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The Economic Impacts of Direct Produce Marketing: A Case Study of Oklahoma's Farmers' Markets

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Abstract

The IMPLAN model is used to estimate total (direct and secondary) economic impacts of farmers' markets in Oklahoma's economy. The results show that Oklahoma farmers' markets generate a total gross sale of $3.3 million, with a total economic impact of $7.8 million.

The Economic Impacts of Direct Produce Marketing: A Case Study of Oklahoma's Farmers' Markets

The number of farmers' markets in the United States has been on an upward trend; increasing from 1,755 in 1994 to 4,385 in 2006, an increase of 150% (USDA-AMS, 2007). Similarly, the number of farmers' markets in Oklahoma has increased from 29 in 2002 to 35 in 2004, an increase of 21% (USDA-AMS, 2007; Agustini, 2003). The increase in the number of farmers' markets has been attributed to a growing consumer demand for fresh locally grown produce, consumer interest in direct interaction with the growers and knowing the source of the product, and the change in the economics of agriculture (Brown, 2002; Bullock, 2000). Also, because many of the produce growers in Oklahoma are small scale and are faced with difficulties accessing the conventional retail outlets, farmers' markets have become a popular channel for marketing fresh produce. For example, a 1988 Oklahoma grower survey showed that the majority (56%) of Oklahoma farmers are small (less than 5 acres) and use mainly farmers' markets to market their produce (Henneberry and Willoughby, 1989).

While farmers' markets contribute to the economy of the states in which they are located through direct effects, they also play an important role through their secondary effects.[1] Despite their economic contribution, little is known about the economic impacts of farmers' markets in Oklahoma. Although a number of studies have addressed the economic impacts of farmers' markets in the United States, none of the previous studies have estimated the economic contribution of farmers' markets to Oklahoma's economy. In this light, the objective of this study is twofold. One is to give a profile of farmers' markets in Oklahoma, including characteristics of market managers, customers, and vendors. The second objective is to measure the economic contribution of farmers' markets to Oklahoma's economy.

This study is organized as follows: In the next section, a review of literature regarding the economic benefits of farmers' markets is presented. This is followed by a description of the Oklahoma farmers' market profile. This section is followed by a description of the model used to estimate the economic impacts of farmers' markets in Oklahoma. Then data and procedures used to estimate economic impacts of farmers' markets in Oklahoma are described. Finally, results are discussed followed by concluding remarks.

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

While farmers' markets are growing in importance in Oklahoma, relatively little research has been conducted on the topic. Farmers' markets have been reported to provide economic benefits to producers, consumers, and local communities (Sanderson et al., 2005). 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% increase in return on the product by marketing through sales using farmers' markets rather than traditional brokers (Lencucha et al., 1998). However, the average vendor's earnings from farmers' markets in the United States have been less than $10,000 per season. For example, in 2000, the majority (81%) of U.S. farmers' market vendors had sales under $10,000 (Payne, 2002). Among those vendors, 35% had sales under $1,000, 29% had sales ranging from $1001 to $5,000, and 17% had sales ranging from $5001 to $10,000.

Although sales from the majority of farmers' market vendors may not be sufficient to support their lives, farmers' markets have been playing an important role for producers, especially for small producers. Farmers' markets play a vital role in enabling small-scale producers to gain direct access to consumers. Without this direct access to consumers, the existence of many small growers would be threatened. This is because small farmers may not be

able to sell to conventional market outlets because of insufficient volumes and stringent demands for product consistency (Sanderson et al., 2005). Furthermore, farmers' markets offer the advantage of improved market information through direct contact with the consumer. Direct contact with the consumers allows farmers to learn about consumers' preferences and consequently adjust and add products that meet buyers' preferences.

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's atmosphere (Hughes and Mattson, 1992). Regarding the perceived superior quality, the majority (98.5%) of respondents of a 1997 survey of New Jersey farmers' market consumers indicated that they expected the produce quality sold at farmers' markets to be of better quality than produce sold at the retail level (Govindasamy et al., 1998). In Oregon, almost a half (41%) of the respondents reported that they believed food produced in Oregon was safer than food imported from outside the state (Lev, 2001).

