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# What Prohibit CSA Membership Renewals? Identifying Barriers of CSA Participation

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## Abstract

Community Supported Agriculture (CSA) serves as platform for local producers, especially for small size farms, to sell local fresh products directly to local residents. Joining CSA will benefit the local economy as well as the local agriculture. Although CSA is widely accepted across the United States, the amount of CSA membership is still very low. Some people argue that the CSA membership is prevented by lack of choices in variety of products, or inconvenience of picking-up. In this study, we apply quantitative methods to identifying barriers that prohibit CSA participation or factors affecting unsubscribe of the CSA membership. We also compare characteristics and food perception of different consumers group (non-CSA members, previous CSA members and current CSA members). Based on the 780 responses collected from a consumer survey at the national level, our results show that only 6% of the total sample is current CSA members. The top two reasons for unsubscribing of the CSA membership are that they prefer farmer's market and not cooking at home. On the other hand, the top two important factors for participation in CSA are supporting local and family farms.

## Keywords

Community-Supported-Agriculture (CSA); consumer behavior; membership

## **Introduction**

Local food is often considered fresh produced and environmental friendly. Quality of food and selection of the local produce are the most reasons that why consumers will shop at farmers' market (Brown, 2003). Adam and Salois (2010) stated that consumers' preference on local food is by reason of support for local farm economy, and their growing demand for fresh produce. However, farmers' market is not the only access to local fresh food. Since the birth of Community-Supported-Agriculture (CSA) movement in New England in 1986 (Kolodinsky and Pelch, 1997), CSA has become another option for consumers to purchase local food. Among other food venues, the operation of CSA program is very different comparing with farmers' market. CSA program mainly tries to promote fresh produce from local farms. CSA provides platform for both producers and consumers to connect directly (United States Department of Agriculture, 2017). More specifically, consumers join the CSA program and become the member of local farms. They pay for the membership and in return, they will receive local in growing seasons.

CSA program spreads across the United States quickly since its born. A survey collected in 2015 by USDA reported that there were 7398 farms in the United States selling food directly to consumers, which contributed \$226 million or 7 percent to the direct-to-consumer sales transaction (United States Department of Agriculture, 2016). There were over 6000 CSA farms in 2012 and the scale of CSA programs continues expanding (McFadden, 2012). Not only in the United States, the CSA program also witnessed its growth in other countries, including both developing and developed countries. (McFadden, 2012). Although the CSA community is increasing, the amount of CSA membership is still very low. To explore why and what motivate more people to join, there are multiple literatures conducting in this area.

Previous research on CSA argued about its goal and people's motivation to join CSA. Promoting healthier diet and having access to local and fresh food are the most important reasons for consumers to subscribe CSA (Brown and Miller, 2008; Kolodinsky and Pelch, 1997; Landis et al, 2010). Since food from CSA farms is locally produced for sale, CSA program is also considered as a method to support local farms to develop and boost local economy (Kolodinsky and Pelch, 1997; Landis et al, 2010; Russell and Zepeda, 2007; Cooley and Lass, 1998). For the reason that CSA products only need to deliver within a short distance, it generates less air pollution and consumes less gas for shipping, so it is regarded as environmental friendly (Brown, 2003; Tegtmeier and Duffy, 2005). Kolodinsky and Pelch (1997) also stated that joining CSA will increase the household productivity and awareness of CSA program. Other motivations also include social values, knowing where the food from and establishing direct connection with local farms (Landis et al, 2010; Tegtmeier and Duffy, 2005).

Some scholars also discussed about factors that discourage consumers to renew their CSA membership. From the definition of the CSA program, subscribers will receive CSA products only in harvest seasons. In other words, those products are distributed time to time, not on a daily or weekly basis. As a result, this seasonal production and distribution of food can be very unpredictable and may not replace other regular food shopping venues, such as grocery markets (Landis et al, 2010; Cooley and Lass, 1998). Furthermore, CSA membership also hindered by other factors, such as unfamiliar with variety of products, lack of choices in food, and inconvenience pick-up place or time (Zepeda and Leviten-Reid, 2004; Cooley and Lass, 1998).

Due to unfamiliar with CSA products, some people found it would take too much time cooking and preparing once joining (Landis et al, 2010). According from Tegtmeier and Duffy (2005), the price of CSA membership was always expensive, which become an obstacle for people to joining or renewing their membership.

In order to increase the amount of CSA members and encourage current members to renew, it is very important to select advertisement methods. There are some literatures mentioning the source of information for CSA program. Landis et al (2010) stated that the most common way to obtain the information of CSA are hearing from friends and the Internet.

