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# Evaluating the Economic Impact of Farmers' Markets Using an Opportunity Cost Framework

David W. Hughes, Cheryl Brown, Stacy Miller, and Tom McConnell

Farmers' markets presumably benefit local economies through enhanced retention of local dollars. Unlike other studies, the net impact of farmers' markets on the West Virginia economy is examined. Producer survey results are used in estimating annual direct sales (\$1.725 million). Using an IMPLAN-based input-output model, gross impacts are 119 jobs (69 full-time equivalent jobs) and \$2.389 million in output including \$1.48 million in gross state product (GSP). When the effect of direct revenue losses are included (primarily for grocery stores), the impact is reduced to 82 jobs (43 full-time equivalent jobs), \$1.075 million in output, and \$0.653 million in GSP.

*Key Words:* farmers' markets, input-output models, net economic impact

**JEL Classifications:** R15, Q13, Q18

The number of farmers' markets has increased significantly over the last decade, from 2,410 in 1996 to 4,385 in 2006 (AMS). Thus, farmers have the potential for gaining a greater share of the consumer market. Presumably, local and regional economies benefit from an enhanced retention of local dollars. Several studies have examined the economic impact of

farmers' markets on local and state economies. Regional input-output models have been used to quantify this contribution. However, like most impact studies, such efforts have not accounted for the opportunity cost of money spent at farmers' markets. That is, estimates of economic impacts are gross as opposed to net impacts. We present the application of a simple method where inferences can be drawn concerning the net impact of such market activity on local and regional economies. This approach is used in examining the impact of farmers' markets on the West Virginia economy with a combination of producer survey data and an IMPLAN-based input-output model (Minnesota IMPLAN Group, Inc.).

Initially provided is a review of the literature, encompassing a discussion of the potential benefits and economic impacts of farmers' markets on local or regional economies. Also covered are the few studies that have used an approach similar to our oppor-

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tunity cost approach. The approach used in surveying producers and relevant survey results are then examined. A discussion follows concerning how the survey data was integrated into an IMPLAN-based input-output model of the West Virginia economy. Also discussed is how the opportunity cost of such spending was estimated. Impact results are then reported for the farmers' market impact itself, for the opportunity cost impact analysis, and for the net impact analysis. Finally, study results are summarized, conclusions are drawn, and areas of future work are highlighted.

### **Literature Review**

Farmers' markets are a form of direct marketing, where producers sell directly to final consumers thereby bypassing market middlemen. Direct marketing, especially important for small produce growers, is in part a response to low farm-gate prices and wholesalers who only wish to deal with large volume producers (Eastwood et al.). There are a number of possible direct market venues in addition to farmers' markets. These include you-pick operations, on-farm and roadside stands, and a subscription service or community supported agriculture (CSA). Farmers' markets provide a convenient venue for direct marketing along with an important way for directly connecting with final consumers. Producers of organically grown products and specialty items also may receive premium prices at farmers' markets. This study only considers farmers' markets due to data limitations and the importance of these markets for small farms, which make up a majority of West Virginia producers.

Consumers also benefit from farmers' markets including having access to products that might be otherwise unavailable. Products are often of a higher quality, especially in terms of freshness, in comparison to agricultural commodities purchased through standard marketing channels. Many consumers also like the direct interaction with local producers. Such interaction allows consumers to question farmers about pesticide use and

production methods and may ensure that the product is "chemical-free" (Gale). Many consumers also like the idea that they are supporting local agriculture, especially small local farms, and helping to retain dollars in the local economy (Brown, 2003; FPC).

Steele provides a synopsis of the arguments for supporting small farms. Small farms are a source of agricultural innovation through their concentration in alternative products and niche markets, such as organic production. Because small farms are concentrated near urban areas, they provide a means for preserving rural landscapes. Small farms also provide a source of off-farm workers for local economies (Steele). We would add that small farms can serve as a means for attracting affluent in-migrants to an area and in general making an area "more livable."

A study conducted by Payne demonstrates the growth of farmers' market as a marketing tool. In addition to growth in the total number of farmers' markets, in 1994, 20,946 farmers participated in farmers' markets with 6,648 (31.7%) using such markets as their only marketing outlet. By 2000, 66,700 farmers participated in farmers' markets with 19,000 using such markets as their only marketing outlet. The estimated number of customers per week grew during the same period from 915,777 to 2,760,000, an increase of 201.4%.

