STATE CORPORATE INCOME TAX: LAMBS IN WOLVES' CLOTHING?

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I. INTRODUCTION*

In an earlier paper I asserted without proof that state corporation income taxes levied on multistate firms have essentially the same effects as discriminatory state taxes on corporate payrolls, property, or sales (at origin or destination), if the profits of the firm are allocated among the states for tax purposes on the basis of formulas including payrolls, property, and sales.[1/] This paper provides a rigorous justification for this surprising assertion and describes the circumstances under which (or the extent to which) it is accurate. It also reiterates another point made earlier, that state corporation "income" taxes are needlessly complicated and non-neutral devices for collecting such mundane non-income taxes. Finally, implications of this analysis for federal policy toward state corporation income taxes -- especially the need to replace the taxes with federal revenues -- are discussed.

It is assumed initially that the state corporation income tax applies only to economic profits. Later this rather unrealistic assumption is modified to recognize that the tax may apply as well to the normal return to equity capital. No account is taken of the deductibility of state taxes in calculating federal income tax liabilities. But in general this should not affect the qualitative analysis, as the "federal offset" should roughly halve any effect that would otherwise occur.

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Finally, it must be noted at the outset that the analysis presented here takes the point of view of the taxing state, in which taxes in all other states are taken to be no more relevant than the weather, rather than asking the effects of the "system" of corporation income taxes levied in the United States.[2/] In this regard it resembles Mieszkowski's analysis of the excise effects of the property tax.[3/] Mieszkowski correctly notes that any local change in property taxes will be borne primarily by locally specific factors and consumers, and will have little effect upon the return to capital, even though a nationally uniform property tax will be borne by owners of capital and have few other important effects.[4/] By the same token, any one state corporation income tax can be expected to have the effects postulated here, even though in the aggregate, state corporation income taxes are, indeed, income taxes.[5/]

II. Tax on Economic Profits

Suppose that a given multistate corporation has total economic and taxable profits that can be described by the following definition:

$$\pi = S - R - W, \tag{1}$$

where π is corporate profits, S is total sales, R is payments to owners of property (including the normal return to equity invested in the firm), and W is the firm's total wage bill. It is assumed for convenience that payments for the services of property and labor are the firm's only expenses.[6/]

Under a three factor allocation formula that includes sales, payrolls, and property, such as the so-called Massachusetts formula, state i would levy a tax on the following tax base:

$$\pi_i = (1/3)\left[(S_i/S)+(R_i/R)+(W_i/W)\right]\pi, \tag{2}$$

where S_i, R_i, and W_i are the amounts of the firm's sales, use of property, and wage payments occuring in state i.[7/] Letting t and T denote the tax rate and revenue yield, respectively, of state i, we could also write:

$$T_i = (t_i/3)\left[(S_i/S)+(R_i/R)+(W_i/W)\right]\pi. \tag{3}$$

By rearranging terms in equation (3) we could, if we wished, also characterize the state "profits" tax as being comprised of three separate smaller taxes, each levied at one-third the statutory rate, on $\pi S_i/S$, $\pi R_i/R$, and $\pi W_i/W$. It will be convenient to do so, but in order to avoid unnecessary complications and duplication in the analysis that follows, we shall focus upon the first of these smaller taxes T_{is}, which

we shall call the "sales related portion" of the profits tax. It has the following yield in state i:

$$T_{is} = t_i' \pi \; S_i/S = a t_i' \pi \, , \tag{4}$$

where t_i' is one-third the statutory corporate tax rate in state i and a is state i's share in the total sales of the firm. The object will be to compare explicitly the effects of the sales-related portion of the state corporate profits tax with the effects of a true income tax and a simple gross receipts tax on corporate output, and, by analogy, the payroll and property-related portions of the "profits" tax to a true income tax and to taxes levied directly on corporate payrolls and property.

The following simple exercise demonstrates clearly that state income taxes based on formula allocation are not truly taxes on income arising in the state. Make two extreme assumptions: (a) that the firm's profits change due entirely to exogenous events that can be identified as changing profits truly attributable to the taxing state,[8/] and (b) that the change in the profitability of operations does not affect sales in the state.[9/] Differentiating equation (4) with respect to profits truly attributable to the taxing state reveals:

$$\frac{dT_{is}}{d\pi_i} = t_i' \; \frac{d\pi}{d\pi_i} \; \frac{S_i}{S} = t_i' \; S_i/S, \tag{5}$$

or:

$$dT_{is} = t_i' \; a \; d\pi_i \tag{5a}$$

That is, tax receipts from the sales-related portion of the "profits" tax change not by the product of the tax rate and the change in the

profits truly attributable to the taxing state, as under a true income tax, but by only the fraction S_i/S times that much. Due to formula allocation, the change in profits truly attributable to a given state is effectively divided among the states in proportion to sales, rather than entering solely and entirely the tax base of the state in which it occurs.

The converse is, of course, also true. Assume that a change in profits occurs, none of which is attributable to the taxing state. Differentiating equation (4) with respect to π, the firm's total (national) profits yields:

$$\frac{dT_{is}}{d\pi} = t_i' S_i/S, \tag{6}$$

and

$$dT_{is} = t_i' \; a \; d\pi. \tag{6a}$$

Thus the state takes its share of changes in the total national tax base, independently of whether profits truly attributable to the state change.

