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Making Sense of the Dollars Spent at Farmers' Markets

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Abstract

The habits, preferences and demographics of consumers at farmers' markets are topics of interest as the number of markets burgeon across North America. This study, using a survey (via interview), researches five markets near Vancouver, British Columbia, focusing on factors associated with spending. The results reveal that spending is significantly related to frequency of shopping, type of products purchased, preferences about buying organic, parking habits, and demographics such as age, education level, ethnicity, family composition and home ownership. The study also shows that Vancouver-area farmers' market shoppers are not significantly different from those elsewhere—they too tend to be older, well-educated and disproportionately Caucasian. Results yield valuable practical strategies for market managers.

Keywords: Farmers' market; economics; consumer behavior; agriculture; urban fringe

Introduction

The level of interest in consuming local food and supporting those who grow food locally is intensifying across North America. Evidence of this can be seen in the dramatic growth in recent decades in the number of farmers' markets and in the number of customers patronizing them. In the United States the number of markets increased from 1,755 in 1994 to 3,706 in 2004 and then grew to 8,268 in 2014 (USDA 2015). In 2011 alone, 1,043 markets were established nationwide (Zezima 2011).

This growth has been paralleled in other countries, including Canada (Bukenya et al. 2007). This study focuses on Vancouver, British Columbia, and its surrounding environs. The B.C. Association of Farmers' Markets had ten new markets join in the 2010 season alone (Shore 2010) and now stands at 125 market members as of 2014 (BCAFM nd). The Vancouver area has also seen this type of growth and more markets are being considered by city council—a 2013 staff report proposed doubling the number of markets from eleven to twenty-two by 2020 (Daflos 2013). Between 2010 and 2013, the number of markets had already doubled and saw an estimated 20,000 visitors each week.

While established markets are becoming a fixture in the local food economy, the rigorous study of farmers markets, particularly farmers' markets consumers in Canada, has lagged behind. Most studies of consumer behavior and demographics originate in the US, from markets in Michigan (Conner et al. 2010), New Jersey (Govindassamy et al. 2002), California (McGarry Wolf et al. 2005), Nevada/Utah (Gumirakiza et al. 2014) and Alabama (Onianwa et al. 2006, Bukenya et al. 2007). It is uncertain whether Canadian (particularly Vancouver-area) consumers differ systematically from the findings of these studies. Given that Vancouver regularly receives attention for being considered an epicenter for local food consumption (Smith and Mackinnon 2007; Jerven 2015), and even has a year-round farmers' market, it is tempting to hypothesize that its farmers' markets may have more loyal consumers who spend more at the markets and who cut more broadly across demographic groups than has been observed at markets in other cities. Thus, one purpose of this study is to test this hypothesis and discern whether Vancouver-area farmers' markets patrons are detectably different from consumers in other studies.

Another motivation for the current study is to augment the literature which uses person-level data collection methods. To study consumers, both market managers as well as researchers usually run surveys of shoppers using the "dot" method. In this data-gathering procedure, shoppers are given small stickers which they attach to boards to indicate specific information such as amount spent, frequency of visit and reasons for buying local produce (Lev et al. 2007; Ragland et al. 2011; Connell et al. 2006; Vecchio 2009).This method of surveying has the benefit of high response rates, but the main deficiency is the data from one question cannot be linked to the data from another question. Thus, these surveys cannot answer questions such as, "Do people who value parking spend more?" or "Do people spend more if they are more highly-educated?" The current study seeks to address this weakness of dot surveys by providing data on a random sample of shoppers which is analyzed for patterns.

This paper focuses on the dollars spent at farmers' markets and how various demographic and other factors are associated with spending. The rest of the paper is laid out as follows: In section two a review of past literature focuses on consumer profiles identified in other studies while

section three details the current study's methodology, including study area, data collection and analysis procedures. Section four provides the results of the analysis and regression models, an analysis of some market attributes, and also includes a comparison of the current study with the findings of past studies. Section five concludes with implications for governments, researchers and market managers.

Literature Review

The study of farmers' markets has been expanding in the past two decades, just as the number of markets has expanded. Journal articles, government reports, and other forms of research on many aspects of markets have been published, from the ability of a farmers' market to be an incubator for entrepreneurs (Gerbasi 2006) to how cities grow and develop around long-standing markets (Yao nd). Several studies have also looked at consumer habits and demographics. The current study follows in this tradition, but this on-going line of work continues to hold value because there are differences between locations (Vecchio 2009) and over time (McGarry Wolf et al. 2005).

Consumer Profiles at Farmers' Markets

Consumer studies of farmers' market shoppers tend to center around a fairly stock set of questions which include dollars spent, goods bought, frequency of visiting markets, willingness-to-pay for local goods, the attributes of markets, and demographics. The amount spent at markets differs across locations, but generally tends to hover around $20 (USD) per visit (Lyon et al. 2009; Pascucci et al. 2011; Alonso and O'Neill 2011; Ragland et al. 2011; Connell 2012; Gumirakiza et al. 2014; Gallardo et al. 2015). Managers use many media for advertising the existence of markets, but surveys show that the way in which shoppers learned about a market still tends to be either passing by the market (perhaps in conjunction with seeing a roadside sign) or through word of mouth (Ragland et al. 2011; Onianwa et al. 2006; Govindassamy et al. 2002).

In numerous surveys, the demographic picture that emerges of North American farmers' market shoppers is rich, well-educated and most-often female (Vecchio 2009; Smithers et al. 2008). At New Jersey farmers' markets, Govindassamy et al. (2002) found shoppers were relatively wealthy with 45% having incomes above $60,000 (USD). In addition, they found 83% of shoppers were female, the majority of respondents were at least 51 years old, and most (62%) had graduated college. McGarry Wolf et al. (2005) examined farmers' market shoppers in San Luis Obispo, CA, and also found that they were significantly more likely to be female, married, and have completed post-graduate education, compared to the general population. Onianwa et al. (2006) found similar results when studying Alabama farmers' markets. In their work, 72% of shoppers were female, 80% had more than a high school education, 70% were married, and 90% earned more than $25,000 (USD) annually.

