includes only profitable subsidiaries. Intercept terms are added to account for losses. For example, consider a small reduction in a tax rate, thus a small increase in net rate of return, and a small increase in assets. If gross income was positive before, it will increase in proportion; if negative, it will be a little less so.

Interest, royalties, and other fees are then computed from gross income as discussed above. Foreign taxable income is then equal to gross income minus these fees (except in the worldwide shares

allocation regime). Foreign tax liability equals taxable income times the effective foreign tax rate. These tax rates are computed from the special tabulation, in order to avoid spurious negative tax rates. Dividends are then computed from net income, as described above. The INTERSIM package is then ready to compute all other parts of total tax liabilities and display the results as desired.

The remaining issue is the computation of tax rates on investment. Needed are changes in total tax that would result from changes in investment, on the margin, under each tax regime. The INTERSIM package is able to compute these marginal effective tax rates directly. It perturbs assets, traces the effects on income flows and tax liabilities, and computes the resulting changes in total tax. Likely values of the marginal tax rates under each regime are discussed in detail below.[17]

In the first set of results presented below, a value of 0.15 is used for the elasticity of assets with respect to net rate of return. This value is chosen because it is in the middle of the range of findings in Frisch (1980). The tentative nature of this paper suggests, however, that a sensitivity analysis on this parameter is appropriate. For example, the paper is able to capture only four-year responses; therefore, the true long-run elasticity may be larger. For this reason, further results are presented which use elasticities that range from 0.05 to 1.00.

## V. Results Including Behavioral Responses

Table 7 presents simulation results with behavioral responses included. The elasticity of assets with respect to net rate of return is set to 0.15. The two changes in the baseline simulation cause a slight decrease in overseas investments. Assets decline by $100 million, or 0.099 percent, from actual 1972 levels. As a result, foreign income and taxes decline slightly. The baseline simulation now shows an increase of only $91 million in the total tax liabilities of the firms.

TABLE 7 HERE

Imposition of the per-country limitation either raises marginal tax rates or leaves them unaffected. Consider an omninational firm that, for simplicity, does not use deferral. Say its foreign taxes are only 40 percent of its foreign income. Then its effective tax rate on all foreign income, after the U.S. credit mechanism, becomes 48 percent, the basic U.S. rate in 1972. Now impose the per-country limitation. The effective tax rate in low-tax countries is still 48 percent. However, the firm might have some operations in a country with a 50 percent tax rate; the effective tax rate for this country would go from 48 percent to 50 percent.

The opposite case is an omninational firm with an average foreign tax rate over 48 percent but with some operations in a low-tax country. Now the tax rates in high-tax jurisdictions are unaffected, but the effective tax rate in the low-tax country is raised to the U.S. level.

In short, the "typical" operations of the omninational firms are unaffected. Tax rates that are on the other side of 48 percent from the firm's average rate will go up, either to 48 percent or to the foreign rate, which ever is higher. Income that is deferred or attributed to the binational firms is unaffected.

Line 2 of Table 7 illustrates these effects on investment incentives. Assets decrease slightly, compared to the baseline results. Detailed results (available from the author) show that some industries are totally unaffected. Total foreign assets of U.S. firms decrease by $30 million more than the baseline; this change causes a small reduction in foreign tax revenues. Imposition of the per-country limitation, taking behavioral responses into account, would increase total tax liabilities of the firms by $68 million, relative to the baseline.

Inferring the direction of movements in marginal tax rates is easier for this reform plan than for most of the ones to follow. Per-country limitation is one of only two reforms in which movements can occur in only one direction. In the others, some marginal tax rates increase and others decline. The reason is the overall limitation, together with omninational firms whose average tax rate flips from one side of 48 percent to the other.

Consider the plans that end deferral. If subsidiaries in low-tax countries retain more than average, ending deferral will lower averaged foreign tax rates. An omninational firm could find itself pushed from above 48 percent to below. Effective tax rates on all its income will go from being equal to local levels to 48 percent, the U.S. rate. This means that effective rates decline for high-tax countries and increase for low-tax countries. Another industry might have its omninational in exactly the opposite position; below 48 percent at first and above 48 percent after deferral is ended. Then marginal tax rates in the same countries would move in exactly the

opposite directions. The overall limitation can lead to some exceedingly complex patterns in marginal tax rates and investment incentives.

Although anything can happen to marginal tax rates in specific circumstances, typical trends are clearer. Movements for the binational firms and for more typical circumstances for the omninationals are usually unambiguous. For example, ending deferral can only raise marginal tax rates for the binational firms. If the deferred income is taxed more than 48 percent abroad then there is no effect; if the tax rate is lower abroad, the marginal tax rate has to increase.

The first column in lines 3 and 4 of Table 7 show that ending deferral would cause sizeable reductions in investments abroad. Assets decline by $1.594 billion relative to the baseline. The plans have exactly the same effect on investment since they differ only in the treatment of losses and, by assumption, subsidiaries with losses do not respond.

These changes in investment decisions are large enough to affect U.S. as well as foreign tax revenues. Foreign income is reduced; therefore, repatriations to the parents fall. As a result, U.S. revenues fall by $30 to $32 million, compared to the simulations that neglect behavioral responses. In addition, foreign tax revenues fall by $66 million. The result is that total tax payments by the firms are only $249 million larger than the baseline for the complete payout method, and $257 million for the consolidation method.

Territorial treatment reduces marginal tax rates in typical situations. The credit mechanism, in general, sets the effective tax

rate on repatriated income to the higher of the local rate or 48 percent. Since the territorial system suspends this mechanism entirely, marginal tax rates in low-tax countries decline. Some marginal tax rates could still increase. An ominational firm that is low-tax on average has marginal tax rates of 48 percent on all nondeferred income, including income from high-tax countries, if any. Suspending the credit system causes the marginal tax rates for this high-tax income to go up, to the local rate. In this atypical case, to reset marginal tax rates to local levels is to raise them.

Line 5 of Table 7 shows that the typical situations rule. Territorial treatment lowers investment disincentives, and causes assets abroad to increase by $800 million. Foreign tax payments rise by $40 million as a result. Note that the change in U.S. tax revenues is not affected by inclusion of behavioral responses. Since basically no attempt is made to tax foreign operations, U.S. revenues are insulated from changes in the firms' overseas investment decisions.

Substituting a deduction for the foreign tax credit raises marginal tax rates in every instance. In the simplest case, the marginal tax rate under the credit system is the higher of the foreign tax rate and the U.S. tax rate. Under the deduction regime,

$$MTR = t^* + (1 - t^*)\, t \qquad (16)$$

As long as $t^*$, the foreign tax rate, is between zero and one, MTR exceeds both $t^*$ and t, the U.S. rate. Therefore, the marginal tax rate under the deduction is greater than either of the values

it could take under the credit. Inclusion of deferral, overall limitation, and the other aspects of actual law do not change the conclusion that marginal taxes on investment must increase.

The result is that assets abroad fall by $2.221 billion. The firms end up paying an additional $1.314 billion to the U.S., and $1.146 billion overall.

The remaining four simulations involve some form of the shares allocation approach to defining tax bases. This approach can have some fascinating effects on marginal tax rates and investment incentives. For example, marginal tax rates on domestic activities can be affected directly, since domestic assets and income appear in the allocation formulas. The question of incentives for domestic investment is beyond the scope of this paper; however, some simple examples are presented in an appendix.

