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# A Model to Explain Participation in New York's Agricultural Districts and Use-Value Assessment Programs

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Logit regression models are estimated to identify factors affecting decisions to enroll farmland in New York's agricultural districts program and participate in the use-value assessment program. The results suggest that the districts law is consistent with preserving the best farmland at the rural-urban fringe and that the decision to enroll in agricultural districts affects in a recursive fashion the decision to participate in the use-value assessment program. Short-term monetary gains are the overriding considerations in applying for use-value exemptions. This may lead to additional erosion of the tax base via tax preferences for agricultural land.

Since World War II, states and localities have given increased attention to policies and programs designed to mitigate the effects of population growth and economic development on the use of land for commercial agriculture. These initiatives often deal with property tax reductions for farmland owners, but also include the formation of agricultural districts, purchases or transfers of development rights, right-to-farm laws, and agricultural zoning (NASDA).

Although most land use programs are voluntary, little attention has been given to the factors that affect landowners' participation. However, recent advances in statistical methods allow analysts to deal with participation decisions of this kind through binary choice models. Kramer and Pope, for example, examined participation in conventional commodity programs. Capps and Kramer and Ranney have studied food stamps, while participation in the farmer-owned reserve, the dairy diversion program, and the dairy termination program have been studied by Chambers and Foster, Lee and Boisvert, and Kaiser and Lee, respectively.

In this paper, factors that influence decisions to enroll farmland in New York's agricultural district program and its attendant provisions for property tax preferences through use-value farmland assessment are studied. The results provide a systematic view of the factors that influence New York's farmland protection efforts and set the stage for evaluation of similar programs elsewhere. Today,

all states provide for use-value assessment, while 12 states are experimenting with the creation of agricultural districts (NASDA). Since programs vary by state, this analysis begins with a review of the New York legislation.

## Agricultural Districts Legislation

The New York Agricultural District Law was enacted in 1971 to protect and encourage the development and improvement of agricultural lands (New York Agricultural and Markets Law §300). Agricultural districts, created by county legislatures after landowners prepare proposals that encompass a minimum of 500 acres, facilitate retention of farmland by: (a) restricting the spending and police power options open to local governments whose boundaries overlap those of the districts; (b) requiring state agencies to alter administrative regulations that otherwise might adversely affect agriculture, and (c) limiting the ability of governmental units to impose benefit assessments or special levies on farmland within a district.

The Law also allows owners to pay taxes on land's value in an agricultural use. Owners of 10 or more acres that generated average gross sales of at least \$10,000 in the preceding two years may apply for use-value assessment of their farmland.<sup>1</sup> If land receiving an exemption is converted to a

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<sup>1</sup> The benefit actually is an exemption equal to the tax due on the difference between the assessed value and the use value, multiplied by an equalization rate. Owners not in a district willing to commit land to agriculture for eight years can also apply for the exemption (Gardner).

**Table 1. Agricultural Districts in New York State**

Year	Number of Districts	Area in Districts	
		Acres (1,000)	Percent of Total Land Area
1972	13	72	*
1973	97	778	3
1974	170	1,752	6
1975	247	3,103	10
1976	313	4,208	14
1977	352	4,811	16
1978	386	5,507	18
1979	410	5,857	19
1980	428	6,203	20
1981	451	6,656	22
1982	466	6,810	22
1983	472	6,898	23
1984	485	7,049	23
1985	500	7,174	24
1986	509	7,268	24

Source: Extension Staff.

\*Less than 1%.

non-agricultural use, a penalty tax, computed as five times the taxes saved in the most recent tax year plus interest compounded for up to five years, is levied on the converted acreage by local assessing officers.

#### *Participation in Districts*

The agricultural community's response to the Law was immediate. Initial proposals led to the creation of 13 agricultural districts, encompassing 72,000 acres. During 1973, over 80 districts (705,000 acres) were added and by 1986 there were more than 500 districts encompassing 7.2 million acres, nearly a quarter of New York's land area (Table 1). In ratifying districts, county legislatures generally include land other than farmland in districts so that boundaries are continuous. Thus, few good estimates of the actual farmland or cropland in districts have been made. However, according to data for 41 of New York's 57 counties, the proportion of farms with sales above \$10,000 in districts averaged nearly 60% in 1982 and ranged from zero in some counties to nearly 100% in others (N.Y.S. Division of Equalization and Assessment, 1984a). For the 51 upstate counties for which data on land in districts are available, an estimated 54% of farmland and 51% of cropland in farms with sales above \$2,500 were in agricultural districts in 1982 (unpublished data from New York State Department of Agriculture and Markets). If counties are grouped into five land resource areas as defined by the USDA (Giardina and Dyke), the county average percentages of farmland in districts ranged from 39% to

72%, while cropland percentages ranged from 39% to 68% (Figure 1).