Internationally, the picture is fairly consistent with the profile found in the United States. Lyon et al. (2009) found Scottish consumers to be older (with a noticeable lack of shoppers in their 20s and 30s), while Murphy (2011) observed most consumers were women (68%) from pre-dominantly well-off households. Connell et al. (2006) conducted research on farmers' markets in

British Columbia, Canada and found that 69% of respondents were female and the average household annual income was $63,913 (CAD) ($72,483 USD).[1]

Not many studies include ethnicity as a variable in the surveys. Those that do however, show that the racial make-up of shoppers is not always a perfect reflection of the population of the area. Govindassamy et al. (2002) found 84% of shoppers were white in New Jersey. The 2005 US census shows New Jersey is 76% white (RPRI 2006). In Alabama, Onianwa et al. (2006) recorded 49% of their sample as white. Madison and Jefferson counties (in which their two markets were located) contain 68% and 53% white residents respectively in the 2010 US census (IndexMundi nd). In Alabama, Bukenya et al. (2007) did a telephone survey of food shoppers and analyzed which factors led to shopping at farmers' markets. They found race to be a significant variable with white shoppers 2.3% more likely than non-white shoppers to patronize farmers' markets. Gallardo et al. (2015) found 81% of the customers in their study to be Caucasian. Given the paucity of published data on the racial composition of farmers' market consumers, the current study makes a significant contribution.

Willingness-to-Pay for Local Food

Besides general consumer demographic characteristics and shopping habits, another area of exploration in farmers' market literature is centered on the perception of price at the markets compared to grocery stores, and whether shoppers are willing to pay more for local or direct-sales produce.

On the first question—perception of price levels at farmers' markets—Murphy (2011) discovered that higher prices at farmers' markets was the top negative influence on attending them, but noted that the effect was still moderate overall, and smaller still for frequent customers. In Bukenya et al. (2007), a model was employed to determine significant factors that lead to farmers' market or grocery store shopping. Those who said that price is a very important factor are 12% more likely to shop at a grocery store compared to those who gave another category.

It is conceivable that customers who aren't very price sensitive are more attracted to farmers' markets. In Feagan et al. (2004), 66% of shoppers believed the farmers' markets produce would be the same price or more expensive than elsewhere, but only 7% said price was a motivating factor in their decision to go to a market. In general, it appears that though prices are generally believed to be higher at farmers' markets, consumers are willing to pay those prices for locally-sourced products which are perceived to be of higher quality.

The second question – whether consumers are willing to pay more for locally-grown products – is a burgeoning area of research, but most studies find the answer is a decisive yes (Feldmann and Hamm 2015). Thilmany et al. (2008) found that the willingness-to-pay for a locally-sourced melon depended significantly on the "perceived economic support of agriculture" and the "relationship with land and environmental benefit."

[1] All currency exchange rate calculatons were performed using Bank of Canada's historical annual average data for the year in question (Bank of Canada nd).

Loureiro and Hine (2002) discovered the willingness-to-pay price premium for a local potato to be about 10% more than the price premium for either organic or GMO-free. Contrasting a general population mail survey with a farmers' market dot survey, Lev and Stephenson (1998) found the price premium the general population is willing to pay for local products is 6%, whereas farmers' market shoppers average a 29% price premium. In a similar vein, Darby et al. (2008) showed that while both direct-market shoppers and grocery store shoppers had a positive willingness-to-pay for a local product, the direct-market shoppers displayed nearly twice the price premium. Finally, Carpio and Isengildina-Massa (2009), calculated that South Carolinians are willing to pay an average price premium of 27% for locally-grown produce and 23% for local animal products.

Methodology

Study Area

The area under investigation is the Lower Mainland of British Columbia, Canada. Vancouver, the economic and political epicenter, is Canada's third-largest city based on population, containing 2.4 million residents in the metropolitan area (Statistics Canada 2011a). The City of Vancouver, which is home to two of the five markets under consideration in the current study, covers just 114 square kilometers. This gives it a population density of 5,249 people per square kilometer, making Vancouver the most densely-populated Canadian municipality, and the fourth most densely-populated city over 250,000 residents in North America, behind New York City, San Francisco, and Mexico City (Statistics Canada 2011b). This fact is relevant because farmers' markets often appeal to the nearby community who can access the market on foot (Stegelin 1992).

The other municipalities under consideration—Surrey, Langley and Abbotsford—represent the suburban segment of farmers' markets. Surrey, being the closest to Vancouver, is the largest with 484,000 people (in 2011) and a rapid transit link to downtown Vancouver (BC Stats 2014). In fact, the farmers' market is located adjacent to a Skytrain station in central Surrey. Langley, located east of Surrey, had a total population in 2011 of 133,000 (BC Stats 2014), and Abbotsford, the eastern-most municipality—located approximately an hour's drive outside of Vancouver—had 138,000 residents in 2011 (BC Stats 2014).

Awareness of the benefits of supporting local agriculture is high in the Lower Mainland and the area is considered on the cutting edge of food system planning (Fodor 2011). The Province of British Columbia has long been recognized as a leader in the protection of farmland through its agricultural land zoning policy, the Agricultural Land Reserve (ALR). The ALR however has not been particularly successful at keeping land under urban development pressure in *active* agriculture (Stobbe et al. 2009). As a result, governments on several levels and the non-profit sector are vigorously promoting the growth of the local food system—of which, farmers' markets are a small but crucial component—in the hopes of increasing the financial viability and sustainability of farming in the region (Curran and Stobbe 2010).

Survey Methodology

The current study uses a survey of farmers' markets' consumers that was conducted between June and September, 2011, at five farmers' markets in or near Metro Vancouver that represent a cross-section of urban and suburban markets. The markets are the Kitsilano Farmers' Market and the Trout Lake Farmers' Market in Vancouver, plus the Surrey Urban Farmers' Market, the Langley Community Farmers' Market, and the Abbotsford Farm and Country Market. The dates of surveying correspond to the height of the local growing season and to the highest period of demand typically seen at farmers' markets.

The survey was administered in-person, asking a variety of questions from products bought, to the importance of amenities at the market, to demographics. (See Appendix 1 for a list of variables collected). Researchers invited participation from shoppers randomly as they exited the market, similar to other studies in the literature (Pascucci et al. 2011; Gumirakiza et al. 2014). The survey took approximately ten minutes to complete, and garnered a good response rate with approximately 75% of shoppers approached completing the survey (Siebring 2013, Smithers et al. 2008).[2] The sample has roughly equal numbers of surveys completed at each of the markets. This is more reflective of the cost of sampling rather than the markets' sizes. (The Vancouver markets are larger but were the most costly to sample in terms of surveyor wages and mileage costs.)

