An Evaluation of the Economic Impacts of Oklahoma Farmers Markets

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The contribution of farmers markets to the U.S. economy has become more significant due to the increased demand for fresh, locally produced products. However, compared to other marketing outlets, the economic contribution of farmers markets often goes unrecognized. This study focuses on farmers markets in Oklahoma and uses the IMPLAN model to estimate the impacts of farmers markets to Oklahoma's economy. The results from this study show that farmers market activities are a vital part of Oklahoma's economy, generating total direct sales of $3.3 million, with a total economic impact of almost $6 million.

Consumer interest in locally grown food has been increasing dramatically in the United States. The number of farmers markets, which mainly provide locally grown foods and goods, has grown significantly from 1,755 in 1994 to 4,685 in 2008, an average increase of 12 percent per year (USDA-AMS 2008). Community Supported Agriculture (CSA) has also gained popularity, increasing from two such initiatives in the mid-1980s to more than 1,000 in 1999 (Zepeda and Leviten-Reid 2004).

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In Oklahoma, a large number of the produce growers have small operations and are faced with difficulties accessing conventional retail outlets.[1] As a result, farmers markets have become a popular channel for marketing fresh produce, as evidenced by their dramatic growth. The number of registered farmers markets in Oklahoma grew from 31 in 2006 to 50 in 2008, an increase of 60 percent in a two-year period (ODA 2008). Farmers markets and other direct marketing venues can have a notable impact on local and regional economies due to the induced retention of local dollars (Hughes et al. 2008). Although a number of studies have addressed the economic impacts of farmers markets for various states in the United States, none have examined these impacts for Oklahoma. In this light, three objectives are developed for this study. The first is to provide a literature review of the studies that have been conducted with respect to farmers markets—including their associated economic impacts and shopper/vendor characteristics. The second is to give a profile of farmers markets in Oklahoma, including characteristics of market managers, customers, and vendors. The third is to measure the economic contribution of farmers markets to Oklahoma's economy.

The remainder of this paper continues in five sections. In the next section, a review of literature regarding the economic impacts of farmers markets on local and regional markets is presented. This section is followed by a profile of Oklahoma farmers markets based on survey data. A discussion of how the survey data was incorporated into an IM-

[1] A 1988 Oklahoma grower survey showed that more than half (56 percent) of Oklahoma produce farms are small (less than five acres) and these farmers use mainly farmers markets to market their produce (Henneberry and Willoughby 1989).

PLAN-based input-output model (Olson and Lindall 2000) for Oklahoma's economy is described next. Finally, results are discussed, followed by concluding remarks.

The Economic Impacts of Farmers Markets: A Review of Existing Literature

Farmers markets are a form of direct marketing where the producers bypass market middlemen and sell directly to consumers. Direct marketing is especially important for small growers as they face low farm-gate prices and wholesalers who prefer to deal with large volume producers (Eastwood et al. 2004). The increase in the number of farmers markets has been attributed to a growing consumer demand for fresh, locally grown produce; the change in the economics of agriculture; consumer interest in direct interaction with the growers; and product source knowledge (Brown 2002; Bullock 2000).

Farmers markets have been reported to provide economic benefits to producers, consumers, and local communities (Sanderson et al. 2005; Otto and Varner 2005). In particular, farmers markets provide producers with an opportunity to retain valuable returns associated with improved product quality. It has been estimated that producers realize a 40–80-percent increase in return on their product sales using farmers markets rather than traditional brokers (Lencucha et al. 1998). Although the number of producer participants in U.S. farmers markets has been growing, from 20,946 in 1994 to 66,700 in 2000, only about one-third of the participants in 2000 used such markets as their only marketing outlet (Payne 2002). Moreover, according to Payne (2002), a majority (81 percent) of U.S. farmers market vendors had sales under $10,000.

Although for many small growers income from sales at farmers markets is small and most vendors do not entirely rely on such sales for their livelihood, farmers markets play an important role for many growers and other local food suppliers. Farmers markets offer the advantage of improved market information through direct contact with the consumer (Gale 1997). This direct contact allows consumers to question farmers about their production methods (such as pesticide use) and lets farmers learn about consumers' preferences and consequently adjust and add products that meet buyers' preferences. Without this direct access to consumers, many small growers would face the additional challenge of finding and developing an appropriate marketing outlet, which is something that most small growers simply do not have time for. Insufficient volumes and stringent demands for product consistency make it difficult for small farmers to sell their goods through traditional marketing outlets (Sanderson et al. 2005).