We can also demonstrate that the sales-related portion of the profits tax affects corporate decisions in much the same way as a tax on corporate gross receipts in (from) the taxing state. As a preliminary step, let us review the traditional result that a national tax on corporate profits has no effect on price and output decisions of a profit maximizing firm.[10/] To do this, we differentiate both equation (1) and the following expression for net profits (7) with respect to Q, the output of the corporation, and set the two results equal to zero:

$$\frac{d\pi}{dQ} = \frac{dS}{dQ} - \frac{dR}{dQ} - \frac{dW}{dQ} = 0. \tag{1a}$$

$$\pi_n = (1-t)\pi = (1-t)\ (S-R-W) \tag{7}$$

$$\frac{d\pi_n}{dQ} = (1-t)\left(\frac{dS}{dQ} - \frac{dR}{dQ} - \frac{dW}{dQ}\right) = 0. \tag{7a}$$

The traditional result is readily apparent from a comparison of equations (1a) and (7a); so long as the tax rate t is a constant, a profit maximizing firm sets marginal cost equal to marginal revenue, whether it is gross or net profits that is the maximand. Thus the general corporate profits tax, being a tax on economic rent, does not affect output or price, and is not shifted in the short run. This result does not hold for a state tax on corporate profits, as usually imposed.

To see this, we focus upon the sales-related portion of the state corporation income tax. We begin by differentiating equation (1) with respect to Q_i, the quantity of sales in state i, and setting the result equal to zero:

$$\frac{d\pi}{dQ_i} = \frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i} = 0. \tag{1b}$$

Profits are maximized by setting marginal revenues resulting from sales in a given state equal to the marginal capital and labor costs associated with those sales. Let us now consider whether this result holds when state i imposes a sales-related corporate profits tax.

An expression for net corporate profits, taking account of only the sales-related element of the corporate income tax in state i,

is derived by subtracting equation (4) from equation (1):[11/]

$$\pi_n = \pi - T_{is} = \pi \left(1 - t_i' \frac{S_i}{S}\right)$$

$$= (S-R-W)(1-a\, t_i'). \qquad (8)$$

This expression differs from equation (7) in that t is replaced by at_i', which is not generally constant as Q_i changes, even if t_i' is.

Differentiating equation (8) with respect to Q_i, the quantity of the firm's output sold in state i, and setting the result equal to zero yields the following equation:[12/]

$$\frac{d\pi_n}{dQ_i} = \left(\frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i}\right)(1-a\, t_i') - (1-a)\, t_i' \frac{\pi}{S} \frac{dS}{dQ_i} = 0. \qquad (8a)$$

Algebraic manipulation of this expression produces the following equation:

$$\frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i} = \frac{(1-a)}{(1-a\, t_i')}\, t_i' \frac{\pi}{S} \frac{dS_i}{dQ_i}. \qquad (8b)$$

Thus we see that in the case of the sales-related portion of the state corporate income tax, for the profit-maximizing firm, marginal revenue resulting from sales in the taxing state does not generally equal marginal cost due to those sales, as it does in the cases of no tax or a general (national) tax on the firm's profits.[13/] Rather, marginal revenue exceeds marginal cost attributable to these sales by the amount on the right-hand side of the equal sign in equation (8).[14/]

If the firm sells only a small fraction of its output in the taxing state, $a(=S_i/S)$ is near zero, and the divergence between marginal cost and marginal revenue is near $t_i' \frac{\pi}{S} \frac{dS_i}{dQ_i}$. The product of the first two terms is readily interpreted as a sales tax rate. That is, the ratio

of profits to sales, π/S, tells us how much of the firm's nationwide profits are attributed to each dollar of sales. Multiplying t_i' by this ratio generates an effective sales tax rate. This can also be shown in another way. We can use the identity given in equation (4) above to substitute for t_i' in $t_i' \frac{\pi}{S} \frac{dS_i}{dQ_i}$. This yields the following expression for the divergence of marginal revenue from marginal cost, assuming S_i/S is arbitrarily close to zero and can be ignored:

$$\frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i} = \frac{T_{is}}{S_i}\frac{dS_i}{dQ_i} \tag{8c}$$

T_i/S_i is the fraction that revenues from the sales-related portion of the "profits" tax represent of the firm's sales in the state; that is, a firm-specific effective tax rate on gross receipts. Thus the divergence between marginal revenue and marginal cost can be interpreted as the sales-tax equivalent of the sales-related portion of the corporation income tax.[15/]

That this is a reasonable interpretation can also be seen by writing out the expression for the net profits of a firm selling in state i if a gross-receipts tax levied at rate t_s were used instead of a sales-related profits tax:[16/]

$$\pi_n = S - R - W - t_s S_i. \tag{9}$$

Differentiating with respect to Q_i and setting the result equal to zero yields:

$$\frac{d\pi}{dQ_i} = \frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i} - t_s \frac{dS_i}{dQ_i} = 0 \tag{9a}$$

or,

$$\frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i} = \frac{T_s}{S_i} \frac{dS_i}{dQ_i}. \tag{9b}$$

Comparison of the divergence between marginal costs and revenues in the two cases (equations 8c and 9b) for a given revenue yield from the taxed firm shows them to be almost identical if a small fraction of a firm's sales are made in the taxing state. Thus, for a state constituting a small fraction of the national market for a firm's products, the sales-related portion of the state corporation income tax under a formula allocation rule is essentially equivalent to a simple gross receipts tax levied on the corporation's sales in that state, though at rates that differ between firms. Thus it is likely to have roughly the distributional effects of a tax levied on the firm's sales in the state, and not simply to reduce profits by the amount of the tax, as a general income tax does. Similar procedures would establish analogous results for the payroll and property-related portions of the state corporation income tax.

