Assessing the Market Premium for Organic Certification among Canadian Community Supported Agriculture Programs

Y. Zhou;

University of Manitoba, Dept. Agribusiness and Agricultural Economics, Canada

Corresponding author email: linda.yuan.zhou@gmail.com

Abstract:

Community Supported Agriculture (CSA) is a farming concept that allows growers and consumers to partner together to share the risks and benefits of food production. This study examines the impact of organic certification on Canadian CSA share prices. I use Canadian CSA data collected from online sources that documents CSA share prices and characteristics of CSA farms. Results suggest that CSA farms that self-identify as organic charge a 13% premium over conventional farms. I also find that CSA farms that are certified organic charge a 16% premium. These premiums are not statistically different from each other, which suggests that organic certification does not increase the premium relative to uncertified organic. It appears as though CSA, which is a direct marketing concept, acts as a substitute for third-party certification. This study also identifies several parameters that are important for CSA programs, namely the number of weeks the CSA provides produce, the average number of vegetable varieties, and the number of pick-up locations.

Acknowledegment: My deepest gratitude goes first and foremost to Professor Chad Lawley, my advisor, for providing me precious guidance and constant encouragement throughout the entire process of learning and writing the thesis. Without his continuous support and consistent instruction, this paper would not have reached its present form. I would like to thank Dr. Ryan Cardwell, member of my advisory committee, and Dr. Gregory Mason, my external examiner, for providing valuable feedback and enlightening suggestions. I would also like to express my deepest gratitude for support and feedback from farmers who operate Community Supported Agriculture programs.

JEL Codes: D4, Q11

#2533

Assessing the Market Premium for Organic Certification among Canadian Community Supported Agriculture Programs

Contents

Abstract

Community Supported Agriculture (CSA) is a farming concept that allows growers and consumers to partner together to share the risks and benefits of food production. This study examines the impact of organic certification on Canadian CSA share prices. I use Canadian CSA data collected from online sources that documents CSA share prices and characteristics of CSA farms. Results suggest that CSA farms that self-identify as organic charge a 13% premium over conventional farms. I also find that CSA farms that are certified organic charge a 16% premium. These premiums are not statistically different from each other, which suggests that organic certification does not increase the premium relative to uncertified organic. It appears as though CSA, which is a direct marketing concept, acts as a substitute for third-party certification. This study also identifies several parameters that are important for CSA programs, namely the number of weeks the CSA provides produce, the average number of vegetable varieties, and the number of pick-up locations.

List of Tables

INTRODUCTION

1.1 Background

Community Supported Agriculture (CSA) is an agriculture model proposed in Japan in 1960s in response to the increasing demand for agriculture produce without synthetic herbicide and pesticide (Thompson and Coskuner-Balli, 2007). The CSA allows members to join a farm for a season, paying up front and then receiving a share of the harvest each week. In North America, the CSA movement started in the 1980s. The very first two CSA farms in North America are Indian Line Farm and The Temple-Wilton Community Farm (Paul 2015). Working towards addressing concerns over industrialized agriculture and ecological and community resilience, CSA, as an alternative model of local food provision, has grown immensely in both numbers and variety in the last 25 years (King, 2008). In Canada, I estimate that there are almost 400 CSA farms, providing vegetables, seafood, meat and fruit through CSA shares.[1] Buck *et al.* (1997) observes that there is an increasing trend of the direct marketing and local distribution, both geographic and institutional.

[1] The estimate is from provincial listings. There are 32 farms listed in Alberta, 23 in Manitoba, 130 in Ontario, 30 in British Columbia, and over 100 in Quebec.

1.2 Economic Problem

The Canada Organic Regime (COR) oversees domestic accreditation and certification for products traded between provinces.[2] Certification Bodies (CB), accredited by Canadian Food Inspection Agency (CFIA), provide written assurance that agricultural products are organic as defined in and for the purposes of the *Organic Product Regulations* (Canadian Food Inspection Agency, 2014).[3] CSA production falls into the category of ñorganic products sold within the province of origin;ò therefore, it is not subject to the *Organic Product Regulations*. Rather, CSA production and marketing is regulated by organic regulations at the provincial level. Therefore, not all Canadian organic CSA farms are certified, consistent with results in Veldstra *et al.* (2014) using a sample from several countries.

The decision to certify or not to certify is based on farmersô perception of the costs and benefits of third-party certification. Organic farming practices require higher operation cost than conventional farming practice, due to relatively intense use of labor, specialized equipment and other substitutes for synthetic chemicals (Oberholtzer et al.,

[2] The Canada Organic Regime (COR) is the equivalent to National Organic Program in United States On June 17, 2009, the Government of Canada entered into Canada - US Organic Equivalence Arrangement on the trade of organic products with the United States.

