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An Econometric Model to Predict Participation in Urban and Community Forestry Programs in South Carolina, U.S.

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Abstract. A regression-based econometric model was generated from a statewide survey of South Carolina, U.S., residents concerning participation in urban and community forestry programs. The econometric model attempts to estimate the probability of an individual's participation. Results are intended to increase effectiveness of program planning and organization within state forestry commissions. Model 1 was created as follows: participation = *F* (gender, age, education, marital status, region, area raised, area reside, household, duties, and income). Because these responses represented qualitative values, a number of dummy variables (0 or 1, for example, for yes or no) were generated to more accurately reflect the values for participation and a logit model was used. Logit regression analysis produces a value between 0 and 1 that can be interpreted as a probability. Model 2, with fewer variables, was later created to reduce possible multicollinearity problems. Model 1 had a pseudo-R^2 value of 0.2955 or a 29.55% probability of having a correct prediction for participation. Model 2 had a pseudo-R^2 value of 0.2407. The models produced reasonable predictions of participation.

Key Words. Econometrics; public involvement; urban and community forestry.

What factors influence participation in urban and community forestry (U&CF) programs? Which participant characteristics are most predictive of participation levels? How likely is a specific forest owner to participate in the program? Econometrics is a tool that helps answer these questions. Econometrics is "the application of statistical and mathematical methods to the analysis of economic data, with a purpose of giving empirical content to economic theories and verifying them or refuting them" (Maddala 2001). We used econometric methods in this study to assist in U&CF program planning and to aid in better identifying the factors that affect participation in the program.

At the turn of the century, over three-fourths of U.S. residents lived in urban areas (Alig et al. 1999; U.S. Department of Commerce 2000) and the urban forest has had a significant impact on their quality of life (Alig et al. 2003). Congress realized this when it amended the Cooperative Forestry Assistance Act of 1978 to authorize financial, technical, and related assistance to state foresters in support of cooperative efforts in U&CF (Cubbage et al. 1993).

Between 1960 and 1997, the nation's urban area increased from 10.2 to 26.7 million ha (25–66 million ac) (Vesterby and Krupa 2001). Over the 48 contiguous states, in 1992, less than 3% of land area was urban and less than 5% of the land area was considered developed (Heimlich and Anderson 2001). Urban land area in 1997 varied from 10% in the Northeast to 1% in the Mountain Region (Vesterby and Krupa 2001). Urbanization has been tied to population growth, and by 2050, another 16.2 million ha (40 million ac) is expected to be converted into urban and other development uses (Alig et al. 2003). South Carolina followed this national trend (London and Hill 2000). This increased urbanization increased the importance of U&CF programs. Knowledge of the characteristics of people who participate and who do not participate in these programs should allow planners to target an audience for participation.

Assistance from U&CF programs involves U&CF planning, recreational development, air and water quality improvement programs, stormwater management, urban wildlife management, and economic, urban development, and conservation management plans. Within the United States, typical program recipients are local governments, policymakers and elected officials, builders and developers, civic and community groups, neighborhood associations, nonprofit groups, local businesses, and urban forest councils (Urban Forestry South Expo 2005).

An important aspect of U&CF programs is public involvement (SC Forestry Commission 2005). Citizen participation has been shown to be essential to U&CF program success (Cole 1979; Henderson 1984). With tight budgets and other constraints, volunteerism and public participation are key determinants to program success (Bloniarz and Ryan 1996;

Sommer 1996). The support of nontraditional audiences is considered crucial to enhancing these programs (Iles 1998) and increased volunteers provide different skills, new ideas, and more effective outreach (Westphal and Childs 1994). For programs like Tree City USA expanded participation is seen as necessary to counter lagging fiscal support (Andresen 1989).

To ensure public participation, one must first establish who the individuals are and when promoting these programs who needs to be targeted. The purpose of this study was to provide insight on continued public participation within the U&CF programs. The econometric model created in this study will show the likelihood of participation in these programs for individuals based on personal characteristics. The data used in the model were described and analyzed by Straka et al. (2005). We used the same data to develop a predictive model that will help identify factors that impact participation and aid in projecting individual forest owner participation.

Wall et al. (2006) described a similar econometric study. They also attempted to identify factors that led to U&CF program participation. That study used data from 42 of the states to quantify participation; we used data from a survey of South Carolina residents to attempt to do the same thing. Wall's study attempted to identify variables that impacted participation, whereas this study produced a probability of participation.