Because no state accounts for a zero fraction of the sales of a firm actually selling in the state, the corporate profits tax is not fully equivalent to a gross receipts tax. However, we can use equation (8b) to calculate the fraction of the sales-tax equivalent of the sales-related part of the profits tax that results in divergence between marginal costs and marginal revenues. Such calculations are presented for a range of sales-related corporate tax rates and values of S_i/S in Table 1.[17/]

Table 1

Representative values of $(1-S_i/S)/(1-t_i'S_i/S)$

for selected values of t_i' and S_i/S

Values of S_i/S	Values of t_i'				
	.01	.05	.10	.15	.20
.05	.950	.952	.955	.957	.960
.10	.901	.905	.909	.914	.918
.20	.802	.808	.816	.825	.833
.50	.503	.513	.526	.541	.555
.80	.202	.208	.217	.227	.238

We see that except for very large values of t_i', the value of $(1-a)/(1-at_i')$ is very near the value of $(1-a)$. Thus, these calculations suggest that even if the firm makes as much as 20 percent of its sales in the taxing state, more than 80 percent of the sales-related portion of the "profits tax" finds its way into divergence between marginal costs and revenues, and that over half of it does so even if the firm sells as much as half of its output there. Thus while the equivalences are not total and absolute, they are quite strong for many multistate corporations. Finally, to the extent that payrolls and property are more concentrated in a few states than are sales, the payroll and property-related portions of the state profits tax are more nearly true profits taxes than is the sales-related portion--but only for the states in which production is concentrated.

III. Tax on Accounting Profits

Strictly speaking, the results presented in the previous section are applicable only to monopolistic firms and firms operating in oligopolistic

industries, since in competitive industries there are no economic profits, except as a transitory phenomenon. Moreover, it might be objected that the results presented thus far depend upon the unrealistic assumption that state corporation income taxes are levied only on economic profits. That the results presented above are generally valid and that this objection is misplaced are both easily demonstrated. To do so, let us define taxable corporate profits to include the normal return to equity capital, N, as follows:

$$\pi_t = \pi + N$$
$$= S - W - (R-N).$$

Thus net profits are the following, for a nationwide tax on profits defined in this way:

$$\pi_n = (S-R-W)(1-t) - tN. \tag{10}$$

Differentiating equation (10) with respect to Q, we derive the usual result that a tax on corporate profits defined in this way drives a wedge between marginal costs and marginal revenues:

$$\frac{d\pi_n}{dQ} \quad \left[\frac{dS}{dQ} - \frac{dR}{dQ} - \frac{dW}{dQ}\right] (1-t) - t\,\frac{dN}{dQ} = 0$$

or

$$\frac{dS}{dQ} - \frac{dR}{dQ} - \frac{dW}{dQ} = \frac{t}{1-t} \quad \frac{dN}{dQ} \cdot \underline{18/} \tag{10a}$$

If we differentiate equation (10) with respect to Q_i, rather than with respect to Q, we see that there is no qualitative difference in the results:

$$\frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i} = \frac{t}{1-t} \quad \frac{dN}{dQ_i} \cdot \tag{10b}$$

The result is quite different if we consider a state tax on taxable profits defined to include the normal return to capital, but apportioned among the states according to formula. Net profits, taking account of only the sales-related portion of the profits tax in state i, are then:

$$\pi_n = (S-R-W)\left(1 - \frac{t_i' S_i}{S}\right) - \frac{t_i' S_i}{S} N . \tag{11}$$

Differentiating with respect to the quantity of sales in the taxing state and setting the result equal to zero yields the following:

$$\frac{d\pi_n}{dQ_i} = \left[\frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i}\right] (1-t_i\, a) - t_i' \frac{\pi}{S}\frac{dS}{dQ_i} (1-a)$$
$$- t_i \left[a \frac{dN}{dQ_i} + \frac{N}{S}\frac{dS}{dQ_i}(1-a)\right] = 0 . \tag{12}$$

As before, this can be rewritten, this time, as follows:

$$\frac{dS}{dQ_i} - \frac{dR}{dQ_i} - \frac{dW}{dQ_i} = \frac{dS}{dQ_i}\; t_i \frac{\pi_t}{S} \frac{(1-a)}{(1-t_i' a)} + \frac{t_i' a}{1-t_i' a}\frac{dN}{dQ_i} \tag{12a}$$

Comparing equation (12a) with equation (10b), we see that in the former there is an extra component in the divergence between marginal cost and marginal revenue due to the formula allocation of taxable profits, and that this extra term is exactly analogous to the right side of equation (8b). Moreover, the component corresponding to the divergence in equation (10b) is now $[at_i'/(1-at_i')]$ (dN/dQ_i), rather than simply $[t/(1-t)]$ (dN/dQ_i). This component vanishes for small values of a, the taxing state's share of the firm's total sales. Finally, comparison of equations (12a) with (8b) reveals that, as before, for small values of a (if S_i/S is small) the difference

between marginal cost and marginal revenue is simply $t_i' \frac{\pi_t}{S} \frac{dS}{dQi}$, and the sales-related portion of the profits tax is merely a disguised gross receipts tax. Similar comments apply to the property and payroll-related portions of the tax on profits defined to include the normal return.

IV. Tentative Thoughts on Incidence

While we have shown that the profits tax in any one state is equivalent to taxes levied at differential rates on each firm's gross receipts, property, and payroll, we have not analyzed the incidence of these differential taxes. While we cannot go into the latter question in detail, we can give some tentative suggestions about results.