Marginal tax rates on foreign investment can increase or decrease, no matter what the credit situation, and can even become negative. Consider a coordinated shares allocation with only assets used to define the shares. Further consider, for simplicity, a firm that does not use deferral and that operates in only the U.S. and one other country, which has a higher tax rate than the U.S. Equations (1) - (4) and (9) - (11) would then imply that total taxes paid by the firm are:

$$T_{TOTAL} = t^{*}\left(\frac{A^{*}}{A+A^{*}}\right) Y_{TOTAL} + t\left(1 - \frac{A^{*}}{A+A^{*}}\right) Y_{TOTAL} \qquad (17)$$

Note that the credit mechanism insures that the tax rate on foreign income is $t^*$, since it is higher than t. This equation may be reexpressed:

$$T_{TOTAL} = \bar{t}\, Y_{TOTAL} \tag{18}$$

$$\bar{t} = \frac{t^* A^* + tA}{A^* + A} \tag{19}$$

$\bar{t}$ is the appropriate weighted average of tax rates applied to total income. The marginal tax rate on overseas investment is:

$$\frac{\partial T_{TOTAL}}{\partial A^*} = \bar{t}\, \frac{\partial Y_{TOTAL}}{\partial A^*} + Y_{TOTAL}\, \frac{\partial \bar{t}}{\partial A^*} \tag{20}$$

There are now two channels by which a marginal investment abroad can affect taxes. First is the usual one; more assets imply more income to be taxed. Second, assets affect the average tax rate because they affect the weighting scheme. Evaluating the derivative in the second term,

$$\frac{\partial T_{TOTAL}}{\partial A^*} = \bar{t}\, \frac{\partial Y_{TOTAL}}{\partial A^*} + Y_{TOTAL}\, (t^* - t)\, \frac{A}{(A^* + A)^2} \tag{21}$$

If $t^*$ is less than t, the second term is negative; increasing assets abroad reduces taxes because the smaller tax rate becomes more important in the average.

The first term is always positive. It will be small, however, if gross rate of return in the foreign country is small. In fact,

if gross rate of return abroad is extremely small and the tax rate there is low, the whole expression can be negative. Note that baseline marginal tax rates should be small in such a situation, since not much income is produced on margin and it is lightly taxed. In sum, it is possible for low baseline marginal tax rates to be pushed through zero by the shares allocation schemes.

This occurs in five out of the 246 cells in the data. The cells, and the marginal tax rates for the baseline and shares allocation scheme with coordination are:

| Industry | Country | Marginal Tax Rate | |
|---|---|---|---|
| | | Baseline | Shares |
| Printing, etc. (4) | Venezuela (5) | .0008 | -.0157 |
| Stone, etc. (7) | Spain (11) | .0003 | -.0122 |
| Fabricated Metals (9) | Venezuela (5) | .0026 | -.0025 |
| Motor Vehicles (12) | South Africa (14) | .0057 | -.0044 |
| Other (15) | Japan (15) | .0096 | -.0104 |

In these cases, interactions among tax rates in the various countries actually result in subsidies to investment.

Such sharp declines in marginal tax rates are not typical for the shares allocation regimes. On average, in fact, marginal tax rates rise moderate amounts. Assets and sales are distributed in the data in a way that shifts income into the relatively high-tax countries. The net result is to discourage investment abroad by U.S. firms. As Table 20 shows, assets fall by $852 million under the coordinated shares allocation regime.

Total tax liabilities rise by $509 million when behavioral responses are included. Foreign taxes fall by $1.845 billion and tax collected by the U.S. rises by $2.353 billion. Again, this regime implies a particularly large redistribution of tax revenues away from foreign governments and towards the U.S. (Disaggregated results, analogous to Table 6, are available from the author.)

Marginal tax rates for the shares allocation scheme without coordination are more complex. Income is first taxed at the basic foreign rate, then U.S. law adds aspects that work through the two channels outlined above. In effect, foreign income is potentially double-taxed, once by the ordinary foreign rate, and again by the shares allocation mechanism. To the extent that income is deferred, this double taxation is avoided.

The effect is to cause greater increases in the marginal tax rates. In three cases, they rise by enough to force net rate of return negative. This fact poses a problem for the routine that calculates behavioral responses. Since a constant elasticity form is used, a negative net rate of return would call for an infinitely large reduction in assets. It is clear that the simple functional form chosen is inadequate for some of the large changes that can result from this reform. Rather than investigate more realistic, but more complex, functional forms, this study resets the three negative net rates of return to 25% of their pre-reform levels. This procedure insures that behavioral responses in these three cells are proportionately larger than in any other cell, but not so large as to skew the whole analysis. The three cells and their

net rates of return under the baseline, under this reform before adjustment, and after adjustment are:

| Industry | Country | Net Rate of Return | | |
|---|---|---|---|---|
| | | Baseline | Not Adjusted | Adjusted |
| Scientific (14) | Brazil (4) | .0993 | -.2027 | .0248 |
| " | Venezuela (5) | .1176 | -.0079 | .0294 |
| " | Belgium (6) | .1986 | -.1390 | .0496 |

Overall, adoption of a shares allocation approach by the U.S. alone would cause assets abroad to decrease by $4.351 billion; see line 8 of Table 7. This is largest response in assets of any of the simulations. This result agrees with the fact that, when behavioral responses are neglected, this same regime causes the largest change in taxes. With responses included taxes increase by $1.370 billion. Inclusion of behavioral responses causes the change in total tax liabilities to be only two thirds as large as before.

The final two simulations involve the aspects of the 861 regulations. Under these regimes, a share of certain domestic deductions is allocated to the measure of income used to compute the foreign tax credit limitation. The result is to reduce credits and raise U.S. taxes.

Since taxes must increase, it should not be too surprising that marginal tax rates increase on average. None increase by enough to cause net rate of return to go negative. On the other hand, it is probably not surprising by now to discover that some rates go down. In fact, the third of the five cells listed above again experiences a negative tax rate, of -.000002.

How can a marginal tax rate fall so sharply in this regime? Remember that the tax rate in this cell is very low; therefore, the foreign tax credit never approaches the limitation. So an allocation that reduces this limitation does no damage. But headoffice deductions allocated into this country cannot do damage elsewhere. In short, the firms have the incentive to increase operations in this country so that the special deductions are allocated away from where they matter into a situation where they do not.

The average effect, however, is to increase disincentives for investment abroad. Line 9 of Table 7 presents the results when both assets and sales are used in the 861 allocations. Assets abroad decline by $1.644 billion. Total taxes increase by $755 million. Finally, the last line presents the results when only assets are used as the basis of the allocations. The decline in assets is slightly larger, $1.650 billion. The change in total taxes is still slightly higher, $793 million.

In summary, the nine reform proposals can change investment incentives in complex ways. The result is that overseas investments of U.S. firms can respond by large amounts. Substituting a deduction for the foreign tax credit and instituting a shares allocation scheme without coordination would have the largest effects. Changes in total tax liabilities are smaller than when behavioral responses are neglected. It is clear, however, that changes in tax revenues are not the only important aspect for evaluating the reforms.

Tables 8, 9, and 10 present the results of the sensitivity analysis on the basic response elasticity. Perhaps the most interesting changes show up in Table 10, when the elasticity is set equal to 1.00. Assets

now change by as much as $-23.963 billion; again, the shares allocation regime instituted by the U.S. only shows the largest response. This reduction in overseas investment causes large reductions in tax revenues in the U.S. and abroad. In fact, these changes are large enough to reverse the direction of change in total tax revenues; total tax payments now fall. Note that U.S. revenues still increase, although the change is smaller than with no or more modest response elasticities. Similar results hold for the simulations that repeal deferral.