[3] Accreditation is the process by which an authoritative organization gives formal recognition that a particular third-party certifier is competent to carry out specific tasks.

2005). Costs for organic certification are due to increased administrative requirements and the use of more costly production methods to satisfy strict Canadian Organic Standards, including the productivity loss due to the 36-month transition of land required for certification.[4]

In terms of benefit, some consumers are willing to pay a premium for products that carry third-party certification labels. Another incentive for farmers to obtain certification is that the third-party certification allows them to get access to wholesale markets where there is less direct contact between the producer and the final consumer.

In this paper, I empirically estimate the size of the market premium due to organic certification on Canadian CSA farms. For CSA farms considering the option of obtaining organic certification, the size of the market premium is unknown. Past research suggests that direct marketing approaches, such as CSA, serve as substitutes for third-party certification of organic production practices (Veldstra *et al.* 2014). If this is true, then certified organic will not command a substantial premium over uncertified organic. Since organic certification is costly, it is therefore important to ask how much third-party certification can increase revenue for CSA workers/small farmers.

[4] The Canadian Organic Standards require that land should be managed according to the organic standards for 36 months prior to harvest of the first organic crop. This period is known as the transition period.

1.3 Literature Review

Several authors have studied the Willingness to Pay (WTP) in terms of local produce and organic produce.[5] Darby *et al*. (2008) find that in United States of America, state boundaries may serve as a natural point of geographic delineation for ñlocalò production in the minds of consumers. The WTP for the closer location is $0.92 per basket, twice the WTP for out of state produce ($0.48 per basket). Further, they indicated that consumersô WTP for local production is independent from other attributes that are associated with product freshness and farm size.

Adams & Salois (2010) find that there is a distinct consumer preference turn between the demand for local and organic produce, without an effective way to separate the two. They studied these products in three categories: 1) Local; 2) deep organic is a combination of local and organic; and 3) organic lite, which is organic but usually distant. They reviewed relevant studies and concluded that prior to the late 1990s strong support for factors such as protection of the environment, consumer health, and conservation of resources resulted in stronger preference in organic than in local; around late 1990s, local became more important than organic in consumerôs preference.

Although the CSA model has evolved and is adapted by each farmer and their

[5] Willingness to Pay (WTP) is the maximum price at or below which a consumer will definitely buy one unit of the product.

members, in general the original motives of community support and community sharing remain unchanged. Howell (2008) concluded that the concept of CSA usually includes supplying organic produce, building direct contact between farmers and consumers, and environmentally sustainable farming practices, which is considered as an alternative to the contemporary industrial agricultural system.

Several other authors (Cooley & Lass, 1998; Sabih & Baker, 2000, Brown & Miller, 2008) have measured the potential value associated with CSA membership. Cone and Myhre (2000) examined the perceptions and behaviors of farmer members in motivation for memberships, the role of women, and the extent of member participation. They reported that the degree of participation is in direct correlation with the renewal rate of CSA membership and positive responses to questions regarding member commitment to the farm. They pointed out that change of lifestyle, lack of choice, and inconvenience played a larger role in deterring membership. Further, they pointed out that retaining shareholder participation is one constraint for long-term sustainability of CSA farms.

In all, most of the literature offers analysis in CSA as a model in community building. However, Paul (2015) pointed out that in reality many CSA farms are more likely to represent little more than a direct marketing opportunity for vegetable farms, rather than a movement of ethical farming, local consumption, and community building.

Few articles have delved into the marketing and economic side of the issue.

Connolly and Klaiber (2014) provide some of the first revealed preference evidence of consumersôvaluation of a variety of characteristics typical of CSA farms and the products they produce, with particular focus on the role of organic food production and certification. Their first-stage hedonic results show that there is a 7% premium for certified organic labeling from local food production, with slightly higher premium of 8% associated with farms that offer fresh-cut flowers in addition to vegetables. Further, they present empirical evidence that the CSA market they study is highly competitive. They report that firms are successfully marketing USDA organic certification to consumers and are receiving a price premium from this certification.

The key factor in the decision to obtain organic certification lies in the potential difference between the market premium due to certification and the additional cost associated with being certified. Veldstra *et al.* (2014) suggest to separate the decision to become certified organic into two partsð a production decision to use organic practices and a marketing decision to certify. They conclude that the certification process discourages certification, conceding barriers being the three year transition period, the financial cost, and time cost for certification. They also suggest that direct marketing does not influence the decision to use organic practices, but it does decrease the likelihood of obtaining USDA certification. Veldstra *et al.* (2014) conclude that direct marketing is a substitute for third-party certification.