Yet another way to see the similarity between the sales-related portion of the state corporation income tax and an ordinary sales tax in the case of values of a near zero is to rewrite equations (8c) and (9a) in yet another way, as follows:

$$MR_i \left(1 - \frac{\pi}{S} t_i'\right) = MC_i \qquad (8d)$$

and

$$MR_i \left(1 - t_s\right) = MC_i \, . \qquad (9c)$$

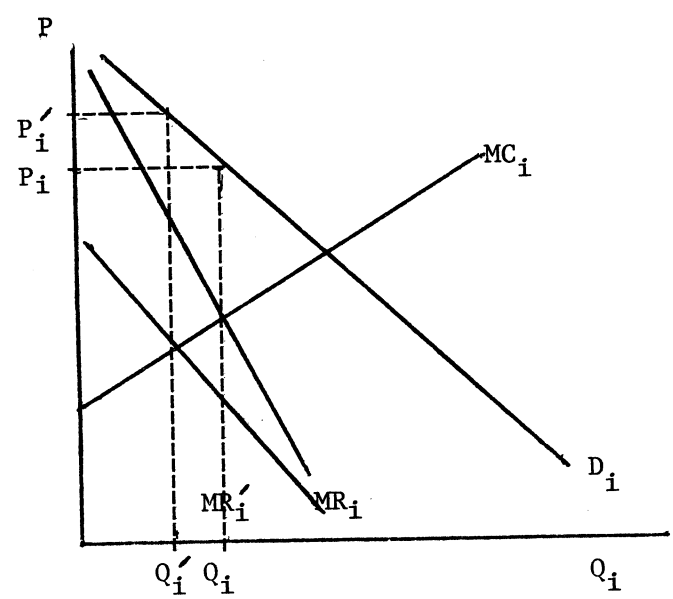

Figure 1

Thus we can expect reactions to the sales-related part of the profits tax that are similar to reactions to gross-receipts taxes. This is most clearly seen in the monopoly case.

Using the terminology of Figure 1, we can see that in the case of a monopolist, the sales-related part of the corporate income tax affects the corporate decision on prices and output in just the same way as an equal-yield sales tax.[19/] It reduces the marginal revenue curve as seen by the firm form MR_i to MR_i', where $MR_i' = MR_i(1-t_s)$ or $MR_i\ (1-t_i'\pi/S)$, and results in a fall in the profit-maximizing output from Q_i to Q_i' and a rise in price from P_i to P_i'. Because the analysis of the incidence of sales taxation on a monopoly is generally understood, there is no need to repeat it here. Of course the results are somewhat different once non-zero values of a are taken into account, but the analysis of Table 1 suggest that they are similar.

It seems likely that results for oligopolistic industries will also be similar to those for a true gross receipts tax, though the analysis required to demonstrate it is not so clear-cut. The problem is not that the tax does not resemble a sales tax for the interstate firm with relatively small amounts of sales in the taxing state. Rather, the problem is (a) that for a given firm the tax falls somewhere in the spectrum between a true profits tax and a sales tax, depending upon the firm's value of a, as noted above, and (b) that for the interstate firm the effective sales tax rate depends upon the firm's profitability in the nation as a whole. Because various firms have different values of a and different profit margins, and therefore different effective sales tax rates, the degree of shifting for a given industry is not clear, even if we ignore usual complexities of market interaction that plague the analysis of incidence of taxes in oligopolistic industries. It

seems reasonable to believe, however, that in industries dominated by interstate firms, the high-profit firms selling relatively small fractions of their output in a given state are likely to hold a price umbrella over the less profitable firms and/or intrastate firms for whom the tax is more truly a profits tax. Thus it seems quite likely, especially for the smaller states, that the sales-related portion of the state profits tax is shifted in roughly the way we would expect a true state sales tax to be.[20/] Oligopolistic interaction merely strengthens this supposition.

The arguments of the previous two paragraphs applies, strictly speaking, only to a state tax levied on economic profits. But there is little reason to believe that the result would be much different for a tax on accounting profits.

Finally, we can consider briefly the case of pure competition, for the tax on accounting profits. (In long-run equilibrium there would be no profits in the competitive case, and therefore no tax, if economic profits were the tax base.) Though the analysis would again be tricky, it seems likely that the tax would be reflected in higher prices. By how much the price would rise, however, is unclear, since firms would pay different tax rates, and there is less presumption of price umbrella affects, etc.

As with any tax on the use of a factor, rather than on sales, the property and payroll-related portions of the corporate income tax are not easily portrayed using the partial equilibrium diagram of Figure 1 except in the case of complete impossibility of factor substitution.[21/] But in the cases of both monopoly and pure competition, the property and payroll portions of the tax on economic or accounting profits are almost certainly

borne, at least in part, by owners of immobile factors, land and labor, located in the taxing state.[22/] The real analytical problems involve the oligopolistic sector. Here it is quite possible that the factor-related portions of state profits tax are shifted to consumers of taxed products throughout the nation via price-umbrella effects, rather than reflected in lower factor returns, especially if production is dominated by a few firms and geographically centered in the taxing state.[23/]

V. Further Analysis of Results

In order to understand better why the surprising results of the previous three sections occur, we need only examine equation (4) and its counterpart in the case in which the tax applies to the normal return to equity, as well as to economic profits. To facilitate the examination we can rewrite these expressions as follows:

$$T_{is} = (t_i' \, \pi/S)Si \qquad (4a)$$

and

$$T_{is} = (t_i' \, \pi_t/S) \, Si \, . \qquad (4b)$$

Concentrating upon equation (4a), we see immediately why the sales-related portion of the profits tax is roughly equivalent to a tax on the sales of the corporation in the taxing state, which could be written as follows:

$$T_s = t_s \, Si \, . \qquad (4c)$$

Revenue from the sales-related portion of the profits tax is simply the product of three things: the statutory tax rate t_i', the corporation's ratio of profits to sales for the nation as a whole, and the corporation's

sales in the taxing state. Thus, by analogy, we can characterize the product of the first two of these factors as an effective sales tax rate applied to sales in the taxing state, and rewrite equation (4a) in the same functional form as (4c):

$$T_{is} = t_e S_i . \tag{4a'}$$

Of course, this effective sales tax rate is not a statutory constant, as is t_s, the statutory sales tax rate. In particular, it depends inter alia, upon sales in the taxing state and on profits from those sales. If however, the taxing state constitutes a small part of the firm's market, π/S, and therefore the effective sales tax rate, will be little affected by activities in the taxing state and revenues from the "profits tax" will simply be roughly proportionate to sales in the state. In other words, the sales-related portion of the state profits tax is essentially a disguised tax on the corporation's sales, especially in states in which the firm does a small fraction of its business.