TAXES 8, 9, 10 HERE

In sum, the effects on investments now appear to swamp, or nearly swamp, the effects on total tax revenues. One implication is that the reforms do more to redistribute revenues from the foreign governments to the U.S., than they do to increase total tax payments.

This implication does not apply, of course, to the territorial treatment simulation, which reduces U.S. tax revenues. Note that changes in overseas investments are so large that U.S. revenues are affected even for this reform. Comparing line 5 of Table 10 to the same line in Tables 5 or 7 shows that the U.S. collects an extra $4 million as the result of the response in assets. This increase comes from the small flows of interest payments, royalties, and other fees paid by the subsidiaries to the parents. These flows are still part of the income of the parents and thus are taxed by the U.S., even though the subsidiaries' profits are not taxed by the U.S. under this regime.

## VI. Conclusions

This paper looks at some aspects of U.S. tax policy toward multinational corporations. Six basic issues and nine specific reforms are formulated. The INTERSIM computer simulation package is used to estimate the effects of these reforms on investment decisions and tax liabilities.

It is important to emphasize the limitations of the analysis. First, it is necessary to work with cross-tabulated data, rather than with data from individual firms. This fact makes dealing with the overall credit limitation somewhat difficult. Perhaps simulation of the per-country limitation, which is closely related, is inaccurate as a result. Further, the difference between the two plans for ending deferral is probably understated, since some of the subsidiaries with losses are hidden in the cross-tabulation process.

One could wish for better data, also, on quantities that are not now involved in the tax calculations but are important to the analysis. The prime example is assets of foreign subsidiaries. This number is required on the information returns filed by the corporations; however, since it does not affect tax liabilities, it is possible that neither the firms nor the I.R.S. take it very seriously. Biases may result in the simulations involving shares allocations, since they depend on assets to set the shares. The simulation of behavioral responses also relies on assets and may also be faulty. Of course, it is impossible to measure these biases with the current data.

Similar problems arise in measuring the special deductions needed for the 861 regulations regimes. Only a proxy could be used,

since research and development expenses of the U.S. firms are not separately listed in the data or in published I.R.S. statistics.

As is discussed above, the analysis of behavioral responses by the firms is certainly not complete. Responses in financial decisions are given only summary treatment. Only partial equilibrium analysis of responses in investment decisions is attempted.

In sum, this paper extends previous analyses of U.S. taxation of international income in some ways. It uses data that affords an improvement since they provide information by industry and by country. A wider set of issues is examined, particularly in connection with allocation of income among national tax jurisdictions. Treatment of responses to tax changes in the investment decision of the firms is begun. However, it is clear that many extensions need to be done before analysis of these issues is complete.

Daniel A. Frisch

TABLE 1

INDUSTRY GROUPS AND COUNTRIES

A. Industry Groups

1. Food and kindred products
2. Textile and apparel products
3. Lumber and paper products
4. Printing and publishing
5. Chemicals and allied products
6. Rubber and miscellaneous plastics products
7. Stone, clay, and glass products
8. Primary metal industries
9. Fabricated metal products, except machinery
10. Machinery, except electrical
11. Electrical machinery
12. Motor vehicles and equipment
13. Transportation equipment, except motor vehicles
14. Scientific instruments, photographic equipment, watches, and clocks
15. Other, including tobacco, furniture, leather, and miscellaneous products

B. Countries

1. Canada
2. Mexico
3. Argentina
4. Brazil
5. Venezuela
6. Belgium
7. France
8. Italy
9. Netherlands
10. West Germany
11. Spain
12. Switzerland
13. United Kingdom
14. South Africa
15. Japan
16. Australia
17. Other Countries

TABLE 2 SELECTIONS FROM 1972 DATA.

RESULTS BY INDUSTRY AND COUNTRY FOR: FOR ASSETS

| | CANADA | MEXICO | ARGENTINA | BRAZIL | VENEZUELA | BELGIUM | FRANCE | ITALY | NETHERLNDS |
|---|---|---|---|---|---|---|---|---|---|
| FOOD PRODS | .1400E+10 | .2990E+09 | .1305E+09 | .2225E+09 | .1699E+09 | .1204E+09 | .5787E+09 | .2379E+09 | .2657E+09 |
| TEXTILES | .3842E+09 | .1483E+09 | .5301E+08 | .3902E+08 | .5800E+08 | .7101E+08 | .6705E+08 | .5647E+08 | .1678E+08 |
| LMBR,PAPER | .1855E+10 | .6701E+08 | 0. | .9440E+08 | .1598E+08 | .1630E+09 | .2063E+09 | .2160E+09 | .1184E+09 |
| PRINT,PUBL | .4378E+09 | .4411E+08 | .1438E+07 | .1060E+08 | .1150E+08 | .5117E+07 | .3881E+08 | .6576E+08 | .2953E+08 |
| CHEMICALS | .3246E+10 | .6280E+09 | .2692E+09 | .6490E+09 | .3025E+09 | .7077E+09 | .1033E+10 | .1093E+10 | .8891E+09 |
| RUBBER PRD | .4558E+09 | .1000E+09 | .6347E+08 | .1785E+09 | .7901E+08 | .2123E+09 | .2486E+09 | .1127E+09 | .1026E+09 |
| STONE,CLAY | .6774E+09 | .3420E+08 | .3025E+08 | .8651E+08 | .5140E+08 | .4164E+08 | .9225E+08 | .5339E+08 | .8625E+07 |
| PRIM.METAL | .1636E+10 | .2273E+09 | .6627E+08 | .1155E+09 | .1052E+09 | .6750E+08 | .6361E+08 | .9775E+08 | .3462E+09 |
| FABR.METAL | .7868E+09 | .8387E+08 | .1378E+08 | .4865E+08 | .4322E+08 | .1427E+09 | .1857E+09 | .1677E+09 | .1611E+09 |
| MACHINERY | .2311E+10 | .3254E+09 | .1145E+09 | .5652E+09 | .1699E+09 | .5913E+09 | .1932E+10 | .1077E+10 | .7810E+09 |
| ELEC.MACH. | .1787E+10 | .2213E+09 | .4987E+09 | .2892E+09 | .1086E+09 | .6683E+09 | .7547E+09 | .7917E+09 | .3477E+09 |
| MOTOR VEH. | .4302E+10 | .3194E+09 | .4237E+09 | .7352E+09 | .1967E+09 | .1203E+09 | .1093E+10 | .2826E+09 | .3093E+09 |
| AIRCRAFT | .1575E+10 | .2486E+08 | .1346E+08 | .4373E+08 | .3426E+07 | .1501E+08 | .2752E+09 | .7053E+08 | .3641E+08 |
| SCIENTIFIC | .3575E+09 | .5648E+08 | .2479E+08 | .9757E+08 | .1198E+08 | .8217E+08 | .7760E+09 | .3047E+09 | .2305E+09 |
| OTHER MANU | .4647E+09 | .2853E+08 | .2064E+08 | .1515E+08 | .8153E+08 | .4295E+08 | .3385E+08 | .2225E+08 | .3806E+08 |
| TOT CNTRY: | .2168E+11 | .2608E+10 | .1724E+10 | .3191E+10 | .1409E+10 | .3051E+10 | .7379E+10 | .4649E+10 | .3681E+10 |

