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Location and investment effects of a tax abatement program, by George W. Morse and Michael C. Farmer.



AAEA.

AAEA paper ... meetings,
Ithaca, NY, August 5-8, 1984

## Abstract

### Location and Investment Effects of a Tax Abatement Program

Previous research has generally found tax abatements to be unimportant in firm location, but their popularity is growing. This study uses an expected value approach to establish criteria for measuring effectiveness and uses primary data to assess the actual effectiveness of a form of tax abatement used in 34 states.

# Location and Investment Effects of a Tax Abatement Program

## Introduction

Financial incentives and tax abatements are used by all fifty states in attempts to attract new firms. In October 1982, every state had at least three types of tax exemption, with nine different types of abatement granted in over 20 states.[1/*] Since 1980, 19 states have authorized enterprise zones, which rely primarily on tax incentives and President Reagan has proposed federal legislation in enterprise zones (Butler; Sabre). The widespread adoption of tax abatements and enterprise zones suggests the debate about tax exemptions is far from settled. The effectiveness of tax exemptions in influencing firm investment and location decisions needs to be reexamined because of the popularity of this form of incentive and the conflicting, and frequently, poorly developed empirical evidence.

Since 1960, over eighteen empirical and theoretical articles have examined the effectiveness of tax exemptions in attracting new firms to a specific location, yielding conflicting results (Kieschnick; Bahl; Cornica, Testa and Stocker; and Stinson). A major problem with all of these studies is that they either establish no criteria for evaluating the effectiveness of tax abatements or do not measure the actual effectiveness of the abatement against this criteria. Using data from seven states during the 1958-1961 period, Morgan and Hackbart estimated that the benefits of tax exemption programs exceeded the costs provided at least 5 percent of the investments were induced or influenced and that at least 25 percent of the value added were net benefits. While they suggested economic criteria for evaluating abatements, they provided

* Notes are at the end of the paper.

no evidence on the actual influence of these abatements. Further, since their estimates define benefits as the private value added, the breakeven point is likely to be considerably lower than if only public revenues and expenditures are considered. Since much of the public debate over tax abatements focuses on the impacts on local governments, the breakeven proportion needs to be examined using changes in public revenues and expenditures.

## Objectives

This study focused on a property tax abatement program for new buildings or improvements on existing buildings, Ohio's Community Reinvestment Tax Exemption Law. The specific objectives of this research were:

1. to establish an expected value criterion for evaluating the effectiveness of the tax abatement program,
2. to determine the actual effectiveness of the tax abatement program in changing firm decisions,
3. to compare the tax abatements actual effectiveness against the criterion and,
4. to examine the policy implications of these findings.

In this study, three methodological innovations were made to the procedures used in previous examinations of abatements. First, the expected value approach is used to determine a breakeven point for judging the effectiveness of an abatement program in expanding local investment, and this standard is compared to actual experience. Second, the state aid to education formula is incorporated into the fiscal impact evaluation of abatements, with important shifts in the breakeven

point. Third, the survey methodology not only incorporates both inter and intrametropolitan location decisions but asks for specific alternative sites. These data allowed a follow-up cost comparison study of specific locations and investments for the firms that had claimed to be influenced by the abatement.

## Community Reinvestment Area Tax Exemption Law

Ohio adopted the Community Reinvestment Area Tax Exemption in 1977, which allows abatement of local taxation on new or renovated real property located in designated areas. A participating firm still pays property taxes on machinery, equipment, supplies and inventories and still pays local income and sales taxes. The abatement zone can be authorized by either a municipality or a county, but schools have no formal vote in the decision to grant an abatement. The length of the exemption is at the discretion of the local government and may be extended for as long as 15 years to any new investment. All firms locating in a given zone receive the same abatement regardless of their net impacts.

This program was studied for several reasons. First, the majority of the sixty-six communities using this tax exemption were smaller ones. Over one-half of the communities using the program in 1981 had under 40,000 residents and nearly one-fourth of the communities had 5,000 or fewer residents. Second, from a research perspective, this law was interesting because it is a "pure" tax exemption with no compensating payments in leiu of taxes or accompanying service contracts. Third, the use of similar laws in 34 other states made it an important issue, but yet did not negate its potential effectiveness. Fourth, the exemption

of only new real property means that the percentage of firms needing to be influenced is lower than for programs that abate all taxes.

## Data Collection

The results of this study are based on three mail surveys and one set of personnel interviews. Since no state agency had a list of the local administrators of this program, the first mail survey, sent to the municipal officers of communities reported to be using this abatement, was used to identify the local administrator. All 62 municipal abatement officials were identified after a series of follow-up calls. The second mail survey, which had a response rate of 76 percent, asked the tax abatement officials for the names of each firm receiving the tax break and the amount of new employment generated. The third mail survey, which had a response of 66 percent, was sent to a random sample of 62 firms known to be receiving the abatement (Farmer; Morse and Farmer).