Studies examining the economic impact of farmers' markets have been limited in number, despite claims about the benefits for local economies. In fact, a paper reviewing research of farmers' markets from 1940 through 2000 (Brown, 2002) erroneously claims that there is no method for evaluating such impacts. However, a few studies have estimated the impact of farmers' markets on local economies. Otto and Varner used a combination of an IMPLAN-based input-output model and consumer survey data from 55,000 visitors to analyze the economic impact of farmers' markets on the Iowa economy for 2004. They estimated direct sales of \$20 million and a total economic impact of \$31.5 million, with \$12.2 million of that impact in personal income throughout the regional economy. They estimated that 471 full-time jobs were

generated by the spin-offs arising from Iowa farmers' markets. Myers used a survey approach and a retail economic multiplier for the Baltimore–Washington region of 1.6 to estimate the impact of three local farmers' markets on the Howard County Maryland economy in 2004. Spending at the markets themselves and spending at nearby businesses because of the markets' presence were included as parts of the impact. The author estimated annual revenues at the three markets of \$192,030, with an impact of \$307,249, and an impact on adjacent businesses due to enhanced customer flow of \$965,788. No attempt was made, apparently, to control for spending that would have occurred at nearby businesses had the markets not existed. A similar study conducted for the Crescent City Farmers' Market in New Orleans claimed \$550,000 in direct sales for vendors and \$450,000 in enhanced sales for nearby businesses (McCarthy).

Another area of relevant research is input-output based studies that account for the opportunity cost of spending that originates in a local economy. Probably partly because of political economy reasons, such impacts are usually evaluated in a gross as opposed to net framework. That is, entities that fund economic impact studies usually want the studies to show the largest defensible level of economic impact. For example, supporters of farmers' markets are interested in showing that such activity generates significant levels of local employment and income.

Another issue is the lack of literature as a guide to conduct studies where the opportunity cost of impacts is included. In particular, determining the sector and location where the alternative (opportunity cost) spending would have occurred is not a straightforward issue. Still, several studies have used a combination of input-output models and opportunity cost in evaluating net impacts. Unlike our study, these efforts have focused on the opportunity cost of using a particular natural resource, such as land or water.

One study that did use an opportunity cost framework was that conducted by Elder and Butcher, who examined the net impact of a

new irrigation project on the Washington economy using a state input-output model. They estimated that net impacts led to a reduction of 34.4% as compared with merely examining the positive impacts of the project. Another study that used the approach was an examination of the effects of the U.S. Department of Agriculture's Conservation Reserve Program (CRP) in Virginia (Siegel and Johnson). Land devoted to the CRP is taken out of production, and as expected, this negatively impacts local and regional economies. However, maintaining CRP land in appropriate vegetative cover has some positive benefits. For example, expenditures made in establishing and maintaining required vegetative cover on CRP land can be expected to have a positive impact on the local economy. More importantly, CRP land can lead to recreational uses that generate local economic activity. Based on an input-output model of the Virginia economy, Siegel and Johnson estimated the per acre level of recreational activity that would be necessary for the CRP to be a breakeven proposition from the viewpoint of the state economy in terms of gross output, employment, and income.

### **Research Approach**

We had three main research objectives. First, to use a combination of vendor survey data and an IMPLAN-based input-output model of the West Virginia economy to estimate the gross contribution of farmers' markets to that economy. Second, to use estimates of consumer spending on food products through more traditional food marketing systems (such as grocery stores) to estimate the economic impact of spending that is lost to West Virginia because of spending at farmers' markets. Third, we wanted to test the hypothesis that, while reduced, farmers' markets will still provide a net positive impact on the state economy after this opportunity cost is included in the analysis.

### *Data and Methods*

A survey of vendors at West Virginia farmers' markets conducted in 2005 is used in estimat-

ing the value of direct sales by local producers at such venues.<sup>1</sup> The estimated value of direct sales is then “shocked through” a hybrid input-output model of the West Virginia state model.

In 2005, West Virginia had 34 farmers’ markets across the state with a total of 331 vendors who formed the surveyed population. From these 331 vendors, 226 surveys were returned for a response rate of 68.3%. Respondents who indicated that they did not sell any products at a West Virginia farmers’ market in the 2004 season, or whose business partner had already completed a questionnaire, were removed from subsequent analysis, leaving 183 (55.3%) usable questionnaires.

The survey questionnaire was developed based on a review of previous farmers’ market surveys. Content and face validity was established in cooperation with four volunteer vendors as a pilot study. Reliability of the instrument was determined based on alpha scale analysis of the sample population’s data. Cronbach’s alpha was valued at 0.92 and the instrument was deemed to have exemplary reliability (Robinson, Shaver, and Wrightsman).

Survey respondents were asked to indicate a range for the value of their sales at farmers’ markets in West Virginia. The midpoint of each of 21 categories was used to provide an estimate of sales per respondent.<sup>2</sup> Responses to questions concerning the types of products sold, for example, specific fruits and vegetables, were used in delineating sales into specific input-output model agricultural sectors. Detailed information on categories of crops sold was matched with sales levels and used to estimate a percentage distribution of sales by major IMPLAN crop category. Typically, all of a vendor’s sales remained in the same broad IMPLAN crop category, such as vegetable and melon farming. As a result, the total level

of spending by consumers at West Virginia farmers’ markets was estimated to be \$1.725 million.<sup>3</sup>

Farmers’ markets may be a potential source of tourism used to attract out-of-town as well as local shoppers. However, only 15% of WV farmers’ market managers use some type of local, state, or regional tourism publication as a means of advertising. Only two markets in the state (Berkeley Springs Farmers’ Market and the Capital Market) appear to be frequented by tourists.<sup>4</sup> We do not have data on expenditures by tourists at any of the farmers’ markets and so assume all farmers’ market sales are to in-state consumers. Sales to out-of-state tourists could mean an opportunity cost to, for example, grocery stores in their home state rather than in West Virginia. If this is the case, the opportunity cost we use for farmers’ market expenditures could be too large. However, two factors mediate this problem in our view. First, the tourist could still make grocery store purchases while visiting West Virginia. More importantly, we believe the dollar value of sales to tourists is relatively low given the general lack of marketing aimed at tourists and our knowledge concerning the markets.

