Setting the Standard for Farmland Preservation: Do Preservation Criteria Motivate Citizen Support for Farmland Preservation?

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The multifunctional set of services provided by farmland complicates the task of identifying which farmland should be preserved. For this reason many states and local governments establish criteria to rank and select parcels of farmland for protection. This study examines whether criteria commonly used by state programs to guide purchases of agricultural conservation easements influence public demand for farmland preservation. The results provide policy makers with additional information to assess current ranking criteria that set the standard for farmland preservation.

Key Words: farmland, farmland attributes, PACE programs, probit model, standards

Millions of dollars are spent annually by states to preserve farmland (Nickerson and Hellerstein, 2003). Farmland provides an array of private and public benefits, and this multifunctional character of farmland (Batie, 2003) complicates the task of identifying which farmland should be preserved. As one way to approach the task, states have developed criteria (for example, soil productivity) for ranking and selection of parcels of farmland for protection. These criteria become the means by which demand for farmland preservation, often expressed through public referenda (Myers, 1999, 2001), is transformed into actual purchases of development rights or conservation easements. Generally speaking, these criteria become the standard for determining which farmland the state considers "good" or "deserving" of preservation.

To examine the demand for farmland preservation, willingness-to-pay studies use general descriptors like "prime farmland" or "agricultural land" to describe farmland in their hypothetical choice scenarios (see, e.g., Beasley, Workman, and Williams, 1986; Bergstrom, Dillman, and Stoll, 1985; Drake, 1992; Halstead, 1984; Krieger, 1999). While these studies support an initial allocation of funds toward farmland preservation, they do not enhance the capacity of policy makers to allocate preservation monies between competing farmland parcels.

Since the early work of Gardner (1977), a host of studies (Kline and Wilchelns, 1994, 1996; Rosenberger, 1998) argue that farmland protection is a means to achieving a multitude of social objectives and, to some extent, that these social objectives are reflected in the ranking criteria currently used by many states' purchase of agricultural conservation easement (PACE) programs. Four common ranking criteria include soil productivity, environmental significance, regional importance, and location (Nickerson and Hellerstein, 2003).

These criteria provide insights into the way state PACE programs weigh various benefits provided by farmland. However, it is less clear if these ranking criteria matter to individuals when they decide

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whether or not to support farmland preservation programs. The willingness-to-pay literature has not examined variation in demand across farmland attributes, and the literature considering the multitude of social objectives associated with farmland preservation has not typically examined preferences for farmland attributes in hypothetical situations involving a private income constraint (e.g., see Kline and Wilchelns, 1998). Consequently, the relationship between state PACE ranking criteria, which prioritize farmland, and public willingness to support PACE programs remains largely unexplored. As a result, it is unclear whether the standards used by PACE programs to judge farmland respond to the public decision to vote for a farmland program. This study addresses this area of uncertainty.

Our survey design examines respondents' decisions to support PACE programs in a hypothetical choice scenario which varies both the mandatory cost of the program and the description of the farmland to be preserved. The description of farmland varies by levels of agricultural productivity, environmental quality, and location. These descriptors are consistent with criteria used by many states to prioritize farmland for preservation. Our findings support the use of state criteria which prioritize farmland for preservation based upon agricultural productivity, environmental quality, and location.

A Discrete Model of the Choice to Vote for PACE

The voter's decision is presented as a discrete choice—to vote for or against a PACE program—and is modeled as follows:

$$(1) \qquad V^1\left(Y \,\&\, C_F; F(\mathbf{R})\right) \,\&\, V^0(Y),$$

where V^1 is the respondent's indirect utility function with a PACE program that results in an unavoidable household cost, C_F, for the public purchase of conservation easements on farmland F, which is described by a vector of specified attributes, $\mathbf{R}$, such as agricultural productivity and environmental quality. Y represents household income. V^0 characterizes the respondent's initial (pre-PACE) level of indirect utility. An implicit component of both V^0 and V^1 is the price of a numeraire good which is indexed to one.

