ASSESSING THE ECONOMIC IMPACTS OF REGIONAL FOOD HUBS

Todd Schmit, Becca Jablonski, & David Kay
Cornell University

Innovative Strategies in Local Foods Marketing Symposium
USDA - Agricultural Marketing Service
Washington, D.C.
August 7, 2013
(revised 10 Oct 2013)

Supported by Cooperative Agreement 12-25-A-5568 with the USDA-Agricultural Marketing Service

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

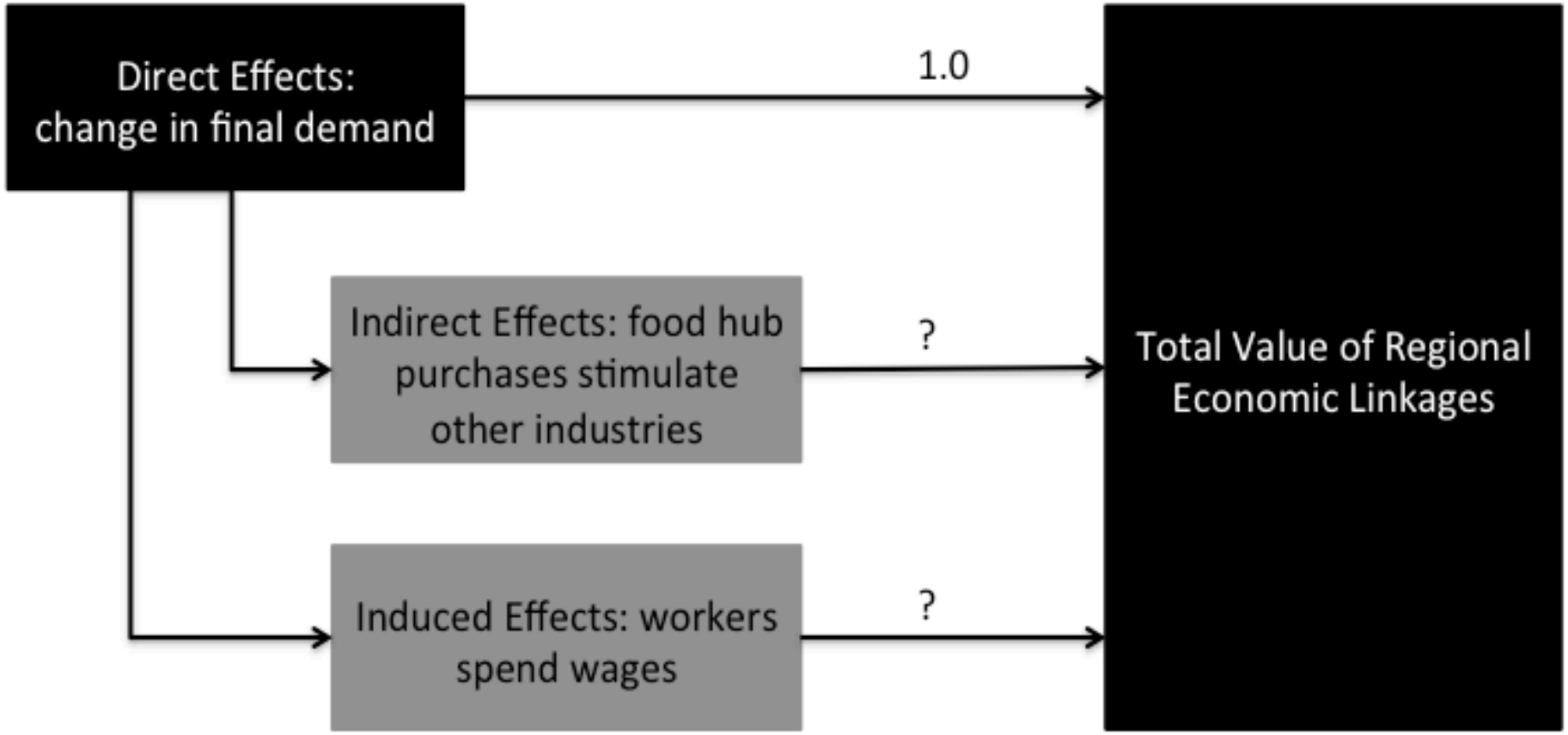
College of Architecture, Art, and Planning, Cornell University

Research Objectives

1. Promote the utilization of a best-practice methodology to evaluate the economic contributions of food hubs on their local economies and participating farms
   A. Develop a data-driven, replicable empirical framework applicable to a variety of food hub structures.
   B. Estimate impact of increase in final demand

2. Better understand the extent to which food hubs affect the overall demand for and consumption of local products
   A. How do sales to/purchases from food hubs augment other farm sales/food product purchases