Another benefit of farmers’ markets could be enhanced revenues of merchants located near the farmers’ market. No data was available regarding additional expenditures that occurred at nearby businesses due to existence of the markets, so these benefits are not included in this analysis. These enhanced

<sup>1</sup> The terms vendor, farmer, and producer are used interchangeably throughout this study to indicate a farmer selling at a farmers’ market.

<sup>2</sup> The 21 categories began with “\$1,499 or less” and increased in \$1,500 increments to “\$30,000 or more.” \$749.50 was used as the lowest category and \$40,993 was used as the highest.

<sup>3</sup> Prices at farmers’ markets are assumed to be the same as those for grocery stores. Among surveyed vendors, 40.1% indicated that grocery store prices and their prices were roughly the same or higher, 35.9% felt their prices were somewhat lower, and 24% felt their prices were significantly lower. We made the assumption of equal prices because on average prices seem to be roughly equal. If prices were markedly higher (or lower) at the farmers’ market, the opportunity cost scenario would have to be adjusted based on assumptions about quantities consumed and shifts from other types of spending. Farmer profitability levels in the input-output model might also have to be adjusted in the input-output model.

<sup>4</sup> According to an unpublished West Virginia University Extension analysis of West Virginia farmers’ markets.



revenues could also be simply a spatial redistribution of expenditures that would have occurred anyway, but in a different location. A thorough survey of farmers' market patrons would be required to understand these peripheral benefits. Our intention is not to provide a totally comprehensive analysis of the impact of farmers' markets but to examine the more direct food system impacts.

While farmers' markets are a means of direct marketing, such markets still often generate a small return to the market itself from fees paid by the vendors. According to Payne, 82% of U.S. farmers' markets were self-supporting. Based on survey data provided in Miller (2005b), it was determined that 63.2% of West Virginia farmers' markets received a small fee from each vendor. Based on per stall fee (booth rental) rates and number of vendors, we calculated a return to the market of less than 1% (0.8%). Also based on survey data found in Miller, spending by farmers' markets was distributed among paid employees and other spending categories (mostly to support various forms of advertising). Based on survey data, discussions with vendors and market officials, and our own observation, farmers' markets in West Virginia are well-subsidized, especially in terms of in-kind support provided by West Virginia University Extension personnel and other uncompensated forms of support, such as volunteer activities by vendors and others.

Another consideration is transportation expenditures that vendors incur in bringing their product to market. Based on data from Miller (2005a), we calculated the transportation cost of moving product to the farmers' markets. The average one-way trip was 14.5 miles. Also based on Miller, eight trips were assumed over the marketing season for the typical or average market vendor. Assuming a transportation cost of 22 cents per mile based on federal reimbursement rates in 2005 (U.S. Dept. of Interior), we calculated the total transportation cost bill. Based on this amount, slight changes were made to farm spending patterns, which were also accounted for in our farmers' market impact scenario.

The level of spending by consumers at West Virginia farmers' markets (i.e., the \$1.725 million) is used to generate our opportunity cost scenario. The opportunity cost impacts reflect what would have occurred had the consumer spending at farmers' markets instead been directed to West Virginia grocery stores and building material and garden supply stores. This opportunity cost scenario assumes that expenditures made at farmers' markets are the same as those that would have been made at grocery stores; however, shoppers may spend more at farmers' markets because they can purchase a different basket of product characteristics. If this is the case, then assuming that all \$1.725 million would have gone to grocery and other stores is an overestimate of the opportunity cost of farmers' markets resulting in a conservative estimate for the positive impact of farmers' markets in the state. If consumers do spend more at farmers' markets than they would have spent at the grocery store, they have less money to spend in other sectors of the economy. Without an in depth analysis of how consumers are diverting funds to farmers' markets, the losing sectors cannot be identified and are thus not accounted for in this study.

