STATE CORPORATION INCOME TAXATION*

An Economic Perspective on Nexus

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1 Introduction

Recent years have seen considerable debate about the proper role and scope of state corporation income taxes. Under what conditions can or should a state be able to impose taxes on the income of a corporation? Of the universe of all corporations in the world, which are or should be taxable by an individual state? The "is" part of these questions depends on current laws and their interpretation. The "ought" part of these questions can be addressed from a legal/constitutional perspective or, alternatively, from the perspective of economic analysis.

In the US federation, the taxing powers of state governments are legally restrained first, by the US Constitution, and second, by Federal statutes. The Constitution's Commerce and Due Process Clauses, in particular, have played a major role in defining the taxing powers of the states. The Commerce Clause states that Congress has the authority to regulate interstate commerce, which has been interpreted to mean that state governments cannot impose policies, such as tariffs on interstate trade, that interfere with interstate commerce. The Commerce Clause has been interpreted to mean that Such taxes as states do impose cannot "unduly burden interstate commerce" (*Quill Corp. v. North Dakota*). In addition, the Due Process Clause of the Fourteenth Amendment limits the power of a state to tax individuals or businesses without "due process of law", which has been interpreted to mean (again, see *Quill*) that there must be "some definite link, some minimum connection, between a state and the person, property or transaction it seeks to tax". Under both the Commerce Clause and the Due Process Clause, a business must have a sufficient *nexus* with a state before it can be subject to tax there.[1]

As indicated by the remarks above, the precise meaning of any constitutional restraints on state taxing powers is determined by the courts, which, in the absence of definitive rulings, can create considerable uncertainty for taxing authorities and for taxpayers alike, and new rulings can trigger significant policy responses. For instance, in 1959, the Supreme Court ruled (*Northwestern States Portland Cement Co. vs. Minnesota*) that a state could constitutionally tax a portion of the profits of an out-of-state corporation that solicited sales there, even if it had no plant, employees, or other physical presence or activities within the state. Apparently, this ruling came as a surprise to many, since it spurred nearly immediate Congressional action, in the form of a Federal statute, Public Law (PL)86-272, that specifically prohibits states from imposing corporation income taxes on out-of-state businesses if their only contact with a state is that they solicit sales for tangible products there. Congress thus exercised its constitutional power to regulate interstate commerce and, in effect, prohibited by statute state taxes of the type that the Supreme Court had just declared constitutional.

[1]For one recent discussion of the Commerce Clause, including the so-called "Dormant" Commerce Clause, see Enrich (2007), who writes (p. 23): "Over the centuries, the Supreme Court has deployed this dormant Commerce Clause hundreds of times to strike down a wide variety of state tax and regulatory measures that were found to impermissibly interfere with the free flow of economic activity in a national common market." For extensive discussion of these matters, including a record of opinions from relevant case law, see Pomp and Oldman (1998).

This law, which illustrates the potentially important role of Congress in regulating the taxing powers of states, significantly restrains the ability of states to impose taxes on the profits of out-of-state corporations.

Whether by accident or design, PL86-272 leaves open an issue that has come to assume considerable importance. Suppose that a corporation is not physically present in a state, but that it derives revenues from the sale or licensing of *intangible* services or assets there. These intangible services or assets might, for example, take the form of downloadable software, music, or text, delivered electronically to in-state households or businesses. Alternatively, they might take the form of license fees or royalties paid for the use of trademarks, patents, or copyrighted materials. If a business delivers *tangible* products to in-state consumers, for instance through mail-order deliveries of books, CDs, or other physical items, its income is not subject to that state's corporation income tax because of PL86-272. However, because the law is silent with respect to intangible goods and services, the power of a state to tax the profits of firms that derive revenues from the sale of intangibles is not directly settled by PL86-272.[2]

In recent years, a number of court cases have addressed the question of whether a state may or may not tax the profits of out-of-state firms that have no physical presence within the state. In one noteworthy case, *Geoffrey Inc. v. South Carolina Tax Commission* (1993), the Supreme Court of South Carolina ruled that states may indeed impose such taxes. (In this case, a firm outside of South Carolina licensed the trademarks used by retail stores within South Carolina, and the firm was deemed to be subject to South Carolina's corporation income tax.) This issue has been the subject of ongoing litigation and policy reform. Many states [...] now impose state corporation income taxes on out-of-state firms that derive revenues from the sale of intangibles to in-state buyers, for instance by declaring that any firm that "does business" within the state has an "economic presence" there, even if it employs or owns no tangible assets, goods, or services within the state.[3]

Of course, this "doing business" nexus standard does not yield any taxable income for a state unless it apportions the revenues of multistate corporations in a way that includes the sales of a corporation within the state, and thus the issue of nexus is closely linked to that of income apportionment. The classical "three-factor" formula does so by apportioning the income of a multi-state corporation on the basis of a firm's payroll, capital, and sales within

[2]For convenience, the term "sale" of intangibles will generally be used henceforth as a shorthand for any means by which the owner of an intangible can derive compensation for the right to own or use it, whether by outright transfer of ownership, or through licensing, royalties, or by other means.