On the demand side, past studies show that farmers market customers are primarily attracted by three factors: the overall quality of the products offered (freshness, taste, and food safety), the lower prices compared to those of comparable goods in supermarkets, and the market atmosphere (Hughes and Mattson 1992). Regarding the perceived superior quality, the vast majority (98.5 percent) of respondents to a 1997 survey of New Jersey farmers market consumers indicated that they expected the quality of produce sold at farmers markets to be better than that sold at traditional outlets such as grocery stores; a study of California markets showed that consumers perceived fresher-looking, fresher-tasting, and higher-quality produce at farmers markets when compared to supermarket produce (Govindasamy et al. 1998; Wolf, Spittler, and Ahern 2005). In Oregon, about two-fifths (41 percent) of the respondents reported that they believed food produced in Oregon was safer than food imported from outside the state (Lev 2001).

Concerning how farmers market prices compare to grocery store prices, results vary. A study of California farmers markets showed that prices in those direct markets were 33 percent lower than the supermarket prices for similar items (Sommer, Wing, and Aitkens, 1980). In a survey of West Virginia vendors, 40.1 percent indicated that their prices were roughly the same as or higher than grocery store prices, 36.0 percent said their prices were lower, while 24 percent felt their prices were significantly lower (Hughes et al. 2008). Cheaper prices were also cited by farmers market consumers, with 71 percent indicating that they preferred prices at the farmers market to those at supermarkets (Onianwa, Mojica, and Wheelock 2006).

Regarding consumers' willingness to pay a premium for local foods, Brown (2003) found that 58 percent of food consumers were unwilling to pay a premium for food products labeled as "locally grown" given that the unlabeled foods were of the same quality. However, 16 percent of consumers indicated they would pay a five-percent premium,

five-percent indicated that they would pay a ten-percent premium, and one percent said they would pay at least a 25-percent premium (Brown 2003). Another study by Darby et al. (2008) measured the value that consumers place on local production, through a choice-based conjoint analysis survey instrument. They used data from responses to a survey instrument administered to 530 shoppers at 17 Midwestern locations, including seven retail grocery stores and ten direct markets (farmers markets and on-site markets), in face-to-face interviews during the 2005–2006 period. Their results showed that shoppers at farmers markets were willing to pay almost twice as much as retail grocery shoppers for the same locally produced foods, and that both kinds of shoppers were willing to pay more for guaranteed fresh produce and favor buying food produced by small farmers over what they perceive as corporate operations. Carpio and Isengildina-Massa (2008), also using contingent valuation, found that consumers in South Carolina were willing to pay an average premium of 27 percent for local produce and 23 percent for local animal products.

Factors such as enhancing the local economy, benefiting the environment, conserving resources, building a deeper relationship with the growers, and providing a meeting place for friends and community members have also been given as reasons for shopping at local farmers markets (Cummings, Kora, and Murray 1999; Zepeda and Leviten-Reid 2004). While quality, price, and market atmosphere are the primary attractions for farmers markets, some demographic characteristics are more likely to put a premium on these factors. Several studies have shown that higher levels of education and the presence of children are significant factors in determining the likelihood of shopping at a farmers market (Onianwa, Wheelock, and Mojica 2005). Also of importance are attitudes and behaviors associated with food shopping, such as the "enjoyment of cooking" (Zepeda and Li 2006). In general, it is the combination of the factors that attract people and the type of people prone to those factors that dictates what the typical farmers market crowd looks like.

Various methodologies have been used to analyze the economic contribution of farmers markets at local, state, and national levels. Most of the research in this area has shown a significant economic impact as a result of farmers market activities. For example, Cummings, Kora, and Murray (1999) used general agricultural multipliers to estimate the economic impacts of farmers markets in Ontario, Canada. However, their methodology is quite coarse, as they apply an aggregate multiplier of 3.0 (without documenting its origin) to their estimate of total farmers market sales. A study conducted by the Economics Institute (1999) specifically asked consumers at Crescent City Farmers market in Louisiana what other businesses they visited, and how much they spent there. The report estimates that consumers at the farmers market generated over $1 million annually in direct and indirect effects to vendors, downtown businesses and rural communities.