For the opportunity cost scenario, we assumed that all spending would have occurred at in-state retail outlets (primarily grocery stores). Spending was distributed to the appropriate agricultural sectors at the consumer (retail) level using the same product mix as was used in the farmers' market impact scenario. Based on marketing margins that are used in IMPLAN models, we then allocated spending to the appropriate IMPLAN sector.<sup>5</sup> For example, it was determined that direct spending on vegetables at farmers' markets was \$777,907. For the opportunity cost scenario, this translated into a farm level impact of \$371,875 for vegetable producers, \$89,302 for the wholesale sector, \$114,575 for various forms of transportation (primarily

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<sup>5</sup>These estimates are, in turn, based on the national input-output table, which relies on industry survey data.

trucking), and \$202,155 for food stores.<sup>6</sup> For all agricultural sectors and impacts allotted to wholesalers and transportation middlemen, IMPLAN regional purchase coefficients were used to determine the level of in-state versus out-of-state production (Minnesota IMPLAN Group, Inc.). For the affected IMPLAN retail sectors, food and beverage stores, and building material and garden supply stores, we assumed that all purchases were made in West Virginia or that there was no leakage (i.e., the regional purchase coefficient was set at 1). For agricultural production, the regional purchase coefficients provide estimates of the level of sales by in-state producers to West Virginia agricultural retailers (primarily grocery stores). Of course, commodities produced by farmers located in other states are an immediate leakage of local dollars. The result was a West Virginia opportunity cost-based expenditure vector that was shocked through the hybrid IMPLAN model to estimate a multiplier effect.

Both scenarios (the farmers' market and the opportunity cost) were evaluated using a hybrid model of the West Virginia economy. The hybrid model is based on an original IMPLAN (Impact Planning) model (Minnesota IMPLAN Group, Inc.) of the state economy for 2002.<sup>7</sup> One of the changes to the original IMPLAN model included changing returns in the directly impacted agricultural sectors to reflect small farmers' use of the markets. Specifically, payments to the other property income category were reduced, while those going to proprietors' income were slightly enhanced to reflect the noncorporate structure of small West Virginia farmers.

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<sup>6</sup>Originally, based on an evaluation of the U.S. Consumer Expenditure survey for food items (U.S. Department of Labor, 2006a), a portion of the opportunity cost spending was assigned to restaurants. However, based on discussions with vendors and managers, prepared foods are usually not available at West Virginia farmers' markets, in part because of state government food safety regulations.

<sup>7</sup>A hybrid input-output model is a nonsurvey based input-output model, such as the one produced by IMPLAN, which is changed to improve accuracy that is based on knowledge of the local economy and superior data (Miller and Blair).

Many agricultural jobs are part-time jobs, especially those generated by small farms. Employment opportunities generated at farmers' markets themselves are also typically part-time (Payne; Miller 2005a). To properly compare our two impact scenarios, we converted employment impact results to full-time employment equivalents.<sup>8</sup> For all sectors of the economy except production agriculture, estimates of the number of part-time workers and their number of hours worked based on Bureau of Labor Statistics data (2006b) were used to make the conversions. For the impact on agricultural employment under the opportunity cost scenario, data derived from the 2002 West Virginia Census of Agriculture was used to convert full- and part-time employment to full-time equivalents. For the farmers' market impact, data taken from Miller (2005a) was used to make the conversion to full-time equivalents.

### **Study Results**

The difference between the results of the farmers' market shock and the opportunity cost shock provides an estimate of the net impact of farmers' markets on the state economy. These results provide a truer estimate of the real benefits of such markets that can be provided to policy markers with greater confidence.

The distribution of the total impact of farmers' markets on the West Virginia economy by major industry category is provided in Table 1. Gross impacts on industry output totaling \$2.389 million were concentrated in

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<sup>8</sup>Our approach was inspired by Otto and Varner's Iowa farmers' market impact study, where direct employment impacts for vendors were converted into full-time equivalent jobs, to reflect the fact that small operators selling at such markets often have farming as a secondary source of income. Still, compared with Iowa, our conversions are less important for agriculture. According to Steele, using data from the 1992 Census of Agriculture, Iowa had the smallest proportion of small farms among all U.S. states (30%), while West Virginia had the highest (88%). Hence, for West Virginia, vendors at farmers' markets are in all likelihood more representative of the general farming population than in a state such as Iowa.

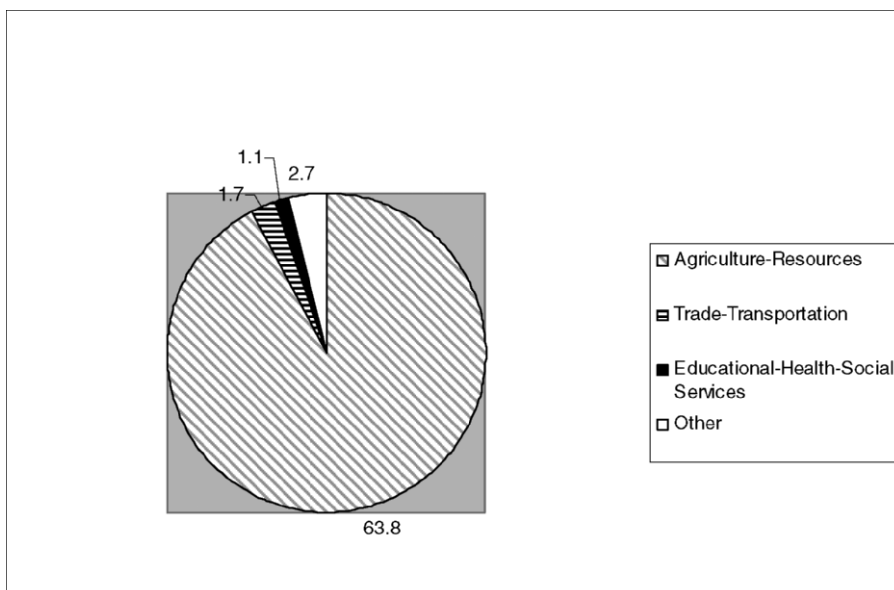
**Table 1.** Distribution of Farmers' Market Impacts (Millions \$)