The current literature mainly focuses on figuring out what factors influence people's decision to subscribe CSA program and data in those studies on CSA are always at the state level. Very few articles use econometrics methods to explain factors that influence consumers' choice on CSA subscription. In this study, we will analyze what influence the CSA membership subscription at the national level and apply quantitative methods to identifying barriers that prevent CSA membership to subscribe and renew their membership. The groups of respondents in this study will be divided based on three conditions:(i) whether they used to be CSA member; (ii) whether they are current member: and (iii) whether they plan to subscribe in the future. Past literature mainly compared CSA member with non-CSA member. There are rarely literatures comparing consumers with past membership, current membership and future intention to join CSA program together and this study will fill this gap. The objective of this study is to analyze why people didn't renew their CSA membership by comparing their past, current and future membership status. Multiple groups of consumers were analyzed by taking time into consideration and more consumers behaviors will be estimated by comparing multiple consumer groups.

## **Data**

In May of 2015, an online survey was generated by authors and sent to Survey Sampling International (SSI) to collect data. SSI distributed the survey to consumers across the United States so the sample is at the national level instead of state level. To ensure the data sample close to the national population, SSI applied a quota sampling method to adjust demographics distribution (Vassalos et al, 2017). The final number of observations after removing missing values is 768 in the dataset.

The survey contained questions about whether they were CSA member, whether they are and their intentions to be a member in the future. Figure 1 indicates the percentage of past, current and future CSA members in the total sample size, which showing only 12% of the total sample is current CSA members. We created the variable  $a$ , as the dependent variable in the model based on those three questions. The variable  $a$  is categorical variable assigning values from zero to seven. Table 1 indicates what each value represented in the dependent variable.

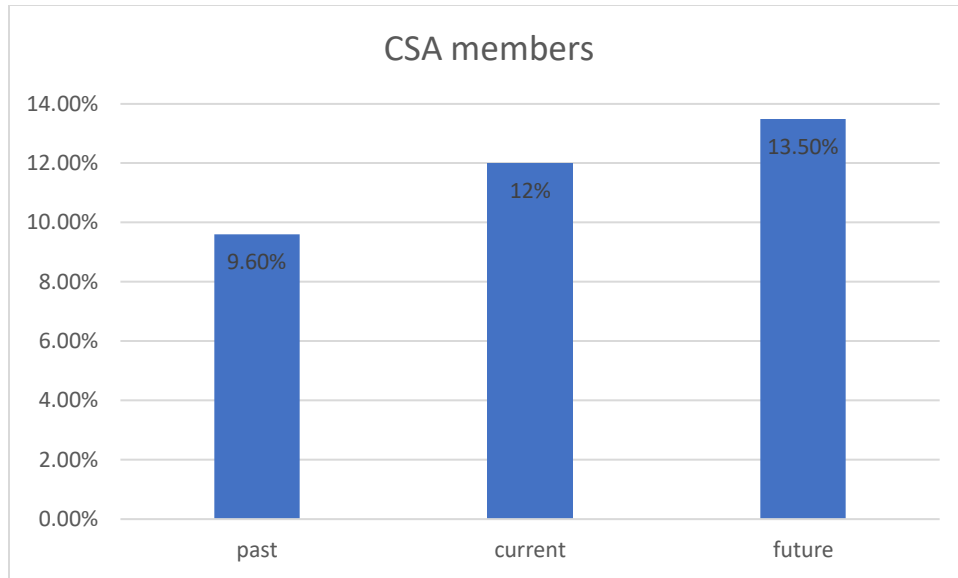


Figure 1. Percentage of CSA members in the Sample

Table 1. The Definition of Dependent Variable  $a$

$a$	past	current	future
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

In the survey, we listed ten reasons that attract people to become CSA members and nine reasons that discourage people to join CSA. Respondents were asked to rank those reasons from unimportant to very important with values ranging from zero to four. Table 2 listed the reasons that motivate people chose to join CSA and the average rank score for each reason. The top two most important reasons for people to be a CSA member are to support sustainable agriculture and local farms and farmers. From Table 3, the top two reasons that discouraged people from subscribing CSA are preference on famers' market and high cost of CSA subscription. Respondents were also asked questions about how they heard about CSA and rank from unimportant to very important, which values are from zero to four. Overall, consumers thought internet and word of mouth are the most important way for them to know about CSA program.