STUDY METHODS

In the fall of 2003, a survey was mailed to 324 South Carolina residents to identify characteristics of participants and nonparticipants in U&CF programs and their attitudes toward the programs (Straka et al. 2005). Past participants were randomly selected from South Carolina Forestry Commission records, whereas nonparticipants were randomly selected from occupational groups that would be expected to exhibit equal interest in U&CF programs. The information on the 192 surveys returned was used to generate the econometric model. This is a 59% response rate; participants were 56% of the respondents.

Econometrics involves the specification of a regression analysis model that forecasts or explains behavior. We developed an econometric or regression model to predict participation in U&CF programs. Specific questions answered by both participants and nonparticipants were used to create the independent and dependent variables. "Regression analysis is concerned with describing and evaluating the relationship between a given variable (often called the explained or dependent variable, in our case participation) and one or more other variables (often called the explanatory variables or independent variable)" (Maddala 2001). The responses to each question were placed in a Microsoft Excel document then imported into SAS 9.0 (Statistical Analysis System for Windows) to create the regression model (SAS Institute 2002).

Model formulation needed to describe the dependent variable, participation, was the primary task. The standard regression model using ordinary least squares could not be used because the dependent variable was nonnumeric, that is, questions were answered by responses like "yes" or "no" or "male" or female." A linear probability model was first considered for the analysis with a dichotomous dependent variable, that is, the *participation* variable would take on a value of 1 or 0, yes or no, respectively (Maddala 2001). Participation would be an indicator variable that shows the incidence of an event or whether the person participated in the program, and we would have some independent variables that determine the likelihood of participation (Maddala 2001). The qualitative nature of the dependent variable proved inappropriate for the linear probability model.

The logit model creates dummy variables for each of the dependent variables, that is, it accounts for the nonnumeric values by transforming the qualitative values into numeric values (0 or 1). This is achieved by creating dummy variables for each of the independent variables.

Dummy variables were created to define each independent variable (Table 1). For the independent variable "age," three dummy variables were created. The question was "What is your age?" The possible responses were: a) under 30 years old, b) 30 to 49 years old, c) 50 to 65 years old, or d) 66 years old or older. Of these four answers, three were chosen to become dummy variables. One answer was omitted because its effect can be seen in the models intercept. This approach was used throughout the model. The three answers retained for age were a, b, and d. They were defined as age1, age2, and age4.

The logit regression analysis was computed using the SAS 9.0 system. This type of regression returns a numeric value between 0 and 1(which can be interpreted as a probability or percent) that describes how likely a certain individual (based on characteristics such as gender, age, and education level) will be to participate in U&CF programs. Once the value for participation of an individual is computed, if it is less than 0.50, we predicted that individual is not likely to participate in U&CF programs. Likewise, a value greater than or equal to 0.50 indicated that the individual is likely to participate in U&CF programs. Another way to interpret the participation value is to consider it a probability. If the value is 0.85, we predicted the individual will likely participate, but you can also say the individual is 85% likely to participate in U&CF programs.

RESULTS AND DISCUSSION

The logistic regression completed in SAS 9.0 yielded the following model (model 1) for participation:

Table 1. Independent variable definitions.

Variable		Variable	
Gender		**Environment raised**	
Gender	Female	AreaRaised1	Rural nonfarm
Age		AreaRaised2	Rural farm
Age1	Under 30 yrs old	AreaRaised4	Urban
Age2	30 to 49 yrs old	AreaReside1	Rural nonfarm
Age4	66 yrs old or older	AreaReside2	Rural farm
Highest level of education		AreaReside4	Urban
Education1	Elementary school	**Type of household**	
Education2	High school	Household1	Family household without children
Education3	Associate 2-yr degree	Household3	Female householder with children under 18
Education4	Some college	Household4	Male householder with children under 18
Education6	Graduate degree	Household5	Householder living alone
Marital status		**Employment duties**	
MaritalStatus1	Never married	Duties2	Director/coordinator
MaritalStatus3	Separated	Duties3	Consultant
MaritalStatus4	Widowed	Duties4	Educator
MaritalStatus5	Divorced	Duties5	Superintendent/manager
Region in SC where currently living		Duties6	Planner
Region1	Upstate	Duties7	Other
Region3	Lower Coastal Plain	**Household Income**	
		Income1	$0–30,000 per year
		Income3	Greater than $85,000 per year