[3]Obviously, since a firm's profits depend both on its revenues and its costs, they are determined not only by sales but by purchases. To the author's knowledge, however, no state asserts its power to tax the incomes of out-of-state businesses that *purchase* goods or services from vendors within its boundaries, although, from an economic perspective, there is little basis to distinguish between sales and purchases in determining whether a business has a "definite link" or "minimum connection" to a state. Insofar as state provision of contract enforcement is interpreted to meet these nexus requirements, it would seem to be as important to out-of-state buyers of the state's exports as it is to the out-of-state sellers of the state's imports, and thus, a "doing business" standard could presumably imply that a state could tax the profits of any business that engages in any commerce with the state.

a state, with each of these three factors being equally weighted. Few states now adhere to this formula, however, as they increasingly apply a greater weight to the "sales factor" in their apportionment formulae. As noted by Goolsbee and Maydew (2000), as of 1979, the sales factor was overweighted in the apportionment formulae of only 5 states, but this number had grown to more than 20 states by 1995. Currently, only 9 states apply a 33% weight to the sales factor, while most others apply weights between 50% and 100%. Of these, 22 presently use a 50% weight. Five states now apply a 100% weight to the sales factor for many or all types of businesses, and several others will transition to a single-factor sales-based apportionment formula within the next several years.[4] Thus, as a broad characterization, it is fair to say that corporations must pay income taxes in all states where they sell their goods and services, except that they may be exempt from income taxes in states where they export tangible goods, due to PL86-272. The sales factor has come to predominate in the apportionment of the profits of multistate corporations.

These developments raise a number of interesting economic questions. To return to the opening paragraph, one might ask whether, as a matter of economic policy, state governments "should" be empowered to tax the profits of out-of-state firms, even if they have no physical presence within a state.[5] To address this question, it is necessary to analyze the economic implications of different nexus standards for state corporation income taxes. The following analysis examines the effects of state corporation income taxes in a series of models that specify the taxing powers of states, and their economic relationship to out-of-state households and businesses, in different ways. It also examines how states would optimally set their corporation income tax policies, assuming that they seek to advance the economic interests of their residents. This involves determining not only what tax rates a state would choose, but whether or not it would wish to include a sales factor in an income-apportionment formula. To anticipate the results, the analysis indicates that states have conflicting incentives to tax the profits of out-of-state firms. On the one hand, such taxes may benefit the residents of a state by capturing rents that would otherwise accrue to the owners of out-of-state firms. On the other hand, they can harm the residents of a state by imposing what amounts to an implicit tariff on imports, a policy that is not in itself advantageous to the households residing within a small, open economy. The optimal state tax policy involves a balancing of these two

[4]For analyses of the effects of different apportionment formulae, see, e.g. McLure (1980), Gordon and Wilson (1986), Goolsbee and Maydew (2000), and references therein. The present analysis is limited to issues relating to state taxation of business income, but analogous issues certainly arise in the international context. See, e.g, Shackelford and Slemrod (1998) for an analysis of the revenue effects of formula apportionment applied to US multinational firms. It should also be noted that different countries deal with the taxation of business profits for multi-jurisdictional enterprises in different ways. See, e.g., Wildasin (1998, 2000), for some comparison of Canadian and US practices.

[5]It is important to distinguish the question of nexus for corporation income tax purposes, which is the topic of the present analysis, from that of nexus for sales taxation. According to the Supreme Court's decision in *Quill*, out-of-state vendors are not subject to state sales taxation. To the degree that the sales tax is viewed as a consumption tax on households, this decision creates substantial administrative obstacles for state policy, only imperfectly offset by the widespread but ineffectual imposition of use taxes. (As noted by Ring (1999), however, state sales taxes fall far short of comprehensive consumption taxes in any case.) For a discussion of recent initiatives for "streamlined" sales taxation, see Hellerstein and McLure (2004). These authors also discuss, and criticize, proposed Federal statutes that would extend PL86-272 so that nexus, for state income tax purposes, would effectively be based on a physical presence standard.

considerations, resulting, in equilibrium, in a non-zero tax on the profits of out-of-state firms. In this equilibrium, interstate trade is distorted, and state corporation income taxes thus give rise to deadweight efficiency losses. This result alone does not determine whether state income taxation of the profits of out-of-state firms is economically desirable, even within the framework of the models developed below, since distributional equity considerations must also be taken into account. The balancing of equity-efficiency tradeoffs and other policy considerations are discussed further in the concluding section.