The respondent votes for the PACE proposal if the welfare gain derived from the publicly preserved farmland exceeds the welfare loss that accompanies the mandatory household tax ($V^1 > V^0$). The respondent trades off the utility loss associated with costs of the PACE program against the benefits from publicly preserved farmland which are a function of a bundle of attributes. Increases in the costs of the PACE program are hypothesized to reduce the difference between V^1 and V^0, and thereby reduce the likelihood of a yes vote. On the other hand, it is hypothesized that higher levels of farm attributes (agricultural productivity and environmental quality) and preferred locations for farmland increase the utility derived from publicly preserved farmland. Subsequently, the difference between V^1 and V^0 is increased, and the respondent is more likely to vote yes for the PACE program.

The survey design allows us to measure the systematic components of utility (Y, C_F, $\mathbf{R}$). Probabilistic statements can be made about the systematic components of the utility function by introducing a random component to the choice. The introduction of a random element results in a description of choice behavior which is similar to traditional descriptions of the random utility model (RUM) (for detailed discussion, see Hanemann, 1984; Adamowicz, Louviere, and Swait, 1998; Milon et al., 1999). We assume the error term follows a cumulative normal distribution, and therefore a probit model is used to examine voting choice as a function of costs, variation in farmland attributes, and a number of additional demographic measures.

A Survey Design to Examine Testable Hypotheses

A door-to-door survey was conducted with a random sample of Kent County, Michigan, households during August 2001. The purpose of the survey was to examine residents' opinions about the services provided by farmland and farmland attributes, and how variation in descriptions of farmland influence the likelihood that survey respondents would vote for PACE proposals.[1]

We chose Kent County, Michigan, because it traditionally has been one of the more important agricultural counties in the state, and it encompasses an expanding metropolitan area, Grand Rapids. Between 1990 and 2000, U.S. Census data reveal the population growth rate in Kent County was nearly twice that of the state of Michigan (U.S. Bureau of the Census, 1990, 2000).

[1] Although not included here, additional details of the survey, a copy of the survey instrument, and survey results are provided online at http://agecon.lib.umn.edu/cgi-bin/detailview.pl?paperid=5732.

In addition, Kent County contains a unique fruit-growing area referred to by local residents as the "Fruit Ridge." The Fruit Ridge's proximity relative to Lake Michigan and its relatively high altitude have contributed to its capacity to grow fruit (mainly apples). Public recognition of this area provided a unique opportunity to examine how PACE criteria which identify particular locations based on regional importance might influence public support for farmland preservation initiatives.

The survey design was developed with the assistance of two focus groups of Kent County residents (one comprised of rural residents and the other urban residents). In addition, a meeting was held with Kent County extension agents to review the survey. The survey was pre-tested using door-to-door visits. Discussions with focus groups, county agents, and residents strongly influenced the wording of the survey, the description of the PACE program, and the hypothetical costs of the PACE program. Further, after door-to-door pre-testing, we altered the method of survey delivery to allow respondents the opportunity to complete the survey instrument at their convenience (as discussed below).

A random sample of households in Kent County was identified through addresses provided by Survey Sampling, Inc., which uses a database of all listed telephone numbers. The sample was stratified by non-rural and rural areas. We defined rural areas by identifying census tracts which were defined by the 1990 Census as 100% rural. The area defined as rural contained approximately 10% of the households in Kent County. Households not located in rural areas are referred to as "non-rural." The initial sample consisted of 205 households. However, 12 of the addresses were nonexistent or were located outside of the county boundaries. Of the remaining 193 households, 141 returned the survey forms (representing a 73% response rate). Of these surveys, 135 were usable. Because each respondent voted on three hypothetical PACE referenda, 405 choice observations are available for analysis.

The final survey was administered using the following procedure. A fieldworker carried the survey form to the door of a household. If a survey respondent was home (someone who regarded himself or herself as a head of the household), the fieldworker introduced the survey. The introduction to the survey involved a general discussion of survey purpose and a review of each section of the survey. Respondents were then asked to fill out the survey at their convenience, and subsequent arrangements were made to pick up the survey sometime that day or during the week. In four cases, at the request of the survey respondent, the survey was read to the respondent and the fieldworker filled out the survey as directed by the respondent.