The sample firms, which were randomly selected, had a higher percentage of manufacturing firms than the state average (38% vs. 8%) but a lower percentage of retail firms (19% vs. 30%) and a lower percentage of service firms (18% vs. 29%). The firms receiving the tax abatement had a mean employment of 211 persons and added 14 new employees with an annual payroll of slightly over $250,000 (see Table 1). About two-thirds of the new investment, which averaged just over $1 million, was abated.[2/] For 32 respondents that provided information, the owner had been in the area nearly 21 years. Only twenty percent of the firms (N=39) were started after the tax abatement program was initiated.

Table 1

Descriptive Characteristics of Firms Receiving Tax Abatement

| | Mean | Standard Deviation | Range |
|---|---|---|---|
| Total Employment in 1982 | 210.7 | 644.3 | 1-4300 |
| New Employment (man-years)* | 14.3 | 23.9 | 0-100 |
| New Payroll ($1000) | 254.8 | 460.3 | 0-2060 |
| New Land ($1000) | 93.2 | 272.9 | 0-1300 |
| New Buildings ($1000) | 675.2 | 973.3 | 0-3200 |
| New Machinery ($1000) | 332.0 | 1276.0 | 0-6000 |

N = 32 to 41

* The new employment, payroll and property reflects the increase as a result of the investment which received an abatement.

## Expected Value Criterion for Abatement Effectiveness

If elected officials attempt to maximize net public revenues, they will only use tax abatements if the weighted net benefits of their use exceed the weighted net benefits of not using them. This can be used to derive a breakeven probability where the community would be indifferent between using and not using the tax abatement. At the breakeven probability the weighted average of the benefits from using the abatement and from not using the abatement are identical (Mishan, p. 352-354). This can be seen by examining a two way payoff matrix, as shown in Table 2.

Table 2 shows the annual net revenues to all units of local government with and without the property tax abatements under two circumstances. In the first row the firm would locate in the community without

Table 2

Tax Abatement Pay-Off Matrix
Annual Net Revenues to Local Governments

| | Community Decision | |
|---|---|---|
| | 1 | 2 |
| Firm Decision | No Abatement | Abatement |
| 1. Locate Anyway | $G_1$ | $G_2$ |
| 2. Locate only if firm receives abatement | 0 | $G_2$ |

the abatement while in the second row it would locate only if granted the abatement. In both cases the annual net revenue to local governments increases but $G_1$ is greater than $G_2$ by the amount of the abatement. In row two and column one there is no net increase or decrease since the firm will not locate in this case.

The weighted average increase in annual net revenues to the community when not granting the tax abatement ($R_1$) is then:

Equation 1: $R_1 = q*G_1 + r*0 = q*G_1$

where: $q$ = probability that firm locates anyway

$r = 1 - q$ = probability that firm locates only if firm receives the tax abatement

The weighted average increase in annual net revenues to the community when granting the abatement ($R_2$) is:

Equation 2: $R_2 = q*G_2 + r*G_2$

Since $q + r = 1$ therefore,

Equation 3: $R_2 = G_2$

The breakeven probability of a tax abatement is the level where a community the net revenues are identical:

Equation 4: $R_1 = R_2$

Substituting equation 1 and 3 into 4 yields:

Equation 5: $q * G_1 = G_2$

Simplifying we get:

Equation 6: $q = \frac{G_2}{G_1}$

The breakeven probability (p) is defined as:

Equation 7: $p = 1 - q$

If the firm's probability of being influenced by the abatement (p') is below the breakeven probability (p) then the community would not grant the tax abatement. In this case the expected value to the community of not granting the abatement exceeds the expected value when granting the abatement. But if the probability of the firm requiring the abatement (r) is greater than this breakeven value it would pay to grant the abatement.

Table 3 reports the calculations of the fiscal inputs with and without the abatement in Columns 1 and 2 respectively based on the average of data reported by firms in the sample. Since only the real property tax is abated, the average firm abatement costs the community $9,807. While the other taxes remain unchanged, school aid increases when the abatement is granted. Since state aid to education is $6,640 greater with the abatement than without it, the net cost of the abatement is only $3,167. In other words, the state pays for nearly 68 percent of this "local" abatement through the school aid formula.3/

Using equation 7, the local breakeven probability is:

$$p \text{ (Local)} = 1 - \frac{\$20,022}{\$23,189} = 13.6 \text{ percent}$$

Table 3

Tax Abatement Pay Off Matrix
Additional Revenue for Local Governments, Ohio 1980

| Firm Decision | Community Decision 1 No Abatement | Community Decision 2 Abatement |
|---|---|---|
| 1. Locate anyway | | |
| Property taxes - real | $ 9,807 | $ 0 |
| Property taxes - tangible | 4,822 | 4,822 |
| Sales taxes | 892 | 892 |
| Income taxes | 2,548 | 2,548 |
| School aid | 5,120 | 11,760 |
| Total | $23,189 | $20,022 |
| 2. Locates only with abatement | | |
| Property taxes - real | $ 0 | $ 0 |
| Property taxes - tangible | 0 | 4,822 |
| Sales taxes | 0 | 892 |
| Income taxes | 0 | 2,548 |
| School aid | 0 | 11,760 |
| Total | $ 0 | $20,022 |

Source: Calculated from average firm data and state average tax rates.