2 A Model and Variations

To see how the effects of corporation income taxes depend on business organization, ownership, and trade, it is convenient to begin with a very simple model and then to vary and extend this model in steps, maintaining a consistent analytical approach and notation. The strategy is to determine what state corporation income tax policy would be chosen by an individual state whose policymakers seek to advance the economic interests of resident households. At each step of the analysis, it is necessary to specify the institutional and economic framework within which policies are chosen, and then to see how different policy choices affect the welfare of state residents.

In order to sharpen the focus on the economic interests of the residents of a state taken as a whole, it is assumed throughout that each state contains many identical households who can be aggregated into a single representative household, making it possible to ignore possible political conflicts among heterogeneous state residents. It is also generally assumed that the state being analyzed is small relative to the rest of the economy, so that its policies do not affect equilibrium prices or tax policies elsewhere. Finally, it is assumed throughout the analysis that each state provides public goods and services that may or may not benefit both residents and in-state firms. In order to focus attention on tax policy, the levels of provision of any such public services are taken as exogenously fixed. It is therefore unnecessary to specify precisely how they affect household utility or private sector production. Not only is the model is extremely general in these respects, it will also be apparent that none of the results depend on whether firms benefit in any way from state government expenditures.

At each step, once it becomes clear how individual states choose the policies that best serve their residents, it is possible to describe the equilibrium of an entire system of such states. As will be seen, the equilibrium policies of the states result in an efficient outcome for the system as a whole in some cases but not in other cases. Comparing different cases thus helps to shed light on how different institutional arrangements may or may not facilitate efficient decentralized policymaking, and why.

2.1 Case 1: Pure profit taxation and foreign ownership.

Suppose that there are two sectors or industries, F and G, in a given state. Each sector consists of many identical competitive firms operating under conditions of strictly decreasing returns to scale, so that they earn pure profits. These profits are subject to corporation income taxation at the rate τ. As in a standard Arrow-Debreu economy, the profits of these firms accrue to households in accordance with exogenously-given initial ownership shares. For present purposes, the only analytically important distinction between the F and G sectors is that firms in the former may be owned, in part, by nonresidents, whereas the latter are assumed to be 100% owned by in-state residents. Let $\theta \in [0, 1]$ denote the ownership share of nonresidents in F-sector firms.

Since the firms in each sector are identical, the notation can be simplified by focusing on a single representative firm in each sector. The production technology in the F sector is represented by a strictly increasing, strictly concave, and smooth function $\phi_f(l_f)$ of the amount of primary inputs, represented by a vector l_f. This input vector may be interpreted as labor (possibly of many types), land, natural resources, or any other factors of production. Similarly, the production technology in the G sector is represented by a well-behaved production function $\phi_g(l_g)$. At this stage of the analysis, the variable inputs are all non-traded factors of production, fixed in supply for the state as whole in the form of an endowment $\bar{l}$, owned entirely by residents within the state, so that

$$l_f + l_g = \bar{l}. \tag{1}$$

The competitively determined factor price vector for primary inputs is denoted by w. The prices of the outputs of both sectors are normalized at unity.[6] The gross (before-tax) profits of firms in each sector are thus given by

$$\pi_i = \phi_i(l_i) - wl_i \qquad i = f, g \tag{2}$$

Firms choose their inputs to maximize profits net of tax, for which the first-order conditions are

$$\phi_{il}(l_i) - w = 0 \qquad i = f, g. \tag{3}$$

Equations (1) and (3) determine the equilibrium values of (w, l_f, l_g) independently of the tax rate τ. As expected, state taxation of pure profits has no effect on input or output choices, nor does it affect factor prices. Clearly, the burden of a state corporation income tax falls on these nonresidents, in proportion to their ownership of firms within the F sector.