If the respondent was not at home, the survey questionnaire was left at the door with a note attached requesting that the survey be filled out and left at a specified place for pick-up the next day. Subsequent visits were made to all homes at which a survey was dropped off. These subsequent visits are categorized as follows: (*a*) "introduced drop-offs," in which a survey (previously dropped off) was introduced to the respondents (as described above) and retrieved as discussed in the previous paragraph; (*b*) "pickups," in which the survey (previously dropped off) was already completed by the respondent when the fieldworker returned; and (*c*) "mail-drops," in which a survey was left with a self-addressed, stamped envelope. Eighty percent of the completed surveys involved an introduction to the survey. The remaining 20% of the surveys were split evenly between pickups and mail-drops.

The survey itself consisted of six major sections. The first section introduced the respondent to the survey and defined the key words that would be used to describe farmland throughout the survey. Respondents were encouraged to refer back to these definitions as they filled out the survey. The second and third sections of the survey asked the respondent to indicate, on a Likert scale, his or her opinions about farmland services and attributes of farmland.

The fourth section of the survey presented a hypothetical PACE program to preserve farmland in Kent County. The PACE program was described and then summarized by noting five important characteristics:

- Owners of farmland are free to choose whether they want to sell a conservation easement to the County government;
- The County reviews offers from farmland owners and selects the land for purchasing a conservation easement;
- The County and landowners agree on the price of the conservation easement;
- The County places a conservation easement (a legal restriction) on the farmland, guaranteeing the land will remain permanently undeveloped, as farmland; and
- The farmland owner who sells the easement retains all other ownership rights.

BALLOT PROPOSAL

If a majority of Kent County residents vote *yes*, your household will pay the special County tax and the County Government will purchase agricultural conservation easements on farmland with the characteristics described in the box below.

If a majority of Kent County residents vote *no*, your household will not pay the special tax and the County Government will not purchase agricultural conservation easements on farmland in the County.

Proposal A summarizes the proposal on which ***you*** are asked to vote:

Proposal A

Purchase of Agricultural Conservation Easements (PACE)

Cost:	**$10 per household each year for the next five years**
Quantity:	**10% of the farmland** in Kent County (18,000 acres)
Location:	**Anywhere** in the County
Productivity:	**Below-average** farmland productivity
Environmental Quality Index Score:	**Below-average** environmental quality

Please indicate *your vote* in one of the two boxes below:

Vote ***for*** Proposal A	Vote ***against*** Proposal A
"	"

Figure 1. Ballot proposal

The first four sections were specifically designed to prepare the survey respondent for the three hypothetical voting scenarios presented in section five. The fifth section's introductory narrative explained the basis for multiple voting scenarios as follows:

> Because there are many different cost estimates and types of farmland, the proposals differ by: (1) cost to each household, (2) productivity of farmland preserved, (3) location of farmland in the County, and (4) environmental quality ranking of farmland.

Moreover, the narrative suggested that referenda would determine whether or not a special County tax would be placed on each household to pay for the PACE program. Finally, respondents were reminded to "vote on each proposal as if it were the only one you would face in the voting booth." In each of the 135 completed surveys, respondents voted on all three proposals.

Figure 1 provides an example of the survey's ballot proposal. The costs of the program were described in terms of a cost to each household over a five-year period. Initially, annual costs were varied by $20, $50, and $300. These dollar amounts were established by focus group discussions and by pretesting. However, once in the field, we inferred from our survey responses that these figures might be too high because essentially no variation was found around the $300 figure. For this reason, the survey design was altered and the costs were changed to $10, $50, and $100. Table 1 provides a list of variables and their hypothesized effects on the probability that a respondent will vote for the PACE program.