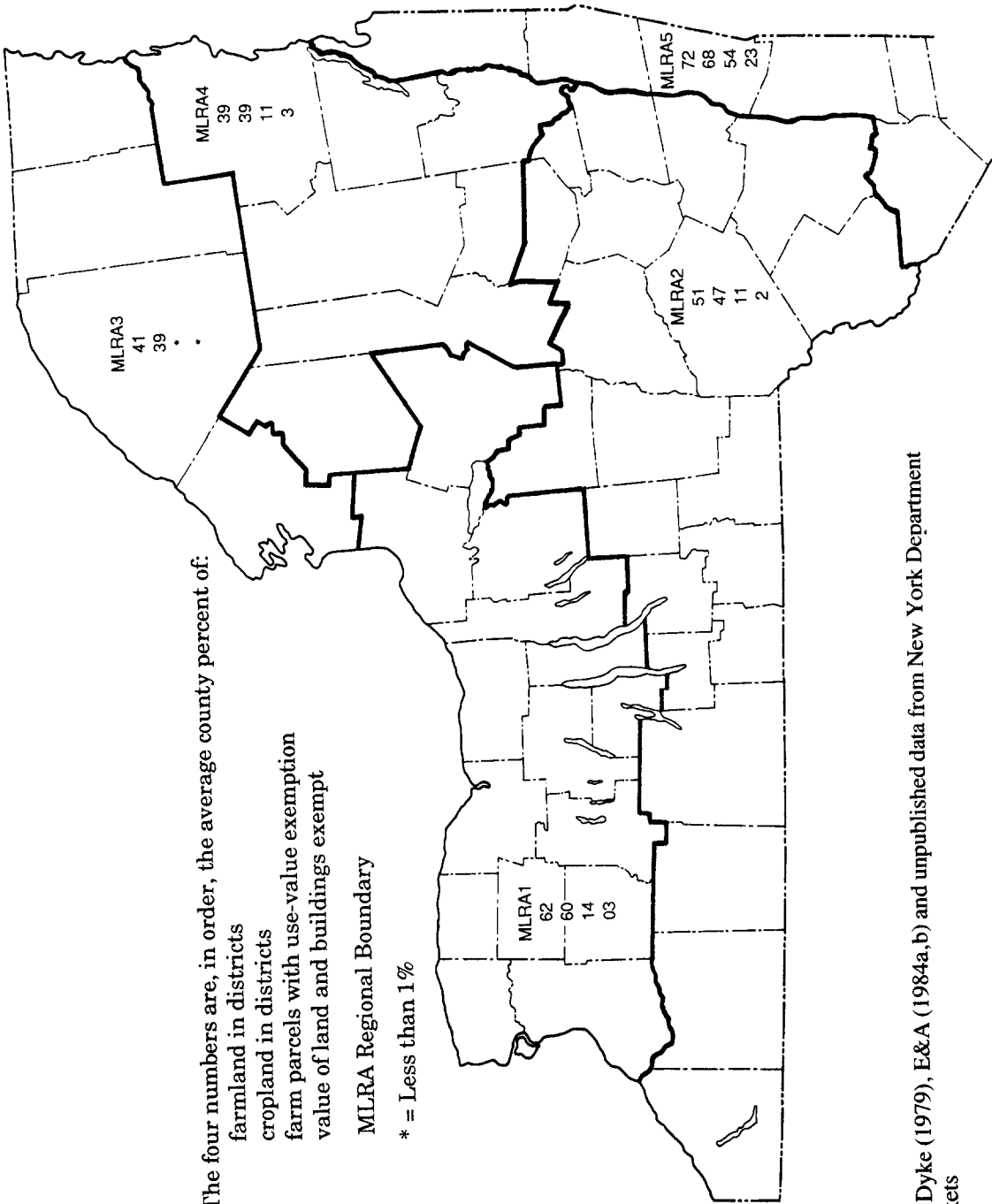
In contrast with efforts to create districts, the Law has led to relatively few use-value tax exemptions, particularly in the early years. In 1977, for example, an estimated 4,000 tax parcels received exemptions (King). The number of exemptions has fluctuated around an upward trend since that time. By 1982, the number of exemptions was about 14,700 (N.Y.S. Division of Equalization and Assessment, 1984b, p. 154) but this was only 14% of the State's farm tax parcels. The full value of exempt parcels was estimated at \$1.2 billion; exemptions totaled about \$352 million.<sup>2</sup> Both the percentage of parcels exempt and the value of exemptions as a percent of the value of land and buildings on farms differed by county and region (Figure 1).

#### *The Participation Decisions*

From the standpoint of the Agricultural Districts Program, New York farmland owners are confronted with two separate choices: the decision to put the farm (or portions of it) in an agricultural district (AD) and the decision to seek use-value exemptions from property taxes (UVE) on the tax parcels in the farm. Following Chambers and Foster, the decision to participate in an AD or seek a UVE may be formulated as a binary choice by

<sup>2</sup> In 1985, just over 29,000 parcels were exempt, representing a full value of \$1.3 billion and exemptions worth \$724 million (unpublished data from N.Y.S. Division of Equalization and Assessment).