| | W. GERMANY | SPAIN | SWITZERLND | U. KINGDOM | S. AFRICA | JAPAN | AUSTRALIA | ALL OTHER | TOT. INDUS |
|---|---|---|---|---|---|---|---|---|---|
| FOOD PRODS | .4479E+09 | .7984E+08 | .1350E+09 | .1249E+10 | .6633E+08 | .1667E+09 | .4572E+09 | .1506E+10 | .7533E+10 |
| TEXTILES | .1001E+09 | 0. | .6434E+08 | .1489E+09 | .3885E+07 | 0. | .2783E+08 | .2681E+09 | .1507E+10 |
| LMBR,PAPER | .1173E+09 | .4704E+08 | .2349E+08 | .3202E+09 | .1969E+08 | 0. | .1181E+09 | .6081E+09 | .3990E+10 |
| PRINT,PUBL | .2954E+08 | .1159E+08 | .2470E+08 | .1560E+09 | .8805E+07 | .2811E+08 | .4761E+08 | .6798E+08 | .1019E+10 |
| CHEMICALS | .1163E+10 | .3202E+09 | .1309E+10 | .1742E+10 | .1452E+09 | .2619E+09 | .6771E+09 | .3494E+10 | .1793E+11 |
| RUBBER PRD | .1640E+09 | 0. | .1321E+09 | .3403E+09 | .5793E+08 | 0. | .1184E+09 | .8473E+09 | .3213E+10 |
| STONE,CLAY | .2458E+09 | .1344E+08 | .3028E+08 | .1340E+09 | 0. | .7733E+07 | .2252E+08 | .2576E+09 | .1787E+10 |
| PRIM.METAL | .2345E+09 | 0. | .4689E+08 | .3790E+09 | .1230E+08 | .3879E+08 | .1199E+10 | .1105E+10 | .5741E+10 |
| FABR.METAL | .4064E+09 | .2127E+08 | .8608E+08 | .3212E+09 | .1758E+08 | .5107E+07 | .9047E+08 | .3844E+09 | .2966E+10 |
| MACHINERY | .2088E+10 | .2763E+09 | .8444E+09 | .2718E+10 | .2301E+09 | .8812E+09 | .6608E+09 | .1854E+10 | .1742E+11 |
| ELEC.MACH. | .1750E+10 | .4519E+09 | .5485E+09 | .2103E+10 | .1028E+09 | .8487E+08 | .2764E+09 | .1805E+10 | .1259E+11 |
| MOTOR VEH. | .2612E+10 | .2540E+09 | .3099E+09 | .1366E+10 | .3118E+09 | .2393E+08 | .1146E+10 | .1154E+10 | .1496E+11 |
| AIRCRAFT | .2085E+09 | .1224E+08 | .5964E+08 | .5318E+09 | .3451E+07 | .4480E+06 | .2138E+09 | .4515E+09 | .3539E+10 |
| SCIENTIFIC | .3992E+09 | .4866E+08 | .1570E+09 | .7910E+09 | .2956E+08 | .3331E+08 | .1504E+09 | .4542E+09 | .4005E+10 |
| OTHER MANU | .1544E+09 | .1610E+08 | .2689E+09 | .1436E+09 | 0. | .2380E+08 | .2020E+09 | .4995E+09 | .2056E+10 |
| TOT CNTRY: | .1012E+11 | .1553E+10 | .4040E+10 | .1244E+11 | .1009E+10 | .1556E+10 | .5408E+10 | .1476E+11 | .1003E+12 |

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RESULTS FROM INTERSIM COMPUTER SIMULATION PACKAGE.
ALL QUANTITIES ARE IN 1972 DOLLARS.
FEBRUARY 15, 1981.

TABLE 3 SELECTIONS FROM 1972 DATA.

RESULTS BY INDUSTRY AND COUNTRY FOR: FOR TX INC

| | CANADA | MEXICO | ARGENTINA | BRAZIL | VENEZUELA | BELGILM | FRANCE | ITALY | NETHERLNDS |
|---|---|---|---|---|---|---|---|---|---|
| FOOD PRODS | .2041E+09 | .1233E+08 | .3400E+07 | .2641E+08 | .1586E+08 | .1291E+08 | .3679E+08 | .1730E+08 | .3400E+08 |
| TEXTILES | .2307E+08 | .4732E+07 | .5622E+07 | -.2316E+07 | .1179E+07 | .8080E+07 | .8636E+07 | .8586E+06 | .3152E+07 |
| LMBR,PAPER | .1304E+09 | .1267E+08 | 0. | .1963E+08 | .4751E+07 | .4142E+07 | .5518E+08 | .3037E+07 | .1207E+08 |
| PRINT,PUBL | .3709E+08 | .2556E+07 | -.1243E+06 | .3545E+07 | -.5149E+05 | .1149E+07 | .7228E+07 | .2160E+07 | .4400E+07 |
| CHEMICALS | .2775E+09 | .1026E+09 | .2068E+08 | .4805E+08 | .3169E+08 | .7225E+08 | .1436E+09 | .1546E+09 | .8678E+08 |
| RUBBER PRD | .4566E+08 | .1640E+08 | .1559E+08 | .3757E+08 | .1181E+08 | .4217E+07 | .7595E+07 | .4328E+07 | .4683E+07 |
| STONE,CLAY | .7880E+08 | .1931E+07 | .3706E+07 | .6237E+07 | .8226E+07 | .6291E+07 | .1067E+08 | .2312E+07 | -.8146E+05 |
| PRIM.METAL | .5290E+08 | .6055E+07 | .1611E+07 | .7656E+06 | .3228E+07 | .9249E+06 | .6223E+07 | .3853E+07 | .1308E+08 |
| FABR.METAL | .9178E+08 | .5619E+07 | .1160E+07 | .8957E+07 | .1170E+07 | .6140E+07 | .2184E+08 | .8265E+07 | .1399E+08 |
| MACHINERY | .3004E+09 | .2243E+08 | .7216E+07 | .5571E+08 | .2870E+08 | .6741E+08 | .3290E+09 | .1420E+09 | .1141E+09 |
| ELEC.MACH. | .1705E+09 | .3250E+08 | .6915E+07 | .1981E+08 | .1524E+08 | .4208E+08 | .5535E+08 | .3380E+08 | .1365E+08 |
| MOTOR VEH. | .5551E+09 | .1487E+08 | -.3361E+06 | .6694E+08 | .1093E+08 | .1164E+08 | .5973E+08 | .1658E+08 | .4260E+08 |
| AIRCRAFT | .1169E+09 | .2741E+07 | .6593E+06 | .9861E+07 | .1995E+06 | .8147E+06 | .2333E+08 | .5279E+07 | -.2550E+06 |
| SCIENTIFIC | .1052E+09 | .1597E+08 | .2304E+07 | .9663E+08 | .5929E+07 | .9916E+08 | .5547E+08 | .5222E+08 | .4393E+08 |
| OTHER MANU | .3925E+08 | .2223E+07 | .3751E+06 | -.7129E+06 | .1125E+08 | .3116E+07 | .1094E+07 | .2325E+06 | .1821E+07 |
| TOT CNTRY: | .2229E+10 | .2576E+09 | .6878E+08 | .3971E+09 | .1501E+09 | .3403E+09 | .8217E+09 | .4468E+09 | .3879E+09 |