| Aggregate Sector                    | Output |      | Gross State Product |      | Labor Income |      |
|-------------------------------------|--------|------|---------------------|------|--------------|------|
|                                     | Level  | %    | Level               | %    | Level        | %    |
| Agriculture–resources               | 1.772  | 74.2 | 1.126               | 76.1 | 0.468        | 71.3 |
| Mining–utilities–construction       | 0.058  | 2.4  | 0.036               | 2.4  | 0.015        | 2.3  |
| Manufacturing                       | 0.097  | 4.1  | 0.032               | 2.1  | 0.018        | 2.7  |
| Trade–transportation                | 0.134  | 5.6  | 0.090               | 6.1  | 0.055        | 8.4  |
| Financial activities                | 0.129  | 5.4  | 0.087               | 5.9  | 0.017        | 2.6  |
| Professional–technical services     | 0.053  | 2.2  | 0.030               | 2.0  | 0.022        | 3.3  |
| Educational–health–social services  | 0.073  | 3.0  | 0.043               | 2.9  | 0.038        | 5.8  |
| Entertainment–travel–other services | 0.053  | 2.2  | 0.023               | 1.6  | 0.020        | 3.0  |
| Government                          | 0.021  | 0.9  | 0.014               | 0.9  | 0.004        | 0.6  |
| Total                               | 2.389  |      | 1.480               |      | 0.656        |      |

agriculture and resource activities and trade and transportation-based activity. In terms of gross state product, impacts of \$1.48 million were concentrated in agriculture (76.1%), trade and transport activities (6.1%), and financial activities. A total impact of \$0.656 million on labor income followed a similar pattern, with 71.3% in agriculture and resource activities, 8.4% in trade and transportation, and 5.8% in education, health, and social services. In terms of employment (Figure 1), the total impact of 69.2 full-time equivalent (FTE) jobs (119.4 full- and part-

time jobs) was also concentrated in agriculture (92.1% of the total job impact) and trade-transportation activities.

The distribution of the total impacts of the opportunity cost scenario on the West Virginia economy by major industry category is provided in Table 2. These impacts are the result of shifts in consumer spending from these sectors to farmers' markets. Opportunity cost impacts totaling \$1.316 million were concentrated in trade and transport activities (58.0%) and agriculture and resource-based activities (18.4%). Thus, gains in agriculture



**Figure 1.** Farmers' Market Employment Impacts by Major Job Sector (Number of FTE Jobs)



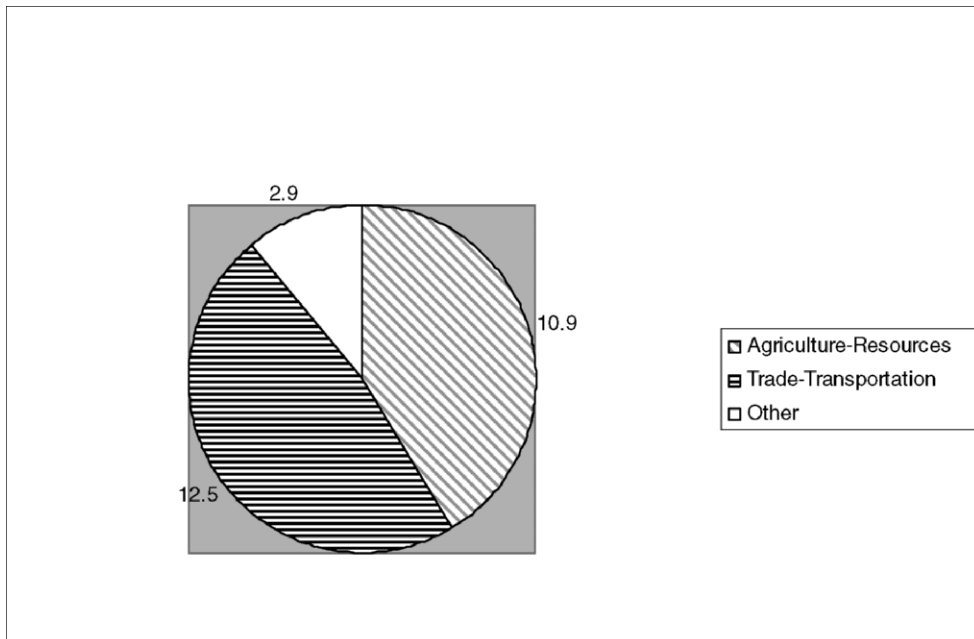
**Table 2.** Distribution of Opportunity Cost Impacts (Millions \$)