Figure 1. Participation in Agricultural Districts and Use-Value Assessment in Upstate New York by MLRA, 1982



Sources: Giardina and Dyke (1979), E&A (1984a, b) and unpublished data from New York Department of Agriculture and Markets

comparing the utility of non-participation with that of participation. The utility of non-participation for the  $i$ th individual is  $u_i^0 = F(y_i^0, x_i)$ , where  $y_i^0$  is a vector of attributes related to the farm business that are associated with non-participation;  $x_i$  is a vector of socio-economic and other characteristics that affect utility. The utility of participation is  $u_i^1 = F(y_i^1, x_i)$ , where  $y_i^1$  are the farm business characteristics measured at their values under participation in either AD or UVE. The utility maximizing landowner will participate in one or the other or both only if  $F(y_i^1, x_i) - F(y_i^0, x_i) > 0$ . A key feature of these models is that individuals are assumed to evaluate the monetary benefits and costs of participation, and also the less tangible benefits and costs. This implies the participation decision has a subjective component because it is difficult to compare intangible benefits and costs with those measured in dollars.

The two decisions that confront farmland owners under the New York law can also be examined separately because it is possible to participate in the use-value exemption aspect of the program (UVE) without having the land in an agricultural district (AD), and vice versa. The decision to participate in UVE, however, may be influenced by the AD decision primarily because penalties for conversion of land to non-agricultural uses are less severe for land in an agricultural district. As discussed later, this is an important consideration in formulating the empirical models of participation.

The short-term benefit of participation in UVE is a reduction in local property taxes. The magnitude of this benefit is affected by urban pressure and increased demand for land for non-agricultural purposes, which raises land values, and by the relative importance of the property tax as a source of revenue for local government. Administrative practices at the local level may also directly affect the tax benefits of UVE. Many jurisdictions levy taxes based on outdated tax rolls, with agricultural land underassessed relative to other classes of property. As a local jurisdiction undergoes property revaluation, the assessed value of agricultural land may rise disproportionately to other classes of property, thus increasing the value of the use-value exemption (Boisvert et al.).

In contrast, both the benefits and costs of participation in an agricultural district are less tangible. As urban pressure intensifies, it becomes more likely that a given land parcel could be sold for a price reflecting its potential value in a non-farm use, which increases the opportunity cost of keeping land in agricultural uses. Enrolling in an agricultural district does not actually restrict owners'

use of the land. The land can still be converted to non-farm uses and there is little effect on the opportunity cost of retaining land in agriculture.

From another perspective, however, it is likely that enrolling in a district will lower the opportunity cost of maintaining farmland in its current use. This stems from the provisions of the Law designed to encourage farming and discourage non-agricultural development. One purpose of these provisions is to insulate agricultural operations from overly restrictive government regulations and administrative practices in localities where agricultural and non-agricultural interests conflict. To the extent that such government actions would increase the cost of farming (e.g. through zoning, environmental restrictions, or an increase in the level of services funded by property taxes), placing the land in a district may be important to the continuation of farming. How an individual landowner might weigh these potential future benefits is also unclear, but participation in agricultural districts could be expected to be directly related to the rate of non-agricultural growth and development in an area.

With respect to the nature of the agricultural industry itself, landowners situated on the best agricultural land, or those who have recently made new investments or land improvements, should be more likely to join agricultural districts to help protect the long-term potential for agriculture. Conversely, there may be little incentive to commit marginal land to agricultural uses for an extended period. This tendency could be reflected in a relation between participation and land quality, productivity or profitability.

Finally, the socio-economic characteristics of farmers may be important. For example, age is certainly related to one's planning horizon for the farm business, but could also affect attitudes toward participation in any government programs. Local government officials that have a keen interest in environmental issues and farmland retention could try to increase a farmer's knowledge of the district program and encourage their interest in participation. Participation could also be encouraged by neighbors through a demonstration effect.

### The Data and Model Specifications

Conceptually, the importance of these numerous factors in the two participation decisions can be identified by constructing statistical regression models relating choices to empirical measures or proxies for the factors. Ideally, one would use individual farm-level data to make direct application

of the binary choice models (e.g. Domencich and McFadden; Chambers and Foster; and Rahm and Huffman). Unfortunately, farm-level or micro data on participation and factors influencing participation are not available. Thus, application of the qualitative choice models is limited to predicting the probability of a given choice for groups of farmers by county. This is equivalent to an analysis of individual farm data that has been aggregated into county groups.

The aggregate approach was followed for the 51 upstate counties in this study, incorporating data that show the proportion of farmland and cropland in agricultural districts and the proportion of agricultural tax parcels receiving the use-value exemption.<sup>3</sup> Obviously, farmers own more than one acre and often have their land divided into more than one tax parcel; on an individual basis, they can participate at different levels. In the aggregate approach, the results should remain unaffected if, for each county, one treats the decision to place each acre in a district or to request a use-value exemption on each parcel as a binary choice made by a single representative farmer in each county.<sup>4</sup>

Following this line of reasoning, the dependent variable relating to participation in agricultural districts is the proportion of farmland in districts in 1982 (FLD82). An inferior alternative would have been to examine the proportion of cropland in districts. About 62% of all New York farmland is actually used for crops (U.S. Dept. of Commerce, 1984) but farmland in districts is of greater interest to policy makers and the general public. Retaining all farmland as open space may be important to maintaining the integrity of individual farm units while preserving many environmental values for the public at large.