Concerning the price, Californian farmers' market customers believe that prices at farmers' markets are lower than supermarket prices. This is because a study of California farmers' markets showed that prices in those direct markets were 33% lower than the supermarket prices for similar items (Sommer et al, 1980). However, it is necessary to note that the perceived differences between farmers' market prices and supermarket prices might significantly vary from state to state. For example, only 10.7% of respondents of the 1995 Orono farmers' market survey in Maine reported that good price was one of the reasons of shopping at farmers' markets (Kezis et al., 1998). Finally, farmers' market customers generally believe that

farmers' markets contribute to the society by providing a meeting place for friends and community members (Cummings et al, 1999).

In order to calculate the economic contribution of farmers' markets at local, state, and national levels, the Impact Analysis for Planning (IMPLAN) input-output (I-O) model has been utilized in past studies. Cummings, et al. (1999) used IMPLAN to estimate the economic impacts of farmers' markets in Ontario. Their results suggest that farmers' markets in Ontario generated $1 billion in secondary effects. Otto and Varner (2005) used the IMPLAN model to estimate the economic benefits of farmers' markets in Iowa. The results showed that $31.5 million were directly and indirectly generated by farmers' markets total gross sales in Iowa's economy. Furthermore, a study conducted by Tulane's A.B. Freeman School of Business has found that the Crescent City Farmers' Market in Louisiana generated over $1 million annually in direct and indirect effects to vendors, downtown businesses and rural communities (Economics Institute, 1999).

Farmers' markets also have been reported as a notable source of employment for many local communities. Feenstra and Lewis (1999) report that the majority of farmers' market vendors at metro and small-town markets in California were full-time growers with a large number of part-time vendors selling at rural markets. Cummings, et al. (1999) estimated that a total of 1,329 employed vendors and assistants in Ontario farmers' markets generated 800 employment positions out of farmers' markets. These 800 employment positions might represent people who were involved in picking, packing, labeling, and cleaning produce or engaged in other parts of the preparation. Similarly, Otto and Varner (2005) found that over 140 employment positions within Iowa's economy were indirectly attributed to farmers' market activities.

Oklahoma Farmers' Market Profile

In order to describe the profile of farmers' markets in Oklahoma, this study utilizes the data from three separate written surveys of farmers' market managers, consumers, and vendors/producers. The Kerr Center for Sustainable Agriculture conducted the three surveys in 2002. In 2002, there were twenty nine farmers' markets in Oklahoma. However, twenty one farmers' markets were chosen randomly for the surveys. The response rate was 43%, 57%, and 15% for the farmers' market managers, customers, and vendors/producers' surveys, respectively (Agustini, 2003). Additional information was obtained from the responses to personal interviews which had followed the written surveys (Henneberry and Agustini, 2002; Agustini, 2003). The profile of farmers' markets in Oklahoma and their participants based on the data collected from the three surveys are described below. This section is followed by the description of the model used to estimate the economic impacts of farmers' markets in Oklahoma's economy.

Characteristics of Oklahoma Farmers' Markets

Farmers' market managers were asked questions regarding the characteristics of the market, including the organization which owned the market and the number of years that the market has been operating. Survey results showed that the majority (78%) of the surveyed Oklahoma farmers' markets were owned by the respective cities at which they were located in (Figure 1). The state and county governments each owned 11% of total surveyed Oklahoma farmers' markets (Figure 1). Furthermore, the results from the survey indicated that a little over three-fourths (78%) of the total surveyed Oklahoma farmers' markets had been operating in Oklahoma for at least six years; while only 22% of the total surveyed Oklahoma farmers' markets had been operating for less than two years (Figure 2).