| Aggregate Sector                    | Output |      | Gross State Product |      | Labor Income |      |
|-------------------------------------|--------|------|---------------------|------|--------------|------|
|                                     | Level  | %    | Level               | %    | Level        | %    |
| Agriculture–resources               | 0.242  | 18.4 | 0.107               | 13.3 | 0.044        | 9.6  |
| Mining–utilities–construction       | 0.034  | 2.6  | 0.021               | 2.6  | 0.009        | 1.9  |
| Manufacturing                       | 0.040  | 3.1  | 0.011               | 1.4  | 0.007        | 1.5  |
| Trade–transportation                | 0.763  | 58.0 | 0.526               | 65.1 | 0.326        | 70.5 |
| Financial activities                | 0.085  | 6.5  | 0.057               | 7.1  | 0.011        | 2.4  |
| Professional–technical services     | 0.051  | 3.9  | 0.031               | 3.8  | 0.022        | 4.8  |
| Educational–health–social services  | 0.051  | 3.9  | 0.030               | 3.7  | 0.027        | 5.8  |
| Entertainment–travel–other services | 0.038  | 2.9  | 0.017               | 2.1  | 0.014        | 3.1  |
| Government                          | 0.011  | 0.8  | 0.007               | 0.9  | 0.002        | 0.4  |
| Total                               | 1.316  |      | 0.807               |      | 0.463        |      |

from farmers’ market sales are to a small degree offset by losses in agriculture from reduced grocery store sales of similar products produced in West Virginia. In terms of gross state product, impacts of \$0.807 million were also concentrated in trade and transport activities at 65.1% and agriculture and resource activities at 13.3%. Impacts on labor income of \$0.463 million showed an even larger concentration in the trade and transportation sector at 70.5%, followed by agriculture and resource activities. Purely second-

ary impacts were also found in education, health, and social services (5.8%). In terms of employment (Figure 2), the total job impact of 26.4 full-time equivalent jobs was also concentrated in trade and transportation activities (47.1% of the total job impact) and in agriculture (41.3%).

Differences between the two scenarios or overall net impacts, as provided in Table 3, support our hypothesis that the impacts of farmers’ markets are still pronounced and positive but substantially reduced when the



**Figure 2.** Opportunity Cost Employment Impacts by Major Job Sector (Number of FTE Jobs)

**Table 3.** Gross and Net Impacts of West Virginia Farmers' Markets

| Measure of Economic Activity      | Farmers' Market | Opportunity Cost | Net Difference |           |
|-----------------------------------|-----------------|------------------|----------------|-----------|
|                                   |                 |                  | Level          | % Decline |
| Industry output (millions \$)     | 2.391           | 1.316            | 1.075          | 55.0      |
| Gross state product (millions \$) | 1.480           | 0.827            | 0.653          | 55.9      |
| Labor income (millions \$)        | 0.656           | 0.463            | 0.193          | 70.6      |
| Employment (full-time equivalent) | 69.200          | 26.400           | 42.800         | 38.2      |

opportunity cost of such spending is accounted for. For example, the net impact on full-time equivalent employment was 42.8 jobs or a reduction of 38.2% when the opportunity cost of spending at farmers' markets was included (that is, the 26.4 FTE jobs that would have been generated by alternative spending at grocery stores was subtracted from the farmers' market FTE employment impact of 69.2 jobs). Interestingly, the percentage decline in employment was only slightly larger than it would have been if we had not made the full-time equivalent adjustments. In that case, the decline in employment impacts would have been 31.1% (from 119.4 to 82.3 full and part-time jobs). Including the opportunity cost reduced impacts in terms of total gross output in the West Virginia economy from \$2.391 million to \$1.075 million, a decline of 55%. Estimates of labor income declined by 70.6%, the largest percentage decline among our four measures of economic activity. Impacts on gross state product show a drop of 55.9% to \$0.653 million, when the \$0.827 million gross state product generated under the opportunity cost scenario is subtracted from the gross farmers' market impact of \$1.48 million.

A potentially important result under this type of analysis is specific winners and losers. That is, which parts of the economy stand to gain or lose if spending in farmers' markets becomes a major part of the household food consumption bill? As shown in Table 4 and Figure 3, sectors that might experience losses include the directly affected food and beverage stores and building material and garden supply stores. Specific impacts were also concentrated in the trade and transportation sectors, including truck transportation, whole-

sale trade, and air transportation.<sup>9</sup> Several sectors experienced relatively large net negative impacts due primarily to indirect effects. For example, management of companies and enterprises ranked fifth in net losses in outputs, gross state product, and labor income. Food and beverage stores (with estimated impacts of \$0.416 million in sales, and \$0.314 million in contribution to gross state product), building material and garden supply stores and wholesale trade had relatively strong backward linkages to this sector. Wholesale trade also had relatively strong backward linkages to management consulting services (which ranked sixth in expected loss in contribution to gross state product). Other transportation and business services sectors would also experience losses. As model results stand, sectors such as food and beverage stores experience relatively small projected declines in economic activity. For example, the drop in employment of 8.7 jobs in food and beverage stores is for a sector with 16,471 jobs. Our results are, however, indicative of sectors that could experience marked declines in economic activity if West Virginia farmers' markets experienced large increases in economic activity. Further, similar results are likely if other forms of direct marketing that replace food and beverage stores experience marked growth. It is also interesting to note that while the net effect on wholesale trade was negative, activity by farmers' markets

