AN ANALYSIS OF SOME FACTORS ASSOCIATED WITH CALIFORNIA LANDOWNERS' ACCEPTANCE OF USE-VALUE ASSESSMENT

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Concern over conversion of agricultural land to urban uses led to the passage of the California Land Conservation Act of 1965 (CLCA). This program, based on a voluntary contract between the landowner and local government, provides for use-value assessment in return for a binding contract to maintain the land in agricultural or related use for a minimum of 10 years. Use-value assessment typically results in reduced property taxes for participating landowners with the magnitude of the reduction depending on the difference between use-value and market value and the property tax rate. Thus, the incentive to keep land in agricultural or related uses is reduced property taxes.[1] The potential success of this voluntary approach to land use planning and preservation of agricultural land has been the subject of several studies and it continues to be a controversial topic.

Previous Studies

Growing evidence indicates that the CLCA has limited potential for preventing urban sprawl and conserving agricultural land. This evidence includes observations of the location of land placed under the Act, hypothetical calculations of the tax incentive vs. potential capital gains income, and case studies.

A preliminary examination of the proximity to urban areas of land placed under the Act in 1968-69 revealed that the proportion of available land placed under the Act increased as the distance from urban areas increased [3]. It was concluded that land being placed under the Act at that time was in little immediate danger of being converted to urban uses. A similar analysis by Gustafson for an 11 county study area in 1971-72 came to the same conclusion [7]. Three other reports have criticized the Act on the basis of the type and location of land being enrolled and on the concentration of tax benefits to very large landowners [4], [12], [17].

[1] Preferential assessment of farmland to promote its conservation is a very popular program. Some 35 states have adopted legislation for use-value assessment of farmlands [5].

A theoretical model presented by Bahl indicates that property tax reductions have limited potential for conserving agricultural land [1] Gustafson presents a similar model with illustrative examples and arrives at the same conclusion [7]. Hansen and Schwartz, in a Sacramento County case study, found that high development expectations are a cause of low enrollment in the CLCA [8]. Their conclusions regarding the potential effectiveness of preferential assessment for preserving agricultural land were pessimistic. Schwartz, Hansen and Foin analyzed the determinants of use-value assessment benefits under the CLCA and found that changes in contract (tax) benefits would have little impact on enrollment [16]. They concluded that a reduction of expectations regarding land value appreciation, by more effective planning and enforcement of zoning, would have the greatest impact on increasing landowner participation in the CLCA.[2]

Objectives

This study examines factors associated with the rate of acceptance of the CLCA by landowners in participating counties. Its objectives are to:

1. Empirically estimate the rate of acceptance of the Act by landowners on a county by county basis, and
2. Explain differences in the rate of acceptance in terms of variables which are thought to enter the enrollment decision.

Analytical Model

A preliminary examination of time series data on the cumulative percentage of farmland enrolled in the CLCA revealed a definite S-shape for most participating counties. This pattern results from signups occuring slowly at first,

[2] These conclusions are consistent with those reached in other states. For example Gloudemans [5] summarizes experience in the U.S. and Canada while Holland [9] discusses Washington legislation.

then increasing at an increasing rate as landowners become familiar with the program, followed by slower signups as the total acreage enrolled approaches some maximum. A similar pattern of adoption (or diffusion) of different innovations has been documented in studies by a number of researchers.[3] The logistic function has been successfully used to empirically summarize this time pattern for several innovations, including hybrid corn [6], soybeans [14], and durable inputs [13].

To summarize the acceptance of the CLCA by landowners, we used the logistic growth curve:

$$P_t = K/ [1 + e^{-(a + bt)}]$$

where P_t is the percentage of farmland under the CLCA during Year t, K is the ceiling or equilibrium value, a is a constant, b is the rate of acceptance coefficient and t is the time variable. A simple log transformation, as described by Griliches [6, p. 504], results in a linear equation in a and b which can be estimated by use of ordinary least squares. The equation estimated for each county is:

$$\ln P_t/K\text{-}P_t = a + bt.$$

We hypothesized that differences in the b coefficient, the rate of acceptance of the Act by landowners, are a linear function of variables related to the opportunity to convert land to urban uses at a profit, the landowners' commitment to farming, and the tax saving available by enrolling land under the Act. Proxy variables must be specified to measure the separate effects of each of the hypothesized variables. The equation specified is:

$$b = f(X_1, X_2, X_3, X_4)$$

where X_1 is the percentage of the population in the county living outside urban areas,
X_2 is the percentage increase in total assessed value the five years before the county began using the Act,
X_3 is the percentage of farmers over 55 years of age, and
X_4 is the estimated average per acre tax saving (county taxes only) for land under the Act in the 1974-75 fiscal year.