Otto and Varner (2005) used perhaps the most detailed methodology, implementing the Impact Analysis for Planning (IMPLAN) input-output (I-O) model to show that $31.5 million in gross sales were directly and indirectly generated by farmers markets in Iowa. Hughes et al. (2008) used a combination of the IMPLAN model and producer surveys to show that the direct sales of $1.7 million in farmers markets in West Virginia generated $2.4 million in output. They also included calculations of the opportunity cost of money spent at farmers markets (consumers not shopping at local grocery stores).

Farmers markets also have been reported as a notable source of employment for local communities. Feenstra and Lewis (1999) reported that the majority of farmers market vendors at metro and small-town markets in California were full-time growers, while a large number of vendors selling at rural markets were part-time growers. Cummings, Kora, and Murray (1999) estimated that the 1,329 employed vendors and assistants in Ontario (Canada) farmers markets generated 800 additional jobs. These 800 positions might be related to employment in the indirect areas of picking, packing, labeling, and cleaning produce or jobs involving other parts of the preparation, or even at various restaurants or hotels where individuals involved in the farmers market might spend their money. Similarly, Otto and Varner (2005) found that over 140 employment positions within Iowa's economy were indirectly attributed to farmers market activities, while Hughes et al. (2008) showed that 119 positions were created within West Virginia's economy due to the presence of farmers markets.

The methodology used in this study is most similar to that of Otto and Varner (2005) in that we generate sector-specific multipliers for farmers market activity via IMPLAN. We also include estimates of farmers market customer spending in other sectors using survey results, and estimate the total number of jobs and income created by farmers markets. Furthermore, our study is specific to Oklahoma—a state that has not previously been analyzed. This study will use survey data and IMPLAN software to provide estimates of the output, income, and employment generated by farmers markets in Oklahoma.

A Profile of Oklahoma Farmers Markets

In order to understand the structure and conduct of farmers markets in Oklahoma, this study examines the responses from three separate written surveys related to farmers market managers, consumers, and vendors/producers. The surveys were conducted in 2002, and at that time there were 29 farmers markets in Oklahoma. However, 21 farmers markets were chosen randomly for the surveys. The market manager surveys were mailed, while the customer and vendor surveys were given in person. The customers and vendors had the choice of either responding to the surveys onsite or of mailing them back later. The response rates were 43 percent for the farmers market managers' survey, 57 percent for the customers' survey, and 15 percent for the vendors/producers' survey (Agustini 2003). Additional information was obtained from the responses through personal interviews which followed the written surveys (Henneberry and Agustini 2002). The vendor/producers' lower response rate compared to the customer survey response rate may have resulted from the fact that the surveys were given during very busy months of the year for growers. A large majority of the growers were too busy to fill out the surveys on site and took them home, which resulted in a lower response rate compared to customers who filled out the surveys on site. The profile of farmers markets in Oklahoma and their participants, based on the data collected from these surveys, are described below.

Characteristics of Oklahoma Farmers Markets

Farmers market managers were asked questions regarding the characteristics of the market, including the institution that owned the market and the number of years that the market had been operating. Survey results show that a majority (79 percent) of the surveyed Oklahoma farmers markets were owned by the cities in which they were located, while the state and county governments each owned 11 percent of the farmers markets (Table 1). Furthermore, market manager survey results indicate that a little over three-fourths (78 percent) of the farmers markets had been operating in Oklahoma for at least six years, while only 22 percent had been operating for five years or less (Table 1).

Characteristics of Oklahoma Farmers Market Managers

The farmers market manager survey asked questions regarding characteristics of market managers. Specifically, survey respondents were asked to identify the organization that employed them. The results showed that although the majority of the farmers markets were owned by the cities, a majority of market managers were not city employees. Interestingly, 34 percent of the farmers markets were managed by volunteer market managers; while farmers market organizations, the city, and the county governments each employed 11 percent of farmers market managers. The rest (33 percent) of farmers market managers were employed by other arrangements different from those mentioned above (Table 1). Among the employed farmers market managers, 50 percent of those surveyed allocated one-quarter of their time to managing/coordinating the market. Market managers were also asked to state the number of years that they had been working as managers at the market. The responses indicate that 63 percent had been working as farmers market managers for at least five years (Table 1). However, when they were asked if they had received any specialized training as a market manager, all respondents stated that they had never received any specialized training, but the majority had a farming background.