Characteristics of Oklahoma Farmers' Market Managers

The farmers' market manager survey asked questions regarding characteristics of market managers. Specifically, survey respondents were asked to state the organization which employed them. The results showed that although the majority of farmers' markets were owned by the cities, the majority of market managers were not city employees. Survey results showed that in 2002, 34% of surveyed Oklahoma farmers' markets were managed by volunteer market managers. Farmers' market organizations, the city, and the county governments each employed 11% of farmers' market managers. The rest (33%) of farmers' market managers were employed by other arrangements different from those mentioned above. Among the employed farmers' market managers, survey results showed that 50% allocated quarter time for managing/coordinating the market. Market managers were also asked to state the number of years that they have been working as managers at the market. The results showed that 63% of them have been working as farmers' market managers for at least 6 years. However, when they were asked if they have received any specialized training as a market manager, all respondents stated that they have never received any specialized training, but the majority had a farming background.

Characteristics of Oklahoma Farmers' Market Consumers

Farmers' market customers' survey revealed information about the characteristics of typical Oklahoma farmers' market costumers, including their purchase patterns and the reasons for shopping at farmers' markets. The survey results showed that most customers have been shopping at farmers' markets for many years and the majority of them heard about farmers' markets through family or friends and from a newspaper article (Figure 3). Farmers' markets in Oklahoma undertake a variety of promotional activities through radio, internet, flyers, roadside signs, and television to attract more customers. However, survey results showed that these

promotional activities had little effect in informing customers about the existence of farmers' markets (Figure 3).

Regarding the characteristics of a typical farmers' market customer, the results showed that a typical customer was a woman, age 36 or older, highly educated, with a household annual income of $40,000 or higher. These results are consistent with those obtained from other surveys of farmers' market customers across the United States, which have portrayed the customers being above average in income, education, and age. This might be explained by a finding by Buitenhuys et al. (1983) who reported that while lower income consumers are more concerned about the price, those in high income brackets are more concerned with quality factors when purchasing produce.

Farmers' market customers were also asked to state the types of products that they had regularly purchased at farmers' markets. The Oklahoma survey results showed that 70% of the customer respondents purchased vegetables, and 41% purchased fruits regularly at farmers' markets. Among fruits and vegetables, berries and organic produce were purchased regularly; while cheese and meat were the products that 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 wish were more frequently available at farmers' markets. The answer to this question included a variety of produce; including carrots, okra, tomatoes, green beans, lettuce, organic vegetables, eggs, fresh salad mix, and Oklahoma handicrafts.

Moreover, quality was the most important reason mentioned by the majority (84.3%) of customers respondents as affecting their decision to shop at farmers' markets. Other factors identified were availability of in season products (58%) and the fact that the products were grown in Oklahoma (46.5%). Oklahoma farmers' market customers also indicated that farmers'

markets serve as a place to meet friends and community members. Furthermore, customers indicated that they choose to shop at farmers' markets in order to support local farmers and business. Kezis et al. (1998), Sommer et al. (1980) have identified price saving 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.

Characteristics of Oklahoma Farmers' Market Producers/Vendors

Producers/vendors survey collected data regarding the general characteristics of a typical Oklahoma farmers' market producer/vendor. Survey results revealed that the majority (94%) of producers/vendors were at least 36 years old with half (50%) of them ranging from 36 to 55 years old. The primary occupations of the majority of farmers' market producers/vendors were non agricultural and vegetable farming. However, the majority (49%) of producers/vendors had an average annual household income of $39,999 and below. Furthermore, farmers' market producers/vendors were asked to describe the general characteristics and the origin of their products. Products sold at farmers' markets can be fresh produce or value added products. In Oklahoma, survey results revealed that 33% of respondents said they sell value added products. When asked for the origin of their products, the majority (79%) of respondents reported that they or their employees prepared the products themselves.