In the only recent Canadian study, Doucette (2004) examines CSA programs in Southern Manitoba from both producer and consumer perspectives. She finds that, for CSA farmers, the perceived motivations included social, economic, and environmental justice, and a manifestation of intergenerational responsibility. On the other hand, CSA members reported their primary reason was to get fresh produce. Unfortunately, for consumers who choose the option of eating local food, it is difficult to disentangle ñlocalò with a perception of connection, support, and loyalty from eating *fresh*. Therefore, it is impossible to testify whether supporting local is one rationale for CSA shareholder.

1.4 Purpose and Objectives

When adopting organic farming practice, CSA farmers have to make key decision in terms of organic certification and other attributes. In this paper, I address the following questions:

1. How much is the organic certification premium for Canadian CSA programs?
2. How much are premiums for other attributes for a CSA share?

1.5 What Do I Find?

The premium due to certification is not statistically significant among Canadian CSA programs, with the marginal value difference between organic and certified organic being 3% (13% for non-certified organic and 16% for certified organic). In other words,

the difference between organic with and without certification is minor.

Further, as expected, consumers are willing to pay if a CSA share offers more vegetable variety and pick-up locations in a longer CSA season. I also identified the size premium for medium and large CSA shares as being 3.6% and 6.4% respectively. The results also suggest that several characteristics are not important determinants of CSA share prices, including co-worker drop off, home delivery, additional products, work share, winter share, and u-pick.

The remainder of the paper is developed as follows. The next section describes the details of a conceptual framework for analyzing the market premium for CSA programs. The following section presents hedonic results in terms of organic certification and other attributes. The final section provides policy implications based on the major findings. The limitations of this study and potential areas for further research is also discussed in this section.

2 METHODOLOGY

2.1 Model

Based on the model developed by Connolly and Klaiber (2014), the dependent variable will be the advertised CSA prices, with a set of characteristics that I assume will differentiate the CSA share. Following Feenstra (1995) and Connolly and Klaiber (2014),

with the assumption that the CSA market is competitive, the coefficients of a hedonic regression represent the implicit price of each characteristic. I estimate the parameters of the following semi-log regression model:

$$\square\square\square_{\square} = \square + \square\square_{\square} + \square_{\square} \qquad (1)$$

where $\square$ indexes the CSA farm; $\square_{\square}$ is the price of the CSA share; Ŭ is an intercept; ϐ is the vector of marginal values for characteristics Z_i and V_i represents the unobservable attributes influencing price. I use two approaches to measuring price: (1) the total price of a share for the full season and (2) the per week price of a share.

2.2 Variables

The objective of this paper is to estimate the market premium for organic certification for CSA programs. It is therefore important to classify farms by farming practices. CSA farms use various terms, including ñsustainable,ò ñnaturally grown,ò ñecological,ò and ñbiodynamic.ò Other farms choose to give detailed description for their customers to understand and build the trust relationship. Examples include the following: ñWe are committed to maintaining the land for future generations; therein we do not use any synthetic chemicals, artificial fertilizers or GMO seeds;ò and ñWe grow our food in a way that encourages the health and vitality of the soil, promotes humane animal management, and preserves ecological integrity.ò

In order to realize the research goalð assessing the market premium for organic certificationð I categorize all the farms into three categories: (1) Conventional, (2) Organic without certification, and (3) Certified organic. I categorize self-identified organic farms into the second and third groups according to the certification, with the rest going to conventional group. In this study, 24 of 113 farms are organic certified, 61 organic without certification, and the rest are classified as conventional. Therefore, this study will capture organic premiums based on consumer perception.

There are several potential problems associated with classifying farms as organic. First, different consumers can perceive ñorganicò differently and it is impossible to detect the perceptions of each consumer. Differentiated consumer perception for organic farming will pose difficulty for market premium estimation. For example, some consumers simply conceive that no chemical spraying is the equivalent term for organic. This will cause the overestimation of market premium for the category of conventional. Further, this can demerit the WTP for organic produce, either with or without certification. In other words, this will result in underestimation for the coefficient on organic produce. However, as the main purpose of this study is highlighting the market premium for organic certification relative to organic and not certified, I am still able to derive the difference between the two.

A second issue with categorization is that the organic standard is a common

farming standard rather than the highest standard. Therefore, there are several cases in which combined biodynamic and ecological farming practices are not incorporated in this study.

The other characteristics of the CSA share are recorded as a vector of variables, namely size of the weekly share, the number of weeks, the number of pick up locations, the average number of vegetable varieties, several payment and delivery alternatives, and province indicators. Each of the explanatory variables are described in more detail below.

