Who Leaves the Farm?
An Investigation of Community Supported Agriculture (CSA) Farm Membership Renewals

This study examines the factors that influence a consumer's decision not to rejoin a community supported agriculture farm. Using concepts from household production theory and the economics of consumer complaint behavior, a bi-nomial logit model is estimated. Results indicate that variables representing household production have the greatest effect on the probability not to re-join a CSA farm. Satisfaction with cost is also important. To increase satisfaction and keep members, CSA farms should stay attuned to price and work on ways to decrease necessary consumer outlays of time to membership.

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Introduction and Background

There is growing evidence that Community Supported Agriculture (CSA) is a viable option to support locally grown produce and to connect consumers with the source of their food supply. It is estimated that there are at least 566 CSA projects in the U.S. and Canada, and hundreds more around the world (Bio Dynamic Farming, 1996). The question of who becomes a member of a CSA farm has begun to be answered by several researchers. However, anecdotal evidence suggests that once a consumer decides to join a CSA farm, there is no guarantee that a long term relationship will develop. In fact, it is estimated that one-third or more of the members do not rejoin their CSA farm after each season of membership (Jones, 1996). This study investigates the factors that influence individuals to leave CSA farms. It utilizes an interdisciplinary approach combining concepts from household production theory and the economics of consumer complaint behavior to lend new insight into an issue of concern for sustainable agriculture.

CSA is a form of direct marketing of agricultural products which connects the farmer and consumer. Some of the risk of farming is distributed back onto the consumer, and in return the consumer has a chance to become more involved in the process of growing his or her food, and may feel more connected to both the food system and the natural environment. Members generally pay an up-front fee which allows the farmer to purchase seed, fertilizer, and equipment and gives him or her a guaranteed salary for the season; the member receives a share of the weekly harvest and may be asked to help with weeding or harvesting at some point in the season (Smith, 1994). The CSA movement began in Europe about 30 years ago when farmers decided to do something about the fact that they were losing market share, as well as the ability to produce diverse crops, and were maximizing production quantity rather than quality (Cohn, 1993). The birth of the movement in the U.S. occurred in 1986 (Bio Dynamic Farming, 1996).

CSA results in an economic relationship which includes values other than just cheap food and profit maximization. It affords farmers a security which is not often achievable without large-scale operations, and offers consumers greater contact with the producers of their food, and with the process itself. As a tool to be used in the attempt to address the negative aspects of our current food system, CSA seems to have promise.

However, increased contact of consumers with their food supply does not come without a cost. One major cost is the price of a consumer's time. This price should be accounted for in modeling the demand for CSA farm membership as the choice to become a member is essentially a choice to spend more time in household production. Most CSA farms require members to come to the farm to pick up produce. Although it is washed, most of the produce is presented to the consumer in its "original" form. That is, all

produce is in bulk form: root crops have green tops which must be removed, brussel sprouts come attached to the stalk, etc. And, since most members do not subsist entirely on food obtained from the CSA, they must spend some time shopping at other food marketing outlets as well as the time spent in pickup, and in processing of the raw vegetables. The theory of household production is key in the examination of who decides not to re-join a CSA farm because it highlights costs of membership which may be a barrier and are not fully accounted for in the neoclassical model of demand.

Review of Literature

Most of the CSA literature is descriptive, anecdotal, or instructional in nature (see Demuth, 1993). Suput (1992), Laird (1995), and Kelvin (1994)conducted small sample analyses of CSAs to examine economic viability and benefits. Generally, all the findings point to the fact that positive benefits to consumers include high quality food, increased sense of "community," organic food, and variety. Convenience and pick-up schedule are problem areas for CSAs. Many consumers find that pick up times are limited and making an extra trip for part of a household's weekly groceries is inconvenient.

Organic or low-input production methods are an important aspect of the CSA philosophy. Therefore, research investigating consumer attitudes and behavior relating to organic food and direct marketing gives insight into consumer attitudes toward CSA membership. During the 1980s, consumption of organic produce increased dramatically due primarily to four factors: health concerns lead to a desire for a low-fat high-fibre diet; perceived health risks were associated with consumption of food additives; a perception of danger was associated with agrochemical residues; and there was an increasing awareness of the environmental damage associated with modern agricultural techniques (Stopes, 1989).