That the profits tax is roughly equivalent to a composite tax on corporate sales, payroll, and property does not, of course, imply that it is equivalent to a general tax on those economic variables. First, the tax applies only to sales, payrolls, and property in the corporate sector of a state's economy, and distorts choices on sales and production in that state away from the corporate form of organization. This may or may not make good sense on non-economic grounds, but it is certainly questionable on economic grounds, unless there is some reason to believe that corporate activity should be taxed at differentially heavy rates. That question is

beyond the scope of the present paper.

Second, as equation (4a) shows, the effective sales tax rate applied to a given firm's sales in a state depends on the firm's overall ratio of profits to sales (and on the statutory tax rate). Similar comments apply to the effective payroll and property tax rates. In other words, firms with unusually high (low) ratios of profits to sales, payrolls, and property are subjected to higher (lower) than average effective rates of sales, payroll, or property taxation. Thus there is discrimination both between firms in the same industry, and due to the different profit margins in various industries, between industries.[24/] Again, there seems to be no economic rationale to justify this kind of discriminatory tax treatment.

Of course, it can be argued that the tax is really a profits tax after all, in that the effective tax rates depend crucially upon the profitability of the firm. This argument, however, is invalid, for at least two reasons.

Most obviously, the effective tax rate depends on the firm's profitability _in the nation as a whole_. As argued above, this may be largely independent of its profitability in the taxing state. Second, even though effective tax rates are directly proportionate to profit rates, the firm's total profits are not likely to be seriously curtailed by the state profits tax, except in those cases in which the firm is earning some sort of monopoly rents in the state. Since it is in effect sales, property, and payrolls which are being taxed under the profits tax--albeit at rates that depend upon profit rates--corporations will adjust the geographic location of their sales, property, and payrolls in response to the tax, until the conditions described in equations (8c) or (12a) are met.[25/] This being the

case, it seems safe to believe that it is consumers (for the portion of the tax levied effectively on sales at destination) or immobile factors owners (for the portion related to sales at origin, payrolls, or property) who bear the bulk of the tax, and not that the tax simply lowers after-tax profits, as a true profits tax would.

VI. Concluding Remarks: Implications for Policy

The analysis presented here has important implications for tax policy. But, as in the case of Mieszkowski's analysis of the incidence of the property tax, the implications are somewhat different, depending upon whether one takes the point of view of one state, or that of all states or the nation as a whole. Nonetheless, the most important implication of both points of view is that the corporation income tax is an unsatisfactory source of revenue for state governments and should be replaced by other forms of state or federal taxation.

A. State Tax Policy

The upshot of this analysis for state tax policy is clear. Economists have long recognized that state and local governments have little business engaging in redistributional taxation implemented through corporate income taxes and progressive personal income taxes, because geographic mobility is likely to doom such efforts.[26/] The analysis of this paper suggests that the prospects are even worse than usually supposed. Rather than being the potentially progressive tax that it appears to be, the state corporation income tax is actually levied on two bases that would usually be agreed to lead directly to regressive taxation, sales and payrolls. Moreover, recent

analysis of the incidence of the property tax suggests that the property-related portion is likely to be regressive, as well.[27/] Thus the state corporate income tax does not do what many would seem to intend it to do, and it works only very clumsily, and possibly at considerable cost. Therefore, any single state would seem to be well-advised at least to replace the corporation income tax with a tax levied directly on corporate sales, payrolls, and property (or whatever else happens to be in its present allocation formula).[28/] The only real changes would be (a) the use of a standard rate of tax, instead of one that depends upon the firm's national profit performance, and (b) a considerable simplification of tax administration and compliance. Moreover, unless there is a clear reason for preferring to discriminate against the corporate form of organization, it would seem even better to levy the sales, payroll, and property tax on all activity in the state economy, instead of only in the corporate sector. Finally, the portions of the adjusted tax based on payrolls, property, and sales at origin could probably be replaced by a state personal income tax (or increase in the state income tax), and the portion on rates at destination could be absorbed into the (perhaps newly enacted) state retail sales tax.[29/] I submit that this kind of replacement of the corporation income tax would make economic and administrative sense for any state.

B. The National Perspective

There are at least three good reasons why state governments should not employ corporation income taxes, aside from the two already made (that states have no business levying taxes such as this that are supposedly progressive, and that the tax, as seen by any one state, is not really an

income tax anyway):

(1) even as a federal levy, the corporation income tax makes no sense, except as a withholding device;

(2) it is generally logically impossible to tax the corporate profits of a multistate firm originating in any particular state accurately;

(3) the locational allocation of resources is distorted by differentials in the corporate profits taxes levied in various states.

The first of these is beyond the scope of this paper, and has been discussed elsewhere, in any event.[30/] But the analysis of this paper is directly germane to the second and third.