In this study, shares are categorized into three sizes, namely: small, medium, and large. Table 1 shows the standards for categorization, which can be easily applied to most of the CSA farms. However, justification and clarification is needed in some cases. Medium size is the most common share size, denoted as the basic option. This is reasonable according to the chronological development of a typical CSA farm. For the first few years of a farm operating a CSA, the farm starts with a medium sized share aimed to a couple or a small family. Afterwards, if farmers have energy and time, they start improving and perfecting their CSA products, by offering more share size options. The medium sized share is usually 1.5-1.75 times greater than small, and is priced 1.25-1.5 times higher. Large size will be 1.25-1.5 times greater than medium size and the price will be 1.25-1.5 times higher. Thus, this can offer justification for specifying the share size if farm offers more than one share but without giving additional size

information. For example, if some farms provide the information as ñto fill the basketò, it needs clarification by asking the size of the basket and the number of individuals that can be fed on the share. For Ontario farmers, they tend to use bushel to describe their sizes. If a farm says ñsufficient vegetables for a family of fourò or ñfor families that enjoy variety and tend to eat most meals at homeò without giving any blurry description, I would categorize these as large.

Table 1: Size Description

Size	**Bushel standard**	**Weight standard**	**Description by people**
Small	1/4 bushel	7 lb.	Perfect for Veggie-loving Individuals or Most Couples
Medium	1/2 bushel or 5/8 bushel	10 lb.	Ideal for Small Families or Couples who love Their Veggies
Large	One bushel	-	4-6 people large family or a vegetable loving family

Source: Compiled from various CSA websites

The number of weeks for the summer share is anticipated to have a higher marginal value than other factors, which is mainly because people who sign up for the CSA share tend to have a preference for local fresh food.[6] The WTP increases with the

[6] Some of the farms provide a bi-weekly option, by combining the two-week share and doing one drop off.

length of the harvest season, which is the quantity effect on share price. On the other hand, if the share provides a full season supply, it is highly likely to decrease the switch cost for consumers.[7] However, the quality of produce influences the weekly share price, which declines as season length increases. For example, the longer the season, the more chance customers are to get root vegetables that are commonly considered as low value compared to leaf vegetables.

The number of pick-up locations provides flexibility in terms of reducing the time commitment required of consumers. Simple case is that Farm A has two pick-up locations in the city whereas Farm B provides five. Assuming Farm A and B provides exact same share, the WTP for the share from Farm B should be higher than the one from Farm A. The measured marginal value can also be presented as the time saved for the picking up and the gasoline saved for the nearer location.

The wide variety of vegetables is often advertised by CSA farms, which tend to increase the perceived CSA share value among consumers. For the average number of vegetables, the first question is which standard should be incorporated into my study.

However, this share contains same produce as the regular share. In this case, I record the week number according to the drop off number (usually half the week number) and categorize size according to the combined share information.

[7] Switch cost is the fixed cost incurred by a buyer when changing suppliers. Here, we refer to the switch of getting needed vegetable from CSA to other sources, rather than from one CSA to another.

Two options are: (1) How many different vegetables are included in a weekly share and (2) How many different vegetables are available for the entire season? The first standard is adopted in this study for the following reasons. First, what the consumer cares about is that how many varieties he or she can get for one week rather than over the season. Often the case is, at the beginning of the season, customers receive fewer varieties and start to receive more as the season proceeds.[8] Therefore, it is possible that the number of vegetable varieties could be inflated by the number for the whole season.

Second, in this study, standard CSA shares are pre-packed and being delivered to either farmerôs market or the pick-up location, which makes the maximum number of available vegetables a less relevant number. Further, it is not possible to fit all the available vegetables into a specific share because of feasibility of cooking. This is to say that the CSA farmer cannot put as many as vegetables as he/she has ion a given week into one share because this might lead to a situation where, for example, the number of a certain vegetable is not enough for a dish. In conclusion, consumers likely perceive the minimum vegetable number in a weekly share as a critical value.

Farms usually disclose the minimum and maximum number of different

[8] The lowest harvest is usually in early spring. As the season proceeds, the number of vegetable increases in the summer and peaks in the early fall. Harvest start to have more root vegetable and less leaf vegetable when the fall season wraps up.

vegetables that customers will receive in their weekly share, where it provides consumers more information about the whole season. Therefore, in this study, I choose to record the average number of vegetables in a CSA share derived from the maximum and minimum number.[9] For others who provide the list of available vegetables for the season or have no information listed at all, I contacted the farmer to clarify the variety in a way that the average number can be calculated based on minimum and maximum numbers.[10]

Several characteristics are treated as dummy variables, such as winter share, swap option, work share, additional products, co-worker drop off, and home delivery. The dummy variables included in this paper are all likely to increase the convenience for CSA members. Winter share refers to CSA shares that are designed to accommodate consumers after growing season, which usually starts in October. The swap option offers members exchange opportunities vegetables. The work share aims to reach members who like to participate in farming and in return receive some extent of discount. Additional products are products provided beside vegetables, which varies from farm to farm, but the common additional products are farm-gate eggs, honey, fresh-cut flowers, and fruits.