As noted above, the state government is assumed to provide some exogenously-fixed bundle of public goods and services, the cost of which is denoted by G. Assuming that the state

[6] One possible interpretation is that both outputs are perfectly substitutable in consumption, units are chosen so that their relative price is one, and either is then taken as numéraire. As a second interpretation, the outputs of both sectors are traded on external markets at prices that are taken as parametrically given from the perspective of a small state. In this case, the profits of the firms in these sectors are assumed not to be subject taxation in other states.

may impose a lump-sum tax of T on state residents in addition to taxes on business profits, the state government budget constraint is

$$T + \tau(\pi_f + \pi_g) = G. \tag{4}$$

Finally, given that public goods levels are fixed, it is clear that the utility of the representative state resident depends only on private good consumption. This, in turn, is equal to the household's income net of tax, which is determined by its income from ownership of primary inputs plus its share of after-tax business profits, i.e.,

$$Y = w\bar{l} + (1-\tau)([(1-\theta]\pi_f + \pi_g) - T + \bar{Y} = w\bar{l} + \pi_f + \pi_g - \theta(1-\tau)\pi_f - G + \bar{Y}. \tag{5}$$

where $\bar{Y}$ represents any other exogenously-fixed sources of income that may be received by the state's residents and the second equality follows by substitution from (4).[7]

Assuming that state policymakers choose the rate of taxation τ in the interest of the state's representative household, they seek to maximize Y. Given the fact that factor prices, allocations, and gross profits are unaffected by the rate of tax, it follows that

$$\frac{dY}{d\tau} = \theta\pi_f \geq 0 \tag{6}$$

and the inequality is strict, provided that $\theta > 0$. Hence:

Proposition 1: Provided that nonresidents own a positive share of profit-making firms within the state, the optimal state corporation income tax rate is 100%.

This straightforward result highlights the importance of foreign ownership of the firms in a state. A pure profits tax captures rents that would otherwise accrue to the owners of profit-making firms. If some of these owners do not reside within the state, the imposition of a tax on profits allows the state to transfer some of these rents from nonresidents to residents. Within the strict confines of the model as developed so far, such rent transfers do not give rise to any allocative consequences: the imposition of state corporation income taxes affect the distribution of income among households in the economy but do not give rise to any deadweight losses from inefficient resource allocation. Even if every state were to impose such taxes, and thus effectively confiscate some portion of the income that would otherwise accrue to residents of other states, these taxes would not result in an inefficient outcome for the economy as a whole.

Of course, in practice, there are many reasons why state corporation income taxes might produce significant inefficiencies. These could arise from the fact that corporation income

[7] In particular, $\bar{Y}$ may include any net income that the households in this state derive from their share of ownership of firms located in other states. Given that each state is assumed to be small, any such income may be treated as exogenously fixed from the viewpoint of any one state.

taxes fall not only on pure profits but on other types of income (such as the normal return to capital). The deadweight losses resulting from such taxes have been amply discussed elsewhere and need not be examined further here.[8] In addition, it should perhaps be emphasized that policies that transfer rents give rise to incentives for rent-losers to lobby against them. In the present instance, although businesses cannot influence the political process directly through voting, they might have incentives to expend resources to limit the extent of rent transfers through state tax policies. These activities can also be socially costly. The following analysis abstracts from such considerations, which however may well warrant separate study.

As a final remark, it is worth wondering whether and under what circumstances a state is or should be constitutionally permitted to impose taxes directly on the nonwage income of nonresident households. From an economic standpoint, in the model presented above, the incentive for a state to impose a tax on corporations derives precisely from the fact it allows for a portion of the state's tax burden to be shifted to nonresident owners, and in fact is equivalent in its economic effects to a direct tax on the share of business net income received by nonresidents. Presumably such a tax would be deemed an unconstitutional extension of state taxing powers, although this may be debatable.

2.2 Case 2: Pure profit taxation with foreign ownership and traded inputs

In the preceding case, issues relating to the apportionment of corporation income do not arise. This is because firms are assumed to operate only within the boundaries of a single state, with the possible exception that they may derive revenues from out-of-state sales which, by assumption, could not make them subject to tax elsewhere. Now consider the case where interstate transactions do occur. In particular, suppose that firms in the F sector, in addition to using non-traded primary inputs l_f in the production process, also use a vector of tradeable intermediate inputs m that they import from out-of-state firms. Let p denote the price at which this input is purchased by firms in the F sector. The production function for this sector is now written as $\phi_f(l_f, m)$ and profits in this sector are given by

$$\pi_f = \phi_f(l_f, m) - wl_f - pm. \tag{7}$$

Let M denote the total output of the out-of-state producers of the intermediate inputs, so that $M - m$ represents intermediate inputs sold to firms in other states, at a price denoted by $\bar{p}$. The profits of the out-of-state producers of intermediate inputs are given by

$$\pi_m = pm + \bar{p}(M - m) - c(M) \tag{8}$$

where $c(M)$ is the cost function for these producers.

[8] See Wilson (1999), Wilson and Wildasin (2004), and Wildasin (2006) for introductions to the literature on fiscal competition, containing many references to other studies.

Case 2a: No nexus for intermediate goods producers

To begin, let us suppose that the out-of-state producers of intermediate goods are not subject to taxation in states to which they export, for instance because these states do not include a sales factor in their apportionment formulas, because courts declare such taxation to be unconstitutional, or because Federal statutes, such as PL86-272, prohibit such taxation.