Table 1. Descriptions and Hypothesized Signs of Explanatory Variables

Variable	Description of Variable	Hypothesized Sign
Dependent Variable:		
Vote	= 1 if respondent votes yes; 0 otherwise	NA
Explanatory Variables (β's):		
β_1, *Cost*	Yearly cost ($10, $20, $50, $100, $300) to the respondent for five years if PACE proposal is approved by voters of Kent County	–
β_2, *Income*	Total family income before taxes	+
β_3, *HighProd* [a]	= 1 if farmland is described as above-average productivity; 0 otherwise	+
β_4, *LowProd*	= 1 if farmland is described as below-average productivity; 0 otherwise	–
β_5, *HighEQI* [b]	= 1 if farmland is described as having an above-average environmental quality index (EQI); 0 otherwise	+
β_6, *LowEQI*	= 1 if farmland is described as having a below-average EQI; 0 otherwise	–
β_7, *Highway* [c]	= 1 if farmland is located next to highway; 0 otherwise	+
β_8, *FruitRidge*	= 1 if farmland is located in the Fruit Ridge of Kent County; 0 otherwise	+
β_9, *Acres*	Total acreage of land owned in Kent County	+
β_{10}, *FLand*	= 1 if respondent owns farmland; 0 otherwise	–
β_{11}, *Age*	Age of respondent	?
β_{12}, *Gender*	= 1 if respondent is female; 0 otherwise	?
β_{13}, *Children*	Number of own children under age 25	?
β_{14}, *Education*	= 1 if college education or higher; 0 otherwise	?
β_{15}, *Renter*	= 1 if respondent rents home; 0 otherwise	–
β_{16}, Constant	1	NA

[a] Average productivity is the omitted categorical variable.
[b] Average environmental quality is the omitted categorical variable.
[c] Farmland located anywhere in the county is the omitted categorical variable.

Consistent with economic theory and our model of respondent choice, an inverse relationship is hypothesized between the cost of the PACE program and the probability of a yes vote for the program. Similarly, we hypothesize that respondents with higher incomes will be more likely to vote yes. These hypotheses can be used to evaluate whether or not respondents appear to be making income constrained choices.

One of three categorical variables is used to describe the agricultural productivity of the farmland to be preserved by a PACE referendum: above-average productivity, average productivity, and below-average productivity. The survey language defines above-average productivity, for example, as follows: "Above-average productivity refers to farmland where soil type or unique land features contribute to per acre yields or production that are above the County average." Increases in agricultural productivity are expected to increase the level of utility derived from publicly preserved farmland. Therefore, respondent support for a PACE proposal will be positively influenced by the description of farmland as "above-average productivity" (and negatively influenced by the description of farmland as "below-average productivity").

The survey also varied the description of farmland with regard to environmental quality (above average, average, and below average). The survey, for example, describes above-average environmental quality as having an environmental quality index (based on the current effect on soil erosion, wildlife habitat, and water quality) above the environmental quality index of the average acre of farmland in Kent County. Again, it is hypothesized that increases in environmental quality increase the level of utility derived from publicly preserved farmland, and therefore respondent support for a PACE proposal is positively influenced by the description of farmland as providing above-average environmental quality (and negatively influenced by the description of farmland as providing below-average environmental quality).

Similarly, three categorical variables are used to vary the description of the location of farmland. Farmland is described as located in the Fruit Ridge, next to major highways, or anywhere in the County. The survey specified the townships comprising the

Fruit Ridge, as well as the unique features (elevation and location relative to Lake Michigan) of the area. (As is likely the situation in many places, unique features of land and location are difficult to disentangle.) The survey also differentiated farmland by whether or not it was located next to State and U.S. highways. Because focus groups suggested both of these locations would increase the value of a PACE program, we therefore hypothesize that targeting a PACE program to preserve farmland in these areas will increase the probability of respondents voting yes for a PACE program.

The quantity of farmland to be preserved was held constant at 10% (18,000 acres) of the farmland in the County. Because the PACE proposals varied by four factors (cost, location, agricultural productivity, and environmental quality), a full factorial design would have resulted in 81 different treatment combinations or unique referenda. The sampling costs associated with 81 different treatment combinations were prohibitive, so only a fraction of treatment combinations was used. A Taguchi design, available on Minitab (a statistical package), generated an orthogonal array of treatment combinations that would allow for the estimation of the partial effects of each factor on the choice probability. As a result, the survey design included a total of nine treatment combinations. Each respondent was presented with three distinct treatment combinations.

The final section of the survey was designed to gather basic demographic information about survey respondents. Table 1 includes directional hypotheses about the resulting demographic measures. We were particularly interested in the land-ownership characteristics of the survey respondents.

