STATE AND LOCAL TAX EXEMPTION PROGRAMS: REPLY

Mr. Lamberton's comment [5] on our recent study of industrial tax exemption programs [6] is focused on two points: (a) that average costs have been incorrectly compared with marginal benefits and (b) that the costs of tax exemption programs have been overestimated "because the opportunity cost of that part of tax revenues foregone which is attributable to induced investment is zero and should not be included in the costs of tax exemption."[1]

Regarding the first objection, he asserts that "economies of scale are particularly likely to arise in the provision of public services" (i.e., local governmental units enjoy decreasing costs). This contention is not consistent with the economic literature. Empirical studies of state and local cost functions suggest that horizontally integrated services such as high schools, primary/secondary education, police protection, fire protection, refuse collection and hospitals have long-run average unit cost (*LRAUC*) functions which are "*U*" shaped or horizontal.[2] On the other hand, for vertically integrated services such as electricity, sewage plants and gas, the empirical evidence suggests that *LRAUC's* decline. Economies of scale do not exist for horizontally integrated services because labor is usually the major input, locational considerations tend to keep plants small (i.e., as towns and cities increase in population size, plants similar to existing ones are placed in areas of geographic expansion), and few inputs are purchased at major price concessions.

Because increasing and constant costs characterize horizontally integrated services and decreasing costs characterize vertically integrated services, the appropriate assumption regarding municipal cost functions depends on the relative importance of horizontally and vertically integrated services. Hirsch contends that horizontally integrated services account for the majority of metropolitan area government expenditures—80-85 percent [3,178]. Other economists have also concluded that local governmental units do no experience economies of scale. Richardson [7,197] states "they (applied studies) tend to suggest that there are not significant scale economies in public services." Brazer [1] found no relationship between population size and per capita expenditures on municipal services with the exception of police.

While such studies may not be directly interpreted as refuting the assumption of economies of scale, they do suggest that the Lamberton presumption of economies of scale in municipal services is questionable. Moreover, the issue of determining the existence of economies or diseconomies is further clouded by the fact that there is no "standard city." Such would be required to generate "net economy" curves (net of economies and diseconomies) [4,182-8].

Local governmental units would benefit from decreasing costs if excess capacity exists for public infrastructure or if communities were small and operated on the decreasing side of "*U*" shaped cost curves which exist for some horizontally integrated services. Lamberton points out that both of these conditions exist in the southeastern states. While he is probably correct, the point is not empirically relevant to the present study because the information we received from the five southeastern states indicates that the majority of firms eligible for tax exemptions during the period under study were located in or near larger towns and cities. The notable exception was textile plants which were usually

[1] It can be demonstrated mathematically that the only differences between the Lamberton reformulation of the cost equation and the original cost equation are based on these two objections. The original cost equation using Lamberton's symbols can be defined as follows:

$$C = A \cdot R_0 \int_1^n TI\, dt.$$

[2] For a summary of number of empirical cost studies of local public services see [2; 3, 178–84].

located in rural areas with surplus labor. There is no reason to believe that the urban/rural locational patterns of firms attracted to the tax-exempt region because of the exemptions are different than firms locating in the tax-exempt region but not attracted by the exemptions.

Mr. Lamberton points out that given our cost assumptions, "either no public goods exist or all public goods are free goods." It is not very realistic to assume that pure public goods are significant, particularly at the local level. One example of a pure public good provided by local governmental units is mosquito abatement. Congestion costs occur in the provision of virtually every local public service and congestion costs violate the joint consumption property of pure public goods.

We contend that we have not incorrectly compared marginal benefits with average costs. The assumption of constant marginal costs is the most reasonable assumption based on the information available. It would have been desirable if the constant marginal cost assumption had been made explicit in the original paper.

The second comment on the original paper is based on what appears to be a questionable assumption regarding alternative uses of real resources. Our assumption in the original paper was that taxes foregone reflect or are a reasonable approximation of the real cost of providing services to tax exempt industry. Lamberton contends that "the opportunity cost of that part of tax revenues foregone which is attributable to induced investment is zero and should not be included in the cost of tax exemption." Zero real costs would occur only if (a) all resources used to provide public services to exemption-induced firms have no alternative use in the absence of the tax exemption programs, and (b) real resource utilization in industries operating in the region prior to the exemption programs is not directly affected by the exemption programs. This is most unlikely. Regarding (*b*), additional resources will be hired to provide public services to firms induced to locate in the region because of the exemptions. State and local governments will increase taxes to finance the additional services. Some of the additional tax revenue represents foregone private consumption and investment and, therefore, reduced real resource utilization in the private sector. It is not reasonable to assume that all or the majority of the additional tax revenue comes from idle blanaces. An appropriate analogy is the balanced budget multiplier. An equal increase in government expenditures and taxes can increase regional or national income. However, the increase in income would not be as great as that resulting from an equal increase in government expenditures financed by a monetized debt (i.e., printing money). State and local governments, of course, cannot monetize their debts.

However, Lamberton's second comment does raise an important point because it was assumed in the original study, implicitly, that resources used to provide public services to tax induced industry (equal to taxes foregone) would have been fully utilized in the absence of the exemption program. To the extent that this is not true, the cost of the exemption programs will be reduced. Although it is not possible to measure the degree of resource underutilization in the private sector, alternative assumptions could be used to identify sensitivity of results in the benefit/cost calculations.

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