Economic Impacts of Food Hubs

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Research Question

• What is the economic impact of food hubs to local economies and participating farms?
Funding Support

- Agricultural Marketing Service, USDA, Cooperative Agreement No. 12-25-A-5568
- National Institute for Food and Agriculture, USDA, Competitive Grant No. 2012-67011-19957
- Northeast Region Sustainable Agriculture Research and Education Program, Grant No. GNE11-021
- College of Architecture, Art, and Planning, Cornell University
Research Objectives

1. Promote a best-practice, *data-driven*, replicable methodology to evaluate the economic impact of policies that support food hubs on local economies and participating farms.

2. Better understand the extent to which food hubs affect the overall demand for and consumption of local products.
Direct Effect
Direct Effect

Induced Effects

Indirect Effects

Research Question

Literature Review

Methodology

Results

Discussion

Implications
Total Value of Local Economic Impact = direct + indirect + induced
Economic Impact Assessment

• Location of purchases matter
  – Not just what businesses purchases, but also where
  – Only local purchases contribute to the total impact

• Take home message: data needs are significant
Economic Impact Assessment

**IO/SAM Model (method)**
- Tool to analyze inter-industry linkages
- Social Accounting Matrix (SAM) models extend Input-Output model to more comprehensively capture distribution of income

**IMPLAN (data & software)**
- IMpact Analysis for PLANning—dominant source of IO/SAM data and software
  - Data: BEA, Census, Survey of Manufacturers, USDA NASS, etc.
Previous Research

• Substantial and growing literature on food hubs, but no data driven impact assessments

• A few studies that measure the economic impact of alternative food marketing channels – all utilize IMPLAN
  – Farm-to-school programs: Gunter & Thilmany 2012; Tuck et al. 2010
  – Meat processing facilities: Swenson 2011
Challenges with Previous Research

• Data on inter-industry linkages available only on aggregate commodity sector scale via IMPLAN
  – Farmers selling through alternative markets may have different expenditure patterns

• Need to include opportunity cost—i.e., what would have happened had the initiative not have occurred?
Methodology

• Mixed-Method Assessment
  – SAM Model/IMPLAN
    • Create food hub farm sector
    • Two models:
      1. uses IMPLAN default agricultural data
      2. uses customized food hub farm data from interviews
  – Data collection based on case study
    • Food hub (Regional Access, RA)
    • Interviews with 30 farmer-vendors and 15 artisan processors working with RA
    • Surveys/interviews of 305 RA customers
Case Study: Regional Access

- Regional Access LLC, est. in 1989
- Over $6 million in sales, 32 employees
- Delivery (mostly) throughout NYS
  - 10 vehicles
- Over 3,400 product listings
  - Beverages, breads, cereals, flour, meats, produce, prepared foods, grains, fruits & vegetables, etc.
- Purchases from over 100 farmers & 65 specialty processors
- Over 600 customers
  - Individual households, freight, restaurants, institutions, distributors, buying clubs, retailers, manufacturers, bakery
Regional Access’ Expenditure Pattern

<table>
<thead>
<tr>
<th>RA expenditure item</th>
<th>% of total expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>food sold-nonfarm</td>
<td>7% local, 37% nonlocal</td>
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<tr>
<td>employee compensation</td>
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</tr>
<tr>
<td>retail stores-gasoline stations</td>
<td>4% local, 2% nonlocal</td>
</tr>
<tr>
<td>proprietor's income</td>
<td>3% local</td>
</tr>
<tr>
<td>automotive equipment rental and leasing</td>
<td>3% local</td>
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<tr>
<td>other</td>
<td>8% local, 3% nonlocal</td>
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Regional Access’ Expenditure Pattern

MSU Survey results also show 61% of expenditure on ‘food and/or product purchases’

- Food sold-nonfarm: 7% local, 37% nonlocal
- Food sold-farm: 16% local, 1% nonlocal
- Employee compensation: 16% local
- Retail stores-gasoline stations: 4% local, 2% nonlocal
- Proprietor's income: 3% local
- Automotive equipment rental and leasing: 3% local
- Other: 8% local, 3% nonlocal

% of total expenditure

Research Question  | Literature Review  | Methodology  | Results  | Discussion  | Implications
Regional Access’ Expenditure Pattern

- Food sold-nonfarm: 7% local, 37% nonlocal
- Food sold-farm: 16% local, 1% nonlocal
- Employee compensation: 16% local
- Retail stores-gasoline stations: 4% local, 2% nonlocal
- Proprietor's income: 3% local
- Automotive equipment rental and leasing: 3% local
- Other: 8% local, 3% nonlocal

MSU Survey results show 23% of expenditure on ‘salary and benefits’

Research Question         Literature Review         Methodology         Results         Discussion         Implications
Case Study: Farm Interviews

• 30 interviews with RA’s farmer vendors out of a population of 86 located in NYS
  – Response rate, 35%

• Commodity, by primary sales:
  – Meat/Livestock, 37%
  – Fruit and Vegetable, 30%
  – Value Added Products, 33%