Since the export of the intermediate good has no tax consequences for its producers, these firms will only export the intermediate good to states in which their products can be sold at a price as high as that obtainable elsewhere. Hence, it must be the case in equilibrium that $p = \bar{p}$, provided that $0 < m < M$.[9] The net income of the representative household in an importing state is still given by (5), with the understanding that π_f is given by (7)and where $p = \bar{p}$ is treated as parametrically fixed on external markets. In this case, the analysis of the optimal choice of the state's corporation income tax rate τ is essentially unchanged, and we have

Proposition 2a: Assuming that a state cannot or does not tax the profits of out-of-state firms, Proposition 1 continues to hold. That is, provided that nonresidents own a positive share of profit-making firms within the state, the optimal state corporation income tax rate is 100%.

Case 2b: Single-factor sales-based apportionment

Now consider what happens when a state can and does impose a tax on the profits of the out-of-state producers of intermediate inputs. This can happen if some of the profits of those firms are apportioned to the states to which they export. For simplicity, assume that states use only the sales factor to apportion the profits of firms in other states. In order to simplify the algebra, assume further that the cost of production of intermediate inputs is zero, i.e., $c(M) \equiv 0$, so that the profits of intermediate good producers are equal to their total revenues. (In effect, the intermediate good may be thought of as a fixed endowment, for instance of some natural resource.) Under single-factor apportionment based on sales, the importing state can impose its corporation income tax on the share

$$\sigma = \frac{pm}{pm + \bar{p}(M - m)} \tag{9}$$

of the profits of the intermediate goods producing firms, whose after-tax profits are now given by

$$\begin{aligned} \pi_m^* &= (1 - \sigma\tau - [1 - \sigma]\bar{\tau})\pi_m \\ &= (1 - \sigma\tau - [1 - \sigma]\bar{\tau})(pm + \bar{p}[M - m]) \\ &= (1 - \tau)pm + (1 - \bar{\tau})\bar{p}(M - m) \end{aligned} \tag{10}$$

[9] If $m = 0$, the model effectively reduces to the previous case. If m is an essential input for downstream producers, however, $0 < m < M$ is guaranteed to hold in equilibrium.

where $\bar{\tau}$ denotes the corporation income tax rate imposed in other states. The intermediate goods producers choose m to maximize their profits, the first-order condition for which is

$$(1-\tau)p = (1-\bar{\tau})\bar{p}. \tag{11}$$

From (11), it follows that the intermediate input price is increased in a high-tax state; in particular,

$$\frac{dp}{d\tau} = \frac{(1-\bar{\tau})\bar{p}}{(1-\tau)^2} = \frac{p}{(1-\tau)} > 0. \tag{12}$$

This result illustrates the fact (see, e.g., McLure (1980)) that a corporation income tax is, implicitly, a tax on those items that are used to apportion profits. In the present case, profits are apportioned on the basis of sales alone, and the corporation income tax is thus, in part, a tax on the importation of traded intermediate inputs. A small state cannot depress the net price received by firms that export to it. An increase in the state's corporation income tax rate must therefore give rise to a compensatory increase in the price of imports, as shown in (12)

As before, the welfare of a state's representative household is determined by its net of tax income, which is now

$$Y = w\bar{l}+\pi_f+\pi_g-\theta(1-\tau)\pi_f+\tau\sigma\pi_m^*+\bar{Y}-G = w\bar{l}+\pi_f+\pi_g-\theta(1-\tau)\pi_f+\tau pm+\bar{Y}-G. \tag{13}$$

To calculate the effect of state tax policy on net income, it is now necessary to take into account the fact that p depends on τ. As a result, the level of imports, the amount of employment and output in each sector of the state's economy, the profits of firms in both sectors, and the prices of primary inputs may all be affected by the choice of τ. Using the envelope theorem,

$$\begin{aligned}\frac{dY}{d\tau} &= (\bar{l}-l_f-l_g)\frac{dw}{d\tau} - m\frac{dp}{d\tau} - \theta\frac{d(1-\tau)\pi_f}{d\tau} + pm + \tau m\frac{dp}{d\tau} + \tau p\frac{dm}{d\tau} \\ &= -\theta\frac{d(1-\tau)\pi_f}{d\tau} + \frac{\tau}{1-\tau}\epsilon_m \end{aligned} \tag{14}$$

where the second equality follows by using (1) and (12) and where $\epsilon_m \equiv d\ln m/d\ln p < 0$ is the general equilibrium elasticity of m with respect to p. The state's optimal policy is to choose τ to maximize Y, which implies that

$$\frac{\tau}{1-\tau} = \frac{\theta}{\epsilon}\frac{d(1-\tau)\pi_f}{d\tau}. \tag{15}$$