[9] CSA farms usually provide the maximum and minimum number of vegetables in a share. However, there are some farms provide share samples in a picture format instead. I counted the variety number from the sample in early spring, summer and early fall.

[10] In total, I have contacted 30 farms for the number of vegetable provided in the CSA share, with 26 responding.

Co-worker drop off service is aiming for reaching more members by providing new drop off locations. Home delivery service offers delivering CSA box to membersôdoorsteps.

2.3 Data

I compiled the primary list from four provincial CSA listings that maintain databases of CSA farms. I visited each farms website and other social media channels (Facebook, Twitter, and Instagram) and collected the share price information and all the characteristics described in the previous section. Because of the unique requirement for CSAð the full or partial payment is delivered before the growing seasonð most of the farms update their price information during the period between the end of January to the beginning of March. This enables the database of this study to cover the price information for the 2016 growing season in British Columbia, Alberta, Manitoba, and Ontario.

In total, I record 191 farms with 314 entries of data.[11] Vegetable CSA farms are included, while meat and seafood CSA farms are excluded. I further restrict the set of CSA farms to those that I could obtain the characteristics described in the previous session, either through their websites or through direct reply from farmers. The final dataset contains 195 entries of CSA share data from 113 farms.

Table 2 displays summary statistics for the attributes discussed above. Among the

[11] CSA farms might offer multiple share sizes. Prices and characteristics were collected for each share size.

113 farms, 85 (75%) farms identify themselves as organic growers, including the certified growers. Some farms refrain from using the word organic, because they are not certified. On average, certified organic CSA farms charge about 100 dollars more than their conventional counterparts and 40 dollars more than the organic without certification. However, the share price differs less from farm to farm, compared to the other two options. Further, certified organic CSA farms tend to offer more vegetable varieties, a longer season, and more pickup locations.

Table 2: CSA Summary Statistics

	Conventional		Organic without certification		Certified organic		Total	
	Obs=28		Obs=61		Obs=24		Obs=113	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev**
Price of CSA share	453.61	101.06	523.85	131.54	566.63	93.76	515.53	122.85
Weekly price of CSA share	28.13	6.32	27.84	5.82	29.87	5.4	28.34	5.87
Number of Weeks	16.46	3.48	18.82	2.47	19.25	2.88	18.33	3.01
Average vegetable number	9.95	3.35	9.49	3.51	10.98	4.35	9.92	3.68
Number of pickup locations	3.68	3.24	2.98	2.07	4.83	5.88	3.55	3.53
Variable	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
U-pick (0/1)	2	7.14%	1	1.64%	1	4.17%	4	3.54%
Work share (0/1)	2	7.14%	9	14.75%	1	4.17%	12	10.62%
Winter share (0/1)	7	25.00%	9	14.75%	5	20.83%	21	18.58%
Swap (0/1)	2	7.14%	13	21.31%	5	20.83%	20	17.70%
Home delivery (0/1)	12	42.86%	17	27.87%	6	25.00%	35	30.97%
Additional produce (0/1)	23	82.14%	54	88.52%	20	83.33%	97	85.84%
Co-worker drop off (0/1)	9	32.14%	11	18.03%	6	25.00%	26	23.01%
Manitoba	7	25.00%	1	1.64%	1	4.17%	9	7.96%
Alberta	7	21.43%	1	1.64%	1	4.17%	9	7.96%
British Columbia	1	3.57%	8	13.11%	2	8.33%	11	9.73%
Ontario	13	46.43%	51	83.61%	20	83.33%	84	74.34%

It is noticeable that farms using conventional farming practice offer more u-pick, home delivery, and co-worker drop off services than farms that self-identify as organic (either organic without certification or certified organic). On the contrary, only 7% of conventional farms offer swap options whereas approximately 20% of organic farms (both for organic without certification and certified organic) provide a swap option.

In terms of provinces, Manitoba and Alberta have a large proportion of CSA farms practicing conventional farming, and one of the two organic farms in each province are certified. On the other hand, CSA farms in Ontario and British Columbia focus more on organic farming practices, with more farms self-identifying as organic (without certification).

