Connecting Taxes and Willingness to Pay for Farmland Protection: A Comparison of Local and State Funded Alternatives in New York

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Introduction

The search for an appropriate funding mechanism for farmland protection programs is a subject of national debate. From the perspective of economic efficiency, Gardner (1977) argued that public intervention in markets to enhance farmland protection is only justified if the goal is to preserve the scenic and environmental amenities of farmland. Adopting this perspective, a fair and equitable farmland protection policy would tax households in proportion to their willingness to pay (WTP) for this public good. While such a taxation scheme is clearly not feasible, valuation research on amenity benefits conducted over the last two decades demonstrates that WTP for farmland protection is positively correlated with household income [Bergstrom *et al.*; Waddington] and the threat of development of agricultural lands [Kline and Wichelns]. Estimated values provided by this research range from $7 [Bergstrom *et al.*] to $252 per household per year [Ready *et al.*].

The objective of this paper is to use these valuation research findings as criteria for comparing state-level "circuit-breaker"-type interventions based on the local property tax. These include a refundable state income tax credit for local property tax levies and the more widely utilized local property tax relief programs. In New York, local property tax relief is accomplished through use-value assessments on farmland and a 10-year holiday for new or newly reconstructed farm buildings. To our knowledge, this is the first attempt to compare WTP research results with actual costs incurred with farmland protection policies.

Specifically, this paper compares the cost of a 50 percent reduction (a range that corresponds closely with recent policy discussion in New York) in school levies on farm real estate under two scenarios. Using a unique school district level data set for New York, the study first simulates the incidence of a program financed through New York's traditional method of exempting some farm property from local tax levies. Because this approach reduces the local tax base, the cost to taxpayers is a local property tax shift as school districts raise levies to recover foregone revenues. Second, we consider New York's 1996 Farmer's School Tax Credit (FSTC), which provides a refundable state income tax credit for about 50 percent of local school property tax levies. The cost to the taxpayers is state income tax revenue foregone with the tax credits.

New York Program

The 1996 FSTC provides for an income tax credit for school property taxes paid by agricultural producers. Landowners that earn at least two-thirds of their federal gross income through "farming" qualify for the credit which is to be phased in over a three-year period. The FSTC was first available on returns filed in 1998 for school taxes paid in 1997. The projected annual cost, measured in terms of displaced revenue for the state's general fund, is $60 million by 1999.

Prior to this legislation, reduced local property tax assessments had served as the sole vehicle for reducing the property tax liability for agricultural landowners. Ten-year exemptions on new farm buildings have been available since 1968 and use-vale assessments on land were initiated as part of the 1971 Agricultural Districts Law. In 1993, these two programs saved agricultural producers about $22 million in local tax levies for K-12 education. However, the cost of these programs fall entirely upon

residents in the local jurisdiction (farmer and non-farmer alike) who are asked to pay higher tax rates to replace the foregone school tax revenues. In the case of New York, the largest tax shifts occur in smaller, more rural communities [Harvey (1997)].

In New York, the FSTC marks a point of departure from property tax relief programs because of the draw on revenues from the state general fund. Since all New York residents pay a state income tax, everyone in the state will help pay for the tax credit. This will avoid further local tax shifts attributed to agricultural exemptions. Such shifts have been avoided in Michigan [Public Act 116 (1979)] and Wisconsin [WI Farmland Preservation Act (1983-84)] with circuitbreaker programs for agriculture that have offered state-funded tax credits if property tax payments exceed a certain percentage of income. Technically, New York's FSTC is not a circuitbreaker because eligibility does not depend on school taxes as a percentage of total farm income.

If we adopt Gardner's economic efficiency approach, then the goal of both local exemptions for farm property and state tax credits should be to discourage the conversion of farmland and preserve its amenity value. However, each takes a fundamentally different approach to finance the program. A property tax exemption, with its local tax shifts, implicitly assumes that only residents in the immediate vicinity benefit from protecting farmland. On the other hand, a state tax credit corresponds to the notion that the benefits of preserving farmland accrues to residents across the State.

Neither of these approaches are capable of capturing the extent to which a resident values protected farmland. However, it is possible to examine which method of tax relief may best reflect factors underlying a resident's WTP for farmland protection. We can

simulate the distribution of the costs using both exemptions and a tax credit for additional tax relief, and compare the results with the findings of valuation research.