As with districts, involvement in use-value assessment can be measured either as the proportion of all agricultural tax parcels receiving an exemption (EXPAR), or as the proportion of the full value of agricultural property removed from the tax rolls by the exemption (EXVAL). The first measures the

participation decision more directly and is used here. The proportion of the value that is exempt affects the decision to participate indirectly because of its influence on monetary benefits. The proportion exempt is also of interest to local governments, particularly in rural jurisdictions where agricultural property makes up an important share of the total property tax base.

In this application, the dependent variables in separate regression models are the county proportions of farmland acres in districts or farm parcels in use-value assessment, respectively. Denoting this proportion for county  $i$  as  $P_i$ , one could proceed by estimating linear probability models provided that the sample size in each group (county) is large and  $\hat{P}_i$  is not zero or one (Maddala). However, a logit model was estimated to avoid any problems with violating the standard assumptions of the linear regression model or generating predicted probabilities outside the (0,1) range.

Following Maddala, the logit model transforms the probabilities (i.e. proportions) according to a cumulative logistic function so that one can estimate

$$(1) \quad Y_i = X_i\beta + u_i,$$

where  $Y_i = \log[P_i/(1 - P_i)]$ ;  $X_i$  is a  $(1 \times k)$  vector of explanatory variables;  $\beta$  is a  $(k \times 1)$  vector of parameters, and  $u_i$  is a stochastic disturbance term. To correct for heteroskedasticity, this equation is estimated using a two-step generalized least squares (GLS) procedure. The variables in equation (1) are divided by the square root of the estimated error variance

$$(2) \quad \text{var}(\hat{u}_i) = 1/[n_i \hat{P}_i (1 - \hat{P}_i)],$$

where  $n_i$  is the number of acres or number of farmland parcels in county  $i$  and  $\hat{P}_i$  is the predicted value of  $P_i$  from an ordinary least squares regression (Maddala, p. 30).<sup>5</sup>

Because of the use of the logit transformations and the GLS procedures, the interpretation of the results and the evaluation of the models in equations (1) and (2) are different from those of a linear probability model estimated using OLS. First, the dependent variables in the logit models are transformations of the probabilities, and the GLS parameter estimates,  $\beta$ , are not the partial derivatives

<sup>3</sup> Data on the proportion of farmers participating were available for only 41 of the 51 upstate counties. Unfortunately, some of the missing counties have had the heaviest district activities. In conducting the analysis, it seemed advisable to use those measures of participation that were most complete. In any case, in the 41 counties for which data are available, there is a relatively high correlation between proportion of farms and proportion of farmland in districts. Thus, one would expect the results to be similar given that the analysis is based on grouped data.

<sup>4</sup> This is a similar assumption to that made in most empirical applications of aggregate data. The models attempt to estimate the probabilities of a given choice by subgroups (in this case farmers in a county), each assumed to be composed of identical micro observations (Pindyck and Rubinfeld, p. 290).

<sup>5</sup> In applying the logit model, a modification to the dependent variable, proposed by Cox (p. 33) and discussed by Amemiya (p. 1499), is used. That is,  $\log(P_i/1 - P_i)$  is replaced by  $\log[(P_i + (2n_i)^{-1})]/[(1 - P_i + (2n_i)^{-1})]$  so that the dependent variable can be defined when  $P_i$  is zero or one. This adds to the number of observations that can be used and little else is changed as  $n_i$  is large in all cases.

of the probability of participation. To convert the coefficients to these partial derivatives, one must evaluate

$$(3) \quad \frac{\partial}{\partial x_{ik}} L(x_i' \hat{\beta}) = \frac{\exp(x_i' \hat{\beta})}{[1 + \exp(x_i' \hat{\beta})]^2} \hat{\beta}_k,$$

where  $L(x_i' \hat{\beta})$  is the logit function,  $x_{ik}$  is the  $k$ th component of the vector  $x$ , and  $\hat{\beta}_k$  is the  $k$ th component of the vector  $\hat{\beta}$  (Maddala, p. 23). In the empirical work below, equation (3) is evaluated at the means over all  $i$  observations.

Second, the use of conventional  $R^2$  is not appropriate in this model as a measure of goodness-of-fit. Thus, a pseudo  $R^2$  developed by Buse and discussed by Amemiya is:

$$(4) \quad \text{pseudo } R^2 = \frac{WSSR_c - WSSR_u}{WSSR_c}$$

where  $WSSR_u$  is the weighted residual sum of squares and  $WSSR_c$  is the weighted residual sum of squares where the coefficients on all the explanatory variables are constrained to zero.

