

Module 6. Addressing Opportunity Costs in the Analysis of Economic Impacts across Local Food Systems

Workshop: Evaluating the Economic Impacts of Local and Regional Food System

University of Tennessee Eastern Region Extension office
Knoxville, TN February 20, 2017



Topics

- Opportunity Cost and Local Foods
- Opportunity Cost of Land and Local Foods (Supply-side, Swenson)
- Opportunity Cost of Consumer Dollar and Local Foods (Demand-side, Hughes)
- Opportunity Cost between Local Foods Activities (Supply-side and Demand-side, Jablonski et. al., Lohr & Diamond)
- Other Considerations

Opportunity Cost and Local Foods

- Opportunity cost the basic relationship between scarcity and choice
- The value of the best alternative forgone, when a choice is made between several mutually exclusive alternatives given limited resources.
- Incorporated by estimating the net impact rather than the gross impact of changes in a regional food economy
- In terms of local foods, can be on supply-side, demand-side, or both.

Net Economic Impact on Local Economy of Local Food System

Local Economic Impact
of Local Food System
(+ or positive)

Plus

Opportunity Cost
Based Impact
(NEGATIVE!)

=

Net Local Economic
Impact of Local Food
System
(Still + but smaller)



Opportunity Cost from Supply Side:
Emphasis on Land
(Based on work by Dave Swenson,
Iowa State University, Department
of Agricultural Economics)

Opportunity Cost of Land Devoted to Local Foods Production

- Assume land devoted to local food production comes from producing other crops.
- A one-to-one land opportunity cost assumption was especially reasonable for the Midwest at the time of the analysis (comparatively robust returns to conventional cropland uses like corn, soybean, and wheat).
- But, local food system production usually concentrated in fruits and vegetables.

But, Gross Opportunity Cost Small Based on US Agriculture Land Allocation (2012 Census)

- 315 million acres of harvested cropland
 - 79.2% field crops (corn, soybeans, cotton, wheat, rice, and other small grains and oilseeds)
 - 17.7% forage and hay
 - 3.1% vegetable and orchard production.
- A very small percentage of the nation's cropland is required to produce annual supply of fruits and vegetables.
- Thus, depending on the potential size of local markets, the expected average amount of area cropland to be used for local food production is just over three-percent.

Impact of Land Converted to Fruits- Vegetables

- Develop two scenarios and difference the two.
- Fresh fruits and vegetables demand in Kane County, IL and surrounding metro areas based on consumption patterns, duration of growing season, the storage life of the crops, and land productivity (Iowa Fruit and Vegetable Market Planner decision tool)
- Regional population of 445,328 would require 905 additional acres of vegetable and orchard production
- Assumed 1,000 acres switch (62% corn, 38% soybeans).

Study Results

- Differencing the economic impact of the two land use scenarios in IMPLAN (i.e., evaluating the shift of the use of 1,000 acres) yielded estimates concerning the net gains to the regional economy

	Output	Local Income	Jobs
(Gains ¹)	<i>\$6.8 million</i>	<i>\$2.1 million</i>	<i>48</i>
(Loses ²)	<u>\$1.5 million</u>	<u>\$0.3 million</u>	<u>13</u>
(Net Gains)	\$5.3 million	\$1.8 million	35

¹ From new fruit and vegetable production on 1,000

² From 1,000 less acres in corn and beans

Beggar-Thy-Neighbor

(Hughes & Boys)

- 2/3 of the nation's fruits and vegetables are grown in California, Florida, Washington, Idaho, and Texas
- A meaningful shift to locally grown fruits and vegetables in other areas could affect those and other regional-export oriented agricultural economies.
- Beggar-thy-neighbor COULD occur:
 - the unarguable benefits of comparative advantage in trade are thwarted when everyone acts only to maximize local production.
 - localized gains come at the expense of other regions
 - Other areas could even retaliate

Opportunity Cost from Demand
Side: Emphasis on Consumer Dollar

Opportunity Cost from the Demand Side

- Accounting for the opportunity cost of money spent on local food systems from the demand side.
- Opportunity cost on other food purchases or on other spending in general. In as much as these cost are local, should be accounted for in impact analysis of local food systems.
- Certain local food spending can also have an impact on other local food activity (both demand and supply side)—for example, a new food hub could draw consumer spending or producer supply away from local farmers (Jablonski et al., 2016).