| | W. GERMANY | SPAIN | SWITZERLND | U. KINGDOM | S. AFRICA | JAPAN | AUSTRALIA | ALL OTHER | TOT. INDUS |
|---|---|---|---|---|---|---|---|---|---|
| FOOD PRODS | .9248E+08 | .1022E+08 | .5111E+07 | .1039E+09 | .5944E+07 | .7369E+08 | .3565E+08 | .9630E+08 | .7864E+09 |
| TEXTILES | .1556E+07 | 0. | -.5397E+06 | .1104E+08 | -.1822E+06 | 0. | .4274E+07 | .1905E+08 | .8821E+08 |
| LMBR,PAPER | .2644E+08 | .9609E+07 | .5694E+07 | .5941E+08 | .2805E+07 | 0. | .3668E+08 | .3868E+08 | .4212E+09 |
| PRINT,PUBL | .3604E+07 | .1600E+07 | .4412E+07 | .2120E+08 | .1122E+07 | .1952E+06 | .4607E+07 | -.1232E+07 | .9346E+08 |
| CHEMICALS | .1826E+09 | .4928E+08 | .7914E+08 | .1966E+09 | .2274E+08 | .4829E+08 | .7609E+08 | .2365E+09 | .1829E+10 |
| RUBBER PRD | -.8280E+07 | 0. | .2139E+07 | .7820E+07 | .1141E+08 | 0. | .4944E+07 | .7161E+08 | .2395E+09 |
| STONE,CLAY | .1987E+08 | .8368E+06 | .4324E+07 | .5842E+09 | 0. | .4900E+06 | .1819E+07 | .9667E+07 | .7393E+09 |
| PRIM.METAL | .5715E+07 | 0. | .2469E+07 | .2090E+08 | .1906E+07 | .6511E+07 | .8663E+08 | .6203E+08 | .2748E+09 |
| FABR.METAL | .5045E+08 | .4030E+07 | .5212E+07 | .2839E+08 | .3024E+07 | .5105E+06 | .9619E+07 | .2264E+08 | .2828E+09 |
| MACHINERY | .4974E+09 | .5118E+08 | .1295E+09 | .2948E+09 | .2067E+08 | .2242E+09 | .7013E+08 | .2202E+09 | .2565E+10 |
| ELEC.MACH. | .2017E+09 | .5092E+08 | .3571E+08 | .1456E+09 | .3554E+07 | .2099E+08 | .2258E+08 | .1411E+09 | .1012E+10 |
| MOTOR VEH. | .3291E+09 | -.1144E+07 | .2308E+08 | .3322E+08 | -.1366E+08 | .1575E+07 | .7946E+08 | .4831E+08 | .1277E+10 |
| AIRCRAFT | .9606E+07 | .1415E+07 | .5128E+07 | .1329E+08 | .4960E+06 | .1192E+05 | .2375E+08 | .2117E+08 | .2344E+09 |
| SCIENTIFIC | .7005E+08 | .9157E+07 | .1960E+08 | .1213E+09 | .1036E+08 | .7855E+07 | .4958E+08 | .5686E+08 | .8216E+09 |
| OTHER MANU | .1087E+08 | .1635E+07 | .4984E+08 | .1837E+08 | 0. | .2437E+07 | .3740E+08 | .1120E+08 | .1904E+09 |
| TOT CNTRY: | .1482E+10 | .1887E+09 | .3708E+09 | .1660E+10 | .7019E+08 | .3868E+09 | .5432E+09 | .1054E+10 | .1086E+11 |

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RESULTS FROM INTERSIM COMPUTER SIMULATION PACKAGE.
ALL QUANTITIES ARE IN 1972 DOLLARS.
FEBRUARY 15, 1981.

TABLE 4 SELECTIONS FROM 1972 DATA.

RESULTS BY INDUSTRY AND COUNTRY FOR: FOR TAXES

| | CANADA | MEXICO | ARGENTINA | BRAZIL | VENEZUELA | BELGIUM | FRANCE | ITALY | NETHERLNDS |
|---|---|---|---|---|---|---|---|---|---|
| FOOD PRODS | .9605E+08 | .1705E+08 | .3732E+07 | .8179E+07 | .6586E+07 | .4267E+07 | .1719E+08 | .1159E+08 | .1369E+08 |
| TEXTILES | .1209E+08 | .2800E+07 | .1900E+07 | .3696E+06 | .1759E+07 | .4262E+07 | .4230E+07 | .1667E+07 | .1295E+07 |
| LMBR,PAPER | .5273E+08 | .7037E+07 | 0. | .4924E+07 | .1280E+07 | .1507E+07 | .1122E+08 | .1986E+07 | .4436E+07 |
| PRINT,PUBL | .1840E+08 | .1437E+07 | .1090E+05 | .6403E+05 | 7345. | .4425E+06 | .3240E+07 | .1597E+07 | .1337E+07 |
| CHEMICALS | .1333E+09 | .5950E+08 | .1154E+08 | .1858E+08 | .1322E+08 | .2814E+08 | .6749E+08 | .4792E+08 | .4005E+08 |
| RUBBER PRD | .2371E+08 | .9887E+07 | .6272E+07 | .1402E+08 | .5808E+07 | .1045E+07 | .3263E+07 | .1613E+07 | .2393E+07 |
| STONE,CLAY | .3074E+08 | .1681E+07 | .1849E+07 | .1232E+07 | .3322E+07 | .2417E+07 | .4883E+07 | .1088E+07 | .3686E+06 |
| PRIM.METAL | .3122E+08 | .3177E+07 | .1242E+07 | .1703E+07 | .1201E+07 | .9536E+06 | .3083E+07 | .2344E+07 | .3540E+07 |
| FABR.METAL | .4489E+08 | .4225E+07 | .6715E+06 | .3188E+07 | .1345E+06 | .2006E+07 | .7597E+07 | .3842E+07 | .8103E+07 |
| MACHINERY | .1543E+09 | .1457E+08 | .4085E+07 | .1700E+08 | .1251E+08 | .2405E+08 | .1484E+09 | .8025E+08 | .5737E+08 |
| ELEC.MACH. | .7914E+08 | .2002E+08 | .3829E+07 | .3883E+07 | .7438E+07 | .1808E+08 | .2145E+08 | .2515E+08 | .9882E+07 |
| MOTOR VEH. | .2690E+09 | .9107E+07 | .3801E+07 | .2639E+07 | .6813E+07 | .5492E+07 | .2700E+08 | .9740E+07 | .1524E+08 |
| AIRCRAFT | .4795E+08 | .1636E+07 | .5086E+06 | .3744E+07 | .1771E+06 | .5290E+06 | .7937E+07 | .2759E+07 | .1694E+06 |
| SCIENTIFIC | .8016E+08 | .1321E+08 | .1895E+07 | .8973E+08 | .4647E+07 | .8320E+08 | .3122E+08 | .2640E+08 | .2018E+08 |
| OTHER MANU | .1701E+08 | .1413E+07 | .4384E+06 | .5073E+05 | .4806E+07 | .1824E+07 | .9920E+06 | .2827E+06 | .2614E+06 |
| TOT CNTRY: | .1091E+10 | .1667E+09 | .4178E+08 | .1693E+09 | .6971E+08 | .1782E+09 | .3592E+09 | .2182E+09 | .1783E+09 |