Characteristics of Oklahoma Farmers Market Consumers

The farmers market customers' survey reveals information about the characteristics of typical Oklahoma farmers market customers, including demographic information, years that they had shopped

Table 1. Oklahoma Farmers Market and Manager Characteristics (N = 21).

Market Charactersitics	
Who owns them?	Percentage of Farmers Markets
Cities	79
Counties	11
State	11
How many years have they been in operation?	
1–5 years	22
6–10 years	34
11–15 years	22
More than 15 years	22
How did customers first learn about them?	Percentage of Customer Respondents
Family/Friend	30
Newspaper article	24
Driving by and saw it	16
Newspaper ad	9
Roadside sign	6
Television, radio, flyer event calendar, internet	8
Did not remember	7
Market Manager Characteristics	
Who employs you?	Percentage of Manger Respondents
Volunteer	34
City government	11
County government	11
Farmer's market organization	11
Other employment arrangement	33
How many years have you worked there?	
1–5 years	63
6+ years	37

at farmers markets, items purchased, reasons for shopping, and where they first learned about the markets. The survey results were composed of responses from 312 respondents and indicate that a typical customer was a female, between the ages of 51–65, highly educated (more than 50 percent have at least a college degree), and had an annual household income of between $40,000 and $60,000 (Table 2). These results are consistent with those obtained from other surveys of farmers market customers across the United States, which have portrayed the customers as being above average in income, education, and age. Buitenhuys, Kezis, and Kerr (1983) report that while lower-income consumers pay close attention to price, those in higher income brackets are more concerned with quality factors when purchasing produce.

Twenty-four percent of customer respondents indicated that they had been shopping at farmers markets for more than five years, while 56 percent

Table 2. Characteristics of Oklahoma Farmers Market Consumers (N = 312).

Demographic Characteristics	Respondents (%)
Sex	
Male	21
Female	79
Age	
<20	0
21–35	6
36–50	29
51–65	41
66–75	14
75+	10
Annual Household Income	
< $20,000	13
$20,000–$39,999	22
$40,000–$59,999	25
$60,000–$79,999	18
$80,000–$99,999	10
$100,000+	12
Education	
High School or Less	18
Some College	30
Undergraduate	20
Some Grad School	11
Masters	16
Doctoral	5
Use of Farmers Markets	
Years that consumer has shopped at FM	
1 year	20
2–5 years	56
6–10 years	15
More than 10 years	9
Percentage purchasing the following items*	
Fruits	41
Vegetables	70
Reason for shopping at FM*	
Quality	84
Availability of in-season products	58
Grown in Oklahoma	47

*The percentages in this category sum to more than 100, as the respondents were allowed to select all the categories that applied

had frequented the markets for two to five years (Table 2). Twenty percent indicated that they were new to the farmers markets and the survey year was their first year shopping at the markets. Most customers (70 percent) regularly purchased vegetables, while 41 percent percent regularly purchased fruits. This is consistent with the fact that the majority of the items supplied at the Oklahoma farmers markets are vegetables. Among fruits and vegetables, berries and organic produce were purchased regularly, while cheese and meat were the products that most customers had never purchased at farmers markets. Furthermore, the customers were asked to list any specific items, such as types or varieties of vegetables that they wished were more frequently available at farmers markets. The response included a variety of produce, including carrots, okra, tomatoes, green beans, lettuce, organic vegetables, eggs, fresh salad mix, and Oklahoma handicrafts.

Quality was the most important reason mentioned by a majority (84 percent) of customer respondents when asked for the reason they decided to shop at farmers markets. Other factors identified were the availability of in-season and grown-in-Oklahoma products (58 percent and 47 percent of customer respondents, respectively). Oklahoma farmers market customers also indicated that farmers markets serve as a place to meet friends and community members, suggesting that the social aspect of attending the market is an important attraction. Furthermore, customers indicated that they chose to shop at farmers markets in order to support local farmers and businesses. Kezis et al. (1998) and Sommer, Wing, and Aitkens (1980) have identified price savings as a critical factor in the decision to shop at the farmers markets. However, Oklahoma farmers market customers ranked price as having little importance on their decision to shop at the farmers markets. Moreover, a majority of customer respondents (54 percent) had heard about farmers markets through family/friends and newspaper articles (Table 1). Farmers markets in Oklahoma undertake a variety of promotional activities using radio, internet, flyers, roadside signs, and television to attract more customers. However, only 23 percent of customer respondents indicated they had received their information from these promotional sources. Sixteen percent indicated that they became aware of farmers markets as they were driving by.