Modeling Opportunity Cost from the Demand Side: How does it “work”?

- Must determine the degree to which the local food spending has a local opportunity cost. For example, if all purchases at a local farmers market were by tourist, and such spending did not reduce tourist spending on other local activity, the opportunity cost would be zero.
- For many local food activities, reasonable to assume that all buyers are local
 - Can then make assumption about where the local food system spending would have gone (such as local grocery stores as was done by Hughes et al.)
 - Can survey local food consumers (Hughes & Isengildina-Massa). 41% grocery stores, 18% restaurants, 21% other spending, 18% savings in SC.

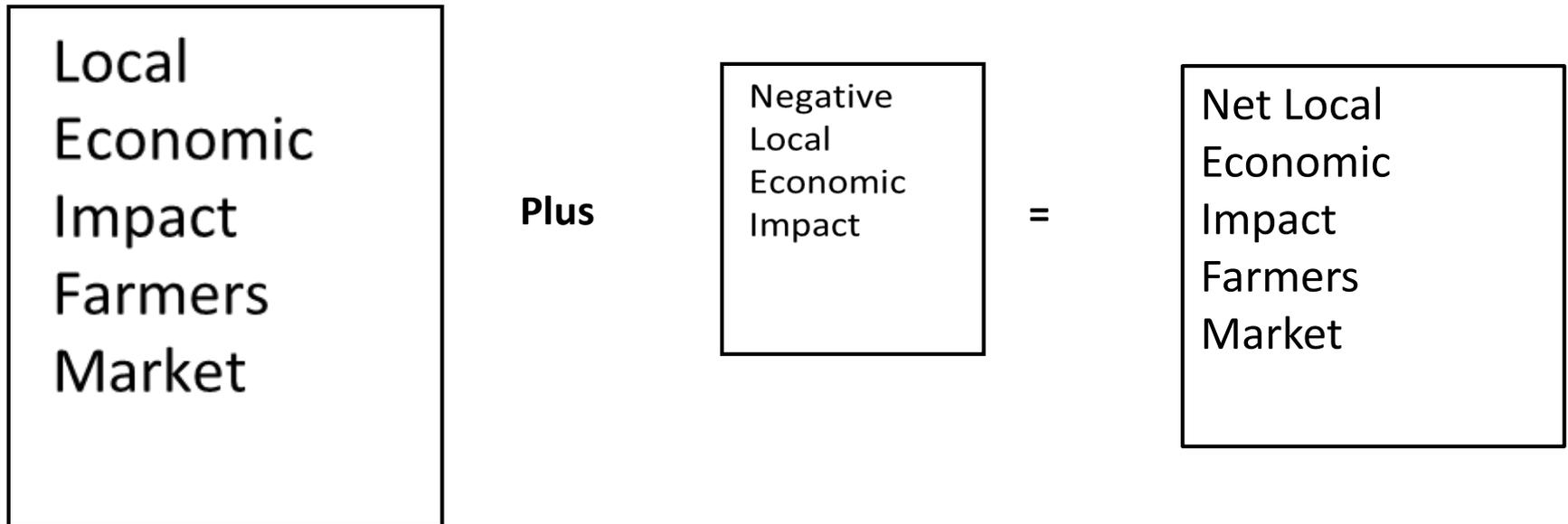
Margining 101 Grocery Store (\$1)

- Grocery Store retains part
- Part goes to wholesalers (aggregate, store)
- Part goes to transportation (getting food to stores)
- Part goes to farmer
- (For more detail see Appendix)

Margining 101 Grocery Store (\$1): Local or Not?