The Data

The study uses secondary data from two sources. The first component is a 1993 farm parcel data set from the New York Office of Real Property Services. This unprecedented collection featured parcel-level tax data on all land classified by local assessing officials as "agricultural." This was merged with 1993 school district data from the New York State Education Department. See Harvey (1997) for additional sources.

Methodology - Creating parameters

Valuation research has found that the WTP for farmland protection is positively related with household income and the threat of development of agricultural lands. As a result, we will group the 456 New York school districts that received agricultural exemptions, farm building exemptions, or both, in a matrix based on these parameters.[1] In the simulation, school districts will be classified into quintiles based on income per taxpayer. This will serve as an indicator for the household income parameter. For the second axis, because the threat of development is closely associated with a district's proximity to an urban center, a rural-fringe-urban classification will be used.[2] In 1993, agricultural parcels in 456 school districts received use-value assessments on land, farm building exemptions or both. Table 1 shows how districts are distributed across these parameters.

[1] Such a classification matrix for state taxation studies has been used before. White and Miller (1977) reported the effects of general property tax relief in Georgia for counties in various "average income / population" categories. Little and Fettig (1989) analyzed the impact of general property tax relief in Illinois by separating counties in deciles based on per capita income.

[2] Districts in counties assigned as non-SMA are classified as rural. Districts in metropolitan counties are broken into two groups; urban counties that contain an urban core of 50,000 populations or more, while fringe districts are in adjacent metropolitan counties.

Table 1. New York School Districts with Agricultural Assessment / Farm Building Exemptions

Inc. / Taxpayer	Rural	Fringe	Urban	Total
$19,418 - $23,532	69	21	1	**91**
$23,523 - $25,271	56	32	3	**91**
$25,300 - $28,002	38	41	12	**91**
$28,045 - $32,872	26	36	29	**91**
$32,883 - $111,047	6	14	72	**92**
Total	**195**	**144**	**117**	**456**

Before proceeding, it is necessary to assess the use of this matrix. As indicated, valuation studies expect WTP to be highest in areas where farmland is more scarce – areas with higher incomes and greater development. The simulation will be useful only if this scarcity is also reflected in the matrix. This can be checked with two measurements.

First we can examine agricultural property values as a percentage of the total in each school district group. One would expect that in areas where farmland is less scarce, the percentage of a district that is classified as agricultural (prior to exemptions) would be higher. Table 2 shows the aggregate percentage of land value classified as agricultural for each district group in the matrix corresponds to our expectations. The groups with the highest share of agriculture (i.e. where it is less scarce) tend to be located in rural and fringe districts with lower incomes.

Table 2. Percentage of Property Values Classified as Agriculture Before Exemptions

Inc. / Taxpayer	Rural	Fringe	Urban	Total
$19,418 - $23,532	10.2%	9.4%	0.2%	**9.2%**
$23,523 - $25,271	8.0%	10.8%	0.7%	**8.1%**
$25,300 - $28,002	3.3%	8.8%	1.8%	**5.1%**
$28,045 - $32,872	3.8%	5.0%	1.8%	**3.2%**
$32,883 - $111,047	3.5%	4.6%	1.3%	**1.7%**
Total	**5.9%**	**6.9%**	**1.4%**	**3.5%**

Another way to measure scarcity is to determine the perceived threat to agriculture in a district. If residents feel that development threatens farmland and wish to protect it, their actions suggest that it is viewed as a scarce resource. Thus, we would expect the WTP to be higher in these areas than in less-threatened areas. One method that can be used to capture this perceived threat is to calculate the percentage of agricultural acreage in a district that owners enroll in the agricultural assessment program. A landowner is more likely to seek tax relief for his parcel if land values are elevated due to encroaching development. Table 3 illustrates the distribution of this "participation rate" across the matrix. The highest percentages tend to be located in the lower right portion of the table. As expected from the WTP studies, the perceived level of scarcity is most significant in areas with higher development pressure and higher incomes.

Table 3. Percentage of Agricultural Acres Participating in Use Value Assessment

Inc. / Taxpayer	Rural	Fringe	Urban	Total
$19,418 - $23,532	27.3%	39.4%	N/A	**29.6%**
$23,523 - $25,271	40.4%	45.3%	32.2%	**42.3%**
$25,300 - $28,002	33.3%	56.6%	36.0%	**47.7%**
$28,045 - $32,872	47.1%	59.2%	62.0%	**55.9%**
$32,883 - $111,047	39.4%	62.6%	54.1%	**55.3%**
Total	**34.6%**	**52.5%**	**53.7%**	**43.6%**

Methodology - Simulation

The costs of a 50 percent reduction in agricultural school taxes are calculated under two scenarios - additional local exemptions supported by local residents and a tax credit supported by the entire state. According to 1993 data, agricultural landowners in the 456 school districts paid $100.4 million in school taxes resulting in a 50 percent reduction of $50.2 million. This level roughly corresponds with the estimated savings of the FSTC in its initial years.