Characteristics of Oklahoma Farmers Market Producers/Vendors

Producer/vendor survey responses provided data regarding the general characteristics of a typical Oklahoma farmers market producer/vendor. Survey results from a sample of 64 respondents reveal that a majority (94 percent) of producers/vendors surveyed were at least 36 years old with half (50 percent) of them ranging in age from 36 to 50 years old (Table 3). The primary occupations were non-agricultural and vegetable farming. Almost half (49 percent) of the producers/vendors had an average annual household income of less than $40,000. Farmers market producers/vendors were asked to describe the extent of processing (fresh or value added) and the origin of their products. Thirty-three percent indicated that they sold value added products (Table 3). When asked for the origin of their products, a majority (79 percent) of them reported that they or their employees prepared the products.

Farmers markets producers/vendors were also asked to rank the reasons for choosing farmers markets as a marketing outlet. Forty-four percent reported that receiving the retail value was the major reason for choosing farmers markets. Interaction with customers was reported by 27 percent of producers/vendors as the most important factor for choosing farmers markets as a marketing outlet. The level of satisfaction with selling products at farmers markets was also examined in the survey. Survey results showed that while about half (52 percent) of the respondents were "mostly satisfied" with the profit from selling at farmers markets, and 25 percent reported that they were "totally satisfied" (Table 3). Only eight percent said they were not satisfied. Furthermore, as a measure of their success, most (64 percent) of respondents believed that having return customers was an indicator of success. The second important measure of success reported by respondents was having robust gross sales.

Data and Economic-Impact Analysis

A hybrid IMPLAN (Impact Analysis for Planning) input-output model (Olson and Lindall 2000) for the 2002 Oklahoma economy is used in this study to measure the contribution of farmers markets to Oklahoma's economy. The IMPLAN model is a ready-to-use system and is frequently used to

Table 3. Characteristics of Oklahoma Farmers Market Producers (N = 64).

Demographic Characteristics	Respondents (%)
Sex	
Male	36
Female	64
Age	
<20	0
21–35	6
36–50	50
51–65	21
66–75	15
75+	8
Annual Household Income	
< $20,000	19
$20,000–$39,999	30
$40,000–$59,999	24
$60,000–$79,999	19
$80,000–$99,999	5
$100,000+	3
Education	
High School or Less	20
Some College	27
Undergraduate	23
Some Grad School	11
Masters	16
Doctoral	3
Use of Farmers Markets	
Extent of processing	
Fresh	67
Value-added	33
Level of satisfaction from selling at FM*	
Totally satisfied	25
Mostly satisfied	52
Not satisfied	8
Origin of products*	
Self- or employee-prepared	79
Reasons for choosing farmers market*	
Retail value	44
Interaction with customers	27
Measure of Success*	
Returned customers	64
Robust gross sales	39

*The percentages may not add up to 100 percent, as the respondents were allowed to select all of the categories that applied or not select some the listed categories.

determine how local changes affect a region's or a state's economy.[2] In this study we integrated the 2002 survey data into an IMPLAN-based input-output model to measure the impacts of Oklahoma farmers market activities throughout Oklahoma's economy.

Survey Data Results

Data on total farmers market gross sales, number of people employed by farmers markets,[3] the annual average of farmers market producers/vendors' household income, and total farmers market visitors' expenditures in other sectors were collected from and/or were estimated using the Oklahoma farmers market surveys from the first phase of this study (Agustini 2003). Survey results showed that the total gross sales for the twenty-one farmers markets participating in the survey were $3.3 million. The estimate of total 2002 sales per market for the surveyed markets was a product of the midpoint average range of dollar purchase per session as reported by the surveyed customers, the average number of customers per session, and the number of sessions during 2002. The sales were then estimated for the twenty-one surveyed markets.

Survey results showed that 795 individuals were directly participating as producers/vendors or directly employed (paid and unpaid) at the 21 surveyed farmers markets. The total farmers market visitors' expenditures in other sectors were estimated to be $630,000. This value was calculated by assuming that farmers market visitors (customers and other visitors) would spend at least $15 on food, drinks, gas, and other general merchandise while driving to and visiting farmers markets during the farmers market season. This $15 figure is based on data collected from the surveys. It was estimated that approximately 42,000 consumers patronized the markets at some point during the season, receiving products from approximately 795 sellers/workers in the twenty-one surveyed farmers markets in Oklahoma. However, the total sales figure of $3.3 million obtained from the survey data was the only piece of data from the surveys used to generate the economic impact results below.