The results of a survey such as this rest upon achieving a balanced sample which reflects the underlying population of shoppers at farmers' markets. A completely randomized, scientific sample was not possible, but steps were taken to attain as representative a sample as possible through inviting participation randomly. Surveying was done on multiple days throughout the season[3] and at various times of operation. Surveying was conducted by the author and a research assistant. Surveyors either stood at multiple exit points (when working together) or at random exit points (when working alone).

Analysis Methodology

All data were managed with Microsoft Excel, spatial analysis was conducted with ArcGIS, and all regressions and other tests were run with STATA 10. Regressions followed a conventional Ordinary Least Square (OLS) design and models were created to explain various aspects of consumer's behavior and characteristics. OLS was chosen because the key variable of interest (spending at farmers' markets) is quantitative, and the models do not exhibit high degrees of multicollinearity which can make OLS unreliable.[4]

[2] The most common reason given for not wanting to participate in the survey was a time constraint on the part of the shopper. This may have led to non-response bias with retired people and people without children being over-sampled. However, without data on non-respondents there is no way to test this conjecture.

[3] The surveying was done during five different trips to the Surrey market, four trips to Langley, three trips to Abbotsford and two different trips to each of the Vancouver markets.

[4] The two models presented both have Variance Inflation Factors (VIFs) that are well below levels where concern may arise (O'Brien 2007). The two models have average VIFs of 1.31 and 1.37 respectively, with no VIF over 1.84 or 1.88.

To analyze the principal variable of interest—spending—two models are presented. The first model uses unadjusted spending, as reported by survey respondents. Due to the skewed nature of this variable (see Figure 1), a log-spending model was also calculated. The independent variables included in the modeling procedure have all been included in similar studies or have theoretical reasons for being considered (see Appendix 1). The final models were estimated using a step-wise approach, maximizing adjusted R^2 (Verbeek 2012, 66). The significance level chosen for the step-wise approach was 0.25. The sample sizes of the final models differ due to the fact some respondents declined to answer a specific question (e.g. two refused to answer "What is your age?" and another two refused to answer "Do you own or rent your dwelling?").

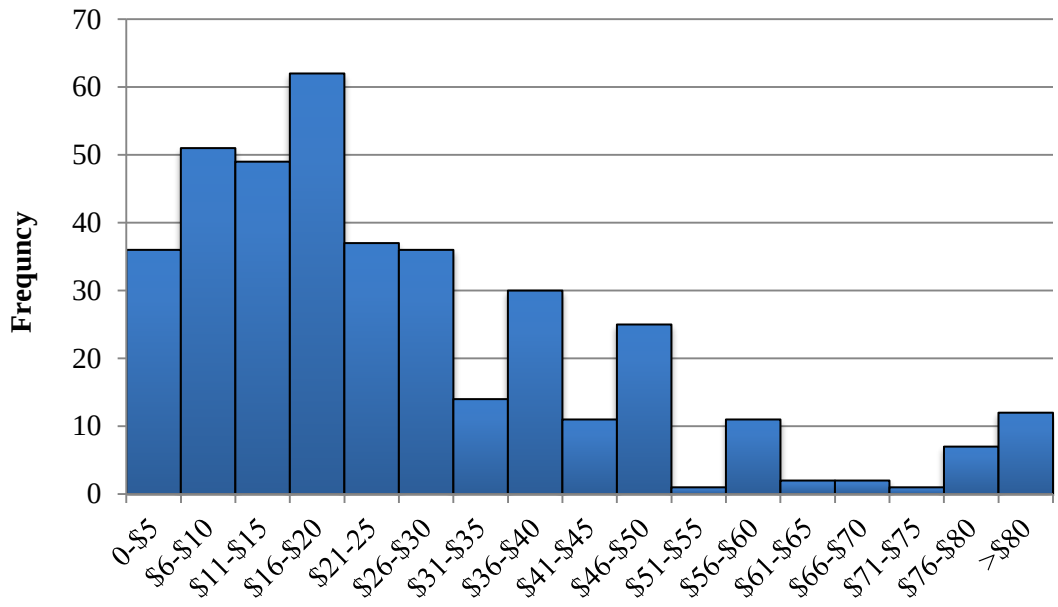

Figure 1. Histogram of dollars spent (n=390)

Results

Descriptive Statistics

Ultimately, 390 surveys were completed with a roughly equal split between the five locations: 74 from Kitsilano, 76 from Trout Lake, 77 from Surrey, 86 from Langley, and 77 from Abbotsford. The survey revealed that shoppers at farmers' markets spend $28.30 (CAD) ($27.99 USD) on average each visit, but this amount is highly variable with a median of $20 (Figure 1).

Shoppers at these farmers' markets are generally not there because they are looking for cheap food. Nearly 54% of respondents expected farmers' market products to be more expensive than grocery stores (with a further 30% saying they expected them to be priced about the same). When asked how much more (in percentage terms) they would be willing to pay for farmers' market products compared to grocery stores, the answers varied between 100% more to 15% less (Figure 2). The average was approximately 25% more.

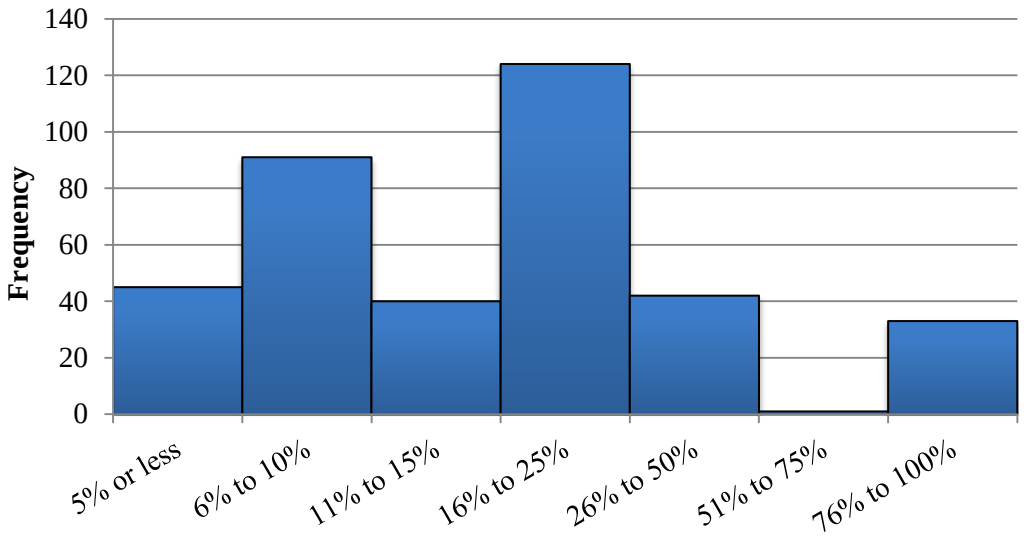

Figure 2. Histogram of willingness-to-pay (in percentage) for farmer's market products over grocery stores