Table 2. Reasons for Becoming a CSA Member

variable	description	Mean
r_organic	Products are organic	3.120
r_easy	Products are easier to cook	2.801
r_small	To support small or family farms/farmers	3.181
r_sustainable	To support sustainable agriculture	3.313
r_local	To support local farm/farmers	3.325
r_time	To save time on grocery shopping	2.916
r_price	To reduce the risk exposes of food prices	2.880
r_eat	To eat seasonally	3.090
r_location	To know how/where food was grown	3.139
r_variety	To have different varieties of food	3.181

Table 3. Reasons for not being a CSA Member

variable	description	Mean
n_variety	Product mix issues	2.083
n_quantity	Problems with quantity	1.977
n_hh	Household issues (moving, donate, cook, etc)	1.848
n_cost	Cost/value issues	2.185
n_organic	Support organic (farms/farmers/agriculture)	2.063
n_pickup	Pick-up issues	1.985
n_quality	Problems with quality	1.964
n_store	Problems processing and storing	1.971
n_farmerm	Prefer farmer's market	2.232

Table 4. Source of Information

variable	description	Mean
s_mouth	Word-of-mouth	2.219
s_web	Website/internet	2.073
s_flyer	Flyer/poster	2.034
s_newspaper	Newspaper	1.935
s_roadsign	Roadside sign	2.008
s_drive	Drove by location	2.035
s_csafarm	CSA Farms	1.958
s_friend	Friend/family members	2.224
s_farmerm	Other farmer's markets	2.152

We also collected demographic information to capture the heterogeneity of consumers, including age, education level, gender, numbers of adults and kids in each household and income. The average age of the sample is 43 years old. For education level, about 39% obtained graduate degree, 38% had college degree and 23% got the high school degree. Around 53% of the respondents are

female. In each household, there are two adults and around 2 kids averagely. The mean income in the sample is around \$6,145 annually.

**Method**

We applied a multinomial logit model to measure the effect of various factors on consumers’ response on CSA membership. There are three models to analyze consumers behaviors. The Model 1 is analysis on why people choose to be a CSA member; the Model 2 is to estimate what factors discourage consumers to join; and the Model 3 is used to examine which source of information will impact consumers’ decision on joining. The variable  $a$  was used as dependent variable in those models and demographic variables were also included in each model. Specifically, we focus on those three groups with never joining CSA as the base group ( $a=0$ ): (i) consumers used to be CSA member, but not renew anymore ( $a=4$ ); (ii) consumers currently join CSA member, but not renew anymore ( $a=2,6$ ); (iii) always enroll in CSA program ( $a=7$ ).

The model is specified as follows:

$$a_i = \alpha_i + \beta_i \cdot X_i + \gamma_i D_i + \varepsilon_i$$

where  $X_i$  shows independent variables in each model. Specifically, it is reasons why people join in Model 1, reasons why people not subscribing CSA in Model 2 and sources of information in Model 3.  $D_i$  represents demographic variables in those models, including income, age, education, numbers of kids and gender. For each model, since not all respondents answered those reason questions but only those who met certain conditions did, the value of  $a_i$  varies. Those conditions are as follow. In Model 1,  $a_i$  takes the value from one to seven because only the respondent either past, or current, or going to be CSA member will answer the question why they become CSA members. On the other hand,  $a_i$  ranges from zero to six in the Model 2, since people who checked the reasons should meet one of three criteria: (i) non-past CSA member; (ii) non-current CSA member; (iii) no intention to be a CSA member in the future. The question about how they hear CSA is for the whole sample size, so the value of  $a_i$  in Model 3 is from zero to seven.

**Results**

All tests and models were estimated in Stata. In each model, we first tested independent variables including demographic variables to see if there was significant difference. Kruskal-Wallis test is adopted since  $a_i$  is non-parametric variable. Table 5 to Table 8 listed results for testing all the independent variables in those models. As for demographic variables, the dependent variable is significantly different among age, numbers of kids and gender. When it comes to the reasons for being a CSA member,  $a_i$  is not significantly different across all the variables. On the other hand,  $a_i$  is statistically significantly different among all reasons for not being a CSA member, as well as source of information variables.