Economic Impacts

In assessing the economic contribution of farmers markets to Oklahoma's economy, three different estimates were calculated. These estimates measured the effect of farmers markets in the Oklahoma economy by assessing their impacts on the total value of economic transactions (gross sales), the overall level of personal income (wages, salaries, and normal proprietor profits), and the number of jobs. The number of jobs represent the number of full-time-equivalent positions in the economy, and not necessarily the number of employed persons. These estimates of economic impacts were derived using the IMPLAN Input-Output model. Total impacts were categorized into direct, indirect, and induced effects.

Direct effects are the set of expenditures made by farmers market customers which is equal to vendors' gross sales revenues. Secondary effects are the sum of indirect and induced effects. Indirect effects measure the value of supplies and services that are provided to farmers market producers/vendors. Induced effects, in turn, represent household spending on all goods and services in the region from the income earned through direct and indirect activities. For example, while the income generated from produce sales at a farmers market is considered a direct activity, the income generated for shade manufacturers that sell shades to the vendors to be used at the farmers markets may be considered an indirect activity. Induced activities involve increased sales of all other businesses (such as retail stores in the area) because there is more spending in the community that has resulted from the income generated from farmers markets direct and indirect activities.

Economic multipliers are calculated from the IMPLAN model using 2002 data on Oklahoma industries. Multipliers measure total change throughout the economy resulting from a one-unit change in the activity of a given sector and are measured as the total effects divided by direct effects. For example, a total farmers market gross sales multiplier of 1.78 suggests that for every $1 increase in total farmers market gross sales (direct effect), the state

[2] For a detailed explanation of the IMPLAN Input-Output model, see Otto and Varner (2005).

[3] In this study, the number of people employed by farmers markets is defined as total numbers of Oklahoma farmers market producer/vendor participants, including paid and unpaid employees such as market managers, and other workers.

experiences an increase of $1.78 throughout the economy from total (direct and secondary) effects. There are three types of multipliers, referred to as Types I, II, and III. Type I multipliers only include direct and indirect impacts, while Type II multipliers include Type I multipliers plus induced impacts. Type III multipliers adjust Type II multipliers based on the spending patterns among different income groups. This study applies Type III multipliers to estimate the economic impacts of farmers markets in Oklahoma. Type III multipliers, as opposed to the other types, are most appropriate to be used in this study because there are vast differences in consumption habits and expenditures among income groups across Oklahoma. Type III multipliers are preferred in such cases since they take into account these demographic differences when measuring the economic impacts.

The specific sectors considered within the produce industry are those pertaining to the products sold at Oklahoma farmers markets. The impact of a "shock" to this sector (in this case, $3.3 million in total sales) is then estimated by the IMPLAN model (multipliers) based on historical data about transactions between sectors. Gross sales impacts to other economic sectors, including direct and induced impacts, are derived from this shock. The IMPLAN model also provides estimates of impacts to personal income and jobs based on this shock, again broken down by sectors.

Results

The results of total (direct and secondary) economic impacts of farmers markets in Oklahoma are presented in Tables 4, 5, and 6. While sector-specific multipliers vary, the average Type III output multiplier across all sectors is 1.78. Applying the gross sales multiplier of 1.78 to the farmers market gross sales of $3.3 million results in a total (direct and secondary) economic impact of $5.90 million on Oklahoma's economy (Table 4). The secondary (indirect and induced) economic impact of total farmers market gross sales in Oklahoma is $2.6 million. This is the difference between the estimated "total" economic impact of $5.9 million and the "direct" economic impact of $3.3 million. Nearly $1.2 million of the secondary effects are "indirect," meaning that they represent the wholesale or supply transactions that support market vendors. About $1.4 million of these effects are "induced," meaning that they resulted from the personal purchases made by the market payroll recipients (vendors and workers) in the businesses that directly serve them (Otto and Varner 2005). A breakout of the sectors most affected can also be seen in Table 4. Of particular interest are the large effects on the manufacturing, finance, and other service sectors.