Across all farms, the average price of an 18-week summer season is approximately $515.53, with weekly price of a CSA share being $28.84. The average number of vegetable varieties is approximately 10. Table 2 also shows that only four out of 113 farms provide U-pick, but a large proportion (86%) offer additional produce. Among the 113 farms, 20 farms (18%) offer swap service, 35 (31%) home delivery, and 21 (19%) winter share. Further, only 11% of farms accommodate work share during the summer.

HEDONIC RESULTS

First-stage hedonic results for two semi-log specifications of equation (1) are reported in Table 3, with natural log of 1) the total CSA share price for the season and 2) the weekly price as dependent variables, respectively.[12] As presented in Table 3, the R^2 for regression 1 is 0.53 and is 0.38 for regression 2. The results suggest that ñorganic without certificationò increases the price of a CSA share by 13% over conventional, which is $58.97.[13] ñCertified organicò increases the CSA share price by 16%. Furthermore, this difference in premium due to certification falls in the weekly share price regressions, where the premium attributed to organic without certification is 12% and the premium attributed to certified organic is 16%. Formal tests suggest that the two premiums are not statistically different from one another.[14]

---

[12] Regression 2 will adopt CSA weekly price as dependent variable, with the rest of the specification unchanged. The purpose of regression 2 is to show the different effect on the whole share price and weekly price brought by the CSA characteristics.

[13] The share price increase is calculated by Price*13%, where Price is the average share price for conventional CSA (the omitted category).

[14] With the hypothesisð H0: Organic with certification – Organic without certificaqtion = 0, F test for two specifications (share price and weekly price as dependent variable, respectively) report that Prob > F being 0.3654 and 0.3274.

Table 3: Hedonic model results

	Ln(price)		Ln(weekly price)	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Organic without certification (0/1)	0.13***	0.05	0.12**	0.05
Certified organic (0/1)	0.16***	0.06	0.16***	0.06
Number of Weeks	0.04***	0.01	-0.02***	0.01
Number of Pick-up Location	0.01***	0.01	0.01***	0.01
Number of Average Vegetable	0.01**	0.00	0.01**	0.00
Medium Share Size	0.34***	0.06	0.34***	0.06
Large Share Size	0.51***	0.10	0.52***	0.11
Drop Off (0/1)	-0.06	0.04	-0.06	0.04
Home Delivery (0/1)	-0.04	0.04	-0.03	0.04
Additional Products(0/1)	-0.04	0.05	-0.04	0.05
Swap (0/1)	-0.04	0.04	-0.03	0.04
Work Share (0/1)	-0.06	0.05	-0.05	0.05
Winter Share (0/1)	-0.03	0.05	-0.03	0.05
Upick (0/1)	-0.13	0.09	-0.12	0.09
Manitoba	0.04	0.09	0.04	0.10
British Columbia	-0.15*	0.08	-0.17	0.08
Ontario	-0.04	0.10	-0.05	0.10
Constant	5.18***	0.13	3.31***	0.14
R^2	0.53		0.38	
Observations	113		113	

Notes: (1) *** denotes significance at the 1% significance level; ** denotes significance at the 5% significance level; * denotes significance at the 10% significance level; (2) Dummy variable coefficients are adjusted according to Halvorson and Palmquist (1980). They state that if the general form of the equation is $\square\square\square = \square + \sum_{\square}\square_{\square}\square_{\square} + \sum_{\square}\square_{\square}\square_{\square}$, then the equation can be written as $\square = (1 + \square)^{\square}\exp(\square + \sum_{\square}\square_{\square}\square_{\square})$.

This result echoes the decision made by farmersð only 21% of CSA farmers are certified organic. In informal interviews, CSA farmers who choose not to be certified stated several reasons. One is that the paper work and the inspections take relatively large amount of time, especially considering the amount of hours in the busy planting and

harvesting seasons. Secondly is that the nature of the CSA concept provides farmer and consumer a strong trust relationship. Certification provides a formal validation of farming practices. Direct marketing through a CSA offers an alternative way to offer this credential, which is ñcertifiedò or assessed by the consumers themselves. It is also noticeable that among the answers in response to the organic certification, self-identified wholesalers tend to choose getting certification, stating that they probably would not choose to certify if they were smaller-scale.

Between the two specification results, the most noticeable change is the coefficient sign on the number of weeks. In regression 1, since this is treating the share as a whole, it is understandable that the more weeks of a share, the more expensive the share will be. On the other hand, specification 2 tests the effect of the number of weeks on the weekly price, where the relationship between the number of weeks and the weekly price becomes negative. The negative sign suggests that the more weeks in a share, the less value the weekly share becomes. One reason is that more likely, the later share will contain more root vegetables that are considered as lower value products. On the other hand, as the season proceeds into the late fall, it is impossible to purchase fresh produce at farmerôs market where consumers usually pick up their share.