| | W. GERMANY | SPAIN | SWITZERLND | U. KINGDOM | S. AFRICA | JAPAN | AUSTRALIA | ALL OTHER | TOT. INDLS |
|---|---|---|---|---|---|---|---|---|---|
| FOOD PRODS | .3907E+08 | .4387E+07 | .5550E+07 | .4112E+08 | .3072E+07 | .3344E+08 | .1913E+08 | .3340E+08 | .3575E+09 |
| TEXTILES | .1069E+07 | 0. | .3118E+06 | .5036E+07 | .4445E+05 | 0. | .1957E+07 | .4318E+07 | .4311E+08 |
| LMBR,PAPER | .1552E+08 | .3017E+07 | .1306E+07 | .1893E+08 | .1927E+07 | 0. | .1077E+08 | .1924E+08 | .1558E+09 |
| PRINT,PUBL | .2265E+07 | .5923E+06 | .1396E+07 | .9820E+07 | .3474E+06 | .1841E+06 | .1357E+07 | .1021E+07 | .4351E+08 |
| CHEMICALS | .7713E+08 | .1510E+08 | .2350E+08 | .7471E+08 | .1054E+08 | .2475E+08 | .3743E+08 | .9485E+08 | .7777E+09 |
| RUBBER PRD | .2004E+06 | 0. | .6934E+06 | .3345E+07 | .5065E+07 | 0. | .2540E+07 | .3042E+08 | .1103E+09 |
| STONE,CLAY | .1007E+08 | 4462. | .9838E+06 | .2946E+09 | 0. | .3358E+06 | .8647E+06 | .2771E+07 | .3572E+09 |
| PRIM.METAL | .2166E+07 | 0. | .6109E+06 | .8205E+07 | .8846E+06 | .3122E+07 | .1805E+08 | .2271E+08 | .1042E+09 |
| FABR.METAL | .2393E+08 | .9798E+06 | .7971E+06 | .1332E+08 | .1487E+07 | .2258E+06 | .4543E+07 | .8301E+07 | .1282E+09 |
| MACHINERY | .2430E+09 | .1945E+06 | .3583E+08 | .1550E+09 | .1173E+08 | .9675E+08 | .4080E+08 | .9594E+08 | .1211E+10 |
| ELEC.MACH. | .7497E+08 | .1869E+08 | .1118E+08 | .6629E+08 | .1834E+07 | .1035E+08 | .1081E+08 | .4097E+08 | .4240E+09 |
| MOTOR VEH. | .1796E+09 | .1747E+07 | .6758E+07 | .1514E+08 | .5151E+06 | .1571E+06 | .3680E+08 | .2583E+08 | .6153E+09 |
| AIRCRAFT | .3144E+07 | .5811E+06 | .1455E+07 | .8548E+07 | .2241E+06 | 7870. | .5270E+07 | .8123E+07 | .9276E+08 |
| SCIENTIFIC | .4225E+08 | .2697E+07 | .7287E+07 | .8915E+08 | .8898E+07 | .3726E+07 | .3991E+08 | .3722E+08 | .5818E+09 |
| OTHER MANU | .5559E+07 | .9103E+06 | .1696E+08 | .7870E+07 | 0. | .1881E+06 | .2201E+08 | .4430E+07 | .8500E+08 |
| TOT CNTRY: | .7199E+09 | .6815E+08 | .1146E+09 | .8111E+09 | .4656E+08 | .1732E+09 | .2522E+09 | .4295E+09 | .5087E+10 |

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RESULTS FROM INTERSIM COMPUTER SIMULATION PACKAGE.
ALL QUANTITIES ARE IN 1972 DOLLARS.
FEBRUARY 15, 1981.

Table 5

Simulation Results No Behavioral Response

| | Change in Assets of Foreign Subsidiaries | Change in U.S. Tax Liabilities | Change in Foreign Tax Liabilities | Change in Total Tax Liabilities |
|---|---|---|---|---|
| A. Changes From 1972 Data | | | | |
| 1. Baseline Simulation | - | +96 | - | +97 |
| B. Changes from Baseline Simulation | | | | |
| 2. Per Country Limitation | - | +70 | - | +69 |
| 3. Repeal Deferral, Complete Payout | - | +344 | - | +344 |
| 4. Repeal Deferral, Consolidation | - | +354 | - | +354 |
| 5. Territorial Treatment | - | -815 | - | -815 |
| 6. Deduction For Foreign Taxes | - | +1,366 | - | +1,365 |
| 7. Shares Allocation, Worldwide | - | +2,387 | -1,842 | +544 |
| 8. Shares Allocation, By U.S. Only | - | +2,059 | - | +2,058 |
| 9. 861 Allocation, Sales and Assets Used | - | +888 | - | +888 |
| 10. 861 Allocation, Assets Only Used | - | +922 | - | +921 |

Note: In Millions of 1972 Dollars.

Table 6

Foreign Tax Revenues, By Country

| | From 1972 data | With Shares Allocation | Change |
|---|---|---|---|
| Canada | 1,091 | 737.1 | -353.9 |
| Mexico | 166.7 | 127.3 | -39.4 |
| Argentina | 41.38 | 38.55 | -2.83 |
| Brazil | 169.3 | 68.06 | -101.24 |
| Venezuela | 69.71 | 50.86 | -18.85 |
| Belgium | 178.2 | 86.87 | -91.33 |
| France | 359.2 | 247.5 | -111.7 |
| Italy | 218.2 | 142.3 | -75.9 |
| Netherlands | 178.3 | 113.8 | -64.5 |
| West Germany | 719.9 | 389.9 | -333.0 |
| Spain | 68.15 | 44.27 | -23.88 |
| Switzerland | 114.6 | 79.77 | -34.83 |
| United Kingdom | 811.1 | 409.8 | -401.3 |
| South Africa | 46.56 | 36.94 | -9.62 |
| Japan | 173.2 | 61.23 | -111.97 |
| Australia | 252.2 | 181.7 | -70.5 |
| Other | 429.5 | 434.5 | +5.0 |

Note: In Millions of 1972 Dollars.

Table 7

Simulation Results

Elasticity = 0.15

| | Change in Assets of Foreign Subsidiaries | Change in U.S. Tax Liabilities | Change in Foreign Tax Liabilities | Change in Total Tax Liabilities |
|---|---|---|---|---|
| A. Changes From 1972 Data | | | | |
| 1. Baseline Simulation | -100 | +96 | -4 | +91 |
| 2. Changes from Baseline Simulation | | | | |
| 2. Per Country Limitation | -30 | +69 | -2 | +68 |
| 3. Repeal Deferral, Complete Payout | -1,594 | +314 | -66 | +249 |
| 4. Repeal Deferral, Consolidation | -1,594 | +322 | -66 | +257 |
| 5. Territorial Treatment | +800 | -815 | +40 | -774 |
| 6. Deduction for Foreign Taxes | -2,221 | +1,314 | -169 | +1,146 |
| 7. Shares Allocation, Worldwide | -852 | +2,353 | -1,845 | +509 |
| 8. Shares Allocation, By U.S. Only | -4,351 | +1,777 | -408 | +1,370 |
| 9. 861 Allocation, Sales and Assets Used | -1,644 | +860 | -106 | +755 |
| 10. 861 Allocation, Assets only Used | -1,650 | +895 | -103 | +793 |

Note: In Millions of 1972 Dollars.

Table 8

Simulation Results

Elasticity = 0.05

| | Change in Assets of Foreign Subsidiaries | Change in U.S. Tax Liabilities | Change in Foreign Tax Liabilities | Change in Total Tax Liabilities |
|---|---|---|---|---|
| A. Changes From 1972 Data | | | | |
| 1. Baseline Simulation | -30 | +96 | -1 | +95 |
| B. Changes from Baseline Simulation | | | | |
| 2. Per Country Limitation | -10 | +70 | -1 | +69 |
| 3. Repeal Deferral, Complete Payout | -537 | +334 | -22 | +312 |
| 4. Repeal Deferral, Consolidation | -537 | +343 | -22 | +321 |
| 5. Territorial Treatment | +270 | -815 | +13 | -802 |
| 6. Deduction for Foreign Taxes | -749 | +1,348 | -57 | +1,291 |
| 7. Shares Allocation, Worldwide | -289 | +2,375 | -1,844 | +531 |
| 8. Shares Allocation, By U.S. Only | -1,484 | +1,964 | -143 | +1,821 |
| 9. 861 Allocation, Sales And Assets Used | -554 | +879 | -36 | +843 |
| 10. 861 Allocation, Assets Only Used | -556 | +913 | -35 | +878 |

Note: In Millions of 1972 Dollars.