In terms of products purchased, the majority of shoppers bought produce (fruit, vegetables or mushrooms), with a sizable minority also buying baked goods (Figure 3). The other categories were all purchased less commonly. These categories include dairy or cheese, meat, fish or eggs, food or beverages, artisan or processed foods (such as honey, preserves or spices), flowers or plants, and other goods (such as crafts or clothes).

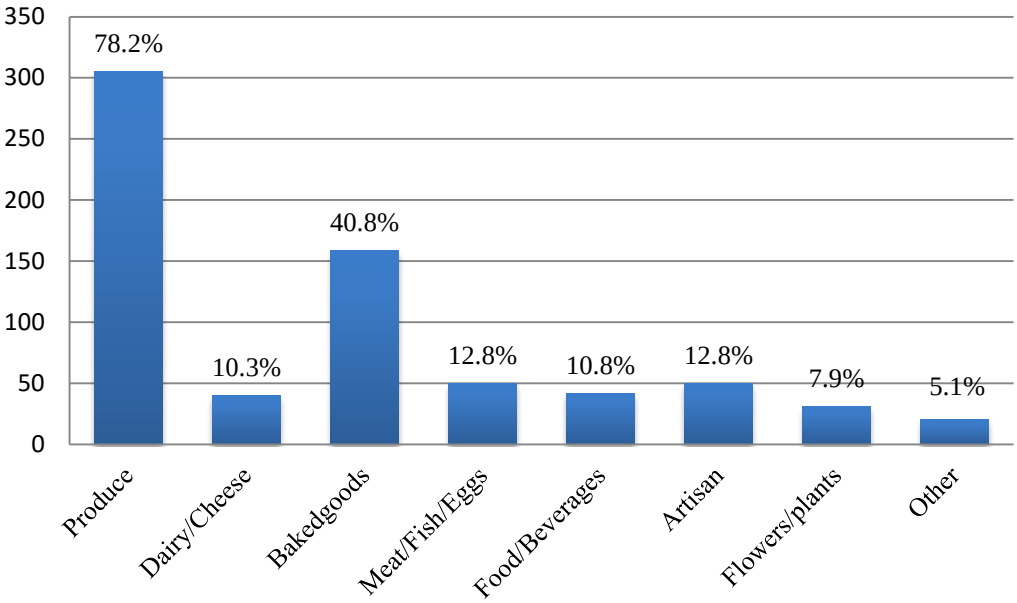

Figure 3. Bar graph of products purchased at the markets

Shopper tend to plan their visits. Of the 390 respondents, 321 (82.6%) planned their visit to the market that day, which means only 17% stopped in spontaneously after seeing a sign or the market itself. Predictably, a much great proportion of first-time shoppers had unplanned visits

compared to repeat shoppers. About a third of the respondents were weekly visitors to the farmers' markets and 23% were first-time visitors that day (Table 1).

The presence of parking is a feature that seems to be highly valued by some and not at all by others. Just over a quarter of respondents classified it as "extremely important"—meaning they would not come to the market without parking. Whereas 39% classify it as "not important"—meaning they do not use parking, choosing instead to walk, bike, or take public transit to the market. This is a variable that shows considerable disparities between the urban markets (which tend to be near public transit hubs and near areas of high population density) and suburban markets (Table 1).

Table 1. Summary of frequency and parking, by market

	Kitsilano	**Trout Lake**	**Surrey**	**Langley**	**Abbotsford**	**Total**
Frequency of visiting						
First time	12.6%	11.5%	31.0%	29.9%	14.9%	**22.3%**
1-3 visits per season	19.0%	25.4%	12.7%	20.6%	22.2%	**16.2%**
Monthly	17.5%	30.0%	27.5%	5.0%	20.0%	**10.3%**
Bi-weekly	22.5%	21.1%	9.9%	19.7%	26.8%	**18.2%**
Weekly	21.7%	17.8%	18.6%	24.0%	17.8%	**33.1%**
Importance of Parking						
Extremely important	12.3%	15.8%	14.3%	45.3%	41.6%	**26.5%**
Moderately important	23.3%	15.8%	13.0%	33.7%	29.9%	**23.4%**
Slightly important	6.8%	17.1%	10.4%	10.5%	10.4%	**11.1%**
Not important	57.5%	51.3%	62.3%	10.5%	18.2%	**39.1%**

The demographics of the respondents show it is a group with varied ages, with a mean age of 48 years (Figure 4). When broken down by frequency of shopping at the market, there is a significant difference in ages. First time shoppers' average age was 43.6 years, one to three visits per season shoppers' average age was 46.9, monthly shoppers' was 47.8, biweekly shoppers' was 49.5, and weekly shoppers averaged 50.8 years. When tested using ANOVA, these groups are different (p-value 0.0101) and a Fisher's Least Significant Difference Test reveals that first time shoppers are significantly younger than biweekly and weekly shoppers at the 5% level. This analysis suggests that committed, regular shoppers at farmers' markets tend to be slightly older than less-regular shoppers. It is also possible that people become more committed shoppers as they age.

In terms of gender, the sample was largely women (81%). This likely overstates the gender bias at these markets though because when male-female couples were approached, the woman tended to respond to the survey with the male partner giving input (Siebring 2013).

The survey respondents tended to have home gardens with 59% growing some vegetables or herbs in either a kitchen garden or a container garden. Vegetarians and vegans were not common – over 85% of the sample consumes animal products.