In both of the regression results, the number of pick up locations assert a significantly positive effect on either share price or weekly price. Every additional

pick-up location increases the CSA share price by 1%. Converting to dollars, this result suggests that every additional pick-up location is contributing $4.54 to the share or 28 cents to the weekly share. Comparable to the number of pick-up locations, the average number of vegetable varieties is showing similar results. In other words, an additional vegetable increases the share price by 1%, which results in a 36 cents increase in the value of the weekly share.

Medium share size charge a 34% premium over small share size and large size premium being 51%, statistically significant. In other words, large share size has only 17% premium relative to the medium size.

Finally, the results presented in Table 2 suggest that drop off, home delivery, additional products, swap, winter share, work share and Upick options do not have a substantial impact on CSA share prices. This might be explained by the CSA share itself can satisfy consumersôdemand by providing fresh local produce.

SUMMARY OF FINDINGS

4.1 Implications

The growing demand for local organic produce is driven by ethical and health considerations, which should be satisfied by flourishing direct marketing ventures and local food initiatives. One example is that The Farmers' Market Association of Manitoba revised its name and structure to the Direct Farm Marketing Association of Manitoba, in

order to include more local food initiatives to build a stronger local connection between farms and consumers. I find that there is little premium due to certification in the Canadian CSA market. This suggests that the direct marketing aspect of CSAs may be acting as a substitute for third-party certification.

To meet the demand, CSA can serve as a convenient tool for small-scale farms to expand their business and to share farm production risk. This paper will be beneficial for the existing CSA farmers to plan their business in terms of designing the share to better accommodate the market. On the other hand, it is also valuable for farmers who are considering adopting CSA as one of their direct marketing tools. Further, it provides some insight for consumers to understand the value of each characteristics of Canadian CSA, as revealed through market prices.

4.2 Limitations

1) **Dataset**

The data set is relatively small. Except Ontario, the other three provinces don't have a large number of CSA farms. Further, as the study is restricted to vegetable CSAs with information on all characteristics, sample size shrank. Another limitation of the sample size is that the 195 entries of data are compiled from 113 farms. Results from farm-level (113 observations) and share-level regressions (195 observations) can be found in Table A1 in the Appendix. It is clear that the two sets of results are consistent.

2) Size Categorization

Share sizes are categorized by description from farmers, which may vary and offers a blurry line between two close share sizes. A medium size described by one farmer might become a small share to another farmer. On the other hand, some share sizes being offered are in between the standard I am adopting in this paper. However, as the number of category grows larger, data sample tends to become insufficient. Therefore, I embrace the category standard farmers are using, with combining multiple standard to be precise.

3) Blurry between Conventional and Organic

For farms that self-identified as conventional and organic, sometimes there is very little difference between the two. A conventional farm might use mulch and integrated pest management techniques but not advertise as organic. A self-identified organic farm might not farm strictly according to the national organic standard. However, as the WTP is capturing the consumerôs perspective, the results from the regression is able to reflect the market premium of the farming practice, namely conventional, organic, and certified organic.

4) Additional Produce

There are approximately 35 additional varieties of produce, including fresh-cut flower, farm-gate eggs, and fruits to resort rent, event, and workshops. The way I define additional food makes a wide range of produce or event inclusive. As it is not possible to

treat each of the additional product as a new dummy variable, the model does not separately identify the effect brought by some of the significant additional food, such as fresh-cut flower and farm-gate eggs.

References

Adams, D. C., & Salois, M. J. (2010). Local versus organic: a turn in consumer preferences and willingness-to-pay. Renewable Agriculture and Food Systems, 25(4), 331ï 341.

Brown, C., & Miller, S. (2008). The impacts of local markets: A review of research on farmers markets and community supported agriculture (CSA). American Journal of Agricultural Economics, 90(5), 1296ï 1302.

Buck, D., Getz, C., & Guthman, J. (1997). From Farm to Table: The Organic Vegetable Commodity Chain of Northern California. Sociologia Ruralis, 37(1), 3ï 20.

Canadian Food Inspection Agency. (2014). Canada Organic Regime: A Certified Choice. . Retrieved from http://www.inspection.gc.ca/food/organic-products/labelling-and-general-information/certified-choice/eng/1328082717777/1328082783032

Cone, C., & Myhre, A. (2000). Community-supported agriculture: A sustainable alternative to industrial agriculture? Human Organization, 59(2), 187ï 197.