We expected the rate of acceptance of the Act to be inversely related to the opportunity to convert land to urban uses at a profit. If this opportunity is highest in urban counties (high percent of population in urban areas) which have had large increases in assessed values, then X_1 should have a positive coefficient and the coefficient for X_2 should be negative. We also expected the commitment to farming to be positively related to rate of acceptance. Since farmers within 10 years of usual retirement age are probably beginning to think about disposing of their farm (and the CLCA contract is for a minimum of 10 years) the coefficient for X_3 should be negative. If the amount of tax savings are an important factor in gaining landowner participation, the coefficient on X_4 should be positive.

[3] For a discussion and summaries of research on the adoption and diffusion of innovations see Jones [10], Katz, et al. [11] and Rogers and Shoemaker [15].

Results

Logistic functions were estimated for 41 of the 47 California counties participating in the CLCA.[4] These counties accounted for 98.4 percent of the approximately 13.7 million acres of land in counties under the Act during the 1974-75 fiscal year (Table 1). The functions were estimated from annual observations beginning with the 1968-69 fiscal year or the year the county began participating in the Act, whichever is later.[5]

Specification of a ceiling value K is necessary in estimating logistic functions. We initially used Census data on land in farms (Col. 2, Table 1) as an estimate of the maximum acreage available for enrollment in the CLCA, giving a K value of 1.0.[6] The ceiling value was then adjusted to obtain the best fit to the data as indicated by the R^2 value.

Results of fitting the logistic functions to county land signups under the CLCA are shown in Table 1. The chosen ceiling K, which maximized R^2, and the resulting R^2 values are presented in columns 3 and 5. As indicated by the R^2 values, the logistic function summarizes the acceptance patterns of the CLCA very well for most of the counties. Since the logistic function was probably not the appropriate model for five counties which had R^2 values less than .80, they were deleted prior to the cross-sectional analysis. Counties deleted included El Dorado, Marin, Napa, Sacramento, and Yolo. Eight other counties were also dropped from further analysis for the following reasons: Colusa, Glenn and Plumas had only four years

[4] Five of the six counties have participated in the CLCA only during the last two or three years. The other, Orange County, reached a peak in participating acreage within three years and has declined since.

[5] Individual county data were not available prior to 1968-69. This is not a problem, however, since participation in the CLCA before that was limited to 200,000 acres in six counties [2, p. 11].

[6] Total private land rather than land in farms was used as the estimated land available for enrollment in the CLCA for three counties. In Kern County there are approximately 1.15 million acres of nonprivate land in farms which will not be placed under the Act. Because of large enrollments of forest land, Mendocino and Tuolumne counties already have more land under the Act than there is farmland.

Table 1. The California Land Conservation Act—Land under contract, land in farms and rate of acceptance based on estimated logistic functions