<sup>9</sup> Because of the manner in which input-output models are structured, impacts in these trade and transportation sectors are primarily direct impacts, even though consumers do not have direct contact with these sectors. For more detail see Miller and Blair.

**Table 4.** Sectors with Largest Projected Losses due to West Virginia Farmers' Markets (Millions \$)

| Sector                                  | Total Output |      | Gross State Product |      | Personal Income |      |
|---|--------------|------|---------------------|------|-----------------|------|
|   | Level        | Rank | Level               | Rank | Level           | Rank |
| Food and beverage stores                | -416,300     | 1    | -313,949            | 1    | -193,643        | 1    |
| Truck transportation                    | -108,486     | 2    | -45,579             | 3    | -35,144         | 2    |
| Wholesale trade                         | -76,702      | 3    | -55,532             | 2    | -30,733         | 3    |
| Building material and garden supply     | -43,773      | 4    | -34,261             | 4    | -19,007         | 4    |
| Management of companies and enterprises | -3,919       | 5    | -2,618              | 5    | -1,788          | 5    |
| Air transportation                      | -2,738       | 6    | -652                | 9    | -526            | 9    |
| Scenic and sightseeing transportation   | -2,016       | 7    | -1,037              | 7    | -944            | 6    |
| Management consulting services          | -1,456       | 8    | -1,101              | 6    | -941            | 7    |
| Courier and messengers                  | -1,388       | 9    | -844                | 8    | -584            | 8    |
| Rail transportation                     | -855         | 10   | -527                | 10   | -313            | 10   |

reduced the negative effect on that sector because of enhanced local consumer spending due to an increased retention of dollars.

Selected sectors that might experience net gains in output are shown in Table 5 and Figure 4. These are parts of the state economy that might be winners if farmers' markets in West Virginia experienced substantial and sustained growth. Sectors directly affected by growth in farmers' markets include fruit farming (at 23.7 net jobs, \$0.537 million in

sales, and \$0.334 million in gross state product), vegetable and melon farming, greenhouse and nursery production, other animal production (except cattle and poultry) (at 8.3 net jobs), and poultry and egg production. Cattle production in West Virginia tends to be cow/calf production rather than finished cattle, which are often shipped to feedlots in other states. An increase in demand for locally finished beef (whether grass- or grain-fed) that could occur with a growth in farmers' market



**Figure 3.** Gross and Net Employment Impacts (Number of FTE Jobs), Job-Losing Sectors

**Table 5.** Sectors with Largest Projected Gains due to West Virginia Farmers' Markets

| Sector                                       | Total Output |      | Gross State Product |      | Personal Income |      |
|--|--------------|------|---------------------|------|-----------------|------|
|  | Level        | Rank | Level               | Rank | Level           | Rank |
| Vegetable and melon farming                  | 766,335      | 1    | 582,239             | 1    | 249,069         | 1    |
| Fruit farming                                | 537,357      | 2    | 333,891             | 2    | 127,977         | 2    |
| Greenhouse and nursery production            | 91,788       | 3    | 78,398              | 3    | 32,838          | 3    |
| Animal production, except cattle and poultry | 90,869       | 4    | 15,840              | 5    | 8,731           | 4    |
| Poultry and egg production                   | 44,849       | 5    | 17,794              | 4    | 7,998           | 5    |
| Pesticides and other agricultural chemicals  | 20,246       | 6    | 10,356              | 8    | 4,183           | 8    |
| Real estate                                  | 18,850       | 7    | 13,300              | 6    | 2,873           | 11   |
| All other crop farming                       | 17,834       | 8    | 10,111              | 9    | 282             | 13   |
| Owner-occupied dwellings                     | 14,861       | 9    | 11,906              | 7    | 0               | –    |
| Power generation and supply                  | 12,289       | 10   | 8,651               | 10   | 2,544           | –    |
| Agriculture and forestry support activity    | 9,828        | –    | 5,686               | –    | 7,154           | 6    |
| Wood container and pallet manufacturing      | 9,760        | –    | 4,169               | –    | 3,248           | 9    |
| Offices of physicians and dentists           | 7,255        | –    | 5,903               | –    | 4,902           | 7    |
| Hospitals                                    | 7,134        | –    | 3,258               | –    | 3,185           | 10   |

sales might lead to gains in this sector as well. Other agricultural sectors were projected to experience a net increase in activity because they provide inputs to the directly affected sectors. These indirectly benefiting sectors include pesticides and other agricultural chemicals and all other crop farming. Other net impacts that were indirect in nature included projected growth in power generation and supply and agriculture and forestry support activity. Further, because local incomes are enhanced by farmers' markets under the net impact scenario, sectors oriented towards induced effects, such as physicians, dentists, and hospitals, would also likely experience increases in economic activity. The real estate sector also experiences gains because of payments by farmers who rent land.