$$\begin{gathered}\text{Participation} = \text{Part} = \text{intercept} + \beta_1\text{Gender} \\ + \beta_2\text{Age1} + \beta_3\text{Age2} + \beta_4\text{Age4} + \beta_5\text{Education1} \\ + \beta_6\text{Education2} + \beta_7\text{Education3} + \beta_8\text{Education4} \\ + \beta_9\text{Education6} + \beta_{10}\text{MaritalStatus1} + \beta_{11}\text{MaritalStatus3} \\ + \beta_{12}\text{MaritalStatus4} + \beta_{13}\text{MaritalStatus5} + \beta_{14}\text{Region1} \\ + \beta_{15}\text{Region3} + \beta_{16}\text{AreaRaised1} + \beta_{17}\text{AreaRaised2} \\ + \beta_{18}\text{AreaRaised4} + \beta_{19}\text{AreaReside1} + \beta_{20}\text{AreaReside2} \\ + \beta_{21}\text{AreaReside4} + \beta_{22}\text{Household1} + \beta_{23}\text{Household3} \\ + \beta_{24}\text{Household4} + \beta_{25}\text{Household5} + \beta_{26}\text{Duties2} \\ + \beta_{27}\text{Duties3} + \beta_{28}\text{Duties4} + \beta_{29}\text{Duties5} + \beta_{30}\text{Duties6} \\ + \beta_{31}\text{Duties7} + \beta_{32}\text{Income1} + \beta_{33}\text{Income3} + \text{error.}\end{gathered}$$

The corresponding β values can be found in Table 2. The calculation of the probability for participation in U&CF programs is best illustrated with an example. Consider a female, age 35, with a graduate degree, married with two children under 18 years old, living in a rural nonfarm area in the upstate, who lived as a child in a suburbs on the Lower Coastal Plain, and is a forestry consultant with an annual household income is $150,000.

Variables that match the individual, like Age2 (because she is 35) become “1’s” and the other variable become “0’s.” If 1’s are plugged into the appropriate areas of the model, the equation becomes participation = 0.721275 + 0.782774 (Gender = 1) + 0.245537 (Age2 = 1) + 0.327203 (Education6 = 1) + 0.686155 (Region1 = 1) + 0.110472 (AreaReside1 = 1) – 0.043248 (Duties3 = 1) – 0.174308 (Income3 = 1).

Participation equals 2.65586. In a logit model, the result must be transformed to equal a probability. In this case, the transformation is (exp^(2.65586))/(1 + exp^(2.65586)) = 0.93437125, which indicates that there is a 93.44% chance she will participate in U&CF programs. Sice 0.9344 > 0.5, we conclude she will be participating in U&CF programs.

A likelihood ratio test, based on the χ^2 distribution, was used to determine if the model was significant. The likelihood ratio value for the entire model was 43.698. The model proved to be useful at the 10% significance level because the calculated value of 43.698 is less than the χ^2 tabulated value of 43.75 with 33 degrees of freedom.

The next step in interpreting the regression results involved the significance of the individual parameter estimates for the independent variables (Table 3). Significance levels were used to determine if the parameter estimates are significantly different from zero. “It is customary to use 0.05 as a low probability and to reject the suggested hypothesis if the probability of obtaining as extreme a *t*-value as the observed t_0 is less than 0.05” (Maddala 2001). In our case, the suggested hypothesis (Ho: $\beta_n = 0$) is true (fail to reject) if the approximate probability is less than 0.05. There were only four variables that were significantly different from 0 for the full model.

This can be misleading when interpreting the results; all of the independent variables are dummy variables, which gives them a value of either 0 or 1. Because these variables only correspond with 10 questions from the survey, there was a high probability that a particular variable would receive more 0’s than 1’s with a sample size of 192. Zeroes indicated that a particular variable was not a characteristic of an individual

Table 2. Corresponding β values for the model 1.

Variable	β's	Numeric value
Intercept	β_0	0.721275
Gender	β_1	0.782774
Age1	β_2	−1.872991
Age2	β_3	0.245537
Age4	β_4	−0.811006
Education1	β_5	−8.57872
Education2	β_6	−1.775104
Education3	β_7	−0.863352
Education4	β_8	−1.167792
Education6	β_9	0.327203
MaritalStatus1	β_{10}	0.909987
MaritalStatus3	β_{11}	−17.808599
MaritalStatus4	β_{12}	−29.098726
MaritalStatus5	β_{13}	0.156967
Region1	β_{14}	0.686155
Region3	β_{15}	0.182202
AreaRaised1	β_{16}	−0.336653
AreaRaised2	β_{17}	−0.273474
AreaRaised4	β_{18}	0.098243
AreaReside1	β_{19}	0.110472
AreaReside2	β_{20}	0.723733
AreaReside4	β_{21}	0.092644
Household1	β_{22}	0.030136
Household3	β_{23}	−1.289152
Household4	β_{24}	−0.711543
Household5	β_{25}	−0.654883
Duties2	β_{26}	−0.615841
Duties3	β_{27}	−0.043248
Duties4	β_{28}	−2.090003
Duties5	β_{29}	−0.551511
Duties6	β_{30}	−0.315801
Duties7	β_{31}	−1.155163
Income1	β_{32}	1.844188
Income3	β_{33}	−0.174308

Table 3. Probabilities for individual parameter estimates.