## Empirical Results

As discussed above, the estimated models attempt to explain participation in agricultural districts (as measured by the proportion of farmland in districts, FLD82) and participation in use-value assessment (as measured by the proportion of farm tax parcels partially exempt from property taxes, EXPAR). The county (or grouped) data used to estimate the models are for 1982. Variables for the 51 upstate

New York counties used in the analysis are listed in Table 2. These variables were selected as "proxy" measures for the several factors hypothesized above as being important in the two separate participation decisions. Each is discussed in turn but, in general, the results of both models are promising. The pseudo  $R^2$ 's (above 0.5 in both cases) are high for models relying on cross-sectional data and the standard errors are low relative to the coefficient estimates on most variables.

### Participation in Agricultural Districts

Table 3 contains two models of participation in agricultural districts. Model 1 incorporates the fixed effects of New York's five major land resource areas (MLRA) established by the Soil Conservation Service of the USDA. These fixed effects for the MLRA's (shown in Figure 1) clearly improve the performance of the two models. (As seen in Table 3, the hypothesis that the coefficients on all MLRA's are jointly zero is rejected at the 1% level.) The MLRA's delineate regions of broadly similar physical and topographic features; MLRA1 (the reference region in the regression) and MLRA5 contain some of the more productive soils in the state. Thus, given that the coefficients on the remaining MLRA's are negative, these fixed effects support the hypothesis that farmers with good agricultural land are more likely to join agricultural districts in an effort to promote the future viability of agriculture. This hypothesis is also supported by direct relation of the probability of participation to another, more direct, measure of agricultural viability, the value of farm sales per crop acre (VASPAC).

**Table 2. List of Variables for 51 Upstate New York Counties**

Variable Name	Variable Definition	County Means
VSAPAC	Value of cropland sales (\$1,000) per acre, farms with sales greater than \$2,500, 1982	0.29
AVTAXAC	Full per acre property tax liability on land in use-value assessment program, 1985	32.91
PCTOFF	Proportion of farmers working 100 days or more off the farm, 1982	0.30
FAVAGE	1982 average age of farm operators, farms with sales \$2,500 or more, 1982	50.34
AVDISTAC	Average size of agricultural districts, 1,000 acres, 1982	17.02
PCGHUNIT	Proportional change in housing units, 1970-80	0.21
PCINCFM	Proportion farm income is of total wage and salary income, 1982	0.04
EQRATE	Assessed value of real property/full value of real property, 1982	0.51
EXVAL	Proportion of value of land and buildings on farms with sales greater than \$10,000 exempt for property taxes under use-value assessment, 1982	0.04
MLRA	Dummy variables for major land resource areas defined by SCS, USDA	
FLD82	Proportion of farmland in agricultural districts, 1982	0.54
EXPAR	Proportion of farm tax parcels partially exempt under use-value assessment	0.15
LOGFLD82	Logit transformation of FLD82 according to equation (1) and footnote 5	0.16
LOGEXMPT	Logit transformation of EXPAR according to equation (1) and footnote 5	-3.22
PRED1	Predicted value of FLD82 from regressions	0.54

Sources: U.S. Department of Commerce (1982, 1984); New York State Office of the Comptroller; E + A (1984a,b); Jones and Barnard; Giardina and Dyke.

Table 3. Regression Models for Participation in New York's Agricultural Districts, 1982

Independent Variables	Model 1 <sup>a</sup>			Model 2 <sup>a</sup>		
	Coef.	Standard Error	Partial Derivative <sup>b</sup>	Coef.	Standard Error	Partial Derivative <sup>b</sup>
Intercept	2.812	2.376	2.051	1.621	2.875	1.314
VSAPAC	1.578	0.910	1.151	3.097	1.092	2.511
AVTAXAC	0.002	0.003	0.001	0.002	0.003	0.002
PCTOFF	-4.283	1.619	-3.124	-1.308	1.704	-1.061
FAVAGE	-0.039	0.046	-0.028	-0.042	0.055	-0.034
AVDISTAC	0.019	0.006	0.014	0.012	0.006	0.010
PCGHUNIT	1.792	0.985	1.307	0.672	1.182	0.545
PCINCFM	-6.811	2.615	-4.967	-3.772	3.072	-3.059
MLRA2	-0.306	0.189				
MLRA3	-1.252	0.312				
MLRA4	-1.110	0.317				
MLRA5	0.307	0.293				
Pseudo-R <sup>2</sup>	0.564 <sup>c</sup>			0.261 <sup>c</sup>		
SSE <sup>d</sup>	1885.944			3357.570		
DF <sup>e</sup>	39			43		

<sup>a</sup>The dependent variable is LOGFLD82 and the equations are estimated by GLS as described by equations (1) and (2). See Table 2 for variable definitions.

<sup>b</sup>Calculated from equation (3). Using overall sample means and setting the fixed effects to zero.

<sup>c</sup>Calculated from equation (4).