County	Land Under Contract 1974-75 (col. 1)	Land in Farms (col. 2)	Calculated Ceiling K (col.3)	Rate of Acceptance b (col. 4)	R^2 (col. 5)
	acres	*acres*			
Alameda	160,949	291,055	.56	.96	.98
Amador	83,090	257,821	.34	.65	.97
Butte	117,422	551,254	.30	.31	.94
Calavaras	116,220	245,651	.48	1.08	.97
Colusa	188,905	484,331	1.00	.02	.99
Contra Costa	66,911	315,493	.63	.22	.99
El Dorado	165,659	226,610	.74	.50	.75
Fresno	1,397,532	2,208,070	.64	1.14	.98
Glenn	251,182	531,823	.49	.80	.99
Kern	1,617,653	2,672,513*	.77	.55	.96
Kings	583,446	713,275	.82	1.44	.99
Lake	37,212	180,905	.22	.54	.97
Lassen	16,502	637,852	.03	.97	.96
Madera	427,859	761,200	.61	.57	.99
Marin	89,168	175,038	.51	.75	.27
Mendocino	1,009,518	1,849,961*	.55	1.81	.96
Monterey	606,411	1,472,126	.43	.66	.99
Napa	61,856	219,640	.29	1.64	.72
Placer	126,438	211,439	.61	1.13	.98
Plumas	90,105	127,114	.72	1.72	.95
Riverside	69,294	626,543	.12	.85	.96
Sacramento	212,295	517,188	.42	.56	.58
San Benito	518,811	726,580	.76	.49	.99
San Bernardino	11,947	2,108,342	.01	.66	.99
San Diego	106,449	615,633	.74	.55	.98
San Joaquin	418,429	876,371	.49	1.03	.96
San Luis Obispo	507,709	1,553,126	.34	1.70	.95
San Mateo	44,221	84,514	.70	.14	.83
Santa Barbara	453,822	951,637	.49	.96	.97
Santa Clara	317,067	480,286	.68	.65	.97
Santa Cruz	10,972	60,960	1.00	.36	.95
Shasta	86,349	548,494	.16	1.59	.99
Siskiyou	244,465	763,580	.33	1.38	.95
Solano	240,808	358,446	.68	1.30	.90
Sonoma	237,355	667,158	.37	.71	.90
Stanislaus	568,329	759,532	.80	1.00	.99
Tehama	544,139	1,101,562	.78	.59	.98
Tulare	945,520	1,337,056	.76	.82	.99
Tuolumne	192,443	317,986*	.61	1.14	.90
Ventura	109,768	432,621	.30	.85	.96
Yolo	433,407	563,609	.89	1.16	.71

*Total private land rather than land in farms.

data available; Lassen, Riverside, San Bernadino and Shasta had a very low proportion of available land under the Act in 1974-75; and Solano County changed its contract terms.[7]

The final step in our empirical analysis was to attempt to explain differences in the b coefficients, the rates of acceptance of the Act, for the remaining 28 counties. In this cross-sectional analysis the variable $b' = bK$ rather than b was used as the dependent variable to allow for differing ceiling percentages between counties.[8] The estimated equation is:

$$b' = .9541 + .0039X_1 - .0105X_2 - .0053X_3 - .0232X_4$$
$$(3.26) \quad (-6.94) \quad (-1.11) \quad (-1.54)$$
$$R^2 = .72$$

where the variables are as previously defined and the values in parentheses are t-statistics. These results in-

[7] At least three of the counties which had low R^2 had changed their administration of the Act of introduced other programs which influenced acceptance of the ACT.

[8] The rate of acceptance b is quite sensitive to changes in the ceiling K. As K approached the proportion of land under the Act in 1974-75, the value of b was forced to increase.

dicated that the rate of acceptance of the CLCA was positively related to the percentage of county population living outside urban areas (X_1), (or inversely related to urbanization), and inversely related to increasing percentage changes in assessed values for the five years before the Act became available (X_2). To the extent that these two variables measure the influence, we can state that rate of acceptance of the CLCA was inversely related to the opportunity to convert agricultural land to urban uses at a profit. The variable to measure commitment to farming (X_3 = percentage of farmers over 55) had the expected negative sign but was not statistically significant. The negative coefficient on the tax saving variable was not expected but it is not significantly different than zero. It is, however, difficult to argue that potential tax savings have been an effective incentive for conserving agricultural land. The negative coefficient on tax savings supports the case study results of Hansen and Schwartz, who found that among parcels with the same cropping activities, larger tax savings were available for non-contract parcels than for contract parcels [8].

Conclusions

This study has two important results. First, it is worthwhile to learn that the pattern of acceptance for a use-value assessment program has been similar to that found for many agricultural innovations. The rate at which new programs are accepted and factors influencing acceptance are important in understanding the process of change. Second, while not conclusive, our results are supportive of other recent work in that we found evidence that opportunity to convert land to urban use at a profit is inversely related to acceptance of a program to conserve farmland, and that increased tax savings do not lead to increased rates of acceptance. We must conclude, as did Hansen and Schwartz [8], that measures other than tax relief are necessary to conserve agricultural land. Comprehensive planning and strict zoning would appear to offer the most promise for agricultural land conservation in that these approaches deal directly with the landowners' opportunities to convert agricultural land to urban uses.

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