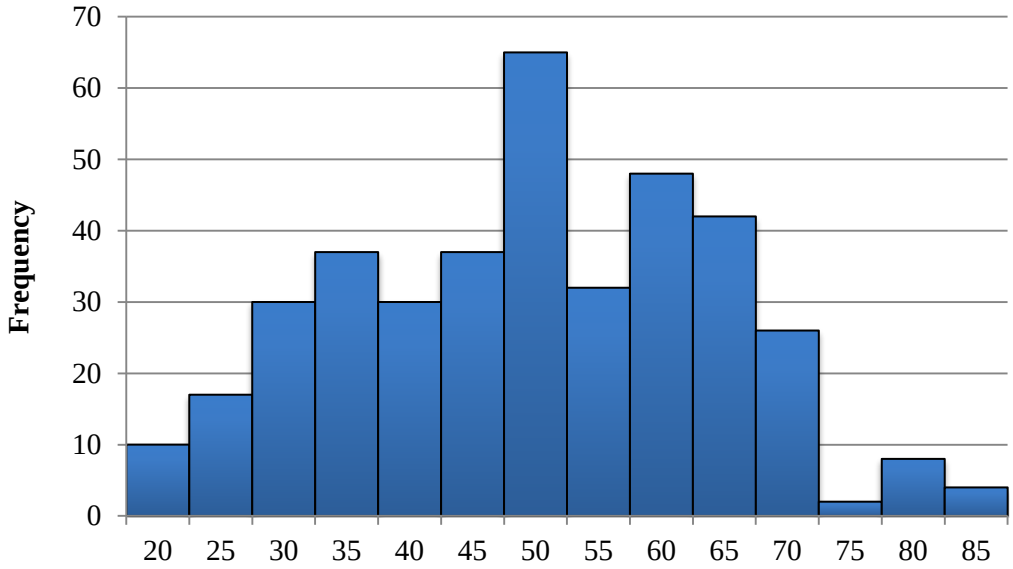

Figure 4. Histogram of Ages

The survey respondents tended to have home gardens with 59% growing some vegetables or herbs in either a kitchen garden or a container garden. Vegetarians and vegans were not common –over 85% of the sample consumes animal products.

The survey respondents were well-educated: more than 75% of them had an undergraduate degree, trade or technical certification, or higher. As is evident in Table 2, shoppers at farmers' markets are consistently and significantly more educated than the underlying populations according to census data. This is particularly striking looking at the rates of educational attainment in Vancouver.

In terms of home ownership, 68% of the sample owned their own home (Table 2). Comparing the results market-by-market to census data, Trout Lake, Langley and Abbotsford shoppers were significantly more likely to own their homes compared to the average rates for those areas, while Surrey shoppers were significantly less likely to own their homes (Statistics Canada 2006). The lower rates of home ownership in Surrey may reflect the fact that the market is adjacent to a public transit hub and more renters use public transit than home owners (Berube et al. 2006).

Distance from the market was calculated (via a GIS program) by recording the postal codes of the respondents. The average distance was 7.9 km and the median was 4.8 km. There was considerable variation—the standard deviation was 8.8 km—with a minimum value of 200 meters and a maximum of almost 65 km.

Table 2. Comparison to census data for education levels and home ownership rates, by municipality (Statistics Canada 2006)

	Grade and high school	Some college, trade/ technical	Undergraduate degree or trade/technical	Graduate school or professional degree	Home ownership rates
Trout Lake	5.3%***	11.8%**	52.6%***	30.3%***	61.8%**
Kitsilano	1.4%***	2.7%***	51.4%***	44.6%***	52.7%
Census (Vancouver)	*35.6%*	*21.5%*	*28.9%*	*13.7%*	*48.1%*
Surrey	20.8%***	15.6%*	52%***	11.7%*	53.2%***
Census	*47.1%*	*23.8%*	*22.4%*	*6.7%*	*75.2%*
Langley	10.5%***	11.6%***	65.1%***	14%***	88.2%*
Census	*43.9%*	*25.7%*	*24.7%*	*5.7%*	*79.9%*
Abbotsford	10.5%***	13.1%*	52.8%***	23.9% ***	82.9%**
Census	*51.3%*	*22.3%*	*20.7%*	*5.7%*	*72.7%*
Total	**10.5%**	**13.0%**	**52.7%**	**23.8%**	**68.3%**

Note. T-tests performed to compare sample proportion to census parameter. *** denotes 1% significance level, ** denotes 5% level, and * denotes 10% level.

Regression Models on Spending

The number of dollars spent at a farmers market is a key variable of interest for market managers, producers, and those interested in questions of policy. Appendix 2 shows two regression models—one for the money spent in dollars and, because of the moderate skew in the distribution of the dollars spent (Figure 1), a natural logarithm was included as well.[5] The adjusted R^2s for the models are 41% and 42% –a respectable level for social science research which is inherently complex and multidimensional (Frost 2013).

The regression shows that many factors are significantly related to dollars spent. Location plays a role as Langley shoppers spent $13.47 less than the base case of Vancouver shoppers (at Trout Lake or Kitsilano), while Surrey shoppers spent $10.63 less and Abbotsford shoppers spent $10.89 less. Compared to all other frequency-of-attendance categories, weekly shoppers spent $8.83 more; thus, the more loyal a shopper is, the more they tend to spend. Not surprisingly, when shoppers buy additional products their overall spending increased.

The model shows that those who say they always buy organic products spent $15.26 more than the other categories of organic buying (usually, often, seldom or never). When looking at how the consumers learned of the market's existence, those who reported word-of-mouth or social media spent $4.01 more than those who learned about it through other means. In terms of parking, those who said parking is "extremely important" spent $6.99 more and those who said "moderately important" spent $6.50 more than those who value parking only marginally or not at all. This could imply that people who drive to the market buy more because they have an easier time transporting their purchases back home.

[5] As one can observe in Appendix 2, the models are very similar in terms of the number of variables and their magnitude. Therefore, the rest of the discussion will proceed to focus on the original values.

Demographically, this models shows that certain categories of people systematically spend more than others. As is logical, the number of people living in the household is related to spending. For every additional adult in the household, the shopper spent an increased $2.15. People who own their own homes spent $6.41 more than renters. Higher education also led to higher spending— those with graduate education or professional degrees spent $11.18 more and those with undergraduate degrees or trade/technical certification spent $5.65 more compared to all other levels of education. The home ownership and education results may point to a wealth effect as home ownership and education are generally correlated with higher incomes.