The survey asked respondents about the number of acres they own in Kent County. Ownership of larger acreages of land is posited to increase the probability a respondent will vote for the PACE referendum. This result may occur for at least two reasons. First, land ownership may proxy wealth differences among respondents. Second, if the external benefits of farmland preservation are capitalized into land values, then the magnitude of that pecuniary gain will be a function of the quantity of land owned.

However, the survey makes a distinction between farmland ownership and other land ownership. If the survey respondent owns farmland, it is hypothesized that the respondent will be less likely to support a PACE referendum. This hypothesis is derived from our assumption that residents who own farmland may already consume a number of farmland services and, assuming diminishing returns to consumption, will be less inclined to pay a tax to support publicly preserved farmland.

The survey also asked if the respondent owned the house (or apartment or mobile home) currently occupied, rented, or occupied the residence without a payment of cash rent. Survey respondents who rent their home are expected to be less likely to support a PACE referenda. Renters may view their residency in Kent County as more temporary than homeowners, and therefore may be less likely to invest in public effort to preserve farmland. Alternatively, but consistent with the same hypothesis, renters may view themselves as potential buyers of land for a home, and consequently may associate PACE programs with appreciating housing prices.

The final section of the survey also gathered information about income. Respondents were provided with a series of income ranges and asked to identify the increment which best described what they thought their total pre-tax family income would be that year. Consistent with demand theory, higher levels of income are hypothesized to increase the probability that a respondent will support a PACE program. This survey section also requested information about age, gender, number of children, and educational level of the respondents. While these variables were included to control for heterogeneity in preferences, we do not pose hypotheses with regard to their directional influence on survey respondents' voting decisions.

Results

All 135 respondents voted on each of the three PACE proposals provided in the survey. However, 12 respondents failed to provide information about family income, six respondents did not provide information about acreage owned, another six failed to provide information on their age, and one did not respond to the question regarding the number of children in the household. In these cases, in order to take advantage of respondents' voting choices, the mean value of the variable, by strata (rural and non-rural), was used to replace the missing observation. (As discussed below, the qualitative findings remain unaltered if these respondents are excluded from the regression.) Observations from three surveys are not included in the weighted regression; two surveys could not be categorized as rural/non-rural and one did not include information on farmland ownership.

Table 2. Regression Analysis Results: Weighted Means and Standard Errors of Variables, and Comparisons with Kent County U.S. Census Data

Variable	Description	Survey Results	Kent County [a]
Vote	For	34.1%	
	Against	65.9%	
Income	Mean	$55,406	
	Standard Error	$3,356	
	Median		$45,980
Acres	Mean	2.324	
	Standard Error	0.525	
Age	Mean	48.77	44 [b]
	Standard Error	1.80	
Gender (=1 if female; 0 otherwise)	Mean	0.413	50.8% female
	Standard Error	0.053	
Children	Mean	1.240	
	Standard Error	0.149	
Education	Less than college	66%	71.2% [c]
	College or higher	44%	21.8%
Renter (=1 if rent home; 0 otherwise)	Rent	0.222	29.7%
	Standard Error	0.045	
Stratified Sample	% Non-Rural	53.4%	
	% Rural	46.6%	

[a] Unless otherwise noted, data come from 2000 U.S. Census, Summary Tape File 1 (U.S. Bureau of the Census, 2000).
[b] Mean age for population age 20 and above (2000 U.S. Census).
[c] Data from 2000 U.S. Census, Summary Tape File 3 ("Educational Attainment of Population Above 25 Years of Age").

Table 2 reports the weighted means and standard errors of the data used in the regression analysis. The same table provides comparisons with U.S. Census data on Kent County. Table 3 gives regression results from the probit model. The estimated Beta coefficients describe the changes in the probability of voting yes from incremental changes in the values of the explanatory variables. The data are weighted using probability weights.

As seen from table 3, the influence of traditional demand variables (price and income) is consistent with a priori expectations. The coefficient for *Cost* is statistically significant (failure to reject the null hypothesis, $B_i = 0$, at indicated significance levels) and negative. The *Income* coefficient is positive and statistically significant; increases in the level of family income increase the probability that respondents support the PACE proposal.