Table 9

Simulation Results

Elasticity = 0.50

| | Change in Assets of Foreign Subsidiaries | Change in U.S. Tax Liabilities | Change in Foreign Tax Liabilities | Change in Total Tax Liabilities |
|---|---|---|---|---|
| A. Changes From 1972 Data | | | | |
| 1. Baseline Simulation | -332 | +94 | -15 | +79 |
| B. Changes From Baseline Simulation | | | | |
| 2. Per Country Limitation | -125 | +69 | -6 | +63 |
| 3. Repeal Deferral, Complete Payout | -5,122 | +248 | -213 | +35 |
| 4. Repeal Deferral, Consolidation | -5,122 | +258 | -213 | +45 |
| 5. Territorial Treatment | +2,692 | -813 | +136 | -677 |
| 6. Deduction for Foreign Taxes | -7,126 | +1,202 | -536 | +688 |
| 7. Shares Allocation, Worldwide | -2,656 | +2,302 | -1,823 | +479 |
| 8. Shares Allocation, By U.S. Only | -13,395 | +1,249 | -1,190 | +59 |
| 9. 861 Allocation, Sales and Assets Used | -5,282 | +801 | -338 | +462 |
| 10. 861 Allocation, Assets Only Used | -5,311 | +838 | -330 | +508 |

Note: In Millions of 1972 Dollars.

Table 10

Simulation Results

Elasticity = 1.00

| | Change in Assets of Foreign Subsidiaries | Change in U.S. Tax Liabilities | Change in Foreign Tax Liabilities | Change in Total Tax Liabilities |
|---|---|---|---|---|
| A. Changes From 1972 Data | | | | |
| 1. Baseline Simulation | -662 | +92 | -30 | +62 |
| B. Changes From Baseline Simulation | | | | |
| 2. Per Country Limitation | -247 | +68 | -12 | +56 |
| 3. Repeal Deferral, Complete Payout | -9,707 | +163 | -406 | -243 |
| 4. Repeal Deferral, Consolidation | -9,707 | +176 | -406 | -230 |
| 5. Territorial Treatment | +5,492 | -811 | +278 | -533 |
| 6. Deduction for Foreign Taxes | -13,489 | +1,062 | -1,008 | +54 |
| 7. Shares Allocation, Worldwide | -4,671 | +2,330 | -1,667 | +663 |
| 8. Shares Allocation, By U.S. Only | -23,936 | +682 | -2,348 | -1,318 |
| 9. 861 Allocation, Sales and Assets Used | -10,016 | +723 | -639 | +84 |
| 10. 861 Allocation, Assets Only Used | -10,092 | +763 | -626 | +137 |

Note: In Millions of 1972 Dollars.

# APPENDIX

## MARGINAL TAX RATES ON DOMESTIC ACTIVITIES: TWO EXAMPLES

This appendix points out that international aspects of U.S. law may affect purely domestic activities of U.S. multinational corporations. Specifically, the marginal corporate tax rate on debt-financial capital is examined. It is well-known that this tax rate is zero for a completely domestic firm.[18] Two simple examples are presented to show that this rate can differ from zero for a multinational firm even on its domestic activities.[19]

Consider a firm with investments as listed in lines 1. through 4., column (1), of Table A.1. Total investment in the U.S. is $2000, of which half is debt financed. Investment abroad, which for simplicity involves only one foreign country, equals $1000, and is all equity financed. What happens if the firm undertakes a new investment project at home, and uses debt to finance it? Column (2) displays the results after a $1000 project of this type is undertaken (the size is immaterial for the conclusions to follow).

TABLE A.1 HERE

Assume that the return to capital equals 10 percent worldwide. Also, the worldwide interest rate is set equal to this rate by competition. Then the extra return to capital (in line 5.) will be offset by the extra interest expenses (in line 6.). If these expenses are deductible, taxable income is unchanged (in line 7.). A purely domestic firm would therefore find its tax liability unchanged. The project would engender no increase in taxes; thus, debt financed capital would be

untaxed at the corporate level. A similar result would hold for a multinational company facing a pure foreign tax credit mechanism based on arm's length principles.

Injection of shares allocation principles can alter this result, however. To see this, consider the simplest form of a shares allocation regime, with complete coordination worldwide and with only one factor, assets, used in the allocation formula.

The allocation share (in line 8.) changes as the structure of assets changes. The result is that less income is allocated to the foreign government (in line 9.) and, implicitly, more to the U.S. The first effect is that taxes paid to the foreign government (line 10.) fall.

This fall in taxes abroad is partially made up by a rise in taxes in the U.S. Note that it is assumed, for simplicity, that the firm does not defer any foreign income. In this example, the foreign tax rate, 60 percent, exceeds the U.S. rate, 46 percent. Therefore, the extra taxes at home do not fully offset the drop in taxes abroad. Lines 11. through 15. show this. Tax paid to the U.S. equals total income times 46 percent (line 11.) minus foreign income times 46 percent (line 13.), since the credit limitation applies. Since foreign income is lower, taxes paid to the U.S. (line 15.) increase. However, line 16. shows that total taxes paid by the firm decrease.

In sum, total taxes paid by the firm fall by $2.20. Since return to capital rises by $100, there is an implied subsidy rate to capital of 2.2 percent. Although this result is highly sensitive to

the assumptions, particularly relative U.S. and foreign tax rates, it is clear that the marginal tax rate on a purely debt financed, purely domestic project is not identically zero.

The 861 regulations issued in 1977 mention some aspects of the shares allocation approach, as is discussed in the paper. Table A.2 presents a simple example of how these aspects can affect the marginal tax rate on the same type of project. Lines 1. through 7. of this table reintroduce the experiment.

TABLE A.2 HERE

The first difference between the tables is in computation of foreign taxable income, in lines 8. and 9. The arm's length approach is to be used for the basic allocation of incomes in this tax regime. Thus foreign gross income and deductions are computed separately, and foreign taxable income derived from them. Given the competitive assumptions made here, and the assumption that no debt is used for foreign capital, foreign taxable income is simply equal to marginal product of foreign capital. Since this capital does not change, neither foreign taxable income (in line 9.) nor tax paid abroad (in line 10.) change.

The only aspect of taxes that is affected by the project is the foreign tax credit, computed in lines 13. through 17. Specifically, a special allocation of interest expenses, which are part of head-office charges, is required. Line 13. displays the allocation share; as in Table A.1, it declines from 0.33 to 0.25. Interest expenses, however, increase as a result of the project. Therefore, the required allocation (in line 14.) rises. Foreign tax base to be used in the credit limitation (line 15.) falls, and thus the limitation (line 16.)

falls. Since the limitation applies in this example, foreign tax credits (line 17.) fall, and taxes paid to the U.S. (line 18.) rise.

In sum, the project affects total taxes paid, even though neither domestic nor foreign taxable incomes are affected. As long as the firm is in a situation where the credit limitation applies, requiring the allocation of interest deductions will reduce foreign tax credits and raise total taxes paid. Thus, U.S. multinational corporations in this situation will face a positive marginal tax rate on purely domestic, purely debt-financed investments. In this example, total tax rises by $7.80, so that the marginal tax rate on a project of this type is 7.8 percent.