Farmers' markets producers/vendors were also asked to rank the reasons of choosing farmers' markets as outlets for produce sale. The survey results indicated that 44% of producers/vendors reported receiving a retail value was the major reason for choosing farmers' markets. Interaction between producers and customers was reported to be the second most important factor for choosing farmers' markets as outlets for produce sale. The level of satisfaction with selling products at farmers' markets was also examined in the survey. Survey

results showed that slightly more than half (52%) of respondents were "mostly satisfied" with the profit from selling at farmers' markets, 25% of respondents reported that they were totally satisfied," and only 8% said they were not satisfied. As a measure of their success, the majority (64%) of producers/vendors reported that having return customers makes them a successful producer. The second important measure of success reported by respondents was having good gross sales.

The Model

A hybrid input-output model for 2001 Oklahoma economy built with IMPLAN is used in this study to measure the economic contribution of farmers' markets to Oklahoma's economy. The IMPLAN model is frequently used to determine how local changes affect a region's or a states' economy. IMPLAN is a ready to use modeling system, which allows one to construct models by combining the original input-output tables with secondary data. The static input-output model consists of a system of equations representing the structural linkage in a regional economy. The input-output model is given as:

(1) $$\mathbf{X_i} = \sum_{j=1} a_{ij}\mathbf{X_j} + \mathbf{Y_i} \text{ for } i = 1, 2, \cdots, I \text{ and } j = 1, 2, \cdots, J,$$

where $\mathbf{X_i}$ is a vector of total gross output in sector *i*; a_{ij} is an input-output coefficient, $0 \le a_{ij} \le 1$, more specifically, a_{ij} is the number of units of industry *i* product required as input to produce one unit of industry *j* output; $\mathbf{X_j}$ is a vector of total gross output of industry j; and $\mathbf{Y_i}$ is a vector of final demand for the output of industry *i*. In the matrix form, equation (1) can be written as

(2) $$(\mathbf{I} - \mathbf{A})\mathbf{X} = \mathbf{Y},$$

where $\mathbf{I}$ is an identity matrix, $\mathbf{A}$ is a matrix of input-output coefficients, $\mathbf{X}$ is a matrix of gross outputs, and $\mathbf{Y}$ is a matrix of final demand of the gross output.

By rearranging the terms, equation (2) can be written as

$$\mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{Y}, \tag{3}$$

where $(\mathbf{I} - \mathbf{A})^{-1}$ is the inverse Leontief multiplier matrix. For the impact analysis, equation (3) can be written as:

$$\Delta\mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1}\Delta\mathbf{Y}, \tag{4}$$

where $\Delta\mathbf{X}$ is the response to a change in total output and $\Delta\mathbf{Y}$ is a change in final demand.

Data and Economic Impact Analysis

In order to estimate the economic impacts of Oklahoma farmers' market activities on Oklahoma's economy, state-level and secondary data are used. State-level data correspond to data on Oklahoma industries, published by the Impact Analysis for Planning (IMPLAN) Corporation. Secondary data used in this study are total farmers' markets gross sales, number of people employed by farmers' markets[2], the annual average of farmers' market producers/vendors' household income, and total farmers' markets visitors' expenditures in other sectors.

More specifically, secondary data on variables described above were taken from and or estimated using the Oklahoma farmers' market surveys. Survey results showed that the total farmers' market gross sales and the annual average of producers/vendors' household income were $3.3 million and $45,762, respectively. Furthermore, survey results showed that 795 individuals were directly participating as growers/vendors or directly employed at the twenty one 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) who visited farmers' markets would spend at least $15 on food, drinks, gas, and other general merchandises while driving to and visiting farmers' markets during the farmers' market season.

In assessing the economic contribution of farmers' markets to Oklahoma's economy, economic multipliers $(\mathbf{I} - \mathbf{A})$ were calculated from the IMPLAN model using 2001 data on Oklahoma industries.[3] Multipliers measure total change throughout the economy from one unit change in a given sector. For example, a total farmers' market gross sales multiplier of 2.2 suggests that for every $1 increase in total farmers' market gross sales, the state experiences an increase of $2.2 throughout the economy from total (direct and secondary) effects. There are three types of multipliers (I, II, and III). Type I multipliers include direct and indirect impacts and type II multipliers include type I multipliers plus induced impacts. Type III multipliers adjust type II multipliers based on spending patterns amongst 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 as there are vast differences in consumption habits and expenditures among income groups across Oklahoma. Type III multipliers are preferred in such cases as they take into account these demographic differences when measuring the economic impacts.