A marketing study done in New York State (AHF, 1992), and studies by Goldman and Clancy (1991), Cook (1992) and Oelhaf (1978) found that individuals who buy organic produce are more concerned with safety and environmental impact than with appearance. Their findings also indicate that organic food consumption may have a link with environmental concerns. Stuhmiller (1976) and Cook (1992) found that direct connections between consumers and farmers leads to increased satisfaction,

and note that organic food is not often found in supermarkets, perhaps due to a lack of flow of information between seller and consumer. This may explain why initial interest in organic foods at supermarkets waned quickly, yet people continue to purchase organic food from health food stores. Pelch (1996) examined factors that influence the probability of joining a CSA farm. Higher prices of membership increased CSA membership probabilities, while family structure, including presence of younger children in the household, decreased membership probabilities. Finally, more highly educated individuals had a greater probability of becoming a member.

Despite the growing literature about what prompts individuals to join a CSA farm, there is little research that describes who chooses to leave a CSA farm once they become a member. Pelch (1996) conducted a bivariate analysis that examined factors associated with consumer satisfaction and plans to rejoin a CSA farm the next season. General dissatisfaction, lack of variety of produce, lack of availability of farm products other than produce, and dissatisfaction with pickup of produce were all associated with consumer plans not to rejoin a CSA farm. Pelch and Kolodinsky (1996) investigated the possibility that CSA farm members obtain utility from time spent in activities associated with membership. They concluded that while picking up produce resulted in providing some satisfaction for members, time spent putting produce away at home created dissatisfaction. Since both these time uses constitute a necessary output of time for consumers, it is possible that individuals leave CSA farms because of dissatisfaction with the time commitment required.

Anecdotal evidence from CSA farmers indicates that a significant portion of members change from year to year, indicating that many consumers of CSA fail to develop a long term relationship with their member farm. Yet, the customer satisfaction literature clearly points out that it is more cost effective to keep customers than to continually search for new customers (Cohen, 1973; Reichheld & Sasser, 1990); and that satisfied customers are more likely to repurchase a product or service (Droge & Halstead, 1991; Kolodinsky, 1993).

Methodology

Why does the relationship cease to exist for so many members? The literature points to several possible reasons: the price of share may be too high, the price of time may inhibit individuals from engaging

in this type of household production, or consumers may be dissatisfied with certain aspects of their membership.

To describe the decision not to re-join a CSA farm, we expand on the framework proposed by Kolodinsky (1995). A consumer maximizes a short-run utility function in each of several periods in order to obtain "optimal" levels of demand. After demand is ascertained in any given period, consumers learn whether their behavior was "sub-optimal." When demand for goods and services is not optimal, consumers can take action. Consumers adjust their preference structures and demand for goods and services becomes a function of demand in the previous period, prices, income, and preference and productivity shifters.

Although the model does not explicitly include household produced goods, it can be easily expanded. We modify the model slightly to include the fact that membership in a CSA farm implies engaging in household production (Becker, 1965).

The action we model is exit from the market (Hirschman, 1970), specifically, an individual's decision not to renew membership. A CSA farm member's utility function can be written:

$$U = v[M_t(x, h), O; P] \qquad (1)$$

where
U = utility
M_{it} = Membership in CSA farm in period t, t= 1,2,....T
x = purchased inputs into CSA farm membership
h = time inputs into CSA farm membership
O = all other goods
P = vector of taste shifters

subject to

$$Y_t = P_{mt}M_t + Po_tO_t \qquad (2)$$

where
Y_t = income in period t
P_{mt} = Price of membership in period t
P_{ot} = Price of other goods in period t

In equation (1) M, requires an output of both purchased inputs (the price of the CSA farm share) and time (pick-up and put away time). Preference and productivity shifters include variables that impact the productivity of household members. The budget constraint in equation (2) is really a full income contraint since the price of membership includes both a time cost to pick-up and put-away produce, and a purchased input cost that includes the dollar cost of membership. Time costs have been included in a few studies of consumer complaint behavior (Kolodinsky, 1995; Kolodinsky, 1993; Kolodinsky, 1990). Maximizing (1) subject to (2) yields the demand eqation for membership in a CSA farm.