- Grocery Store retains part (Yes- so opportunity cost)
- Part goes to wholesalers (No)
- Part goes to transportation (No)
- Part goes to farmer (No: Florida or Mexico)

Net Economic Impact on Local Economy of Sale at Local Farmers Market



West Virginia Study Results:

Accounting for Opportunity Cost

- Estimated declines in the still positive impacts of 55 percent in total gross output, 70.6 percent in labor income, 55.9 percent in gross state product, and 31.1 percent in full-time equivalent employment
- **Winners and Losers:**
 - **Winners! Local Farmers!**
gained income etc. because of the sales at West Virginia farmers markets, but even their employment impacts were slightly reduced when we account for the opportunity cost of such spending
 - **Losers! Local Grocery Stores!**
A net decrease due to lose of market (economic impact tied to opportunity cost)

Future of Local Foods?

- A signal that local food systems is “big” when grocery stores, others, attempt to copy and/or coop?

Fake Farmers Market, Seattle Grocery Store, 2010



Opportunity Cost within Local Foods

Competition between food hub and farmers market

Competition among farmers markets

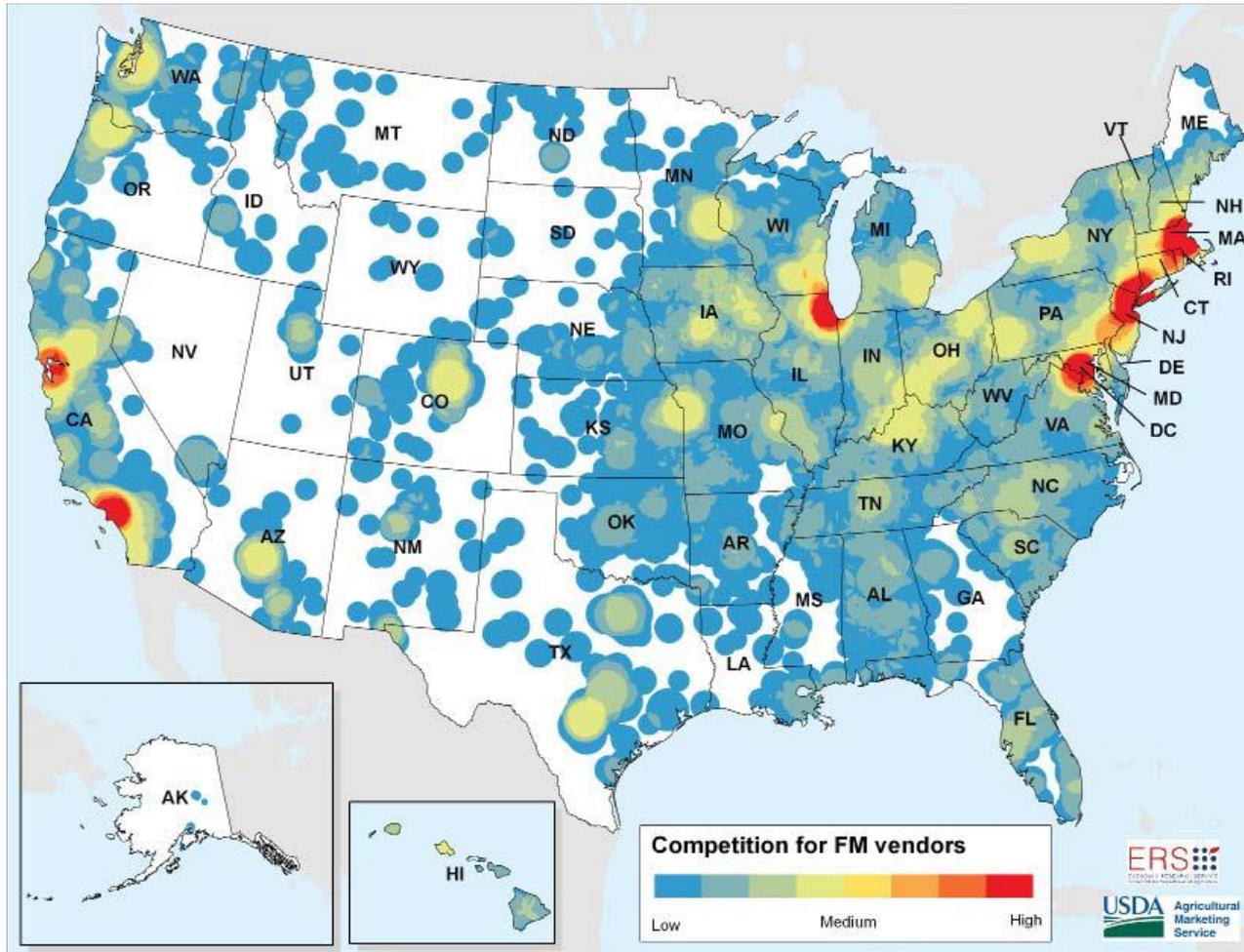
Competition between Food Hub and Farmers Markets (Schmit et al. 2013)