Table 5. Kruskal-Wallis Test on Demographic Variables

variable	prob. (adjusted)	difference
income	0.551	n
age	0.000	y
education	0.677	n
# of kids	0.001	y
male	0.007	y



Table 6. Kruskal-Wallis Test on Reasons for Being a CSA Member

variable	prob.	difference
r_organic	0.525	n
r_easy	0.196	n
r_small	0.641	n
r_sustainable	0.636	n
r_local	0.272	n
r_time	0.962	n
r_price	0.509	n
r_eat	0.856	n
r_location	0.577	n
r_variety	0.646	n

Table 7. Kruskal-Wallis Test on Reasons for Not Being a CSA Member

variable	prob.	difference
n_variety	0.000	y
n_quantity	0.000	y
n_hh	0.000	y
n_cost	0.000	y
n_organic	0.000	y
n_pickup	0.000	y
n_quality	0.000	y
n_store	0.000	y
n_farmerm	0.000	y

Table 8. Kruskal-Wallis Test on Source of Information

variable	prob.	difference
s_mouth	0.000	y
s_web	0.000	y
s_flyer	0.000	y
s_newspaper	0.000	y
s_roadsign	0.000	y
s_drive	0.000	y
s_csafarm	0.000	y
s_friend	0.000	y
s_farmerm	0.000	y

The results of multinomial logit regression are listed in the Table 9 to Table 11 for each model. Across all three models, we focus on comparing four groups: (i) people who never join CSA ( $a=0$ );

(ii) people who used to be CSA members but only anymore ( $a=4$ ); (ii) people who are current members but not intend to join anymore ( $a=2$  or  $6$ ); and (iv) people who always are members ( $a=7$ ).

In the Model 1, we set people who always are CSA members as base group ( $a=7$ ). Since this question is only for people who have ever joined CSA, all observations in this group has CSA experience and the total observation for this model is smaller than the total sample size. The overall probability for this model is 0.0008, which is statistically significant. When it comes to current CSA member and non-past member but not plan to renew anymore, all the reason variables are not significant. However, demographic variables are statistically significant, suggesting individual heterogeneity. Comparing with people who are always CSA members, older generation, household with more kids, female consumers and low-income family may be more willing to enroll in CSA program. As for consumers who are past and current member but not to renew anymore, there is only one reason variable  $r\_easy$  is significant, indicating that if consumers find CSA products easier to cook at home, the probability of renewal will be lower than people who are always CSA members. As for demographic information, older generation and low-income family will intend to join CSA more. For people who used to be CSA member but not anymore, only one variable is statistically significant, which is  $r\_small$ . It indicates that if they aim to support local farms, they will plan to join CSA.

Table 9. Partial Results from Model 1

Variable	coefficient a=2	coefficient a=4	coefficient a=6
<i>reasons</i>			
$r\_organic$	0.33	-0.08	-0.146
$r\_easy$	-0.772	-0.891*	-0.871*
$r\_small$	-0.913	-1.463	-0.64
$r\_sustainable$	0.295	0.67	-0.786
$r\_local$	-0.207	0.281	0.49
$r\_time$	0.522	0.749	0.238
$r\_eat$	-0.426	-0.591	-0.279
$r\_price$	-0.217	-0.586	0.742
$r\_location$	-0.396	0.147	0.231
$r\_variety$	0.599	-0.258	0.625
<i>demographic</i>			
age	0.084***	-0.003	0.059**
edu	-0.562	-0.218	-0.183
nkids	0.605**	-0.361	0.328
male	-1.390**	-0.168	-0.509
inc	-0.147*	-0.051	-0.127*
$R^2$	0.2336***		

Note: \*, \*\*, and \*\*\* indicate significant at 10%, 5% and 1% level of significance.

The Model 2 analyzed why people do not want to be a CSA member. Since this question is aimed to respondents who were non-past member, or non-current member, or non-future member, the value of dependent values excludes seven. As a result, we set  $a=0$  as the base group, which is non-CSA member all the time. As for the past member but not anymore ( $a=4$ ), if there are problems related to quantity and pick-up issues, consumers will not plan to renew their membership anymore. Moreover, younger consumers are more likely to not to renew their CSA membership. For current members but non-past and non-future member, if they prefer to go shopping at farmers' market, then the probability for them to renew their CSA membership will decrease, indicating consumers' preferences on farmers' market over CSA. Furthermore, for those consumers, more kids in the family will motivate them to renew their CSA membership. Consumers who were past member and current member but not future subscriber will not renew CSA anymore if they intended to support organic food industry, indicating that they may choose other way to support organic food or they didn't think that CSA farms always provided organic food. Households having more kids and male consumers will tend to renew their CSA more likely.

Table 10. Partial Results from Model 2

Variable	coefficient a=2	coefficient a=4	coefficient a=6
<i>reasons</i>			
n_variety	0.526	0.092	0.400
n_quantity	0.191	-0.784*	-0.247
n_hh	0.126	0.575	-0.368
n_cost	-0.177	0.102	0.006
n_organic	0.279	0.326	0.559*
n_pickup	-0.135	0.792*	0.163
n_quality	-0.050	-1.384***	0.029
n_store	0.250	0.450	0.407
n_farmerm	-0.513*	-0.098	0.207
<i>demographic</i>			
age	-0.007	-0.079**	-0.014
edu	0.081	0.195	0.159
nkids	0.537***	-0.384	0.430**
male	0.191	1.550	1.126**
inc	0.004	0.098	0.005
<i>R</i> <sup>2</sup>	0.180***		

Note: \*, \*\*, and \*\*\* indicate significant at 10%, 5% and 1% level of significance.