The multipliers were then applied to data from the Oklahoma farmers' market surveys (total farmers' market gross sales, total number of individuals who were directly participating as growers/vendors or directly employed at farmers' markets, annual average of producers/vendors' household income, and total farmers' market visitors' expenditures in other sectors). The total economic impacts of a given sector is estimated by multiplying survey data (eg., total farmers'

market gross sales) by the respective multiplier. For example, if the economic multiplier for total farmers' market gross sales estimated by IMPLAN model is 2.0, the total impact of farmers' market gross sales on Oklahoma's economy is $6 million [the product between the total farmers' market gross sales ($3 million) and the economic multiplier (2)]. As defined above, the direct economic impacts are the changes in economic activity that result from farmers' market activities. For example, the direct economic impact of farmers' markets in terms of total gross sales in Oklahoma is $3 million (the total gross sales reported by growers/vendors respondents). The secondary economic impact is estimated by taking the difference between the total economic impact and the direct economic impact. For the example above, the secondary economic impact of total farmers' market gross sales on Oklahoma's economy is $3 million [the difference between total economic impact ($6 million) and direct economic impact ($3 million)].

Results

The results of total (direct and secondary) economic impacts of farmers' markets in Oklahoma are presented in table 1. Using the IMPLAN model, type III multiplier for total farmers' market gross sales is 2.36. This result suggests that a dollar increase in total farmers' market gross sales would generate $2.36 dollars to Oklahoma's economy through direct and secondary effects. Applying the gross sale multiplier of 2.36 to the total farmers' market gross sales ($3.3 million), the results show that Oklahoma's total farmers' market gross sales lead to a total (direct and secondary) economic impact of $7.8 million to Oklahoma's economy. The secondary economic impact of total farmers' market gross sales in Oklahoma is $4.5 million (Table 1). This result suggests that Oklahoma farmers' market gross sales generate $4.5 million in other sectors of Oklahoma's economy through indirect and induced effects.

The derived employment multiplier is 2.44; implying that every additional individual employed by farmers' markets creates 2.44 jobs throughout the state from direct and secondary linkages. Applying the employment multiplier, it is implied that the 795 farmers' market employees account for 1,940 positions in the state through direct and secondary effects. More specifically, the 795 farmers' markets employees generate 1,145 other jobs in related activities through secondary (indirect and induced) effects. The 1,145 employment positions might represent people who are involved in picking, packing, labeling, and cleaning produce or engaged in other parts of the preparation.

The annual average of farmers' market producers/vendors household income based on the farmers' market survey is $45,762. Applying income multiplier (2.55), the results show a total (direct and secondary) and secondary economic impact of $116,593 and $70,831, respectively in Oklahoma's economy. These results suggest that farmers' market growers/vendors' household income generates additional income of $70,831 through indirect and induced effects. Finally, the results show that farmers' market visitors' expenditures in other sectors are $630,000. These expenses result from farmers' market visitors' purchases in other sectors (other than farmers' markets) such as food purchased at restaurants, gas, and other general merchandise. Applying expenditure multiplier (3.08), the results show total economic impact of $1.9 million from farmers' markets visitors' expenditures through direct and secondary effects.

Summary and 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 the contribution of farmers' markets to Oklahoma's economy. Hence, this study summarizes the Oklahoma farmers' market profile using recent data collected from three surveys of Oklahoma farmers' markets conducted in

2002. Furthermore, this study estimates the economic impacts of Oklahoma farmers' markets using the IMPLAN model.

Survey results of Oklahoma farmers' market profile show that the majority of farmers' markets are owned by the cities at which they are located. However, the majority (78%) of farmers' market managers were not city employees. Farmers' market consumers' survey revealed that a typical Oklahoma farmers' market consumer is a woman, age 36 or older and highly educated. Consistent with farmers' market studies in others states, the quality of farmers' market products was the major reason mentioned by the majority of customers' respondents as affecting their decision to shop at farmers' markets. The Oklahoma farmers' market producers/vendors survey showed that the majority of Oklahoma farmers' market producers/vendors were at least 36 years old. Receiving a retail value and interacting with consumers were reported by producers/vendors' respondents as the major reason of choosing farmers' markets as outlets for their products.