- Food Hub: serve as an aggregator of local production by small to medium size farmers
- Form large lots that meet the size, quality, and timing requirements of large buyers, such as grocery stores
- Estimated the degree that a food hub could take demand away from other components of the local food system by reduced purchases by grocery stores and other business buyers
- Opportunity cost of the food hub was 11% of the original food hub economic impact.

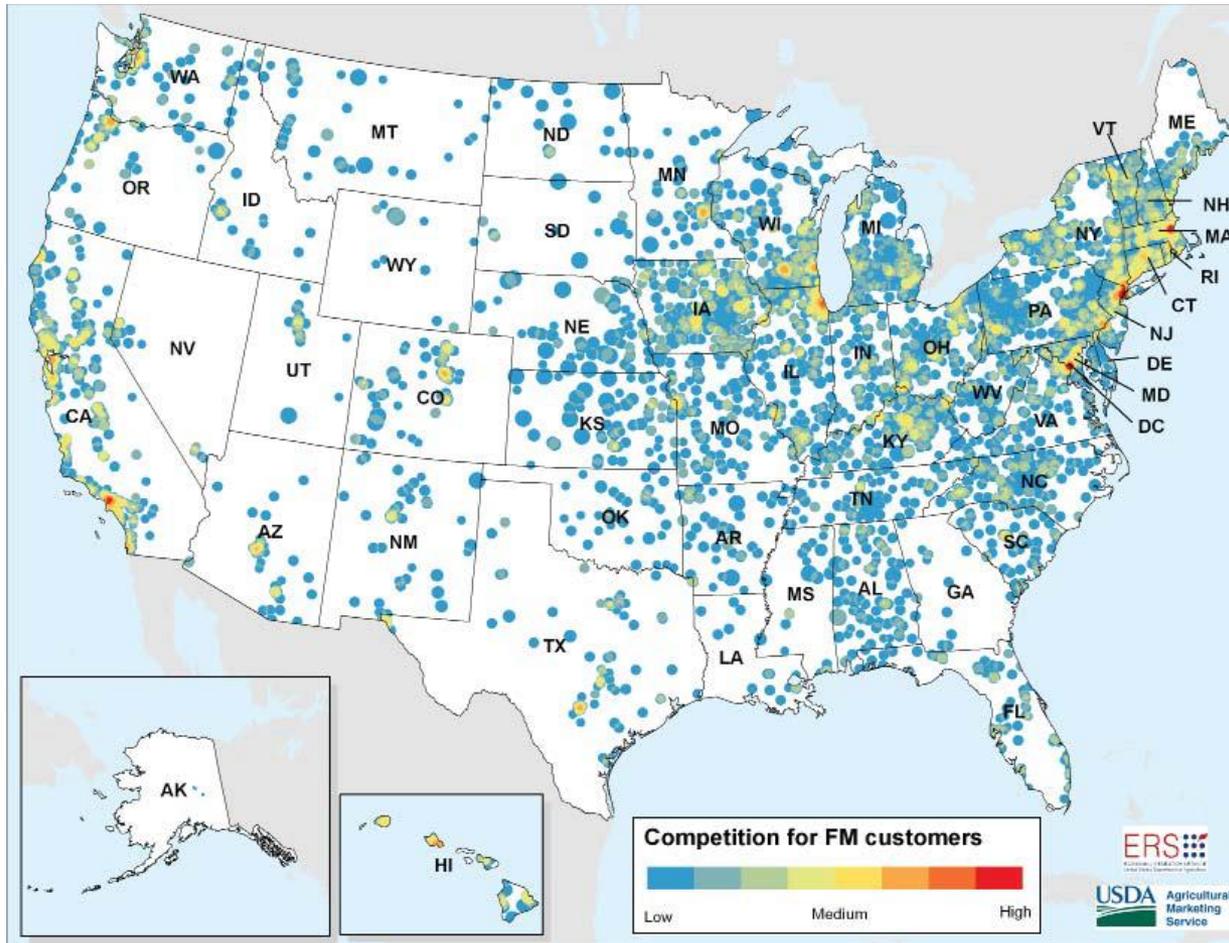
Competition Among Farmers Markets

- Lohr and Diamond (2011) looked at the impacts of growth in new farmers markets on existing farmers market
- The opportunity cost could come from consumer spending or reduction in supply
- New farmers markets may be taking either customers and/or suppliers from existing farmers markets
- Constructed a map of the U.S. indicating the likelihood of competition for both customers and suppliers for farmers markets for a given region.

Competition for Vendors at Farmers Markets



Competition for Customers at Farmers Markets



Take-away:

The three studies imply that the economic development contribution of new food system assets could be reduced or even negligible if new markets cannibalize consumers and/or vendors from existing local food activities.

Summary and Conclusions

- Opportunity cost of local food systems on the supply-side usually small but still an important consideration
- Opportunity cost of local food systems on the demand-side larger and also an important consideration
- Competition between various elements of a local food system could reduce economic impact, perhaps dramatically
- Determining who wins and loses also important
- Need to be aware of implications relating to shifting markets.

Literature

Hughes, David W. and Olga Isengildina-Massa. 2015. "Keeping Dollars Home: the Economic Impact of the Farmers' Markets and the South Carolina Locally Grown Campaign." *Food Policy*. 54(1): 78-84.

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Questions, Comments,
Thank You!