Lastly, the Model 3 was adopted to examine how to advertise CSA well to expand the CSA community. The source of information question is designed to all respondents, so the dependent variable takes the value from zero to seven. For past member but not anymore, if they think flyer is an important to get information about CSA, they are more likely to renew their membership. On the other hand, surprisingly, if they find hearing from friends about CSA important, it will actually decrease their probability to renew their membership, which indicates that information about CSA from friends may not always be positive. Young and male consumers are more likely to subscribe

CSA. When it comes to current member but non-past and non-future member, none of those source of information is statistically significant. Only households with more kids will intend to renew their CSA membership, which is consistent with previous results. This suggests that those households pay more attention to the quality and nutrition of food they eat for the sake of kids. As for consumers who were past and current member but not future subscriber, their probability of subscribing CSA will increase if they find that hearing CSA by road sign and driving to CSA farms important. And if they think getting information from CSA farms directly, they will be less likely to subscribe CSA. Moreover, family with multiple kids and male consumers are more likely to join CSA. For those who are always in the CSA program, they found that getting CSA information from CSA farms very important. And young, high education level, high income level and male consumer are more likely to subscribe CSA program.

Table 11. Partial Results from Model 3

variable	coefficient a=2	coefficient a=4	coefficient a=6	coefficient a=7
<i>source of information</i>				
s_mouth	0.330	0.215	0.004	-0.024
s_web	0.169	-0.197	0.357	-0.122
s_flyer	-0.060	1.143***	0.335	-0.045
s_newspaper	0.126	0.088	0.243	0.426
s_roadsign	-0.501	-0.581	0.918**	-0.177
s_drive	0.398	0.374	0.721*	0.561
s_csafarm	-0.084	0.168	-0.146**	1.044***
s_friend	-0.205	-0.831*	-0.499	0.291
s_farmerm	0.261	-0.261	-0.849	-0.420
<i>demographic</i>				
age	-0.002	-0.076***	-0.005	-0.053***
edu	-0.071	0.287	0.183	0.444**
nkids	0.536***	-0.373	0.416**	0.023
male	0.493	1.295**	1.041**	1.131**
inc	-0.012	0.031	-0.042	0.082*
<i>R</i> <sup>2</sup>	0.224***			

Note: \*, \*\*, and \*\*\* indicate significant at 10%, 5% and 1% level of significance.

### Conclusions and Implications

Previous scholars explored CSA topic by simply comparing non-CSA member with CSA member and very few applied econometrics methods. In this study, we segmented consumers using multiple conditions to examine what responses we can get among different consumer groups. By targeting on various groups, farmers of CSA program can better understand consumers, and in return, they can attract more CSA subscription.

Overall, the adjusted  $R^2$  in three models is all statistically significant. By comparing those models, the Model 1 has the least numbers of significant variables, indicating that the CSA farms should

focus more on reasons that discourage people subscribing CSA program instead of reasons that attract consumers to join, indicating that consumers always understand the benefits of CSA subscription, but those obstacles make them hard to join or renew their membership. So, CSA farmers may need to adjust their farms to avoid those reasons that didn't interest consumers. Furthermore, when we examine how different consumers response to CSA subscription, none of reason variables or source of information variables are statistically significant in the models for people who are current member but not past and future member. This suggests that current members didn't influence by advantages and source of information about CSA. More importantly, this implies that simply dividing consumers based on their current membership status is not a strong evidence for CSA farm to target on their members. They need to collect additional information about their past membership status and their intention for the future subscription to better understand consumers' behavior on CSA subscription in order to expand. As for the source of information, it also varies based on which consumers' group the respondent is.

When it comes to the impact of demographic information, from the Model 1, old generation, family with multiple kids, low-income level and female may care more on what motivates them to subscribe CSA. Meanwhile, young generation, households having more than one kid and male consumers may focus more on what discourages them to join while young, households with kids, male, high education level and high income level may pay more attention on how they get information about CSA program.

Therefore, it is necessary and efficient to segment consumers into various groups based on multiple conditions to analyze motivations and barriers of CSA subscription. This paper had shed light on factors that influence on different consumers groups. The analysis can assist CSA program and farmers to better understand different members' preferences and how to expand the program in the future.

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