Connolly, C., & Klaiber, H. A. (2014). Does organic command a premium when the food is already local? American Journal of Agricultural Economics, 96(4), 1102ï 1116.

Cooley, J. P., & Lass, D. A. (1998). Consumer Benefits from Community Supported Agriculture Membership.Review of Agricultural Economics, Vol . 20 , No . 1 (Spring - Summer , 1998), 20(1), 227ï 237.

Darby, K., Batte, M. T., Ernst, S., & Roe, B. (2008). Decomposing local: A conjoint analysis of locally produced foods. American Journal of Agricultural Economics, 90(2), 476ï 486.

Doucette, K. (2004). Manitoba Harvest: Rural Livelihood Contributions of Community Shared Agriculuture & FamersôMarkets. University of Geulph, Geulph, Canada.

Feenstra, R. (1995). Exact Hedonic Price Indexes. The Review of Economics and Statistics, 77(4), 634ï 653.

Howell, J. (2008). Community Supported Agriculture as Revitalization: reconnecting the farm and the dinner table, 1ï 54.

Hinrichs, C. C., & Lyson, T. A. (Eds.). (2007). Remaking the North American food system: Strategies for sustainability. U of Nebraska Press.

King, C. A. (2008). Community resilience and contemporary agri-ecological systems: reconnecting people and food, and people with people. Systems Research and Behavioral Science, (25), 111ï 124.

Oberholtzer, L., Dimitri, C., Greene, C., 2005. Price Premiums Hold on as U.S. Organic Produce Market Expands. VGS-308-01. U.S. Department of Agriculture, Economic Research Service, May.

Paul, M. (2015). Community Supported Agriculture: A model for the farmer and the community?Retrieved from

http://futureecon.com/wp-content/uploads/MP_Final_PDF.pdf

Halvorsen, R., & Palmquist, R. (1980). The interpretation of dummy variables in semilogarithmic equations. American economic review, 70(3), 474-75.

Sabih, S. F., & Baker, L. B. B. (2000). Alternative financing in agriculture: A case study Acta Hort. 2000; 524: 141-48.

Sproul, T. W., & Kropp, J. D. (2015). A General Equilibrium Theory of Contracts in Community Supported Agriculture. American Journal of Agricultural Economics, 97(5), 1345ï 1359.

Thompson, C. J., & Coskuner-Balli, G. (2007). Countervailing Market Responses to Corporate Cooptation and the Ideological Recruitment of Consumption Communities. Journal of Consumer Research, 34(2), 135ï 152.

Veldstra, M. D., Alexander, C. E., & Marshall, M. I. (2014). To certify or not to certify? Separating the organic production and certification decisions. Food Policy, 49(P2), 429ï 436.

INDEX OF ABBREVIATION

CB	Certification Bodies
CFIA	Canadian Food Inspection Agency
COR	Canada Organic Regime
CSA	Community Supported Agriculture
GMO	Genetically Modified Organism
USDA	United States Department of Agriculture
WTP	Willingness to Pay

Appendix

Table A1: Share-level Robustness Checks

	Ln(price)		Ln(weekly price)	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Organic without certification (0/1)	0.10**	0.45	0.09**	0.04
Certified organic (0/1)	0.10**	0.49	0.10**	0.05
Number of Weeks	0.06***	0.00	-0.01	0.01
Number of Pick-up Location	0.01***	0.01	0.01***	0.00
Number of Average Vegetable	0.01***	0.00	0.01**	0.00
Medium Share Size	0.34***	0.26	0.36***	0.02
Large Share Size	0.51***	0.03	0.64***	0.03
Extra Large Size	0.90***	0.15	0.91***	0.14
Drop Off (0/1)	-0.02	0.04	-0.03	0.04
Home Delivery (0/1)	-0.03	0.04	-0.03	0.03
Additional Products (0/1)	-0.02	0.04	-0.01	0.04
Swap (0/1)	-0.06	0.04	-0.04	0.04
Work Share (0/1)	-0.02	0.06	-0.02	0.05
Winter Share (0/1)	-0.03	0.06	-0.01	0.04
Upick (0/1)	-0.17	0.08	-0.12	0.09
Manitoba	-0.27	0.18	-0.17	0.11
British Columbia	-0.12	0.10	-0.17	0.08
Ontario	-0.28***	0.11	-0.24***	0.75
Constant	5.12***	0.11	3.32***	0.13
R^2	0.75		0.72	
Observations	195		195	

Notes: For robust test, there are 3 observations of extra large shares. They are all suitable for extended family of more than four vegetable loving family member. Standard errors are clustered by farm.