<sup>d</sup>Sum of squared errors (SSE) used in calculating F-test for the null hypothesis of all fixed effects associated with the MLRA and zero (Judge, et al., p. 484). The test statistic is:

$$F(N-1, DF_u) = (SSE_r - SSE_u)/(N-1)(SSE_u/DF_u)^{-1}$$

where  $r$  and  $u$  are the restricted and unrestricted models, respectively; and  $N$  is the number of restrictions.  $F_{3,39} = 10.143$ , thus the null hypothesis is rejected at  $\alpha = 0.01$ .

<sup>e</sup>Degrees of freedom.



According to the partial derivatives of model 1 with respect to this variable, a \$100 increase in the value of sales per acre would increase the probability of farmland being in a district by 0.115.

The major land resource areas (MLRA's), however, may also reflect the higher participation rates hypothesized to be characteristic of areas where urban and development pressures are greatest. MLRA1, for example, contains Buffalo, Rochester, and Syracuse, three of the five largest upstate central cities (Figure 1). MLRA2, by the same token, is influenced by development pressures from Albany to the north and by the ever expanding metropolitan area around New York City to the south.

Further support for the hypothesis that farmers concerned about urban encroachment are more likely to place farmland in districts is offered through the negative effect that the proportion of wage and salary income earned from farming (PCINCFM) exerts on participation. This variable is inversely related to the importance of the non-agricultural sector in the local economy. Thus, as PCINCFM decreases (non-agricultural activities are a larger share of the total economy) by 0.1 (10%) the likelihood of farmland being in a district increases by almost 0.5.

A related factor is that the proportion of farmers with off-farm work (PCTOFF) is inversely related to the likelihood of farmland being in districts. Farmers fully employed in their farm business signal a relatively strong commitment to agriculture. It is not surprising that they see both tangible and intangible benefits to enrolling their land in a district.

The proportional change in housing units (PCGHUNIT) is also a particularly significant proxy for the development pressure which concerns commercial farmers. Over the 1970-80 decade, as in years before, much new housing development occurred on the rural-urban fringe within commuting distance to large urban centers. Much of it encroached directly on agriculture. For a 0.1 (10%) increase in new housing units over this recent decade the probability that farmland would be in an agricultural district increases by 0.13.

Another important variable in explaining the probability of farmland being in agricultural districts is the average size of the districts themselves (AVDISTAC). As mentioned above, agricultural districts often contain a great deal of land other than farmland. The positive effect of this variable on participation in agricultural districts probably reflects two things. First, as district size increases, larger numbers of farmers are cooperating on proposals for creating districts. Thus, this variable re-

flects to some degree the demonstration effect of neighbors' involvement in agricultural districts. Second, this variable may also reflect enthusiasm of government officials in some localities for the formation of large contiguous districts. As these local officials actively promote district formation, they will increase farmers' awareness of districts and undoubtedly increase the likelihood of farmland being in a district. This effect is likely to increase in importance in the future as more local governments become involved in the 8-year district review process. The evidence is growing that during these reviews local governments use the 8-year review as a vehicle for district consolidation. Consolidation can close gaps in district boundaries that may otherwise encourage checkerboard development. Consolidation is also economic for local governments because the expenses required to conduct future 8-year reviews on a large number of districts can be avoided. Regardless, district consolidation often involves adding district acreage.

The remaining variables in the model, the average per acre tax liability on land in use-value assessment programs (AVTAXAC) and the average age of farm operators (FAVAGE), seem to be relatively unimportant as their standard errors are large relative to the size of the coefficients. However, the negative sign on the coefficient of FAVAGE may indeed be plausible. The incentive for farmers closer to retirement age to commit land to agriculture for an extended period of time may be negative. The inflexibility entailed in district participation may be an intangible cost for farmers nearing retirement age—or the cost may be tangible if being in a district would make it more difficult or less lucrative to sell land for non-agricultural uses. On the other hand, the negative coefficient on age may simply reflect a lower propensity of older farmers to participate in government programs of any kind.

The positive sign on the AVTAXAC variable is as one would expect if the size of the short-term benefits from use-value assessment were a major consideration in participation in agricultural districts. Based on the size of the standard error relative to the coefficient, however, this does not seem to be the case. As suggested above, there may be a stronger case for participation in agricultural districts having an effect on the decision to participate in use-value assessment.

### *Participation in Use-Value Assessment*

Two estimated models of participation in use-value assessment are reported in Table 4. As in the discussion above, model 1 contains fixed effects for

Table 4. Logit Regression Models for Participation in New York's Agricultural Use-Value Assessment Program, 1982

Independent Variables	Model 1 <sup>a</sup>			Model 2 <sup>a</sup>		
	Coef.	Standard Error	Partial Derivative <sup>b</sup>	Coef.	Standard Error	Partial Derivative <sup>b</sup>
Intercept	-0.487	6.513	-0.018	-0.021	7.017	-0.001
FAVAGE	-0.150	0.126	-0.006	-0.176	0.136	-0.007
EXVAL	14.510	3.014	0.549	15.252	2.769	0.565
EORATE	2.212	0.591	0.084	1.882	0.637	0.070
PCGHUNIT	3.943	2.578	0.149	2.998	2.737	0.111
PRED1	4.275	2.410	0.162	6.416	2.232	0.238
MLRA2	0.655	0.468				
MLRA3	-2.922	1.396				
MLRA4	0.071	1.226				
MLRA5	0.0603	0.801				
Pseudo-R <sup>2</sup>	0.745 <sup>c</sup>			0.670 <sup>c</sup>		
SSE <sup>d</sup>	5370.561			8351.799		
DF <sup>e</sup>	41			45		

<sup>a</sup>The dependent variable is LOGEXMPT and the equations are estimated by GLS as described by equations (1) and (2). See Table 2 for variable definitions.