The IMPLAN model was used to estimate economic multipliers of farmers' market activities. The derived economic multipliers are 2.36, 2.44, 2.55, and 3.08 for total farmers' market gross sales, producers/ vendors' household income, employment, and visitors' expenditures in other sectors, respectively. These results suggest that every unit added to farmers' market activities would generate more than one unit to Oklahoma's economy from total (direct and secondary) effects. The estimated economic multipliers were used to estimate the total economic impact of farmers' markets in Oklahoma using the 2002 Oklahoma farmers' market survey data. The results indicate that farmers' markets generate a total gross sale of $ 3.3 million, with a total impact of $ 7.8 million. The 795 farmers' markets employees generate 1,940 jobs in the state through direct and secondary effects. Farmers' market producers/vendors' household income and farmers' market customers' expenditures in other sectors generate total economic impacts of approximately $116,693 and $1.9 million in Oklahoma through total (direct

and secondary) effects, respectively. These results support the argument that farmers' market activities are a vital part of Oklahoma's economy. Continued strength of farmers' market activities might be of significant importance as an economic base on which Oklahoma communities can be built.

Footnotes

1. Direct effects are the changes in economic activity that result from farmers' market activities. These changes might result from farmers' market total gross sales and local job opportunities created by farmers' markets. Secondary effects are composed of indirect and induced effects. Indirect effects from farmers' market activities result when farmers' market growers/vendors purchase materials and services from other sectors in the state and induced effects represent household spending based on income earned from direct and indirect effects.

2. In this study, the number of people employed by farmers' markets is defined as total numbers of Oklahoma farmers' market producers/vendors participants including paid and unpaid employees such as market managers, and other workers.

3. Although the three farmers' market surveys were conducted in 2002, we use 2001 data on Oklahoma industries provided by IMPLAN Corporation to conduct the economic impacts of farmers' market in Oklahoma. This is because the reported survey data correspond to 2001 farmers' market season.

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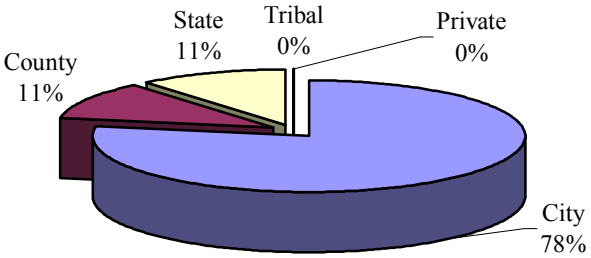

Figure 1. Distribution of Types of Ownership of Oklahoma Farmers' Markets, 2002 Oklahoma Farmers' Market Survey.

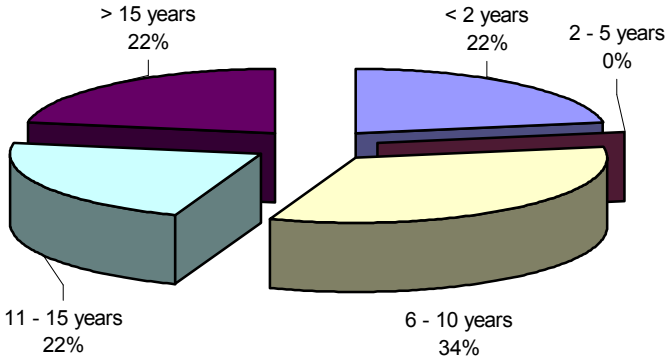

Figure 2. Distribution of period (years) during which Oklahoma Farmers' Markests have been Operating, 2002 Oklahoma Farmers' Market Survey.