Data

There are very few known data sets that include information on the demand for CSA farm membership. Though not specifically collected for the purpose of estimating ex-membership, one data set collected in a northeast state in 1995 provided most of the information necessary to estimate the probability of not re-joining a CSA farm. Data used in this study were collected via phone survey during October of 1995. Members of the largest CSA farm in the state were surveyed. The population of members was 277; 184 usable responses gave a response rate of 66%. The population of ex-members was 123; 57 useable responses gave a response rate of 46%. Member and ex-member phone numbers were obtained from the farms. The first column of Table 1 describes the sample.

Information about household structure, satisfaction with the CSA experience and consumer preferences was available. Several variables measure the time costs associated with membership. Because the wage of the person who picks up the member share was not available, several proxy variables are used to measure an increase in time cost. Income level includes two dummy variables: low income (earning less than $15,000 per year) and high income (earning more than $50,000 per year). As with many data sets that do not include information on individual wages, the effect of income will contain both an income and substitution effect on demand for CSA farm membership. Marital status, and the number and ages of children represent increases in the price of household time. Two variables which relate to the recycling behavior of the household are included that potentially decrease the cost of membership. As previous research has shown that socially responsible behaviors are associated with CSA farm membership (Pelch, 1996), whether a household recycles as much

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as it can and the amount of garbage produced by the household are included as independent variables. Investment in these types of behaviors may increase human capital associated with socially responsible behavior. Having a garden competes with time necessary for pickup and may be a substitute for produce purchased from a CSA farm. Whether a household shops at a supermarket or smaller venue for their winter vegetables is an indication of the increase in cost for obtaining produce from an additional venue, namely the CSA. Older individuals may be adverse to changing their shopping habits and may not wish to use CSA farm membership as a way to obtain produce.

Individual dissatisfaction with three aspects of farm membership were collected: dissatisfaction with the variety and amount of produce, the cost of membership, and pickup systems.

Empirical Model

The log odds of re-joining a CSA farm is written:

$$\log \frac{\text{Probability of re-joining}}{1 - \text{Probability of re-joining}} = \beta_0 + \beta_1 Z_1 + ... + \beta_k Z_k \quad (3)$$

In the model estimated β_0 represents the intercept and β_k represents the coefficients on each of the variables, Z_k, included in the equation.

Results

The last column of Table 1 presents the results of the logit estimation procedure. These parameter estimates indicate the change in the log-odds of not re-joining a CSA farm and are not directly interpretable as changes in the probability of becoming an ex-member. However, these coefficients are used to estimate the probability of non renewal of membership and the effect of each significant variable can be seen using different values of that variable.

Five of the productivity variables included in the analysis are significant. If a household produces more than two 30 gallon bags of trash per week, or if the household has a garden of its own, the probability of re-joining a CSA farm is reduced. Being married or co-habitating, increases in the number of individuals in the household, and presence of children under age 12 all decrease the likelihood of re-joining a CSA farm. If a household can be classified as high income, the probability of renewing membership increases. This coefficient contains two effects: a substitution effect

and an income effect. In the case of CSA farm membership, a higher cost of time should lead to a substitution away from CSA farm membership towards an increase in purchased inputs into meal production. Thus, there is some expectation of a negative coefficient. However, it appears that CSA

Table 1.
Summary Statistics and Parameter Estimates.