Like joint costs such as overhead, corporate profits cannot be accurately allocated to any one state. This is true whether we are talking about economic profits or accounting profits. This is, of course, the fundamental reason why it is necessary to employ such an arbitrary and unsatisfactory approach as formula apportionment to allocate national profits of a firm among states. Nor is the use of separate accounting (the practice under which a firm's activities in each state are treated as constituting a separate business), much better. As experience with Section 482 of the U.S. Internal Revenue Code has demonstrated in the international sphere, joint costs and problems of transfer pricing render separate accounting as arbitrary as formula apportionment.[31/] Since accurate state taxation of corporate income is often a logical impossibility, it seems best to abandon this tax as a source of state revenue.[32/] One way to encourage this abandonment would

be to disallow the deduction of state corporate income taxes in the calculation of income for federal tax purposes.

In discussions of state taxation of multistate corporations, relatively little has been said about the extent to which differential rates of profit taxation distort investment and other decisions, except in the context of discussions of the effects of taxes and tax incentives on industrial location. This is in marked contrast to the situation in the international sphere, where considerable attention has been focused upon the consistency of various systems of taxation with worldwide efficiency, i.e., the neutral allocation of resources (primarily capital), among nations.[33/]

It is usually thought to be necessary for the achievement of locational efficiency that the tax levied on a given amount of profit be invariant with regard to the geographic source of that profit.[34/] In the present context--and inevitably, where we are concerned with taxes levied in an open economy--we cannot generally identify the geographic source of profits, as noted above. But it seems reasonable to argue more generally that locational efficiency requires that the tax levied on a given amount of profit should be invariant with respect to where property is located.[35/]

Naturally enough, the property-related portion of the total corporate tax of the firm is invariant to the location of property only if the tax rate in all jurisdictions is the same or if the firm earns no profits.[36/] (But under those circumstances locational efficiency is relatively easy to achieve using many systems of taxation.) If profits are positive, formula apportionment is generally non-neutral, since it tends to discourage investment in high-tax states.

Concern with locational efficiency of resource allocation thus suggests that states should not use formula-apportioned corporation income taxes, or at least that rates should be uniform across states.37/ Supposing that the tax continues to be used, despite what has been said here, this last conclusion has important ramifications for intergovernmental fiscal relations. First, it suggests that the Multistate Tax Commission (MTC), or something like it, should concern itself with rate differentials, as well as with the definition of income and apportionment formulas.38/ This may, of course, be a large order indeed, since membership in MTC is voluntary.39/ Elimination of differentials would require as a first step the imposition of corporation income taxes in the states now abstaining from using this source of revenue. But we have argued above that this is an inferior form of state tax, regardless of whether it is appraised from the state or the national point of view. Thus, any federal requirement that all states levy state corporate income taxes so that rates could be equalized is hardly a clear step forward. A more sensible approach would be to prohibit state use of this tax and make up the lost revenues through federal taxation and grants to the states.40/ A surcharge on the federal corporation income tax might be the obvious choice, since it is more or less equivalent to a uniform state tax. But given the faults that an unintegrated corporation income tax has, even at the federal level, one might hope that a better source of revenue could be found.41/ Though this is not the place to go into that question, logical candidates might be a value-added tax, the the personal income tax, or a progressive tax on personal expenditures.

FOOTNOTES

1/ Charles E. McLure, Jr., "Revenue Sharing: Alternative to Rational Fiscal Federalism?" Public Policy, Vol. 19 (Summer 1971), p. 472. For a description of state practices in the field of corporation income taxation and recent efforts to gain uniformity, see Charles E. McLure, Jr., "State Income Taxation of Multi-State Corporations in the United States of America," The Impact of Multinational Corporations on Development and on International Relations, Technical Papers: Taxation (New York: United Nations, 1974), pp. 58-111. Whether all states use the same allocation formula and definition of income for tax purposes is largely immaterial for the argument made here, but it is convenient to assume uniformity. Finally, references to "sales" are to gross receipts, rather than to retail sales.

2/ For a further discussion of this approach, see Charles E. McLure, Jr., "The Interstate Exporting of State and Local Taxes: Estimates for 1962," National Tax Journal, Vol. 20 (March 1967), pp. 49-77. State corporation income taxes do, of course, constitute even less of a "system" than do the local property taxes.

3/ Peter Mieszkowski, "The Property Tax: An Excise or a Profits Tax," Journal of Public Economics, Vol. 1 (April 1972), pp. 73-96.

4/ For an elementary exposition of how these apparently conflicting results can be reconciled, see Charles E. McLure, Jr. "A Caveat to Incautious Users of the 'New View' of the Property Tax," National Tax Journal, Vol. 30 (March 1977).

5/ Again following Mieszkowski, we can use the analysis presented here for deviations from the average rate of state income taxation, the average being borne like a nation-wide income tax.

6/ If there are any rents resulting from patents, mineral deposits, etc. they can be thought of as being included in π if owned by the firm.

7/ No distinction is made between sales at origin and sales at destination, since the mathematics does not require it. If the profits tax is based on a formula that includes sales at destination, the sales portion of the tax resembles a conventional destination principle sales tax. If the formula includes sales at origin, the resemblance is to a tax on sales at origin, or production.

Moreover, to be strictly correct we should note that the Massachusetts formula employs the capital stock, rather than payments to capital, in the property component. But little is lost, and some simplification is gained, by using the return to capital as the measure of property.

8/ Such information is, of course, generally unavailable. If it were not, there would be no reason to resort to arbitrary formula allocation of profits.

9/ Perhaps the most convenient way to visualize this is to imagine the discovery of mineral deposits on land in state i owned by the firm. Profits might well increase while sales in state i remained unchanged.