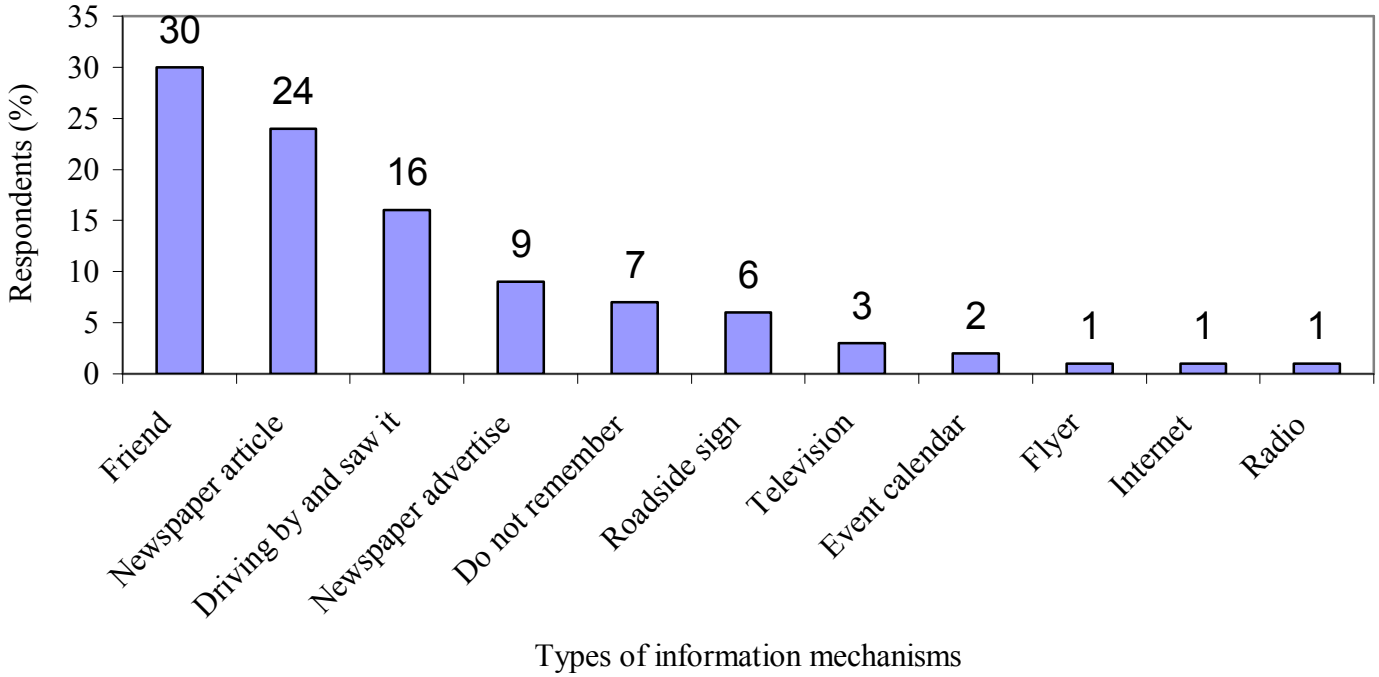

Figure 3. Distribution of Types of Information Mechanisms through which Farmers' Market Customers First Learn about Farmers' Markets in Oklahoma, 2002 Oklahoma Farmers' Market Survey.

Table 1. Direct, Secondary, and Total Economic Impact of Farmers' Markets in Oklahoma

Economic Impact	Activities studied			
	Total Farmers' Market Gross Sales	Total Farmers' Market Employment	Average Farmers' Market Producers/Vendors' Income	Total Customers' Spending
Multipliers	2.36	2.44	2.55	3.08
Direct Impact	$3,321,429	795	$45,762	$630,000
Secondary Impact	$4,517,143	1,145	$70,931	$1,310,400
Total Impact	$7,838,571	1,940	$116,693	$1,940,400

Notes: Mutlipliers are derived using IMPLAN software, with 2001 Oklahoma data