Race also proved to be a significant factor in explaining spending. Those identifying an Asian ethnicity spent $8.15 less than those with a Caucasian/European ethnicity, while Middle-Eastern or African ethnicities spent $20.33 more on average. The "other" ethnicity category, which included people of First Nations background, spent $35.25 more, but this result should be used with caution as the sample size of the "other" category was very small. More research is needed on the racial make-up of farmers' market consumers before any conclusions can be drawn.

The distance variable was weakly significant but did not have a large effect on spending (just $0.22 per km). This is likely because the parking variable already accounted for the ease of transporting groceries home. Considering just those who replied that parking is not important to them (usually because they did not drive to the market), distance remains weakly significant (p-value of 0.093) but the effect is still not large (just a $0.33 decline for every additional km travelled). It seems like distance from the market is not tied strongly to spending. More broadly speaking, the implication of examining distance in this study is that farmers' markets are not principally attracting nearby neighbours but cast a much wider net.

Attribute and Amenity Analysis

Many past studies have asked shoppers about which amenities or attributes of farmers' markets they place value upon or attracted them to the market (McGarry Wolf et al. 2005; Thilmany et al. 2008; Connell et al. 2008; Lyon et al. 2009; Conner et al. 2010; and Ragland et al. 2011). The current survey asked respondents to rank the importance of eleven attributes or amenities on a four-point scale (1–being not important, 2–slightly important, 3–moderately important, and 4–very important). These amenities were analyzed several ways, including being included in the regression analysis. As displayed in Appendix 2, only a few of the categories remained in the final models, and only one of these was (borderline) significant (p-value of 0.083) in the log spending model. People who said the characteristic of being locally produced (to support small/local businesses) was "very important" to them tended to spend $1.19 more. The fact that values for amenities and attributes don't explain variation in spending is interesting because it suggests that once demographics and other factors are taken into account, the relative importance placed on market amenities alone doesn't determine spending.

Following the methodology of Connell et al. (2008), another way to look at the attribute and amenity data is to rank which characteristics were rated as most important (Table 3). When the attributes are ranked in this way, it is interesting to note that food attributes—those attributes which deal directly with the food itself, such as freshness and taste –are generally considered the most important. Process attributes—how the food is grown or produced—tend to rank next, and

market attributes—specific qualities of the market, such as the sociability, convenience or cleanliness of the market—tend to rank lowest. When these attributes are ranked by frequency of shopping at the market (Table 4), the same general patterns hold, with the availability of artisan products and the ability to interact with farmers ranking the lowest.

Table 3. Attribute and amenity ranking

Ranked Attributes	Average	Attribute/amenity type
Taste of produce or food	3.93	Food attribute
Freshness of produce or food	3.92	Food attribute
Supporting local business	3.81	Process attribute
Benefits local environment	3.71	Process attribute
Cleanliness/appearance of market	3.50	Market attribute
Variety of produce or food	3.38	Food attribute
Convenience	3.27	Market attribute
Organic availability	3.17	Process attribute
Social aspect of market	3.08	Market attribute
Ability to interact with farmers	2.86	Market attribute
Artisan goods' availability	2.72	Market attribute

Table 4. Ordered attributes by frequency of shopping

Weekly (n=129)	Twice Monthly (n=71)	Monthly (n=40)	1-3 Times Season (n=63)	First Time (n=87)
3.91 Freshness	3.94 Freshness	3.88 Taste	3.97 Taste	3.94 Freshness
3.89 Taste 3.89	3.94 Taste	3.83 Freshness	3.92 Freshness	3.94 Taste
3.74 Local Bus.	3.84 Local Bus.	3.68 Local Bus.	3.79 Local Env.	3.89 Local Bus.
3.71 Local Env.	3.70 Local Env.	3.55 Local Env.	3.77 Local Bus.	3.72 Local Env.
3.60 Cleanliness	3.56 Cleanliness	3.38 Cleanliness	3.43 Variety	3.49 Cleanliness
3.39 Variety	3.30 Variety	3.35 Convenience	3.41 Cleanliness	3.41 Variety
3.29 Convenience	3.06 Social	3.31 Variety	3.36 Organic	3.35 Convenience
3.14 Social	3.06 Convenience	2.75 Organic	3.26 Convenience	3.33 Organic
3.11 Organic	2.99 Organic	2.73 Social	2.96 Social	3.22 Social
2.84 Artisan	2.94 Farmers	2.61 Farmers	2.82 Artisan	3.08 Farmers
2.75 Farmers	2.92 Artisan	2.39 Artisan	2.68 Farmers	2.59 Artisan

Comparisons with Past Studies

It is an advantage to the current work that studies on farmers' markets consumers have been relatively uniform in the areas investigated. It is possible to compare the current results to those past results to determine if they are systematically different from the norm.

The current study revealed that shoppers at farmers' markets near Vancouver, Canada spent on average $28.30 (CAD) ($27.99 USD). This is consistent with the range found in other studies. Ontario farmers' market shoppers spent $27.46 (CAD) ($29.27 USD) (Smithers et al. 2008), Canadians on average spent $32.06 (CAD) ($36.61 USD) (Connell 2009), Alabama shoppers spent $22.20 (USD) (Onianwa et al. 2006), Washington D.C. shoppers spent $23.93 (USD) (Vecchio 2009), Nevada/Utah shoppers spent $24.78 (USD) (Gumirakiza et al. 2014), Washington state shopers spent $21.65 (USD) (Gallardo et al. 2015), and Italians on average spent €19.63 ($26.73 USD) (Pascucci et al. 2011).

One third of the respondents in this survey reported being weekly shoppers and almost a quarter were first-time shoppers. Other studies of farmers' market consumers have found similar patterns, with variation (Table 5).

Table 5. Comparison with past studies on frequency of shopping

	Vancouver	**Ontario**	**Canada**	**New Jersey**	**Washington DC**	**Scotland**	**Italy**
First-time	*22%*	6%	25%[a]	5%	29%	17%	11%
One to three visits/season	*16%*		-	-		-	
Monthly	*10%*		-	24%		39%[b]	
Biweekly	*18%*		27%	21%		-	
Weekly	*33%*	52%	48%	50%	30%	45%[b]	25%

Notes. [a] Connell (2009) used a category of "infrequent" to mean first-time or very infrequent attendance. [b] Lyon et al (2009) used categories of first time at the market, visited the market a few times, and visited the market many times. A dash in a category means that category was not included in that survey, a blank means the result was not reported in the paper.
Sources. Vancouver (Current study); Ontario (Smithers et al. 2008); Canada (Connell 2009); New Jersey (Govindassamy et al. 2002); Washington DC (Ragland et al. 2011); Scotland (Lyon et al. 2009); Italy (Pascucci et al. 2011).