VARIABLE	DEFINITION	MEAN	COEF.
INTERCEPT			9.38***
			(8.99)
SUPERMKT	1 if purchases of produce are from supermarket when CSA closes	.59 (.49)	.29 (.23)
ORGANIC	1 if purchases organic produce when CSA closes	.76 (.42)	-.26 (.25)
PRODUCED	1 if household produces at least 2 30 gallon bags of trash per week	.23 (.43)	-1.95*** (.50)
RECYCLED	1 if household recycles "most of what it can"	.97 (.18)	.21 (1.09)
GARDEN	1 if household has a garden	.40 (.49)	.32* (.22)
PEOPLE	number of persons in the household	2.74 (1.15)	-.90*** (.24)
OUTTOWN	1 if household lives "out of town"	.29 (.46)	.01 (.24)
SPOUSE	1 if married or co-habitating	.77 (.42)	-.83*** (.30)
EDUC	Years of education of respondent	16.92 (2.32)	-.05 (.09)
LOWINC	1 if household income is < $15,00 per year	.10 (.30)	.13 (.37)
HIGHINC	1if household income is > $50,000 per year	.25 (.43)	.45* (.26)
DISPROD	1 if dissatisfied with produce received from CSA	.18 (.39)	.11 (.28)
DISCOST	1 if dissatisfied with the cost of the CSA membership	.15 (.36)	-.87*** (.36)
DISFUNC	1 if dissatisfied with how the CSA farm functions	.13 (.34)	.65*** (.31)
N = 187	Log likelihood = .32 E-12		χ^2 = 104.68***

farm membership is a normal good and the income effect outweighs the substitution effect, for a net positive effect of high income on membership.

Two of the three satisfaction variables are significant. If a member is dissatisfied with the cost of the CSA membership, the probability of re-joining decreases. However, even if an individual is dissatisfied with the functioning of the farm, including pick-up and delivery systems, the probability of re-joining actually increases. The quality and quantity of

produce received does not affect the probability of renewing membership.

The predicted probability of rejoining a CSA farm using the means of the data is 97%. However, when certain profiles of consumers are drawn up, the predicted probability changes dramatically. For example, for a married couple with no children who make less than $50,000 per year, and who are not dissatisfied with the cost of their CSA farm share, the probability of rejoining is 99%. However, add two additional individuals to that household and the probability of rejoining falls 11% to 88%. If a married couple household with no children, making less than $50,000 per year is dissatisfied with the cost of the share, the probability of rejoining falls to 74%

A similar simulation conducted using single adults leads to similar changes in magnitudes in the probability of re-joining a CSA farm. For singles who have no children and make less than $50,000 per year, the probability of renewing membership is 99%. However, if two additional individuals are added to that household, the probability of re-joining falls to 93%. If these households are dissatisfied with the cost of the CSA share, the probability of rejoining falls further to 86%.

Discussion

What implications do these findings have? The most striking finding is that, over and above all other variables, those representing household productivity have the greatest affect on the probability of re-joining. These variables alter the price of a household's time. Activities that increase the productivity of a household in socially responsible behaviors, i.e., recycling increase the probability of re-joining. On the other hand, activities that are not socially responsible, i.e., producing a lot of trash, decrease the probability of membership renewal. The higher the number of household members, including spouses and children, the lower the probability of membership. Increases in household size, especially children, increase the price of household time and cause competition for time spent in household activities.

Membership in a CSA farm also appears to be a normal good. Though the income and substitution effects of a change in the price of time can not be disentangled, the net effect of having an increased income is an increase in the probability of membership.

Also important is satisfaction with cost. Because the data set included ex-members, no actual cost of

membership data was collected on these individuals. However, all individuals were asked how satisfied they were with cost, regardless of the actual price paid, which is, in essence, a measure of value to consumers. Those dissatisfied with the cost are least likely to re-join a CSA farm. However, those dissatisfied with pick up schedules, a deterrent to membership according to other researchers (Kelvin, 1994; Suput, 1992) did not decrease the probability of re-joining. Once the logistics of juggling a family are taken care of, households who remain members seem willing to put up with inconvenience of pickup schedules.

There are two pieces of advice that arise from the results for CSA farms who want to retain members that should ultimately increase the satisfaction of consumers with the CSA farm concept: stay attuned to the cost of membership, making sure to inform members of the value they receive for their cost, and work on ways to make the time necessary to be a member as short as possible. If customer concerns are met and satisfaction increased, it is quite plausible that the aim of community supported agriculture to connect farmer and consumer can become a reality.

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