Local exemptions. In this scenario, the vehicle is a property tax exemption for which local residents are the sole financiers. We will assume that the value of property tax exemptions necessary to ensure a 50 percent reduction in school taxes is made up elsewhere in the same district and is automatically calculated for each taxing jurisdiction. The additional property taxes that are paid by a local resident to achieve the 50 percent reduction in agricultural taxes is calculated as follows:

$$(1)\quad addlprop_j = \frac{\left(\sum_{i=1}^{n} aglevy_i\right)*.50}{taxpayer_j} \qquad j = 1 \text{ to } 456$$

In equation (1), we multiply all agricultural school taxes in a district (*aglevy*) by .50 and divide by the number of taxpayers in the *jth* district to obtain *addlprop*. Taxpayers are defined as the number of addresses that were registered for a school district on state income tax forms.

State tax credit. This approach simulates the Farmer's School Tax Credit. Tax relief is no longer district specific. Because the tax credit draws on the state general fund, the starting point for this calculation is *costcredit*, the total cost of this program across all 456 participating districts:

$$(2)\quad costcredit = \left(\sum_{j=1}^{456}\left(\sum_{i=1}^{n} aglevy_i\right)\right)*.50.$$

If we assume that the state general fund consists entirely of income tax revenues, each school district is liable based on its share of overall income tax liability. Therefore,

$$(3)\quad incshare_j = \frac{liab_j}{\sum_{j=1}^{456} liab_j} \qquad j = 1 \text{ to } 456$$

where *totliab* is the summation of total income tax liabilities across the 456 districts and $incshare_j$ represents the share of total income tax liability for the *jth* district. Thus we can represent the additional income tax that each taxpayer in a district must contribute:

$$(4) \quad addlinc_j = \frac{incshare_j * costcredit}{taxpayer_j}.$$

While these equations describe the calculations performed at the school district level, the results in the matrices will be reported as weighted averages.

Results

Tables 4 and 5 show the results of the two simulations. Table 4 is the distribution of the cost across the 456 school districts under the local exemptions scenario and Table 5 reflects the costs under a state tax credit. For both methods, the amount of reduced agricultural property taxes totaled $50.2 million and the average cost among the 2.2 million taxpayers in these districts was $22.66. However, this is where the similarities end.

The results for the local exemption scenario in Table 4 show the highest costs accruing to taxpayers in areas where development pressure and incomes are low. According to the totals of the rural and fringe columns, the average taxpayer costs are three-and-a-half to four times as high as those in urban areas. For each step up the income quintiles, the cost declines between $6 and $9. The most rural districts with the lowest average incomes experience the highest costs at $51.48 per taxpayer.

Table 4. Local Exemptions - Cost per Taxpayer for 50% Reduction in Agricultural School Taxes

Inc. / Taxpayer	Rural	Fringe	Urban	Total
$19,418 - $23,532	$51.48	$44.22	$0.80	**$45.20**
$23,523 - $25,271	$39.14	$48.09	$3.21	**$37.84**
$25,300 - $28,002	$19.72	$42.54	$8.96	**$26.20**
$28,045 - $32,872	$22.18	$30.93	$9.56	**$18.56**
$32,883 - $111,047	$27.89	$28.42	$10.02	**$12.57**
Total	**$33.10**	**$37.93**	**$9.32**	**$22.66**

Table 5. State Tax Credit - Cost per Taxpayer for 50% Reduction in Agricultural School Taxes

Inc. / Taxpayer	Rural	Fringe	Urban	Total
$19,418 - $23,532	$11.98	$12.27	$12.15	**$12.07**
$23,523 - $25,271	$14.03	$13.94	$15.01	**$14.13**
$25,300 - $28,002	$16.21	$16.08	$16.35	**$16.19**
$28,045 - $32,872	$20.14	$19.52	$20.16	**$20.00**
$32,883 - $111,047	$22.93	$27.45	$34.92	**$33.74**
Total	**$16.03**	**$18.33**	**$27.98**	**$22.66**

On average, the cost in fringe areas may be higher than its rural counterparts for reasons expressed in Tables 2 and 3. Like the rural areas, there is a relatively high percentage of agriculture, but the perceived threat to agricultural land is high as reflected in the participation of acreage in use value assessment (see Table 3). Populations generally are not high in these areas, but it is likely that development pressures raise farmland values and hence, raise the costs associated with agricultural tax relief.