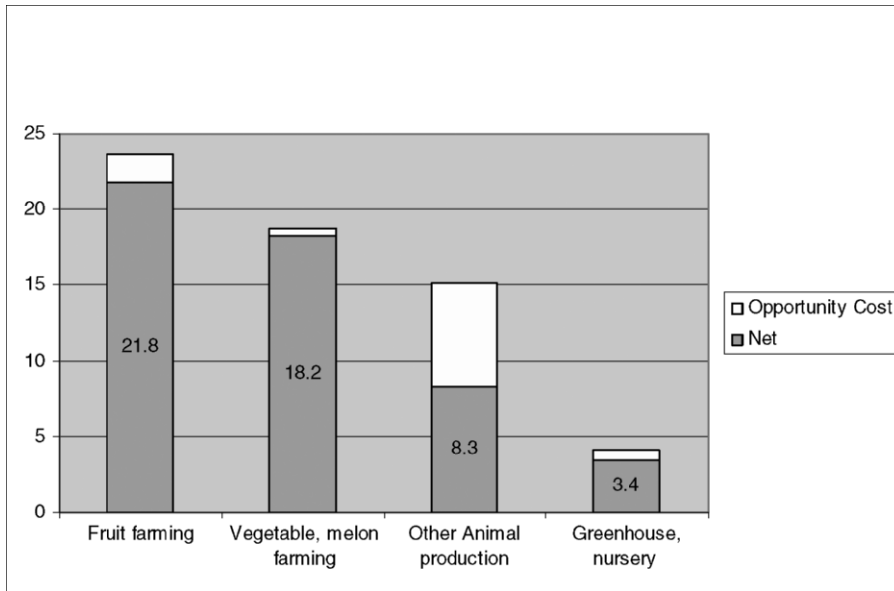
### Summary and Conclusions

Presented here is a simple approach used to evaluate the net impacts on the state economy by economic activity generated by West Virginia farmers' markets. As expected, while still positive and substantial, study results indicate that accounting for the opportunity cost of such spending reduces the impact of

these markets. By incorporating the concept of opportunity cost, the work presented here is more consistent with economic theory as compared with other relevant input-output based studies.

Users of studies such as these (e.g., policy makers) may not like the idea of net (i.e., reduced) impacts. However, results are more easily defended because they are presumably more in line with economic reality. Another advantage is that potential opponents of a given project are more readily identified. For example, based on our results, in-state business support services may become concerned about the growth of farmers' markets if such growth becomes substantial.

This analysis also leads to areas of future work. Other approaches to estimating the opportunity cost of farmers' markets may strengthen study results. A survey of consumers at farmers' markets could better indicate the location (in terms of sector and place) where their alternative spending would go. For example, are consumers spending at farmers' markets instead of grocery stores or does such spending substitute for recreational spending at places such as museums. Such a survey could also help determine the positive



**Figure 4.** Gross and Net Employment Impacts (Number of FTE Jobs), Job-Gaining Sectors

impact of farmers' markets on nearby businesses through "spillover spending."

A related area of future research is determining the conditions under which a farmers' market becomes an entertainment nexus, where crafts, musical events, and other recreational activities are provided. This type of farmers' market should be especially beneficial to local economies with out-of-state tourists as the target market. Because we found that West Virginia farmers' markets are not destinations as they are in some other places, such research could be used to support outreach activities by Extension personnel and others.

Another area of future work would be to incorporate superior data for agricultural producers who sell at farmers' markets. In particular, vendors at farmers' markets tend to be small producers, who may have a different pattern of input use as compared with larger operations. But, coefficients used in input-output models such as IMPLAN based models can be expected to reflect the behavior of the latter as opposed to the former. Since little research has been conducted concerning the impact of spending by small farmers, an area of future work could include further

adjusting coefficients to more accurately reflect the behavior of small operations. These adjustments could help us understand income distribution shifts that could occur if consumers purchase less from regional/national retail outlets and more from farmers' markets. In particular, increasing income for farmers may have a greater impact on local economies if more dollars are circulated locally compared with income losses by chain retailers and related transportation and management, who are likely to have smaller local linkages.

Farmers' markets have also been shown to foster entrepreneurship (Lyson, Gillespie, and Hilchey). Development of an entrepreneurial spirit could benefit farmers and the local economy in numerous ways. However, assessing the impacts of such efforts would be a major research undertaking.

In addition to farmers' markets, other direct marketing outlets may be important sources of income for small farms. The impacts of sales through these additional direct marketing venues are not included here. Future research should expand to include the impacts of all direct marketing outlets.



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