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Appendix

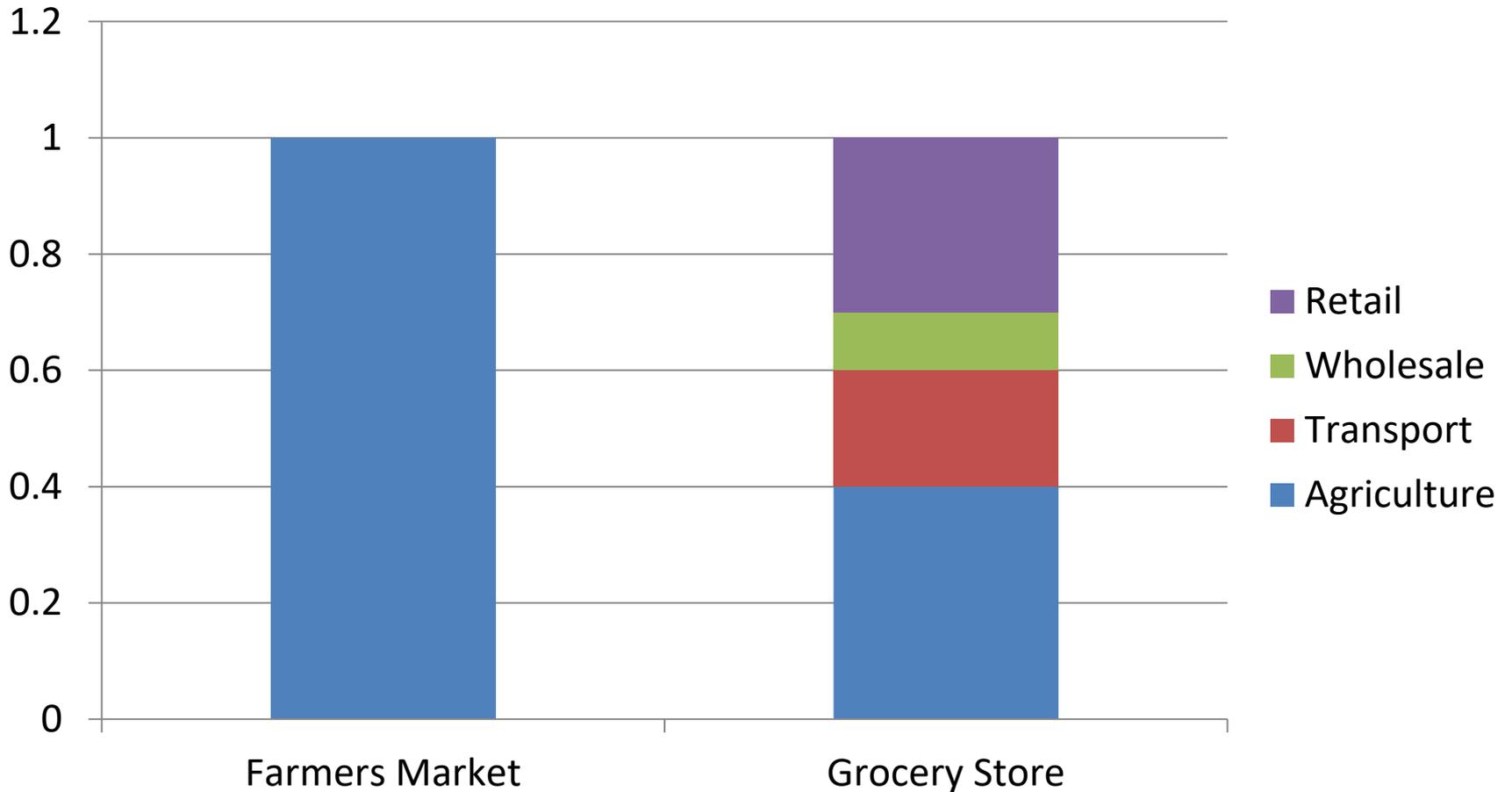
Margining 101

- Commodities (goods) physically and functional move or are sold through a set of marketing channels, specifically transportation, wholesale, and retail marketing channels.
- If input-output (I-O) models were constructed based on these physical linkages, would have very large retail sectors with no direct interaction with the final consumer and the actual maker of the product.
- Margining expenditures at the retail, or final consumer level, allows the I-O model to represent the true functional relationship between producers and consumers.
- consumers can show as purchasing goods directly (in a functional sense) from sectors such as manufacturing and agriculture and part of the retail dollar is allocated to appropriate “margin” sectors (trade and transportation).