Tables 5 and 6 show these impacts in different ways. Table 5 translates the effects from market purchases into personal or household income, while Table 6 shows how these impacts convert into jobs in the Oklahoma economy that are tied to farmers markets activities. Following Otto and Varner (2005), the dollar values in Table 5 are substantially smaller than those in Table 4 because personal income accounts for only one of the components of the transaction price. Nevertheless, Table 5 shows that the personal-income component of $3.3 million in direct sales was $1.3 million. Added to the direct income effect, the $416,190 in "indirect" and $448,144 in "induced" personal income give a total personal-income component effect of $2.2 million in the form of payrolls resulting from market-related expenditures and secondary transactions that support these expenditures. Again, while sector-specific multipliers vary, the average income multiplier is 1.66 in this case, indicating that a $1 increase in personal income for a farmers market translates to $1.66 in personal income across the state's economy. The individual sectors displayed in Table 5 show that most of the secondary income is focused in the manufacturing and service sectors.

Table 6 translates the direct gross sales and income figures into an estimate of the number of jobs in Oklahoma economy that were tied to farmers market activities. A total of 113 jobs were linked to market activities, 81 of which are full-time-equivalent jobs directly related to the $1.3 million in personal income estimated by IMPLAN. An additional 17 "indirect" and 16 "induced" jobs were created throughout the rest of the economy.[4] In particular, 11 indirect jobs were created in the agriculture sector while nine induced jobs were created in the service

[4] Considering that vending of goods at farmers markets is primarily seasonal and often a secondary (hobby) occupation, market activity is often a residual use of time. Therefore our study shows that 81 full-time "Agriculture" jobs are directly attributed to the combined activity of the 795 seasonal vendors (and their paid and unpaid helpers).

Table 4. IMPLAN Output of Farmers Market Impact: Gross Sales (by Sector) (2002 $).

Sector	Direct	Indirect	Induced	Total
Agriculture	3,321,429	280,951	22,712	3,625,092
Mining	0	38,509	12,322	50,831
Utilities	0	50,196	40,722	90,918
Construction	0	19,892	9,978	29,870
Manufacturing	0	281,420	187,291	468,711
Transportation & warehousing	0	73,390	42,886	116,276
Retail trade	0	7,432	165,337	172,769
Information services	0	16,315	48,598	64,913
Finance, insurance, & real estate	0	277,690	193,958	471,648
Professional & technical services	0	34,646	46,546	81,192
Other services	0	53,878	425,316	479,194
Government	0	52,352	197,223	249,575
Total	3,321,429	1,186,671	1,392,889	5,900,989
Aggregate multiplier	1.78			

Table 5. IMPLAN Output of Farmers Market Impact: Personal Income (by Sector) (2002 $).

Sector	Direct	Indirect	Induced	Total
Agriculture	1,309,848	159,831	4,795	1,474,476
Mining	0	9,662	3,073	12,737
Utilities	0	10,905	8,337	19,243
Construction	0	8,555	3,906	12,461
Manufacturing	0	88,917	52,493	141,419
Transportation & warehousing	0	27,967	16,973	44,940
Retail trade	0	3,413	75,145	78,559
Information services	0	4,339	11,481	15,818
Finance, insurance, & real estate	0	51,631	44,112	95,743
Professional & technical services	0	21,811	27,813	49,624
Other services	0	20,534	194,689	215,224
Government	0	8,625	5,327	13,952
Total	1,309,848	416,190	448,144	2,174,196
Aggregate multiplier	1.66			

Table 6. IMPLAN Output of Farmers Market Impact: Employment (by Sector).

Sector	Direct	Indirect	Induced	Total
Agriculture	81	11	0	92
Mining	0	0	0	0
Utilities	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	1	1	2
Transportation & warehousing	0	1	0	1
Retail trade	0	0	4	4
Information services	0	0	0	0
Finance, insurance, & real estate	0	3	2	4
Professional & technical services	0	0	1	1
Other services	0	1	9	9
Government	0	0	0	0
Total	81	17	16	113
Aggregate multiplier	1.41			

sector. These secondary positions might represent the people who are involved in picking, packing, labeling, and cleaning produce or engaged in other parts of the preparation, plus those employed in the sectors that are enhanced in the community as a result of the income spending of individuals involved in the production of products marketed through farmers markets (in particular, the service sector).