	Approximate probability > l t l	Significance level	Hypothesis test Ho: $\beta n = 0$ Ha: $\beta n \neq 0$
Intercept	0.3130	5%	Fail to reject
Gender	0.0971	5%	Fail to reject
Age1	0.0540	5%	Fail to reject
Age2	0.5987	5%	Fail to reject
Age4	0.2469	5%	Fail to reject
Education1	<0.0001	5%	***Reject***
Education2	0.0453	5%	***Reject***
Education3	0.2888	5%	Fail to reject
Education4	0.1131	5%	Fail to reject
Education6	0.4643	5%	Fail to reject
MaritalStatus1	0.4612	5%	Fail to reject
MaritalStatus3	0.9978	5%	Fail to reject
MaritalStatus4	,.0001	5%	***Reject***
MaritalStatus5	0.8897	5%	Fail to reject
Region1	0.1702	5%	Fail to reject
Region3	0.6836	5%	Fail to reject
AreaRaised1	0.5256	5%	Fail to reject
AreaRaised2	0.6541	5%	Fail to reject
AreaRaised4	0.8867	5%	Fail to reject
AreaReside1	0.8412	5%	Fail to reject
AreaReside2	0.3347	5%	Fail to reject
AreaReside4	0.8755	5%	Fail to reject
Household1	0.9486	5%	Fail to reject
Household3	0.5675	5%	Fail to reject
Household4	0.6728	5%	Fail to reject
Household5	0.5725	5%	Fail to reject
Duties2	0.3211	5%	Fail to reject
Duties3	0.9771	5%	Fail to reject
Duties4	0.0023	5%	***Reject***
Duties5	0.4059	5%	Fail to reject
Duties6	0.6411	5%	Fail to reject
Duties7	0.0646	5%	Fail to reject
Income1	0.0580	5%	Fail to reject
Income3	0.6825	5%	Fail to reject

and 1's indicated that that variable (characteristic) did not apply. This would suggest why so many parameter estimates appeared to be equal to 0. Specific groups of individual independent variables were also examined using the likelihood ratio method to determine how different they were from 0, but these tests were deemed inconclusive to the model for the same reasons described for the individual variables.

There are three pitfalls of econometric models. Each is a potential problem for any regression model, but all are more likely to occur when economic or social data are used in the regression model. One potential problem involves unequal variance in the disturbance terms but was unlikely to occur in our model. A second potential problem is autocorrelation associated with time-series data. Because our data were not from a time series, we did not expect this problem.

A third potential problem is multicollinearity caused by highly correlated independent variables. It can cause large standard errors and can make individual correlated variables appear to have weak impacts when, as a group, they have a strong impact (Allison 1999). This problem was possible in our model and we evaluated the problem examining the independent variables (Table 4). There were three pairs of independent variables that were highly correlated: Education1 (elementary school) and MaritalStat4 (widowed), MaritalStat1 and Household5 (living alone), and Region3 (lower coastal) and Region1 (upstate). These three combinations were all correlated higher than 50%. Each individual variable was examined to determine how it might be affecting the model.

Education1 and all marital status variables were likely sources of multicollinearity and these variables were from the original full model to create a second model (model 2) with

Table 4. Pearson correlation coefficients.

Variable	&	Variable	Correlation
Age1	&	MaritalStatus1	0.45848
Age2	&	Household1	–0.37135
Age2	&	Age4	–0.32868
Age4	&	Region1	0.30745
Age4	&	Duties7	0.34561
Age4	&	Income1	0.33776
Age4	&	MaritalStatus4	0.31811
Education1	&	MaritalStatus4	0.57429
Education3	&	Income1	0.3072
Education6	&	Duties4	0.32459
MaritalStatus1	&	Household5	0.53809
MaritalStatus3	&	Household3	0.40063
MaritalStatus3	&	Household4	0.40063
MaritalStatus5	&	Household5	0.47004
Region3	&	Region1	–0.51711
AreaRaised1	&	AreaRaised2	–0.30023
AreaRaised2	&	AreaReside2	0.47169
AreaRaised4	&	AreaReside4	0.34715
AreaReside1	&	AreaReside4	–0.30582
Household1	&	Household5	–0.40581

better explanatory power. The third set of variables that were highly correlated was Region1 and Region3. These variables are in the same category, which would indicate that they should be correlated. Because these variables can never interact, they were retained in the model. Age1 (under 30) and Duties4 (educator) proved to be significant at the 5% level indicating that these variables have a large effect on participation.