• Operation Size, by 2011 gross annual sales:
  – Small, 50%
  – Medium, 20%
  – Large, 30%
Case Study: Customer Surveys

- 305 surveys/interviews with RA customers
  - Response rate, 46%
  - Businesses, 80%; households 20%
- Business customers:
  - Average sales = $5.7 million; median = $515,000
  - Average years in business = 13
    - Median = 8; range = 0-130
  - Primary business function:
    - Retailer, 34%; Restaurant, 25%; Wholesaler, 11%; Processor, 9%; Other, 21%
Results: Farm Expenditure Patterns

**IMPLAN Default Ag Data**
- $0.54 spent locally

**Food Hub Farms**
- $0.77 spent locally

All results refer to “per $1 of output”
Results: Farm Expenditure Patterns

**IMPLAN Default Ag Data**
- $0.54 spent locally
- $0.06 spent on purchases from local farms

**Food Hub Farms**
- $0.77 spent locally
- $0.14 spent on purchases from local farms

All results refer to “per $1 of output”
Results: Farm Expenditure Patterns

**IMPLAN Default Ag Data**
- $0.54 spent locally
- $0.06 spent on purchases from local farms
- $0.02 spent on ‘support activities for agriculture and forestry’

**Food Hub Farms**
- $0.77 spent locally
- $0.14 spent on purchases from local farms
- $0.08 spent on ‘support activities for agriculture and forestry’

*All results refer to “per $1 of output”*
$1 Million

Direct Effect
$1 Million

Direct Effect + Indirect Effects + Induced Effects =

Research Question  Literature Review  Methodology  Results  Discussion  Implications
Results: Local Economic Impacts

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<td>Output Multiplier</td>
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Output multiplier: every additional $1 to food hubs results in an additional $0.75 in the local economy.
## Results: Local Economic Impacts

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Food hub sector has larger multiplier than comparable sectors (NYS):

- Wholesale trade = 1.60
- Truck transportation = 1.60
- Warehousing and storage = 1.73
Results: Opportunity Cost

• 49% of RA customers purchases less from other sources due to purchases from RA (n=164)
  – Average reduction >23%

• Opportunity Cost associated with $1 increase in final demand for food hub sector ~ $0.11
$1 Million

Direct Effect
Direct Effect

$1 Million - ($114,042)
$1 Million

Direct Effect

Induced Effects

Indirect Effects

- ($114,042)
# Results: Local Economic Impacts

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Important to consider OC: >10% decrease in output multiplier (in both models) when including OC.
Results: Local Economic Impacts

Indirect and induced effects per $1 increase in final demand (top impacted industry sectors), with food hub farm data including opportunity cost.
Results: Local Economic Impacts

Indirect and induced effects per $1 increase in final demand (top impacted industry sectors), with food hub farm data including opportunity cost.
Results: Local Economic Impacts

Indirect and induced effects per $1 increase in final demand (top impacted industry sectors), with food hub farm data including opportunity cost.

- Food hub farm: $0.15
- Food sold-nonfarm: $0.10
- Real estate and rental: $0.05
- Retail stores-gasoline stations: $0.05
- Health and social services: $0.10
- Insurance carriers: $0.15
- Retail trade: $0.20
- Automotive equipment rental and leasing: $0.10
- Finance and insurance: $0.05
- Other farm: $0.05
- Utilities: $0.05
- Nondepository credit intermediation and finance: $0.05
- Wholesale trade: $0.05

Indirect and induced effects per $1 increase in final demand (top impacted industry sectors), with food hub farm data including opportunity cost.

- Indirect effects (Total = $0.42)
- Induced effects (Total = $0.22)
Results: Local Economic Impacts

Indirect and induced effects per $1 increase in final demand (top impacted industry sectors), with food hub farm data including opportunity cost

Indirect and induced effects per $1 increase in final demand (top impacted industry sectors), with food hub farm data including opportunity cost.
Results: Farm-level Impacts

Regional Access facilitated sales as a proportion of total farm sales.
Results: Farm-level Impacts
Regional Access facilitated sales as a proportion of total farm sales
Results: Farm-level Impacts

Farm business expansion due to RA?

- **57%**: yes, expanded
- **29%**: no
- **14%**: unsure
Results: Farm-level Impacts

Expanded (urban) market access
“Regional Access enabled us to expand our CSA reach, to grow beyond the local area, meaning in the years to come we will increase our acreage under production.”

Farm business expansion due to RA?

- yes, expanded: 57%
- expanded (urban): 29%
- unsure: 14%
- no: 14%

Research Question  Literature Review  Methodology  Results  Discussion  Implications
Results: Farm-level Impacts

- Increased access to warehousing and cold storage
  “We store our potatoes at Regional Access, which allows for extended season sales throughout the year. That has made a big difference to our farm’s bottom line.”

- Farm business expansion due to RA?
  - Yes, expanded: 57%
  - Unsure: 29%
  - No: 14%
Results: Farm-level Impacts

Do customers receive a price premium for items marketed as ‘locally grown’?

![Bar chart showing the percentage of business customer respondents' perceptions of price premium for locally grown items.]