10/ The analysis presented here is essentially short-run, abstracting from the intersector repercussions described in Arnold C. Harberger, "The Incidence of the Corporation Income Tax," Journal of Political Economy, Vol. 70 (June 1962), pp. 215-40. The point is that the state corporation income tax will have effects more like those of a state tax on corporate sales, property, or payrolls than like those of a tax on corporate profits in the short run, and hence even if long run general equilibrium interactions are taken into account.

11/ This equation and the conditions for profit maximization are based on the assumption that there are no corporate taxes in other states, and would be different if indeed other states levied corporate income taxes. But if we impound other taxes in ceteris paribus, the differences in conditions for profit maximization with and without a corporate tax in state i are as indicated here. Alternatively, if we were examining a national system of state corporate income taxes, this analysis would be appropriate for differentials from the national average tax rate.

12/ The analysis reported here considers an increase in sales to the taxing state which also represents an increase in total sales, rather than a reduction in sales in other states. Thus, $\frac{dS}{dQ_i} = \frac{dS_i}{dQ_i}$, since S is the sum of sales in all states.

13/ Of course if the firm either has no profits ($\pi = 0$) or has sales only in the taxing state ($S_i = S$ and $a=1$), marginal cost equals marginal revenue. But in the case that interests us, the case of a profitable multistate corporation, marginal revenue exceeds marginal cost for the profit-maximizing firm.

14/ One is tempted to go on to say that the tax reduces sales in the taxing state, increases the prices of goods sold there, and is passed on in part to consumers. However, that is more than we need to say, and more than we can say without a more detailed examination of conditions in the industry, including the market interaction of corporate firms of various degrees of profitability, unincorporated firms, and consumer demand. The point we want to make is that the sales-related portion of the profits tax should effect corporate behavior in roughly the same way as a corporate sales tax levied at differential rates would. The further repercussions of such a sales tax are discussed further below.

15/ Since profits tax represents a different fraction of sales for various firms, the tax is not a uniform flat-rate sales tax. This point is considered further below.

16/ This sales tax rate is defined as a percentage of the tax-inclusive price rather than of the tax-exclusive price, which is more common in the United States.

17/ Recall that t_i' is only one-third the statutory rate. Thus, the first two columns are all that are really relevant in the U.S., especially once the federal offset is considered. Other columns may, however, be relevant in an international context.

18/ The part of the tax levied on economic profits does not distort economic decisions, but the part levied on normal profits does. Suppose the tax were levied only on normal profits. Thus, $\pi_n=(S-R-W)-tN$. Differentiating, we have:

$$\frac{dS}{dQ} - \frac{dR}{dQ} - \frac{dW}{dQ} = t\,\frac{dN}{dQ}\,.$$

$\frac{dN}{dQ}$ can also be written as $\frac{dN}{dS}\frac{dS}{dQ}$, the product of the normal profit margin on marginal sales and marginal revenue. Employing $m=dN/dS$, we can rewrite equation (10a) as follows:

$$\frac{dS}{dQ}\left[1 - \frac{mt}{1-t}\right] = \frac{dR}{dQ} + \frac{dW}{dQ}\,.$$

The divergence between marginal cost and marginal revenue thus depends upon the profit margin and the tax rate.

19/ In order to be able to draw this diagram we treat the operations attributable to sales in state i as separable from those in other states, though they will generally not be separable.

20/ If the apportionment formula employs sales at destination, the shifting would be to consumers. If it includes sales at origin, backward shifting to immobile factors, land and perhaps labor, is more likely.

21/ For a further discussion of this problem, see Charles E. McLure, Jr., "General Equilibrium Incidence Analysis: The Harberger Model after Ten Years," Journal of Public Economics, Vol. 4 (February 1975), pp. 125-61.

22/ To the extent that locational monopoly rents exist, the tax may be borne in part by owners of the firm (or other owners of the economic interest in the assets generating rents).

23/ For a discussion of this issue in a slightly different context, see Charles E. McLure, Jr., "The Relevance of the New View of the Incidence of the Property Tax," in Taxation of Urban Property in Developing Countries, Roy Bahl, editor, University of Wisconsin Press, forthcoming.

24/ If the tax is levied on a base that includes the normal return to equity capital, the sales-related portion discriminates against capital-intensive activities.

25/ It is ironic that precisely the most profitable firms are likely to be discouraged from undertaking activity in the state--a result at variance with announced intentions in most states to attract industry.

26/ See, for example, Richard A. Musgrave, The Theory of Public Finance (New York: McGraw-Hill, 1959), pp. 181-82 and Wallace E. Oates, "Theory of Public Finance in a Federal System," Canadian Journal of Economics, Vol. 1 (February 1968) pp. 37-54.

27/ Recall that we are dealing with the tax as seen from the vantage point of individual states.

28/ It may be worth repeating, as we near the end of this paper, that the analysis presented here is predicated upon the proposition that decisions on state taxes are made by individual states, and not at the national level. As noted earlier, what is true for each state is not true for all acting together. That is, if all states levied the same corporation income tax, corporate profits would be burdened (if we continue to ignore Harberger-type shifting to owners of non-corporate capital). But this is largely irrelevant to decisions made in any statehouse, since any deviations from that uniform tax would have the effects described here.

29/ One real problem with state personal income taxes is the difficulty of inclusion of corporate-source income, and especially retained earnings. This is one possible justification for not taking the final step to replacing the state tax on property and payrolls with a state personal income tax. On the other hand, allowance can be made for family circumstances under the personal income tax, but this is impossible under the present corporate profits taxes and flat-rate payroll and property taxes. Similarly, retail sales taxes allow exemption of key items, which does not occur under state corporation income taxes. If the corporate and personal income taxes were integrated at the federal level, it should be substantially easier to obtain the information necessary to tax personal income at residence.