The first term in (14), which is positive so long as an increase in τ reduces net profits, represents the burden imposed on nonresident owners of F-sector firms resulting from an increase in τ. The second term, which is negative if $\tau > 0$, represents the welfare loss from the distortion of trade in intermediate inputs. From (15) it is clear that the optimal state

policy is to set $\tau = 0$ if $\theta = 0$, so as to avoid the distortion from the implicit tariff that the corporation income tax imposes on imports. This result confirms, for this particular context, the classical finding that free trade is optimal for a small open economy. More generally, however, if nonresidents own a share of firms in the F sector, then it is optimal for the state to impose at least a modest corporation income tax in order to capture some of the profits in that sector that would otherwise flow to nonresidents. Thus:

Proposition 2b: If a state uses a single-factor sales-based apportionment formula, it is optimal for the state to impose a corporation income tax at a non-zero rate, provided that nonresidents have a positive ownership share of profit-making firms within the state. An optimal corporation income tax rate balances the marginal gain from the capture of rents from nonresidents against the welfare loss to state residents from increased distortions of trade in imports.

Three additional remarks about this result are in order.

First, when a state chooses its optimal tax rate, i.e., when it chooses that value of $\tau > 0$ such that $dY/d\tau = 0$, it distorts the efficiency of resource allocation in the economy as a whole, producing a deadweight welfare loss. This is in contrast to the situation in Case 1, where the state corporation income tax allows a pure transfer of rents from nonresident to resident households. It is also in contrast to Case 2a, where trade does occur but the state does not tax the apportioned profits of out-of-state firms. In the present case, there is a first-order welfare gain for the state's residents from the introduction of at least a small corporation income tax, but the first-order welfare loss from trade distortions, starting at $\tau = 0$, is zero. Thus, states have incentives to introduce policies that are socially inefficient.

Second, it is interesting to note that the state corporation income tax now achieves economic effects that are equivalent to those that would result from a combination of a state tax on the incomes of non-residents plus a tariff on imports from other states. As noted above, the first of these would likely be viewed as a violation of the Due Process clause, while the second, if implemented directly, would certainly be considered a violation of the Commerce Clause. Thus, from an economic viewpoint, a state corporation income tax, when combined with an apportionment formula based on sales, may be viewed as a blend of two policies, each of which, if implemented in a "naked" form, might be considered unconstitutional.

Third, if allowed the opportunity to do so, states would prefer *not* to tax the profits of the out-of-state producers of intermediate inputs. As individual state would ideally tax the profits of foreign-owned firms operating within its boundaries but would avoid the trade distortions arising from the taxation of the profits of out-of-state firms, which could be achieved by declaring profits to be taxable only for firms operating within the state. This would be the case if liability for state corporation income taxes is based on a "physical presence" nexus standard, and it would also be the case if states were to apportion income for tax purposes solely on the basis of factors like payroll and capital that do not depend on sales within the state.

2.3 Case 3: State corporation income taxes and corporate organization

The analysis so far has highlighted some reasons why states might wish to tax the income of corporations, but it also indicates that the use of the sales factor in the apportionment of profits may be contrary to the interest of a state's residents. This leaves a puzzle: why are states increasingly using apportionment formulas that not only include the sales factor, but that even attach extra weight to it?

To see why states have incentives to do this, recall that the benefit of corporation income taxes, in the models considered so far, is entirely dependent on foreign ownership of profit-making firms that operate entirely within the state – the firms in the F sector. Although these firms may possibly sell their output outside of the state, their production processes occur entirely within the state. The nonresident owners of these firms would desire, if possible, to avoid the tax burdens of state corporation income taxation. To do this, suppose that a corporation is organized, or reorganized, in such a way that ownership of the crucial assets that give rise to its profits can be separated from the ownership of the assets that are used in the firm's operations within a given state, and suppose that the ownership of these assets is embodied in some intangible claim. For instance, in the preceding analysis, the firms in the F sector are assumed to derive pure profits from their operations in a state, perhaps because each has made some innovation, built a reputation, or depends upon some entrepreneurial skill that generates a net return over and above the cost of the firm's primary and intermediate inputs.