- **1%** significantly lower prices
- **5%** somewhat lower prices
- **42%** no price difference
- **49%** somewhat higher prices
- **3%** significantly higher prices
Results: Farm-level Impacts

• 79% of customers reported expanded local food sales due to availability of product through RA (n=166)
  – Mean Increase = 17%

• Businesses would increase purchases if RA:
  – Expanded product offerings, 73%
  – Improved logistics, 40%
Discussion

1. Promote a best-practice, **data-driven**, replicable methodology to evaluate the economic impact of policies that support food hubs on local economies and participating farms.

   • Need to collect data to understand food hub farm expenditure patterns
     – Using default IMPLAN data underestimates local economic impact AND farm-level impact
   • Must include opportunity cost in assessment
     • Opportunity cost results in >10% decline in multiplier
Discussion

2. Better understand the extent to which food hubs affect the overall demand for and consumption of local products.

- Food hubs support the expanded availability of local farm products
  - Farms reported improved access to freight service, storage and access to urban markets
  - Mid-scale farms reported particular importance of access to food hub services
  - Customers overwhelmingly report expanded access to locally-grown foods due to food hub

- Do not know the extent to which decreased sales from wholesale businesses (OC) was of local products
Discussion

What is the economic impact of food hubs to local economies and participating farms?

Local Economic Impact

• Food hubs have larger multipliers than similar businesses
• Participating farms spend more money than other types of farms in the local economy (per unit of output)
• Policies supporting food hubs produce winners and losers

Farm-Level Impact

• Price impact - consumer WTP for differentiated products
• Expanded market access, particularly for mid-scale producers
• Increased access to warehousing and storage
• But, questions remain about profitability impact
Implications for Food Hub Design

When designing or supporting a food hub initiative:

- **Important to involve mid-scale producers**
  - perhaps more difficult if project too reliant on small-scale farms, and large farms have many other options)
- **Availability of warehousing and storage capacity**
- **Diversity of customers!**
  - Particularly those located in a more urban environment (where farms less likely to make their own deliveries)
- **Opportunities for back-hauling?**
Implications for Food Hub Design

When designing or supporting a food hub initiative:

- Remember impact isn’t pure – are there opportunities to work with existing businesses?
  - Improved business-to-business linkages?
- Benchmarking
  - Is the feasibility study/business plan informed by existing work?
    - e.g., Farm Credit Council (2013); Fischer et al. (2013)
Implications for Food Hub Design

- Go beyond total sales of hub – need to understand the extent to which hub is increasing OVERALL sales
  - How is the hub increasing consumer access to products?
  - How are producers gaining market access?
  - Are producers expanding profitability?
    Acres in production? Or, are producers diverting product from one market to another?
Thank You!

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Results: Summary of expenditure patterns per dollar of output for the default agricultural sector (food sold-farm) and the food hub farm sector

<table>
<thead>
<tr>
<th>Selected Industry Sector/Value Added Components</th>
<th>Value of purchases per dollar of output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Food Sold- Farm (Default)</td>
</tr>
<tr>
<td>food sold-farm (default) (^a)</td>
<td>$0.06</td>
</tr>
<tr>
<td>food hub farm (^a)</td>
<td>NA</td>
</tr>
<tr>
<td>other farm (^a)</td>
<td>NA</td>
</tr>
<tr>
<td>utilities</td>
<td>$0.02</td>
</tr>
<tr>
<td>wholesale trade</td>
<td>$0.02</td>
</tr>
<tr>
<td>retail trade</td>
<td>$0.00</td>
</tr>
<tr>
<td>real estate and rental</td>
<td>$0.05</td>
</tr>
<tr>
<td>monetary authorities and depository credit intermediation activities</td>
<td>$0.04</td>
</tr>
<tr>
<td>support activities for agriculture and forestry</td>
<td>$0.02</td>
</tr>
<tr>
<td>transport by truck</td>
<td>$0.01</td>
</tr>
<tr>
<td>truck repairs and maintenance</td>
<td>$0.00</td>
</tr>
<tr>
<td>other sector purchases</td>
<td>$0.06</td>
</tr>
<tr>
<td>Total intermediate purchases</td>
<td>$0.26</td>
</tr>
<tr>
<td>employee compensation</td>
<td>$0.12</td>
</tr>
<tr>
<td>proprietor Income</td>
<td>$0.16</td>
</tr>
<tr>
<td>Total payments to value added</td>
<td>$0.28</td>
</tr>
<tr>
<td>Intermediate Imports</td>
<td>$0.46</td>
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## Results: Local Economic Impacts

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<tr>
<td></td>
<td>Without OC</td>
<td>With OC</td>
</tr>
<tr>
<td><strong>Total Output Effect</strong></td>
<td>$1,747,715</td>
<td>$1,565,683</td>
</tr>
<tr>
<td></td>
<td>$1,816,911</td>
<td>$1,634,896</td>
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Output multiplier means that for every additional $1 of final demand for food hub goods and services, there will be an additional $0.75 generated in the local economy.