30/ For a detailed discussion of the lack of rationale inherent in a separate tax on corporation income, see Charles E. McLure, Jr., "Integration of the Personal and Corporate Income Taxes: The Missing Element in Recent Tax Reform Proposals," Harvard Law Review, Vol. 88 (January 1975), pp. 532-82.

31/ For discussions of problems of Section 482, see, for example, M.L. Hamlin, "Correct Allocations under Section 482 Are Still Difficult Despite New Regs." Journal of Taxation, Vol. 43(December 30, 1975), pp. 358-63 and C. Phillips, "The Current Status of the Application of Section 482 to Foreign Related Corporations," Taxes, Vol. 48 (1972), pp. 472-78.

In recent years there has been some interest in the use of formula apportionment to replace the separate accounting approach found in the tax treatment of multinational firms by national governments. As evidence of this, see The Impact of Multinational Corporations on Development and on International Relations, Technical Papers: Taxation, op.cit. For expression of preference for formula apportionment in the international field, see Peggy B. Musgrave, "International Tax Base Division and the Multinational Corporation," Public Finance, Vol. 27 (1972), pp. 394-413. The present criticism of formula apportioned income taxation should not be interpreted as a preference for separate accounting. Which of these approaches is a superior way allocating the unallocable is beyond the scope of this paper.

32/ The basic problem is jointness or indivisibility of the firm's operations, and the same principles that apply to public goods in the literature on fiscal federalism seem to apply here also. The allocation of responsibility for the provision of various public goods among levels of government should depend upon the area over which benefits extend. Similarly, taxation of the multi-state firm should be imposed by the jurisdiction most nearly congruent with the area the firm's activities cover. If the decision units are smaller than optimal, problems arise. Among the problems are the locational effects discussed below.

33/ This difference in emphasis almost certainly reflects the different principles upon which state and national income taxes are based. State corporation income taxes are based essentially upon a territorial principle. That is, states ostensibly attempt to tax only profits whose source lies within their borders, independently of the legal site of residence of the corporation or its owners. On the other hand, many nations (but not all of even the important industrial nations), apply a worldwide principle, under which all profits of resident firms are subject to profits tax, wherever earned.

Under the territorial principle the net return to investment (assuming the corporation income tax actually to be levied on profits produced in a given area, instead of through formula apportionment), depends upon where capital is invested, unless effective tax rates are the same in all jurisdictions. Thus, the territorial principle inherently interferes with nation-wide (or worldwide efficiency). By comparison, the achievement of worldwide efficiency is at least generally consistent with the worldwide principle. However, nations applying this approach almost always also tax all profits originating within their borders. For an excellent background discussion of various methods of relieving the double taxation that results from overlapping

33/ Footnote continued.
taxes being levied on the same income, and other issues relevant to the material covered in this section, see M. Sato and R.M. Bird, "International Aspects of the Taxation of Corporations and Shareholders," IMF Staff Papers, Vol. 22 (July 1975), pp. 384-455. We take as given continued reliance on the territorial principle, since corporate taxation at residence does not have the appeal in the interstate context that it has in the international sphere.

34/ See, for example, Peggy B. Musgrave, United States Taxation of Foreign Investment Income: Issues and Arguments (Cambridge, Mass.: Harvard Law School, International Tax Program, 1970).

35/ Concern with locational effects on investment is most analogous to concern about equal taxation of profits, which is essentially a matter of the locational allocation of capital.

36/ In order to show that formula apportionment does not generally result in locational efficiency, we write the following expression for the property-related portion of the profits tax on a firm collected in state i and in all other states (lumped together as $j \neq i$):

$$T = \left[bt_i + (1-b)t_j\right] \pi \qquad (13)$$

or

$$T = \left[t_j + b(t_i - t_j)\right] \pi, \qquad (13a)$$

where t_j is the weighted average of tax rates in all states other than i. Differentiating with respect to b, the fraction of total property of the firm located in state (nation) i, we obtain:

$$\frac{dT}{db} = (t_i - t_j)\pi \ . \qquad (14)$$

37/ It is ironic, but natural, that the property-related portion of the state tax is both the culprit most responsible for adverse locational effects and perhaps the most natural choice as the best single apportionment factor in the Massachusetts formula. Similarly, locational distortions can be avoided only if all states levy the same corporation income tax. Fortunately that uniform tax can have a zero rate!

38/ For descriptions of the Multistate Tax Commission and its activities, see McLure, "State Income Taxation of Multistate Corporations...," op. cit., and "Taxation of Multi-Jurisdictional Corporate Income: Lessons of the U.S. Experience," in Wallace Oates, editor, The Political Economy of Fiscal Federalism, (Lexington, Massachusetts: Lexington Books, forthcoming), and especially Eugene F. Corrigan, "Interstate Corporate Income Taxation - Recent Revolutions and a Modern Response," Vanderbilt Law Review, Vol. 29 (March 1976), pp. 423-42.

39/ Moreover, several of the member states of the MTC do not even levy corporate income taxes.

40/ This suggestion might seem to be inconsistent with the author's questioning of the role of unconditional grants in "Revenue Sharing: An Alternative to Rational Fiscal Federalism," op. cit. But he argued there that state corporation income taxes have no place in a rational system of fiscal federalism, whereas unconditional grants may be more or less equivalent to broadbased general taxes such as sales and personal income taxes, and therefore acceptable.

41/ Moreover, if this tax were used, there might be a natural tendency to assume that grants to states should be based upon corporate income originating in the states. But such an assumption would resurrect the insurmountable problems of income measurement that lead us to suggest that the states should not use the corporate income tax.