The estimated coefficients describing the environmental and productivity variables (coefficients β_3, β_4, β_5, and β_6) are found to be jointly statistically different from zero at the 0.05 significance level, indicating environmental quality and agricultural productivity characteristics influence respondent choices. However, of these four coefficients, only β_4, which measures the probability effect of farmland being described as low productivity farmland, is individually statistically significant at the 0.05 level. The probability of a respondent voting yes is reduced if the PACE program targets low productivity farmland. The above-average productivity coefficient is negative, counter to our hypothesis. However, this variable is statistically insignificant. The environmental quality variables (coefficients β_5 and β_6) are on the margin of being jointly significant at the 0.10 level (p-value = 0.1034). The signs of their coefficients are consistent with our hypotheses that the likelihood of a yes vote increases (decreases) if the PACE program targets farmland with a high (low) environmental quality index.

The probability that a respondent will support a preservation program is positively influenced by descriptions of farmland as being located in the Fruit Ridge. The Fruit Ridge coefficient is positive and statistically significant. The other location variable, farmland located next to the highway, is not found to be statistically significant.

Increases in acreage owned increase the likelihood of a yes vote for a proposal; the *Acres* coefficient is positive and statistically significant. However, a farmland owner is less likely to vote for a PACE proposal. Both of these findings are consistent with

Table 3. Probit Model Regression Results

Variable	Coefficient	Standard Error
Dependent Variable = *Vote*		
Explanatory Variables (β's) (DV = discrete variable):		
β_1, cost	!0.011***	0.002
β_2, log of family income	0.357**	0.188
β_3, DV = 1 if high productivity farmland	!0.237	0.203
β_4, DV = 1 if low productivity farmland	!0.442***	0.212
β_5, DV = 1 if high environmental quality index (EQI)	0.232*	0.172
β_6, DV = 1 if low environmental quality index (EQI)	!0.240	0.232
β_7, DV = 1 if farmland next to highway	!0.147	0.203
β_8, DV = 1 if farmland in the Fruit Ridge	0.585***	0.242
β_9, acres of land owned	0.018***	0.008
β_{10}, DV = 1 if respondent owns farmland	!1.140***	0.344
β_{11}, age	!0.002	0.007
β_{12}, DV = 1 if respondent is female	0.364	0.227
β_{13}, children	!0.195***	0.080
β_{14}, DV = 1 if college education or higher	0.004	0.249
β_{15}, DV = 1 if respondent rents home	0.218	0.297
β_{16}, Constant	!3.245	2.141
No. of Observations = 396		
No. of Strata = 2		
No. of Clusters = 132		
F (15,116) = 5.11		
Prob > F = 0.000		

Note: *, **, and *** denote statistical significance at the 0.2, 0.1, and 0.05 levels, respectively.

our hypotheses. Of the remaining socioeconomic variables (*Age*, *Gender*, *Children*, *Education*, and *Renter*), only the estimated coefficient on the number of children is statistically significant. The coefficient of this variable is negative. One possible explanation for the negative sign may be that additional children reduce the income available for spending and thereby reduce the likelihood a respondent will vote yes.

Table 4 provides information on the predictive success of the probit model. The model correctly predicts 289 of the 396 votes (73%). However, the predictive capacity of the model varies with regard to yes and no votes. The model correctly predicts 216 of the 261 no votes (82%) and 73 of the 135 yes votes (54%). Generally speaking, the model predicts that a high percentage of voters will vote against the PACE proposal, and this prediction has a high likelihood of being correct. The model predicted far fewer yes votes (118 out of 396) and these predictions have a modest (54%) likelihood of being correct.

Sensitivity Analysis

The qualitative interpretation of the empirical results is insensitive to the inclusion of means for missing demographic observations. We examined this issue in two ways. First, a dummy variable was included in the reported regression for all respondents who omitted a demographic measure. The dummy variable was statistically insignificant (p-value of 0.881). Second, the reported regression results were compared with regression results that omit respondents who failed to provide a demographic measure included in the analysis. Including means for missing demographic measures has statistical significance for only one variable, *Income* (coefficient β_2), which has a p-value of 0.107 in a regression omitting respondents who did not provide information on family income. Including means for omitted variables results in a sign change for the *Gender* variable only. However, *Gender* is statistically insignificant in both sets of regressions.