Suppose that the ownership of these underlying assets can be embodied in intangible assets, such as trademarks, patents, or copyrights, and that the ownership of these assets can be transferred to out-of-state households or firms with no tax consequences.[10] The services of these assets can be utilized within the state by in-state firms if they pay royalties, licensing fees, or other compensation for them. Suppose that the value of this compensation is equal to the profits that would otherwise accrue to the F-sector firms within the state. With out-of-state ownership of these intangible assets, the state income tax can no longer capture the rents that would previously have been taxable as the profits of the firms in the F sector, unless the state uses an income apportionment formula that includes a sales factor and is empowered to tax out-of-state firms whose only contact with the state is that they derive revenues from the use of their intangible assets by in-state firms.[11] If the state implements a single-factor sales-based apportionment rule, and if out-of-state firms that derive revenues

[10] Alternatively, these assets "originate" outside of the state, subsequent to which the F-sector firms are established.

[11] It might also be possible for firms in the G sector to be structured in such a way that they pay out-of-state firms for the use of intangible assets that, if owned by the in-state firms, would produce taxable profits. From the strict representative-agent perspective, the avoidance of state corporation income taxes in the G sector has no effect on net income, and thus the use of organizational structures that shrink the taxable profits of firms that are owned by in-state residents is inconsequential. If in-state households are heterogeneous, however, the avoidance of taxes by in-state business owners might be problematic. To address this question requires an analysis of the basic rationale for state-level business income taxes, which goes beyond the scope of the present study.

from the sales (licensing, leasing, etc.) of intangible assets within the state are deemed to have nexus for corporation income tax purposes, then the state income tax is still capable of capturing rents that out-of-state residents would otherwise obtain as the return on these intangible assets.

Under this corporation income tax structure, the net income of in-state residents is given by (13), because the term π_f now represents the return to the ownership of intangible assets utilized in the F sector, and this return is taxable. In the special case where the state imports no intermediate goods or services other than the right to utilize these intangible assets, the model effectively reduces to the model of Case 1, and the net income of state residents is given by (5). In this case, the optimal state corporation income tax policy is described by Proposition 1, but its interpretation is different: it now describes the optimal tax policy for a state that taxes the profits of out-of-state firms that license intangible assets to in-state firms, assuming that there are no other imports to the state.

In the more general case where the state does import other intermediate inputs, as of course is true empirically for every state in the highly integrated US economy, the model corresponds instead to that of Case 2. The state does have an incentive to impose a positive tax rate, to use a sales-based apportionment formula, and to deem out-of-state firms to have nexus, for corporation income tax purposes, if they derive revenue from sales to in-state firms.[12] Proposition 2b and (15) describe the optimal state tax policy. As noted in that context, the equilibrium of such a system entail deadweight welfare losses due to the distortion of interstate trade.

3 Conclusion

The preceding analysis has examined the distributional and efficiency implications of state corporation income taxation under varying assumptions about nexus standards, formula apportionment, and business structure. It has highlighted the potential of a corporation income tax to transfer rents to the residents of a state at the expense of nonresident owners of in-state businesses. To the extent that businesses can be structured so that these rents accrue to nonresident owners of intangible assets such as patents, trademarks, and copyrights, however, a state corporation income tax with a nexus standard based on physical presence, or with an apportionment formula that does not include a sales factor, cannot capture these rents. If sales within a state suffices to establish nexus, and if income is apportioned with sales as one or perhaps the only apportionment factor, a portion of these rents can once again be captured through the state corporation income tax. Implemented in this way, however, the corporation income tax imposes an implicit tariff of imports from other states, distorting interstate trade and generating deadweight efficiency losses.

[12] Provided that $\pi_f > 0$, the first-order welfare gain to the state from the imposition of at least a small tax is strictly positive.

In principle, the normative evaluation of tax policy should be concerned not only with matters of allocative efficiency but with distributional issues as well. The distributional effects of state corporation income taxes are not easily ascertained, however. Within the models presented above, such taxes redistribute rents among households in different states in accordance with the degree of cross-ownership of claims on profit-making assets. From a distributional perspective, they would thus seem, on balance, to transfer resources away from states where households own a large fraction of the nation's wealth.[13] The empirical difficulties involved in determining the net degree of cross-ownership of profit-producing assets among households residing in different states are formidable, and there seems to be little evidence on the basis of which one could even hazard an informed conjecture about the net interstate transfers produced by state corporation income taxes.[14] Furthermore, from an overall social perspective, the degree to which state policies ought to be evaluated in terms of their distributional impacts is somewhat debatable; according to one influential perspective on fiscal federalism, the tasks of the "distributional branch"of the public sector should in any case be assigned" to the national government, with subnational governments focusing primarily or even exclusively on promoting allocative efficiency (see, e.g., Oates (1972), for discussion and references). In sum, it is difficult to see a substantial basis, on normative grounds, in favor of any particular nexus standard for state corporation income taxes.