TABLE A.1

EXAMPLE OF SHARES ALLOCATION

| | | (1) | (2) |
|---|---|---|---|
| I. | Capital Stocks | | |
| | 1. Domestic, equity financed | 1000 | 1000 |
| | 2. Domestic, debt financed | 1000 | 2000 |
| | 3. Foreign (equity financed) | 1000 | 1000 |
| | 4. Total capital | 3000 | 4000 |
| II. | Taxable Income | | |
| | 5. Return to capital, 4. x 0.10 | 300 | 400 |
| | 6. Interest expense, 2. x 0.10 | 100 | 200 |
| | 7. Taxable income, 5. - 6. | 200 | 200 |
| III. | Taxes Paid | | |
| | 8. Allocation share, 3. ÷ 4. | 0.33 | 0.25 |
| | 9. Foreign taxable income, 7. x 8. | 66 | 50 |
| | 10. Tax paid to foreign gov., 9. x 0.60 | 39.6 | 30.0 |
| | 11. U.S. tax before credit, 7. x 0.46 | 92 | 92 |
| | 12. Potential foreign tax credit, 10. | 39.6 | 30.0 |
| | 13. Credit limitation, 9. x 0.46 | 30.4 | 23.0 |
| | 14. Foreign tax credit, lesser of 12., 13. | 30.4 | 23.0 |
| | 15. Tax paid to U.S., 11. - 14. | 61.6 | 69.0 |
| | 16. Total taxes paid, 10. + 15. | 101.2 | 99.0 |
| IV. | Marginal Tax Rate on Return to Capital | | |
| | 17. Change in tax, from 16. | | -2.2 |
| | 18. Change in return to capital, from 5. | | 100 |
| | 19. Marginal tax (subsidy) rate, 16. ÷ 17 | | -2.2% |

TABLE A.2

EXAMPLE OF ASPECTS OF 861 REGULATIONS

| | | (1) | (2) |
|---|---|---|---|
| I. | Capital Stocks | | |
| | 1. Domestic, equity financed | 1000 | 1000 |
| | 2. Domestic, debt financed | 1000 | 2000 |
| | 3. Foreign (equity financed) | 1000 | 1000 |
| | 4. Total capital | 3000 | 4000 |
| II. | Taxable Income | | |
| | 5. Return to capital, 4. x 0.10 | 300 | 400 |
| | 6. Interest expense, 2. x 0.10 | 100 | 200 |
| | 7. Taxable income, 5. - 6. | 200 | 200 |
| III. | Taxes Paid | | |
| | 8. Foreign return to equity, 3. x 0.10 | 100 | 100 |
| | 9. Foreign taxable income, 8. | 100 | 100 |
| | 10. Tax paid to foreign gov., 9. x 0.60 | 60 | 60 |
| | 11. U.S. tax before credit, 7. x 0.46 | 92 | 92 |
| | 12. Potential foreign tax credit, 10. | 60 | 60 |
| | 13. Allocation share, 3. ÷ 4. | 0.33 | 0.25 |
| | 14. Allocation of "headoffice charges", 6. x 13. | 33 | 50 |
| | 15. Foreign base for limitation, 9. - 14. | 67 | 50 |
| | 16. Credit limitation, 15. x 0.46 | 30.8 | 23.0 |
| | 17. Foreign tax credit, lesser of 12., 16. | 30.8 | 23.0 |
| | 18. Tax paid to U.S., 11. - 17. | 61.2 | 69.0 |
| | 19. Total taxes paid, 10. + 18. | 121.2 | 129.0 |
| IV. | Marginal Tax Rate on Return to Capital | | |
| | 20. Change in tax, from 19. | | 7.8 |
| | 21. Change in return to capital, from 5. | | 100 |
| | 22. Marginal tax rate, 20. ÷ 21. | | 7.8% |

FOOTNOTES

1. Bergsten, Horst, and Moran (1978), p. vii.

2. Treas. Reg. 1.861-8, T.D. 7456, 1977-G, I.R.S. 6.

3. Recent simulation studies of international taxation include Bergsten, Horst, and Moran (1978), Chapter 6 and Appendix B, and Hufbauer and Foster (1976).

4. The 861 regulations are examined in Bergsten, Horst, and Moran (1978), Chapter 6. Musgrave (1973) and Surrey (1978) discuss more general questions but do not conduct revenue simulations.

5. This description is, of course, highly oversimplified. McDaniel and Ault (1977) provides an overview of these issues.

6. Feldstein and Hartman (1977), Horst (1980), and Dutton (1980) are examples of works that consider welfare implications.

7. Oil-related activities must now use the per-country limitation; note that no oil-related industries are included in the simulations. In 1972, firms could choose the per-country limitation, but few did so.

8. The numbers are computed from I.R.S., Statistics of Income, 1968-1977, Controlled Foreign Corporations, p. 93, and I.R.S., Statistics of Income, 1968-1972, Foreign Tax Credit, p. 77.

9. Note that $zY^*$ is greater than actual dividends paid. It equals actual dividends "grossed up" to reflect pretax profits of the subsidiaries.

In 1972, U.S. firms did not have to "gross up" dividends received from less developed countries; the formulas are slightly different for this income.

10. McDaniel and Ault (1977), Chap. 8, Musgrave (1973), Surrey (1978). As an example, see Treas. Reg. 1.482-1(b)(1), T.D. 6952, 1968-7, C.B. 218.

11. Musgrave (1973), Surrey (1978).

12. Musgrave (1973), McLure (1980).

13. McDaniel and Ault (1977), Chapter 8.

14. Treas. Reg. 1-861-8(e)(2), T.D. 7456, 1977-6, I.R.B. 6.

15. For more information on this data, see Frisch (1980) and I.R.S. Statistics of Income, 1968-1972, Controlled Foreign Corporations, Section 2, "Explanation of Terms."

16. For examples, see Mervyn King, Public Policy and the Corporation (Halstead Press, N.Y., 1977), D. Bradford and R. Gordon, "Taxation and Corporate Finance," Princeton Univ. Financial Research Center Memo 31 (Jan., 1980), and M. Feldstein and J. Green, "Why Do Companies Pay Dividends?" NBER Working Paper 413 (December 1979).

17. This process for computing marginal tax rates embodies all of the assumptions made up to this point. Frisch (1980), containing the empirical work, makes different assumptions about financial decisions and therefore uses different measures of the marginal tax rates. It would be interesting to rerun the empirical

analysis using marginal tax rates as computed here; before this could be done, however, INTERSIM would have to be extended to include 1968 tax law and data.

18. See Stiglitz (1973).

19. For a more formal analysis of similar issues, see Frisch (1979).

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H.S. Rosen, May 2019. 5. Alternative Tax Treatments of the Family: Simulation Methodology and Results, in Martin S. Feldstein, ed., Behavioral Simulation Methods in Tax Policy Analysis, University of Chicago Press, 1983 (with Daniel R. Feenberg). Taxation and Excess Burden: A Life Cycle Approach, International Economic Review, October 1983 (with E. John Driffill).Agency, Delayed Compensation and the Structure of Executive Remuneration, Journal of Finance, December 1983 (with Jonathan Eaton). Despite the important consequences of differential tax treatment of families of different sizes and types, this issue has received little systematic attention. Differentiation between different types of families for purposes of the income tax has been accomplished via personal exemptions and differential rate structures for different types of families. But even these changes have not been consistent.Â  On the basis of a tax simulation model, I estimate that in 1988, 40 percent of all couples will pay an annual average marriage tax of about $1100, and 53 percent will receive an average subsidy of about $600.Â  While these alternative schemes are politically more acceptable, measures need to be taken to counterbalance the confiscating nature desired by the majority of the voters.