Table 4. Predictive Success of the Probit Model

	Predicted Vote		
Actual Vote	No	Yes	Total
No	216	45	261
Yes	62	73	135
Total	278	118	396

Implications

We have examined how specific criteria for preserving farmland—agricultural productivity, environmental quality, and location—influence public support for a hypothetical PACE proposal. Importantly, the influence of these criteria is assessed in an income-constrained choice setting. (The probability of support for a PACE program was inversely related to increases in household costs of the proposed PACE program and positively associated with increases in family income.) The empirical results confirm the general hypothesis that these criteria influence respondent support for PACE programs, therefore suggesting a degree of symmetry between respondent support and the criteria used by many states to set the standard for preserving farmland. However, the results have a number of additional implications for policy makers.

The agricultural productivity criteria were jointly significant determinants of respondent support for the hypothetical PACE referenda. This finding supports the use of criteria like the soil quality index in ranking farmland for preservation. The results indicate respondents were unwilling to support a PACE program which targeted farmland characterized as having low productivity. On the other hand, respondent support for the PACE proposal was not influenced by a description of a PACE program which targeted farmland characterized as high productivity. This finding may suggest the respondents expect a minimum agricultural productivity standard for farmland protected by a PACE program. However, once the minimum standard is achieved, respondents may be less concerned about achieving higher levels of agricultural productivity. Under this interpretation, states might revisit their agricultural productivity criteria and consider productivity criteria that discretely categorize land as acceptable or unacceptable, rather than use a continuous ranking system which emphasizes farmland with high agricultural productivity.

The environmental quality criteria also motivated respondent support for the hypothetical PACE referenda. This finding suggests symmetry between factors which motivate respondent support for PACE programs and states' use of environmental criteria to prioritize farmland based on its impact on soil erosion and water quality. However, we were somewhat surprised that the joint statistical significance of the environmental quality variables was not stronger. One explanation for this finding is that respondents didn't view farmland as a means to achieving environmental quality and, as a result, discounted the importance of the environmental quality criteria. For example, over 80% of the respondents agreed or strongly agreed that farmland provided a sense of local heritage, provided open space, supported the local economy, provided scenic beauty, and prevented urban sprawl. However, less than 50% of the respondents agreed or strongly agreed that farmland protects water quality, 29% were neutral, and 21% disagreed. PACE programs may achieve greater public support if they develop selection criteria assuring the public that preserved farmland will provide specific environmental services.

The strong respondent support for PACE programs targeting farmland in the Fruit Ridge is consistent with state PACE programs which prioritize farmland based on its location and regional importance. Future research may benefit from further examination of the motivations for supporting farmland located in particular areas. The Fruit Ridge appears to provide brand name recognition. Future research might disentangle the extent to which public support for the Fruit Ridge reflects a preference for its location and unique physical attributes or for its capacity to provide residents with a sense of place and community. Advocates of farmland preservation may add value to farmland preservation if specific tracts of farmland become associated with cultural heritage and residents' sense of community. PACE selection criteria can take these issues into account.

Respondents did not appear to support PACE programs which prioritized farmland located next to state and federal highways. We were surprised by this finding given our focus group discussions, which indicated driving was a primary means of interacting with farmland. However, the result is consistent with respondents' opinions about which farmland should be preserved. For example, only 12.2% of respondents agreed with the survey statement, "farmland that can be seen from the highway

should be prioritized for preservation," and 20% disagreed with this statement. This finding is relevant to policy makers who believe significant social benefits lie in preserving farmland which contributes to scenic views. Future research can further examine which geographic and location characteristics enhance the value of public farmland. Our hypothesis—preserving farmland in close proximity to highways would enhance the utility derived from publicly preserved farmland—was not supported by the empirical results.

In this analysis we have emphasized the statistical significance of certain farmland attributes, often used as criteria for preserving farmland, on respondents' support for farmland preservation. Future extensions of this research may involve estimations of willingness to pay for specific farmland attributes. Such studies would provide a money metric for comparing specific attributes and might be useful for weighting various ranking criteria.

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