The next step in defining the model dealt with goodness of fit as measured by R^2. Because the model in this study is logistic, the normal R^2 value cannot be used. We used pseudo-R^2 measures (Maddala 2001). The Cragg–Uhler R^2 is an appropriate pseudo-R^2 formula for a logistic model with 0 to 1 values that assesses a proportion of correct predictions (Table 5). These values are not especially high, suggesting that the model was not properly specified and/or other variables not included on the survey were important.

A modified regression mode was run without the previously mentioned independent variables (model 2) to evaluate the impact of excluding the variables potentially causing multicollinearity problems (Table 6).

The likelihood ratio test, which uses a χ^2 distribution, was used to determine if model 2 was significant. The likelihood ratio value for model 2 was 34.712. The model proved to be useful at the 10% significance level because the calculated value of 34.712 is less than the χ^2 tabulated value of 37.92 with 28 degrees of freedom. Model 2 may prove more useful than the full model in estimating participation as a result of the problem of multicollinearity being reduced.

Table 5. Pseudo R^2 values.

Measure	Model 1	Model 2	Formula
Cragg–Uhler	0.2955	0.2407	$(1 - \exp(-R/N))/(1 - \exp(-U/N))$
McFadden	0.1813	0.1441	R/U

Table 6. Corresponding β values for model 2.

Variable	β's	Numeric value
Intercept	β_0	0.507417
Gender	β_1	0.649682
Age1	β_2	−1.450874
Age2	β_3	0.393127
Age4	β_4	−1.057676
Education2	β_6	−1.677965
Education3	β_7	−0.641793
Education4	β_8	−1.219091
Education6	β_9	0.222361
Region1	β_{14}	0.642748
Region3	β_{15}	0.378596
AreaRaised1	β_{16}	−0.22198
AreaRaised2	β_{17}	−0.273058
AreaRaised4	β_{18}	0.182307
AreaReside1	β_{19}	0.088404
AreaReside2	β_{20}	0.961657
AreaReside4	β_{21}	0.043463
Household1	β_{22}	0.101815
Household3	β_{23}	−1.538715
Household4	β_{24}	−1.468615
Household5	β_{25}	−0.150528
Duties2	β_{26}	−0.530383
Duties3	β_{27}	0.311920
Duties4	β_{28}	−1.891497
Duties5	β_{29}	−0.461981
Duties6	β_{30}	−0.263164
Duties7	β_{31}	−1.154150
Income1	β_{32}	1.047749
Income3	β_{33}	−0.135845

The calculation of the probability for participation in U&CF programs using model 2 was:

$$\begin{gathered}\text{Participation} = 0.507417 + 0.649682\ (\text{Gender} = 1) \\ + 0.393127\ (\text{Age2} = 1) + 0.222361\ (\text{Education6} = 1) \\ + 0.642748\ (\text{Region1} = 1) + 0.088404\ (\text{AreaReside1} = 1) \\ - 0.311920\ (\text{Duties3} = 1) - 0.135845\ (\text{Income3}).\end{gathered}$$

If model 2 is applied to the same individual that was used in the earlier example, the parameters result in all 1's being plugged into the model and participation equals 2.055974. This converts to a probability of 0.88654987, which indicates that there is an 88.65% chance she will participate in U&CF programs. Because 0.8865 > 0.5, this leads to the conclusion the she is very likely to be participating in U&CF programs.

There was a 4.8% decrease in the probability of participation with the use of model 2. Both models may both be very successful in determining the likelihood of participation in U&CF programs.

Education2 (high school) and Duties4 (educator) proved to be significant at the 5% level indicating that these variables have a large effect on participation. U&CF program planners should pay close attention to the characteristics defined by the previously mentioned variables when targeting individuals for participation.