It goes without saying that the foregoing analysis has neglected many potentially important dimensions of state corporation income taxes. In some respects, the analysis bears a resemblance to that presented in Wildasin and Wilson (1998), in which cross-ownership of resources produces incentives for decentralized governments to engage in confiscatory taxation, thereby removing the potential efficiency gains from the pooling of independent risks arising in different jurisdictions; the preceding analysis has abstracted from any such risk-pooling considerations. The analysis has also ignored the possibility that the economic activities of corporations, whether or not they benefit from public goods and services provided by states, may impose costs on states through congestion effects. In general, such congestion effects provide a rationale for taxes or non-tax charges on business activities on firms that are physically present within a jurisdiction, but out-of-state vendors of intangibles do not produce such congestion effects and would not be taxed on such grounds. Whether corporation income taxes are a suitable revenue instrument for internalizing congestion costs is questionable, in any case, since such effects may well be produced both by firms that make profits and by those that do not.

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[13]Departing from the "representative agent" framework, and recognizing that wealth is unequally distributed among households, state taxes on business profits would transfer resources from wealthy to less-wealthy houseohlds. For the issues at stake in the present context, however, the intrastate distribution of income is of secondary importance; different nexus standards "matter" insofar as they affect the distribution of tax burdens among households in different states.

[14]In a general-equilibrium setting, of course, the policies undertaken in one state affect the entire constellation of equilibrium prices for *all* goods and factors throughout the entire economy (Bradford 1978). A computable general-equilibrium analysis could conceivably be used to evaluate the implications of changes in nexus standards for business profits taxes, either for a single state or for all states taken together, provided that data could be found that would permit a meaningful calibration of a CGE model.

Still other complications may arise from the mismeasurement of corporate profits for tax purposes, such that state corporation income taxes distort firm financial structures, investment and employment decisions, organizational forms, and other types of economic behavior. In addition, the foregoing analaysis has assumed that firms in the economy are perfectly competitive and exercise no appreciable market power. Clearly, the welfare implications of alternative tax policies may be quite different in an economy with monopolistic, oligopolistic, or monopolistically competitive firms. Finally, as noted earlier, taxation of economic rents creates incentives for lobbying activities which may give rise to deadweight welfare losses insofar as these are inherently costly or to the extent that they distort policies in ways that introduce additional distortions. Further analysis of these issues, some of which have already been examined in previous research, goes beyond the scope of the present paper.

References

Bradford, D.F. (1978), "Factor Prices May Be Constant But Factor Returns Are Not." *Economics Letters 1*, 199-203.

Enrich, P.D. (2007), "A Defense of the Commerce Clause's Role in Constraining State Business Tax Incentives," *National Tax Association, Proceedings of the 99th Annual Conference* (2007), 22-29.

McLure, C.E., Jr. (1980), "The State Corporate Income Tax: Lambs in Wolves' Clothing," in H. Aaron and M. Boskin, (eds.), *The Economics of Taxation* (Washington: Brookings).

McLure, C.E., Jr. and W. Hellerstein (2004), "Congressional Intervention in State Taxation: A Normative Analysis of Three Proposals," *State Tax Notes 31*, 721/

Oates, W.E. (1972) *Fiscal Federalism* (New York: Harcourt Brace Jovanovich).

Pomp, R.D. and O. Oldman (1998), *State and Local Taxation*, 3rd. ed. (Hartford: R.D. Pomp).

Ring, R.J. Jr. (1999), "Consumers' Share and Producers' Share of the General Sales Tax", *National Tax Journal 52*, 79-90.

Shackelford, D. and J. Slemrod (1998), "The Revenue Consequences of Using Formula Apportionment to Calculate U.S. and Foreign-Source Income: A Firm-Level Analysis," *International Tax and Public Finance 5*, 41-59.

Wildasin, D.E. (2000), "State and Provincial Corporation Income Taxation: Current Practice and Policy Issues for the US and Canada," *Canadian Tax Journal 48*, 424–441.

Wildasin, D.E. (2002), "Tax Coordination: The Importance of Institutions," *Swedish Economic Policy Review 9*(1), 171–194.

Wildasin, D.E. (2006) "Fiscal Competition", in B. Weingast and D. Wittman (eds.), *Oxford Handbook of Political Economy* (Oxford: Oxford University Press), 502-520.

Wildasin, D.E. and J.D. Wilson (1998), "Risky Local Tax Bases: Risk-Pooling vs. Rent Capture," *Journal of Public Economics 69*, 1998, 229–247.

Wilson, J.D. (1999), "Theories of Tax Competition", *National Tax Journal 52*, 269-304.

Wilson, J.D. and D.E. Wildasin (2004), "Capital Tax Competition: Bane or Boon?", *Journal of Public Economics 88*, 1065-1091.