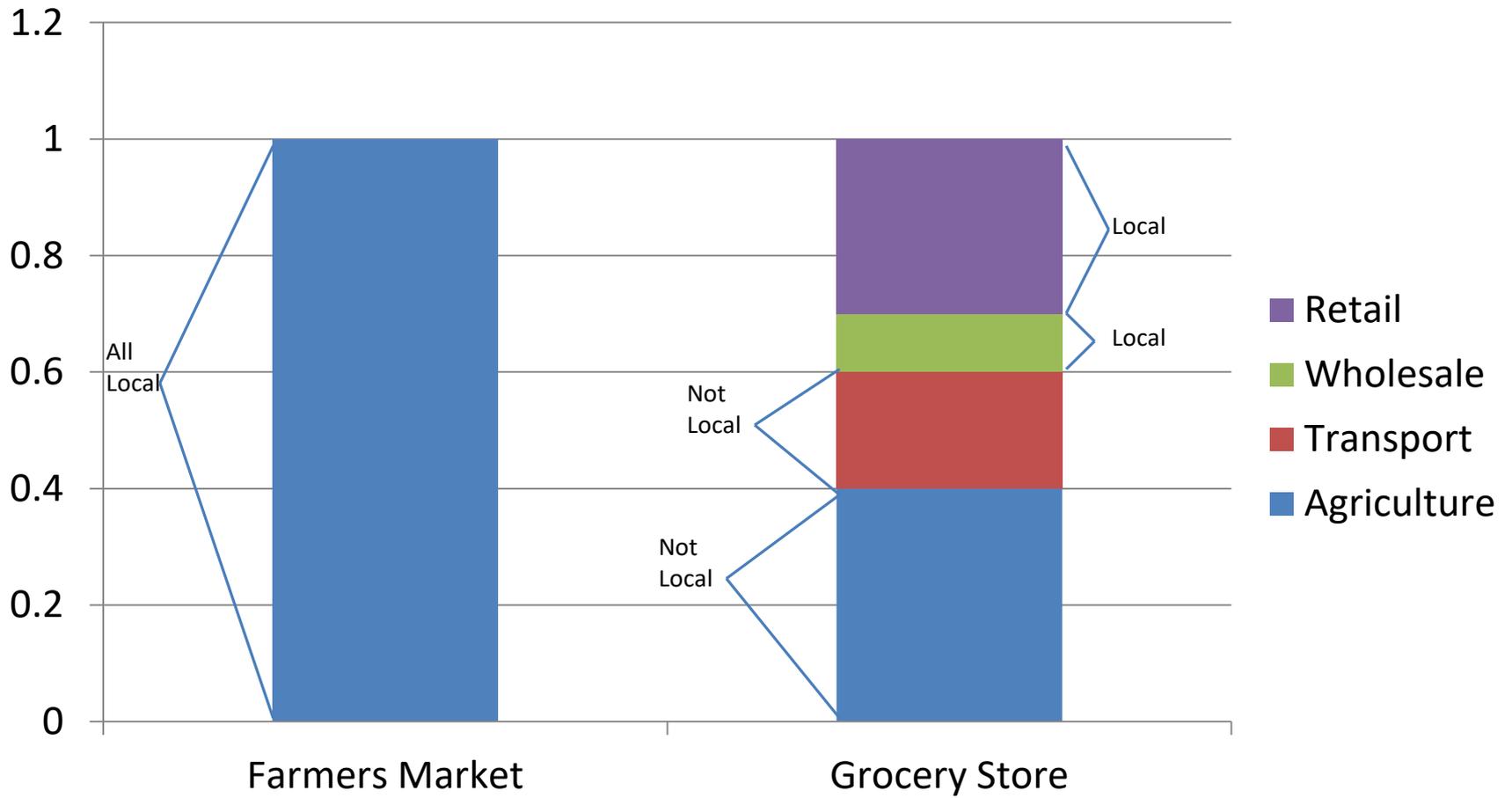
A Dollar of Spending at a Local Farmers Market as an Example

- All buyers local
- Would have spent the dollar at a local grocery store on produce
- All grocery store produce is non-local
- All transportation used in grocery marketing chain non-local
- All retail and wholesale marketing chain is local.

Breakdown of \$1 Spending on Produce, Farmers Market Vs. Grocery Store.



Division of \$1 Spending on Produce, Farmers Market Vs. Grocery Store.



Local Economic Impact of \$1 Spending on Produce, Farmers Market versus Grocery Store (Opportunity Cost).