The average age of shoppers in this study is 48. Previous studies have found the average Alabama shopper is 41.4 years old (Onianwa et al. 2006), the average Nevada/Utah shopper is 42 (Gumirakiza et al. 2014), the average Washington state shopper is 47.2 (Gallardo et al. 2015), and the average Italian shopper is 55 (Pascucci et al. 2011). In Scotland, there was a noticeable lack of younger people under 20 years and from 21 to 30 years in all the markets. Most consumers were in their 40s, 50s, and 60s, with smaller proportions in their 30s and 70s (Lyon et al. 2009). This mirrors the current study's results.

Education is a demographic feature that has been well-studied at farmers' markets and the current study's results are consistent with other findings. As Table 2 shows, 52.7% of the current sample had an undergraduate degree or completed technical or trade school, and a further 23.8% had attained a graduate degree or professional degree or had attended graduate school. Some other studies have found:

- 62% of New Jersey shoppers had graduated from college (Govindassamy et al. 2002)
- 80.2% of Alabama shoppers had more than a high school education (Onianwa et al. 2006)
- 37% of Italian shoppers had university degrees, compared to the Italian average of just 10% in the 2001 census (Pascucci et al. 2011)
- The average shopper in Utah/Nevada had a college-degree, and when clustered based on spending, those who spent the most had significantly more education than the medium or low spenders (Gumirakiza et al. 2014)
- 76% of Washington state shoppers had at least some college education (Gallardo et al. 2015)

Unfortunately, other studies often do not break post-secondary education into undergraduate and graduate so it impossible to compare specific statistics. But the overall picture is clear: farmers' market patrons are much more highly educated than the general population and Vancouver extends this pattern.

Ethnic background of shoppers is not a well-studied variable at farmers' markets. As discussed in the literature review, some studies have shown that white shoppers are disproportionately represented at farmers' markets (Govindassamy et al. 2002). In their work in Michigan, Conner et al. (2010) found that there was a preponderance of white and higher-class values at the farmers' markets.

In the current survey, 91.2% of the respondents were white (Caucasian or European descent) while 5.3% identified as Asian ethnicity, and just 3.5% fell into a different category. Just over 80% of respondents were born in Canada. This is markedly disproportionate with the ethnic make-up of the underlying population where visible minorities make up 51% of Vancouver's population (Ministry of Attorney General BC 2008), 52.6% of Surrey (Statistics Canada 2011c), and 22.8% of Abbotsford's (Ministry of Attorney General BC 2008). The reasons for these disparities were not a focus of the current work and remain an area for future investigation.

Conclusion

This work adds to the literature on farmers' market shoppers and specifically furnishes information about which factors are correlated with higher spending. The most important factors associated with higher spending include the frequency of visiting the market, if the consumer sets out to always buy organic, if they value the availability of parking, if they own their home, and if they are highly educated. These results can provide insights for various groups including market managers and local policy-makers as well as scholars of consumer behavior.

Market managers can devise from this work many practical tips and strategies for managing their markets more effectively. For instance, since a large proportion (about a quarter) of visitors are still first-timers at the markets, the importance of clear and appealing signage may still hold relevance (particularly in Surrey and Langley) as well as other marketing strategies – including

the prominent use of social media, as this is positively associated with increased spending. Since families with children tend to spend more, markets should consider being family-friendly with activities to keep children engaged such as free samples, live child-friendly entertainment or a portable petting zoo from a local farm.

Another practical result of this study for market managers relates to the ethnic make-up of farmers' markets in this area. Though it is not well-understood why non-Caucasians are not coming to farmers' markets, there exists the possibility of increasing sales and visits by targeting these groups to increase awareness of the market and to welcome them to shop there. More than 80% of the study's sample was born in Canada, so targeting immigrant communities may also be beneficial. More research which examines the racial make-up of the vendors may help shed light on the attendance rates of various racial groups.

One issue that perennially arises for many farmers' markets is securing adequate parking. Since half of shoppers reported parking to be "moderately" or "extremely" important, it is an issue that both market managers and city policy-makers cannot ignore if they wish to maintain or enhance their commitment to the local food system. A temptation may be to de-emphasize parking while making other options for transit more conspicuous such as biking and walking. While this may have air quality and public health benefits, this study shows that shoppers who do not drive also purchase less (in dollars) from the market, likely because they are constrained by how much they can carry. Parking is particularly important to the Langley and Abbotsford markets.

This study has added to the consumer behavior literature to help understand the purchasing habits and motivations of shoppers. However, several questions remain unanswered and will be left for future research. These include the reason for the skewed ethnic make-up of farmers' market shoppers, and how shoppers' perceived WTP is related to their actual WTP as displayed by their shopping behavior. Another area of future research could explore how and if casual shoppers become regular shoppers over time. One result from this study suggests that younger shoppers attend the market less often than older shoppers. Is it that markets are failing to "keep" their younger customers, or is it typical for younger people in general to not be stable repeat customers for this type of business?

Finally, the relationship between wealth, education, and shopping at farmers' markets is not clear. Though farmers' market consumers are undoubtedly better educated than the general population (as demonstrated by this study and many others), it is not evident whether education has a direct effect (i.e. more educated people understand the benefits that farmers' markets may have on the local agricultural economy) or whether it is an indirect effect (i.e. wealthy people tend to shop at farmers' markets and wealth is correlated with education). If it is the former, this could represent an opportunity for market managers and policy makers to encourage farmers' market shopping by launching public education campaigns which seek to bolster the public's knowledge of the environmental and economic sustainability of the local food system.

This study has sought to augment the literature on farmers' market consumers, particularly in the Canadian and Vancouver-area contexts. Though Vancouver is known as a hotbed of local food consumption, this study revealed that it is not substantially different in many aspects from other cities' farmers' market shoppers, including age, frequency of attending farmers' markets, the amount spent there, and education levels.