Our results are consistent with other research on factors affecting participation in volunteer organizations. All the variables identified in the final model are considered primary determinants of participation (Natural Resources Conservation Service 2004). Other studies that discuss determinants of participation consistently use the type of variables in the models discussed here (Smith 1994). Pseudo R^2 values are not high. Analysts using biologic or physical data would generally be unhappy with these results. However, for social data of this type and the logit model formulation, these R^2 levels are usually considered acceptable (Maddala 2001). We were satisfied that these results are significant and do illustrate valuable explanatory relationships that can be used to estimate participation levels.

Note that we were limited to data included in the 2003 survey. This model is merely a starting point in establishing factors that affect participation. Additional data will surely strengthen the model. Our main contribution is showing that this technique can be used effectively to estimate participation and we provide a starting point for a more detailed study.

Can a model like this be used in day-to-day work of the U&CF professional? Yes, it does provide valuable information. Notice in our prior example of the 35 year old female forestry consultant that we determined the likelihood of her participation. The variables in the model interact and a simple table of likelihoods by characteristic would be too complex to be usable. However, other variables can be held constant and changes in variables like income level or age can be evaluated. The model certainly can be used to estimate likelihood of participation for any individual and would show the program planner where to best spend his or her time.

CONCLUSION

The purpose of this study was to provide insight into participation within U&CF programs. A logistic regression model was used with independent variables being qualitative. Two econometric models were evaluated—one using all the available independent variables (model 1) and the other omitting certain variables (model 2). The pseudo-R^2 values were not especially high, but they suggest a level of predictability. These low values could mean the model was not properly specified or that relevant variables were omitted. For an econometric study of this type, these are acceptable R^2 values.

The two models proved to be significant (at the 10% level) in the prediction of participation. Model 2 may prove more useful than the full model in estimating participation as a result of the problem of multicollinearity being corrected.

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Zusammenfassung. Von einer bundesweiten Erhebung unter den Einwohnern von Südkarolina über die Teilnahme an urbanen Forstprogrammen wurde ein ökonometrisches, auf Regression basierendes Modell generiert. Das ökonometrische Modell versucht, die Wahrscheinlichkeit einer individuellen Teilnahme zu schätzen. Die Ergebnisse können die Effektivität der Programmplanung und Organisation innerhalb der Forstkommission verstärken. Das Modell 1 war wie folgt konzipiert: Teilnahme $= F$ (Geschlecht, Alter, Ausbildung, Familienstand, Region, erhobene Fläche, Haushalt, Pflichten, Einkommen). Weil diese Antworten einen qualitativen Wert darstellen, wurden eine Anzahl von leeren Variablen (0 oder 1 z.B. für Ja oder Nein) generiert, um die Werte der Teilnahme besser zu reflektieren und es wurde ein Logit-Modell verwendet. Die Logit-Regressionsanalyse produziert einen Wert zwischen 0 und 1, der als Wahrscheinlichkeit interpretiert werden kann. Modell 2, mit weniger Variablen, wurde später entwickelt, um mögliche multikollineare Probleme zu reduzieren. Modell 1 hatte eine Pseudo-R^2 Wert von 0.2955 oder eine Wahrscheinlichkeit von 29,55%, die richtige Vorhersage für die Teilnahme zu treffen. Modell 2 hatte einen Pseudo-R^2 Wert von 0.2407. Die Modelle produzierten brauchbare Vorhersagen für die Teilnahme.

Resumen. Se generó un modelo de regresión econométrico de un censo a los residentes de South Carolina concerniente a la participación en programas forestales urbanos y comunales (U&CF, por sus siglas en inglés). El modelo intenta estimar la probabilidad de participación. Los resultados se dirigen a incrementar la efectividad de los programas de planeación y organización dentro de las comisiones estatales forestales. El Modelo 1 fue creado como sigue: Participación = F (Género, Edad, Educación, Estado Marital, Región, Área Económica, Área Residencial, Familia, Impuestos e Ingresos). Debido a que las respuestas representan valores cualitativos, fueron generados un número de variables ficticias (0 o 1, por ejemplo, para sí o no) para reflejar más precisamente los valores para participación y fue empleado un modelo "logit". El análisis de regresión logit produce un valor entre 0 y 1 que puede ser interpretado como una probabilidad. El modelo 2, con menos variables, fue creado más tarde para reducir posibles problemas de multicolinearidad. El modelo 1 tuvo un pseudo-valor R^2 de 0.2955, o un 29.55 por ciento de probabilidad de tener una predicción correcta de participación. El modelo 2 tuvo un pseudo-valor R^2 de 0.2407. Los modelos produjeron predicciones de participación razonables.