<sup>b</sup>Calculated from equation (3). Using overall sample means and setting the fixed effects to zero.

<sup>c</sup>Calculated from equation (4).

<sup>d</sup>Sum of squared errors (SSE) used in calculating F-test for the null hypothesis of all fixed effects associated with the MLRA's and zero (Judge, et al., p. 484). The test statistic is:

$$F(N-1, DF_u) = (SSE_r - SSE_u)/(N-1) [(SSE_u/DF_u)]^{-1}$$

where r and u are for the restricted and unrestricted models, respectively; and N is the number of restrictions.  $F_{3,41} = 7.586$ , thus the null hypothesis is rejected at  $\alpha = 0.01$ .

<sup>e</sup>Degrees of freedom.

the five MLRA's. According to the F-test in Table 4, one must reject the hypothesis that the fixed effects are jointly zero. However, in contrast to the district participation decision, these fixed effects seem to be less important in the case of use-value assessment. Only for MLRA3 is the standard error on the coefficient small relative to the size of the coefficient.

This model is designed to test the hypothesis that participation in districts exerts a recursive effect on the decision to enroll farmland in the use-value assessment program. To do this, the predicted value of the dependent variable from model 1 of Table 3 was used as a regressor in the use-value assessment model. The results show that, as the predicted probability of participation in agricultural districts (PRED1) increases by 0.10, the probability of participation in use-value assessment increases by about 0.02. There are two possible explanations for this relationship. The first has to do with improved flows of information among land owners who make a proposal to create a district. District participants are likely to be more familiar with all features of the law, including its provisions for use-value assessment. The second and perhaps more compelling explanation is that the penalty and tax rollback provisions associated with converting land under use-value assessment to non-agricultural uses have historically been less severe for parcels within a district. Prior to March 1988, conversions of land in a district resulted only in a tax rollback; conversions of land outside a district brought a more significant monetary penalty.

As hypothesized, the most important factors affecting participation in use-value assessment relate to the size of the yearly monetary benefits of participation. The proportion of the value of land and buildings exempt under use-value assessment in 1982 (EXVAL) is a direct measure of the difference between the full value of farm property and the value that is taxable under use-value assessment. As this proportion rises by 0.1, the likelihood that farm tax parcels are in the use-value assessment program rises by 0.05.

The county-wide equalization rate (EQRATE) is also a significant explanatory factor because assessment rolls in many local taxing jurisdictions are out of date and farm property is often under-assessed relative to other classes of property (Boisvert et al.). Conversely, when local taxing jurisdictions update their assessment roll, the equalization rate (assessed value divided by full value of property) increases. The assessed value of farm property is likely to rise proportionately more than that of other classes of property under these circumstances.

Consequently, the difference between the assessed value and use value of farmland rises, increasing the value of the use-value exemption.

The other two variables in the equation, (FAVAGE82 and PCGHUNIT), appear to affect the participation in use-value assessment in the same fashion as they effect the decision to participate in agricultural districts. One might logically argue that the rationale is the same, although the effects, as measured by the partial derivatives, are not as large. Furthermore, as suggested by the relatively large standard errors, the direct effects are measured with less precision. Part of the explanation for this result is that these variables affect participation in the use-value program indirectly through the predicted value for district participation (PRED1).

### Summary and Policy Implications

The purpose of this paper is to develop a conceptual framework for identifying factors that influence decisions to enroll farmland in New York's agricultural districts program and to participate in that Law's provisions for use-value assessment of farmland. These participation decisions are viewed as binary choices. Logit regression models of the two decisions were estimated using GLS procedures and grouped data (county-level aggregates) for 1982, the only year for which information on participation is available. The empirical results are relatively robust and there is strong evidence that the decision to enroll in agricultural districts affected in a recursive fashion the decision to participate in the use-value assessment program.

From a policy perspective, these results have direct implications for farmland retention efforts geared toward use-value assessment of farmland and local initiatives to create agricultural districts. The analysis strongly suggests that, in New York, such programs are consistent with an objective of protecting the highest quality farmland in areas at the rural-urban fringe. Enrollment in districts is directly and positively related to land productivity, urban pressure, and the importance of non-farm activity in the area. The rate of participation is also affected through a demonstration effect and by the intent of local governments to encourage district formation or district consolidation. Participation is also higher in areas where farmers are more dependent upon employment on the farm.