In the urban column, while the costs are substantially lower, the average cost rises with income. This relationship can be attributed to some very wealthy school districts in New York on the edge of cities where productive land exists and agriculture continues to thrive. Unlike the fringe and rural areas however, the large populations in these high

income, urban districts help to distribute the cost of local tax relief so that each taxpayer still only pays $10.02.

It should be noted that the calculation in equation (1) divides the cost of the program by all taxpayers in a school district and *includes* agricultural producers. Consequently, farmers would pay some of the cost of reducing their own taxes and the effectiveness of the policy would be reduced. Thus, Table 4 is a conservative estimate of the distribution of the cost. If we were to hold only non-agricultural landowners responsible for the program, then those areas with a high share of agriculture would pay even more per taxpayer - i.e. those districts that already experience the highest burdens.

In Table 5, the costs associated with a state tax credit among the 456 districts tells an entirely different story. As expected with an income tax, the share of the cost per taxpayer rises with income level. The results also indicate that the costs rise as we move to the right on the matrix, that is, when development pressure increases.

In a complete reversal, the 69 districts in the most rural areas with the lowest incomes contribute the least under the tax credit - $11.98 compared with $51.48 under the local exemption scenario. The urban districts with the highest incomes pay the most with a tax credit at $34.92 per taxpayer compared with just $10.02 in the previous simulation.

Recall from equation (3) that the costs of the tax credit was based on the assumption that only the 456 districts with participating agricultural land were required to finance the policy. If taxpayers in all 680 districts in New York were to contribute to this fund, as is expected, the responsibility for the 456 districts is greatly reduced - from $22.66 to $5.82.

The Link with Willingness to Pay: Discussion

Valuation studies that have argued that the WTP for farmland preservation is positively related with both income and development pressure have generally concluded that policymakers do not incorporate this perspective into the process. It is true enough that it would be nearly impossible to conduct a policy based on these parameters. However, from the basic policy options illustrated in this analysis, the question is: does one method appear to incorporate these WTP principles better than another? According to the results, a state tax credit distributes the cost in a manner which more closely embodies the findings of the valuation studies.

In the local exemption scenario, the task of property tax relief for agriculture was placed entirely in the hands of the local citizenry. From the perspective that preserved farmland is a public good, the simulation revealed two negative consequences. First, because scenic amenities are not limited to local taxpayers, residents in more developed areas that pay few or zero dollars for the policy may still accrue benefits. Second, because our simulation cut agricultural taxes by 50% across all districts, the areas which paid the most per taxpayer were also those with an abundance of farmland. Certainly, with such a large supply, the WTP for the protection of an additional acre of farmland would be much lower than residents in areas where farm parcels are scarce.

In New York, the distribution of the costs of a state tax credit more closely corresponds with valuation research: as development increases and incomes rise, so does the cost of the program (or WTP) per taxpayer.

Conclusion

In New York State, the Farmers' School Tax Credit, financed at the state level, departs from existing tax relief efforts that have relied solely on local exemptions. While both seek to prevent the conversion of farmland to other uses, each distributes the costs of the program very differently. With Gardner's assumption that the preservation of open space is the only economically efficient motivation for farmland protection, valuation studies can help gauge the effectiveness of the policies. That body of research has argued that the WTP for farmland protection is positively related with income and development pressure.

A simulation of a 50 percent reduction in school taxes for both local exemptions and a state tax credit reveal that the average cost per taxpayer is $22.66 for each program. Under the local exemption scenario, the costs per taxpayer are greatest in rural, lower-income areas where farmland is abundant. In contrast, under the state tax credit, the cost rose incrementally as incomes rose, and as the amount of development – along with the scarcity of farmland – increased.

The distribution of the costs of farmland protection under the state tax credit follows closely with the results of the valuation studies. Citizens with higher incomes in developed areas that are willing to pay more for the preservation of farmland, in fact, do contribute higher levels. According to New York data, a tax relief policy funded by the income tax appears most economically efficient. As for other states, if the goal of farmland preservation is to protect the scenic amenities of open space, policymakers might revisit programs that distribute these costs solely at the local level.

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