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Appendix 1

Table A1 List of variables collected, coding, and hypothesized sign in regression model for spending (if theory exists)

Qualitative Variables	Description of Coding	Hypothesized Sign
Location: Kitsilano, Trout Lake, Langley, Surrey and Abbotsford	1 if respondent from that market, 0 otherwise	
Frequency: first-time visitor, visits one to three times per season, monthly visitor, bi-weekly visitor, weekly visitor	1 if respondent reports the given frequency, 0 otherwise	+ for more frequent visitor
Planned visit that day	1 if visit to market was planned, 0 otherwise	+
Products purchased: produce (fruit, vegetables or mushrooms); baked goods; meat, fish or eggs; dairy or cheese; food or beverages; artisan or processed goods; flowers or plants; other	1 if purchased product category, 0 otherwise Note 1: food or beverages refers to food truck sales at the markets; artisan or processed goods refers to processed food products (i.e. honey, preserves, spices); and other refers to all else including clothes, jewelry and soap	
Organic purchase frequency: always, usually, often, seldom, and never	1 if respondent reports given frequency of choosing organic products, 0 otherwise	+ for stronger organic preferences
Expectations of farmers' market prices compared to grocery stores: expects FM is more expensive; expects FM is same price; expects FM is less expensive	1 if respondent reports given expectation, 0 otherwise	
Market attributes: freshness of produce or other food; taste of produce or other food; variety of produce or other food; availability of organically grown produce or other food; locally produced (for environmental reasons); locally produced (to support local businesses); ability to interact with farmers; availability of artisan or other processed goods; social atmosphere; convenience; cleanliness/appearance	Rated on a scale of 1 to 4, with 1 indicating "not important", 2 indicating "slightly important", 3 indicating "moderately important" and 4 indicating "very important"	+ for stronger preferences for attributes of farmers' market
How they learned of farmers' market: word of mouth or social media; mass media; roadside signage or passing by	1 if respondent reported given way they learned of market's existence, 0 otherwise	
Importance of parking: very important, moderately important, slightly important, or not important	1 if respondent reported given category of importance for parking, 0 otherwise	
Garden	1 if respondent has home garden, 0 otherwise	– for having a garden
Gender	1 if a woman, 0 if a man	
Own home	1 if respondent owns their home, 0 if a renter	+ (proxy for income)

Table A1. List of variables collected-*Continued*

Primary shopper	1 if primary shopper, 0 otherwise	
Eats meat (i.e. not vegetarian or vegan)	1 if respondent eats meat, 0 if otherwise	
Education level: high school; some college or trade/technical school; undergraduate degree or trade/technical completed; some graduate education or graduate/professional degree	1 if respondent has attained the given level of formal education, 0 otherwise	+ for higher education levels (proxy for income)
Ethnicity: Caucasian, Asian, African or Middle Eastern, other	1 if respondent reported given ethnicity, 0 otherwise	
Born in Canada	1 if born in Canada, 0 if otherwise	
Quantitative Variable	**Units of measurement**	**Hypothesized sign**
Spent ($)	Dollars spent at the market that day	
WTP (%)	The average premium (expressed as a percentage of the price) that a respondent is willing to spend on farmers' market goods over conventional grocery store equivalents	+
Age	Age of respondent (years)	
Adults (number in household)	Number of adults living in respondent's household	+
Children (number in household)	Number of children (18 years or less) living in respondent's household	+
Distance to market (km)	Respondents reported postal codes allowing researchers to calculate distances with GIS	–

Appendix 2

Table A2. Regressions with spending and log spending as dependent variables (n=367, n=352)

	Spending Model		Log Spending Model	
Variable	**Coefficient**	**P-Value**	**Coefficient**	**P-value**
Abbotsford	-10.8876***	0.001	-0.3488***	0.002
Langley	-13.4695***	0.000	-0.3779***	0.000
Surrey	-10.6303***	0.001	-0.4749***	0.000
First-time visitor	-4.6195	0.118		
Twice monthly visitor			0.2220**	0.025
Monthly visitor			0.1995	0.104
Weekly visitor	8.8302***	0.000	0.3649***	0.000
Planned visit that day			0.2700***	0.007
Bought produce (fruit, veg. or mushrooms)	8.5793***	0.002	0.4114***	0.000
Bought baked goods	5.1932**	0.024	0.1844**	0.011
Bought meat, fish or eggs	11.8786***	0.000	0.2934***	0.004
Bought dairy or cheese	8.1734**	0.023	0.2509**	0.027
Bought food or beverages	13.7059***	0.000	0.3742***	0.001
Bought artisan or processed goods	7.3887**	0.023	0.2811***	0.006
Bought flowers or plants	10.1386***	0.010	0.2676**	0.029
Bought other products	15.5707***	0.006	0.5706***	0.001
Buys organic always	15.2613***	0.000	0.2694**	0.031
Buys organic often			-0.1118	0.219
Buys organic seldom			-0.1320	0.176
Variety rated as “very important”	3.0561	0.183		
Artisans rated as “very important”	-3.1033	0.217		
Freshness rated as “very important”			0.1816	0.182
Supporting local business rated as “very important”			0.1727*	0.083
Ability to interact with farmers rated as “very important”			-0.1094	0.148
Convenience rated as “very important”			-0.0895	0.178
Learned of market by word-of-mouth or social media	4.0055*	0.071	6.4975	
Parking extremely important	6.9898**	0.020	0.1891**	0.045
Parking moderately important	6.4975**	0.021	0.2043**	0.025
Age	0.0991	0.248		
Adults (number in the household)	2.1472*	0.061	0.1090***	0.003
Children (number in the household)	2.3906	0.123		
Own home	6.4059**	0.013	0.1817**	0.023
Eats meat (non-vegetarian)	3.6603	0.232	0.2254**	0.025
Graduate/professional degree or some graduate education	11.1775***	0.001	0.2369**	0.022
Undergraduate degree or trade/technical school	5.6510**	0.042	0.1207	0.171
Asian ethnicity	-8.1534*	0.093	-0.2659*	0.075
Middle-Eastern or African ethnicity	20.3303***	0.006	0.5170**	0.025
Other ethnicity	35.2547***	0.003	0.7456**	0.045
Distance (via road)	0.2243*	0.075	0.0076*	0.066
Constant term	-14.2702	0.045	1.2998	0.000
Adjusted R^2	0.4122		0.4210	

Note. *** denotes 1% significance level, ** denotes 5% level, and * denotes 10% level