Because of the recursive nature of the models, these factors also indirectly explain the attractiveness of the Law's provisions for use-value assessment, although short-term monetary gains associated

with the exemption (which is directly related to the proportion of a parcel's exempt value and equalization rates) are the overriding considerations in applying for use-value exemptions. Thus, as local governments become increasingly dependent on the property tax, public officials can expect additional erosion of the tax base via tax preferences for agricultural land. This is also true for jurisdictions undergoing revaluation in an attempt to correct tax inequities across property classes on outdated tax rolls.

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## **A Content Analysis of the Northeastern Journal of Agricultural and Resource Economics (NJARE): 1978–87.**

**Organizer and Moderator:** C. M. Gempesaw II (University of Delaware)

**Speakers:** Catherine Halbrendt (University of Delaware), C. M. Gempesaw II (University of Delaware), James W. Dunn (Penn State University), and Cleve Willis (University of Massachusetts)

In the last ten years, the NJARE has undergone several important changes. Since 1978, the *Journal* has had four different editors. In 1983, the membership voted to discontinue the practice of publishing selected papers presented at the Northeast Agricultural and Resource Economics Association (NAREA) annual meetings. In 1984, the *Journal*'s name was changed from Journal of the Northeastern Agricultural Economics Council to the present NJARE and the size and typeset were improved. During the 1983 annual business meeting, it was noted that a possible impact of not publishing selected papers is that the Journal editor would have control over the contents of both issues of the *Journal*. It was also argued that the *Journal* might become an irrelevant outlet for

publication by the NAREA members if the editor has a narrow view in terms of subject matter and methodology.

Catherine Halbrendt provided an overview of the focus and trends of the American Journal of Agricultural Economics for the last 25 years. C. M. Gempesaw II discussed the content analysis of the NJARE covering the 1977–87 period. James Dunn provided his own observations on the content analysis results and discussed the characteristics of both accepted and rejected papers submitted since 1987. Cleve Willis also offered his own perspective on the content analysis results. In addition, he also addressed the various issues cited above by providing data on the characteristics of all papers submitted during his editorial term.

# **Undergraduate Teaching in the Northeast: Alive?, Well?**

**Organizers:** Steven E. Hastings (University of Delaware, Chairman), Johannes Delphendahl (University of Maine), and Dennis K. Smith (West Virginia State University).

**Moderator and Presenters:** Steven E. Hastings (University of Delaware, Moderator), Johannes Delphendahl (University of Maine), Thomas Brewer (The Pennsylvania State University), John E. A. MacKenzie (University of Delaware), and Kenneth McIntosh (West Virginia University)

Many undergraduate agricultural economics teaching programs in the Northeast are under going drastic changes in response to a variety of new demands by students, faculty and administrators. Some are experiences expanding enrollment; others are facing decline. Some face resource constraints. This symposium allowed five faculty/administrators who either are or have been involved in undergraduate teaching to share their views on critical issues in this area.

Dr. McIntosh described the trends in undergraduate enrollment and teaching resources at West Virginia University. He postulated a "stickyness" in the allocation of resources in response to changing enrollment. Dr.

Delphendahl described important characteristics of agricultural economics programs in the New England universities. Significant variety exists. Dr. Kezis presented a summary of University of Maine's program, highlighting strengths and weaknesses, teaching innovations and recruitment activities. Dr. Brewer highlighted the program at Pennsylvania State University. He commented on student strengths and weaknesses and the treatment of teaching in the promotion and tenure process. Dr. Mackenzie offered some philosophical thoughts on the justification and purpose of an undergraduate program in agricultural economics. He also described the recent renovation of the program at the University of Delaware.

# **Agricultural Economics Research in the Northeast: Programs and Implications for the Future**

**Organizer:** Clark Burbee (USDA-CSRS)

**Moderator:** Julie A. Caswell (University of Massachusetts)

**Speakers:** Clarence Davan (Davan Consulting International, Inc.), Roland Robinson (USDA-CSRS),  
and Paul Farris (Purdue University)

Several reports appearing in recent years have called for a reexamination of the research priorities of agricultural economists. To further this reexamination, the Cooperative State Research Service (CSRS) of USDA has undertaken studies of past and current state research programs and priority topics for the future. The results of three such studies were presented and discussed in this symposium. Clarence Davan reported on the results of interviews conducted on behalf of CSRS with a variety of agribusiness interests, elected officials, and consumer groups to identify and give priorities to researchable questions in agricultural economics. Roland Robinson discussed a new data base developed by CSRS to clas-

sify, by topic area, research being done at state agricultural experiment stations. These data show a great deal of variance between states in sources and uses of research funds for agricultural economics research. Paul Farris reported on changes in total, federal, and nonfederal funding of economics and marketing research through state agricultural experiment stations between 1970 and 1985. Over this time period, federal funding of agricultural marketing economics research decreased substantially but increases in nonfederal funding, primarily state appropriations, offset much of the relative reduction in federal support.