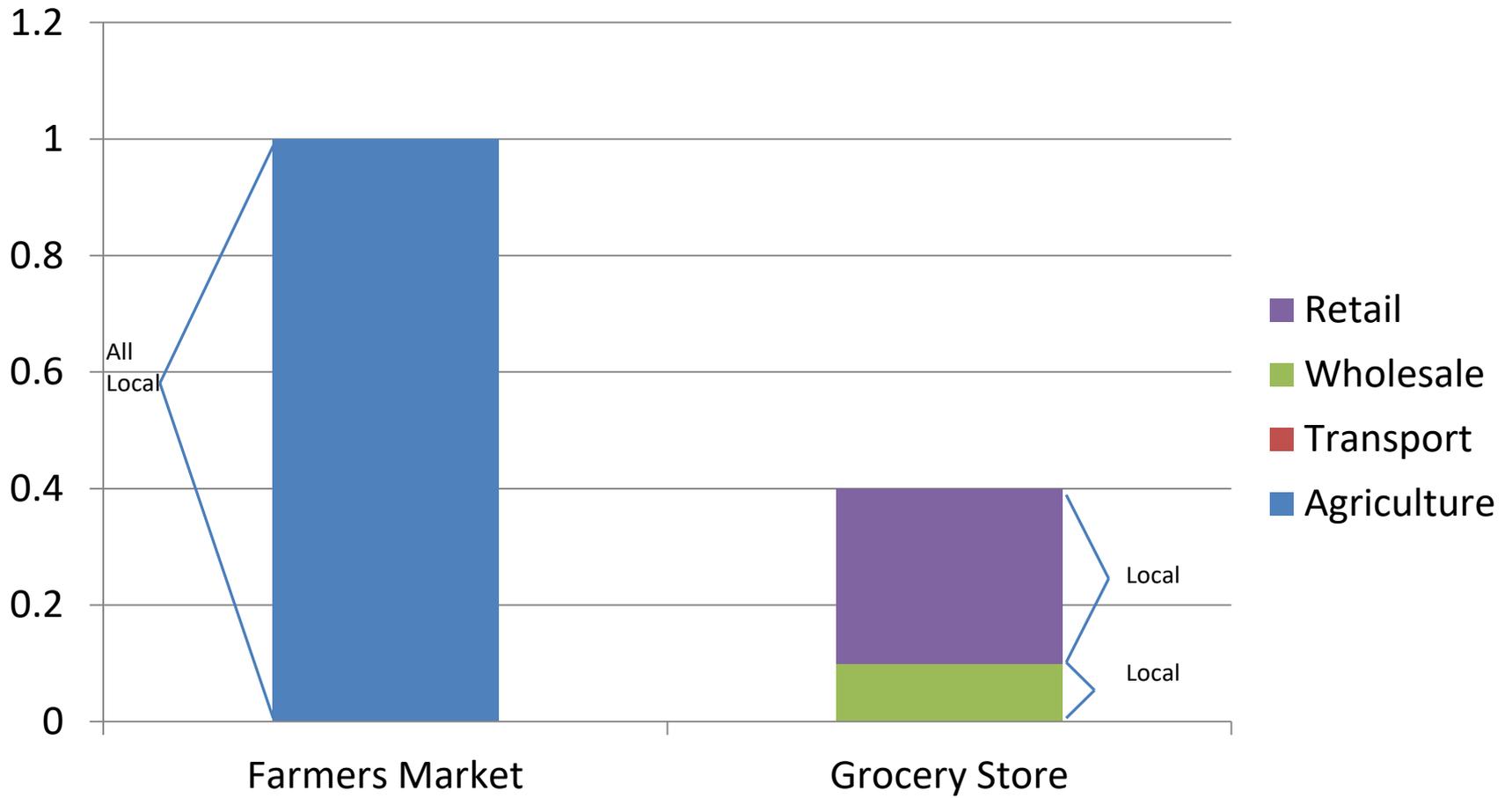


Figure 6. Net Economic Impact on Local Economy of Sale at Local Farmers Market