From the communities perspective the abatement would need to influence only slightly more than 13.6 percent of the firms in order to be a viable public policy.[4/] A major reason that the breakeven percentage is so low is that the state pays for 68 percent of the abatement costs. If this compensatory factor is removed by providing the same state aid regardless of abatement status, then the net gain in column 2 is only $13,382 rather than $20,022. This results in a state breakeven probability of:

$$p\ (\text{State}) = 1 - \frac{\$13,382}{\$23,189} = 42.3$$

From the state perspective, the abatement would need to influence at least 42.3 percent of the firms to locate in Ohio vs. some other state.[5/]

## Abatement Investment Results

In the mail survey, firms that named at least one other community which was seriously considered as an alternative location and that cited tax abatements as one of the three most significant factors in the decision to invest in their current location were defined as having their location affected by the tax abatement (Farmer, 1983). A similar definition was used for industrial site choices. Using these definitions, only 3 firms of the 36 respondents (8.3%) reported the abatements influenced their location (See Table 4).

Firms which reported that a strong positive community attitude toward their investment encouraged their investment and which reported that the tax abatement signaled this positive attitude were defined as having their investment influenced by the abatement. Seven of the 36

Table 4

Investment Affected by Tax Abatement

| Investment Effect | Mail Survey | | Cost/Comparison Interview | |
|---|---|---|---|---|
| | Number of Firms | Percentage | Number of Firms | Percentage |
| Abatements Influence Location | 3 | 8.3 | 0 | 0 |
| Additional Possibly Induced Investment | 7 | 19.4 | 1 | 2.9 |
| Total Possible Affected Investment | 10 | 27.8 | 1 | 2.9 |
| Unaffected Investment | 26 | 72.2 | 34 | 97.1 |
| Total | 36 | 100.0 | 35 | 100.0 |

firms (19.4%) had their investments influenced as a result of positive community attitudes. In total the mail survey shows a total of 10 firms (27.8%) that were affected by the abatement.

While strategic answers are reported to be a major problem in using this type of survey, no previous study has explored the extent of this problem.[6/] As a check on the mail survey, personnel interviews were conducted with each of these 10 firms and data collected on their costs of production in alternative locations or for alternative investments. After discussing cost differentials the respondents were asked to estimate the tax differentials between locations and to qualitatively assess the importance of these differentials. Only one firm (2.9%) reported that its expansion would have not occurred without the tax exemption.[7/] Thus, it appears that the level of strategic answering was indeed very high.

## Conclusions

Using the mail survey results, the use of tax abatements appears rational at the community level since the percent influenced (27.8%) is higher than the breakeven percentage (13.6%). But the abatement is not rational from the state perspective since at least 42.3 percent of the firms would need to be affected and only 27.8 percent reported being influenced. Clearly when the cost comparison results are considered, the abatement influences too few firms to justify its use by communities from either the local or state perspective.

The above conclusions assume the community is trying to maximize its return based on the expected value of its two choices. Yet, a risk-averse community can rationally adopt this program since at least some of the firms are influenced by the tax abatement. And further, the existence of tax abatement option forces local adoption since the lack of development can always be attributed to the unavailability of tax abatements. While economic theory suggests that negotiated abatements would be desirable, this may divert local leadership and professional attention from more basic development concerns.

The results of this study suggest that repeal of tax abatements at both the state and national level is desirable. Further, they cast severe doubts on the tax abatement elements of the Enterprise Zones currently receiving national attention.

## Notes

1/ The terms tax abatement, tax exemption, tax concessions and tax breaks are used interchangeably in this paper.

2/ In every case the standard deviation for these variables was very large showing that there is wide variation in the characteristics of these firms. The number of usable responses ranged from 32 to 41 for the data shown in Table 1.

3/ The school aid formula grants more aid since it provides more help to poorer districts. Since the abatement property is not included in the tax base while enrollment expands the districts wealth/student declines on paper increasing state aid. The charge in 1983 for basic state aid is estimated by the following formula:

$$\Delta BSA = (\$1680 * \Delta ADM) - (.02 * \Delta AV)$$

$\Delta BSA$ = changes basic state aid

$\Delta ADM$ = number of new students in the district measured by the average daily membership, estimated to be a mean of 7.

$\Delta AV$ = additional school districts assessed valuation, estimated to be $352,520.

This yields a change in state aid for each school district that has no abatement of $5120.00. But for districts in which the abatement is granted there is no reduction in the state aid so these districts gain all $11760. It was assumed that this small addition to the population and student enrollment would result in no increase in additional expenditures.

4/ If no new students are added to the school district the breakeven points are considerably higher than shown here. This means the abatements would be less favorable when there are no additional children for the school district.

5/ The state government breakeven point also applies to communities if the state aid to education does not increase with an abatement.

6/ Strategic answers are those designed to influence future public policy.

7/ One other was dropped from the sample since the respondent refused to provide the cost data.

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