Conclusions

Although the number of farmers markets in Oklahoma has been on an upward trend, little research documents the profile of Oklahoma farmers markets, and none is available on the contribution of farmers markets to Oklahoma's economy. This study addresses this lack by summarizing the Oklahoma farmers market profile using data collected from three surveys of Oklahoma farmers markets conducted in 2002. The surveys pertain to farmers market managers, producers/vendors, and customers. An IMPLAN-based input-output model was used to show the economic impact of farmers markets in Oklahoma. The results of this study estimated that a total sales value of nearly $6 million, personal income of over $2 million, and 113 full-time-equivalent jobs were generated from the gross 2002 sales of $3.3 million at the twenty-one surveyed farmers markets in Oklahoma.

Considering that at the time of the surveys (2002), there were 29 markets (the impact figures relate to only 21 markets) and currently (2008) there are fifty markets operating in Oklahoma, the potential economic impacts contributed to farmers markets can be significant. The findings of this study indicated that typical consumer was 51–65 years of age, buying mostly vegetables. Therefore it may be concluded that an increase in market activity may be achieved through efforts to attract younger consumers. Also, unpublished data (based on conversations with Oklahoma Department of Agriculture, Food, and Forestry marketing staff) shows that in 2008, three markets in large urban areas of the state (Edmond, Oklahoma City, and Norman) generated sales accounting for over half (53.6 percent) of total Oklahoma farmers markets. Therefore targeting urbanities and those approaching or in retirement

age (as the population is aging) can be successful marketing strategies to increase sales.

Moreover, the surveys showed that buyers at farmers markets would have liked to have a wider variety of fresh, semi- and fully processed goods available to them. Therefore in order to increase sales and economic activity it is important to encourage the participation of a wide variety of producers in farmers markets. In particular, although fresh fruits and vegetables will likely continue to be the dominant sellers at most farmers markets across the state, a market does exist for semi-processed goods such as sauces, dips, or jellies. While these types of products must be manufactured in a licensed food processing facility in order to be sold at a farmers market, some vendors may find that catering to the built-in demand for this particular crowd is a venture worth pursuing, especially given the existence of licensed kitchen facilities in many business incubators across the state. Generally, increased participation among producers may be accomplished through education and distribution of information regarding potential profits from sales at farmers markets.

Consumer participation may also be supported through improved information about the availability of products and benefits from shopping at farmers markets, as well as advertising in the popular media. In particular, stories on vendors and consumers participating in the market, along with regular announcements about dates and locations, make for interesting material for both the local newspaper and radio stations. Appearances on local news stations may even be possible in some more urban areas. Additionally, a number of organizations have a vested interest in promoting farmers markets, including several specific to Oklahoma—the Kerr Center for Sustainable Agriculture and the Oklahoma Sustainability Network—who use a "Buy Fresh, Buy Local" marketing theme. While their pamphlets and websites do a good job of providing information, they are most likely to be found by those actively seeking information on the topic. The OK-Grown designation is another good example of promotion through regional identification; however, it has been used only on a limited basis by Oklahoma farmers market vendors. Therefore reaching an unaware audience may require investing in radio or newspaper ads or being active in getting success stories publicized. Furthermore, survey results showed that consumers enjoy interacting with producers and friends and in general they are attracted to the entertainment part of the farmers markets. Therefore, it is expected that providing crafts, entertainment, musical and children's activities, and other recreational events would help attract and retain customers. More research is needed in this area, perhaps including case studies of markets that have employed these techniques in an effort to generate more traffic.

Recommendations for future studies include evaluating the opportunity cost resulting from consumers not buying the items from grocery stores. Moreover, an accurate measure of gross farmers market sales is crucial in measuring the economic impacts. The sales figure used in this study to generate the economic impacts was obtained from vendor surveys. Producers/vendors tend to understate their gross sales (Otto and Varner 2005), and therefore the economic impacts in terms of sales, personal incomes, and jobs may be an under-estimation of their true values. Other direct-marketing outlets for local foods, such as roadside stands, pick-your-own operations, and consumer-producer cooperatives may also be important sources of income for small-scale producers. This study does not measure the impacts of sales through these additional direct-marketing venues, which suggests that future research in this area may provide useful information related to the marketing of locally grown foods.[5]

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[5] It is important to note that the IMPLAN model is not intended for providing income flows at different times during the year. However, although there are seasonal impacts, these impacts do not vary by the industry and therefore the annual results presented here would not be affected by the seasonal nature of the industry.

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