Economic Impact Analysis



Source: Modified from Ribeiro and Warner, 2004

Economic Impact Analysis

- IO/SAM methods
  - IO models allow researchers to analyze the activities of industries that produce goods (outputs) and consume goods (inputs) from other industries (i.e., inter-industry linkages)
  - SAM extends IO to more comprehensively capture the distribution of income

- MIG, Inc.'s IMPLAN data and software
  - Utilizes multiple data sources
  - Provide complete model of economy (all inter-industry transactions)
  - Available at national, state, county, and zip code levels
  - Modifiable, allows users to build unique industry sectors

Data Challenges

- No 'food hub' sector in IMPLAN (or other data sources), defining it requires that we determine:
  - The commodity sectors that provide inputs to a food hub;
  - The size of a food hub's direct impact in those sectors; and
  - The location(s) of the inputs purchased.
- Data on inter-industry linkages available only on aggregate commodity sector scale
  - Differentiation of sectors backward linked from food hub?
  - Farmers selling through food hubs *may* have different expenditure patterns than those that do not (Schmit et al 2013)

Methodology: Data requirements

Model 1

- P&L data from food hub
  - Used with default IMPLAN data to determine share of sectors represented by food hubs

Model 2

- P&L data from food hub
- Vendor surveys
  - Used to separate farm vendor sectors from ag sectors – modified production functions
    - Are food hub vendors different from the default?

Methodology: Data requirements

Model 1

- P&L data from food hub
  - Us
    IM
    de
    se
    fo

Model 2

- P&L data from food hub

farm
m ag

production functions

- Are food hub vendors different from the default?

Look at the impact of a $1 million increase in final demand for food hub products

Methodology: Case Study

- 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' 25,000 sq ft warehouse, Trumansburg, NY

Regional Access

Farm / Non Farm Vendor Services:

- Aggregation
- Freight
- Warehousing
- Marketing

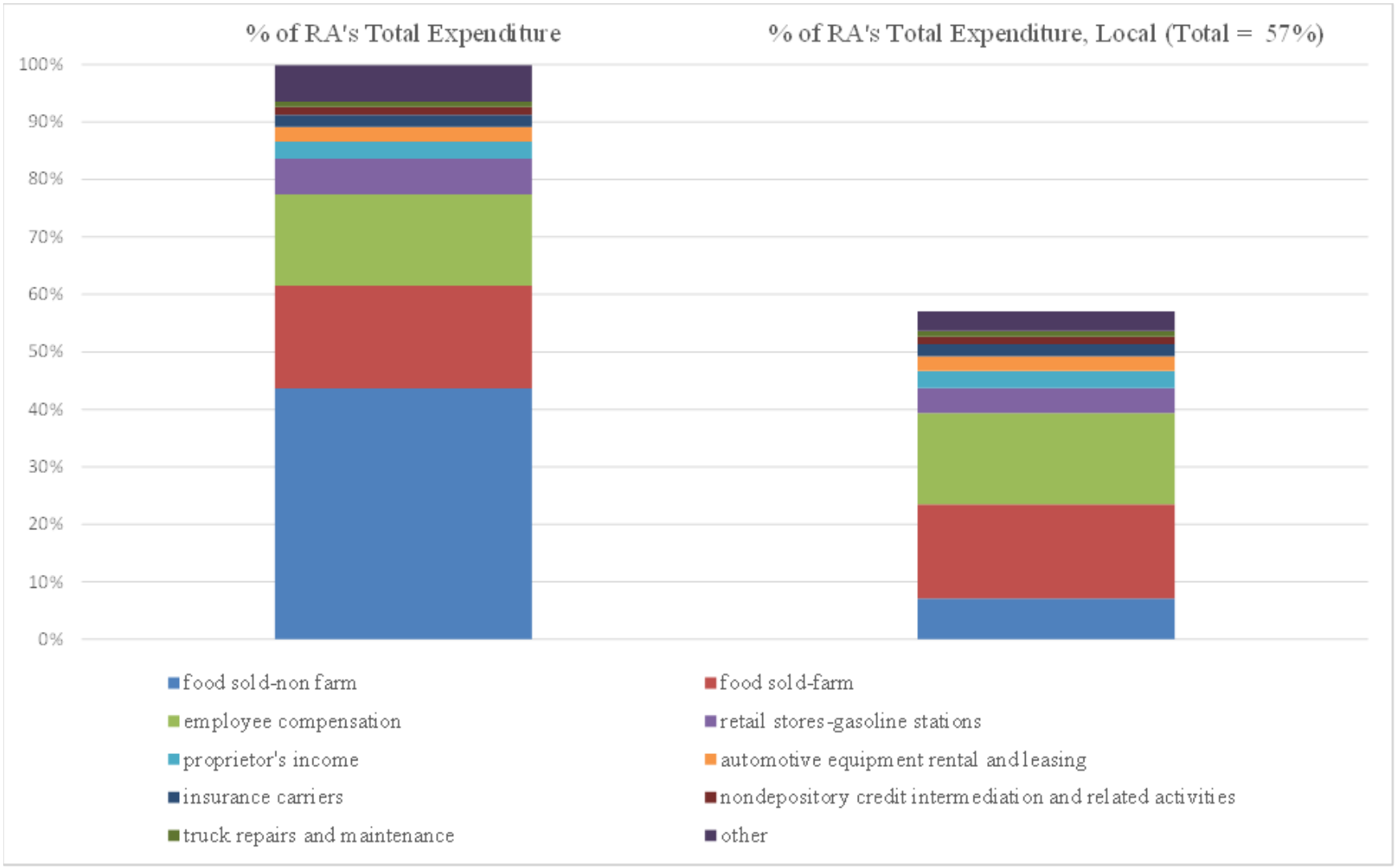
Customer Services:

- Home delivery
- Retail, Wholesale, Institutional delivery
- Backhauling

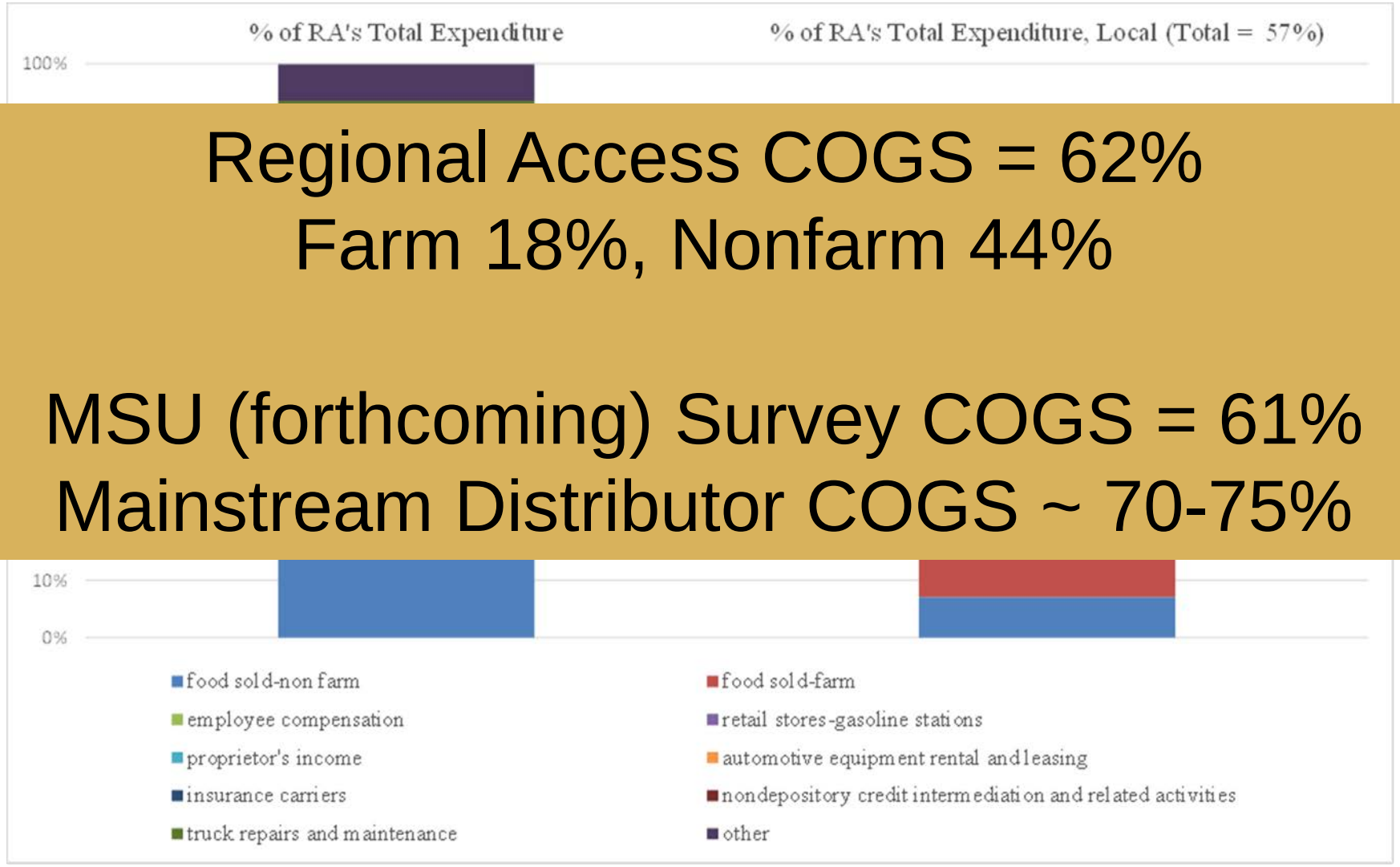
Community Outreach:

- Food donations
- Foundation – Great Local Foods Network
  - community event, special projects (i.e., 'Bake mobile')

RA Expenditure Profile



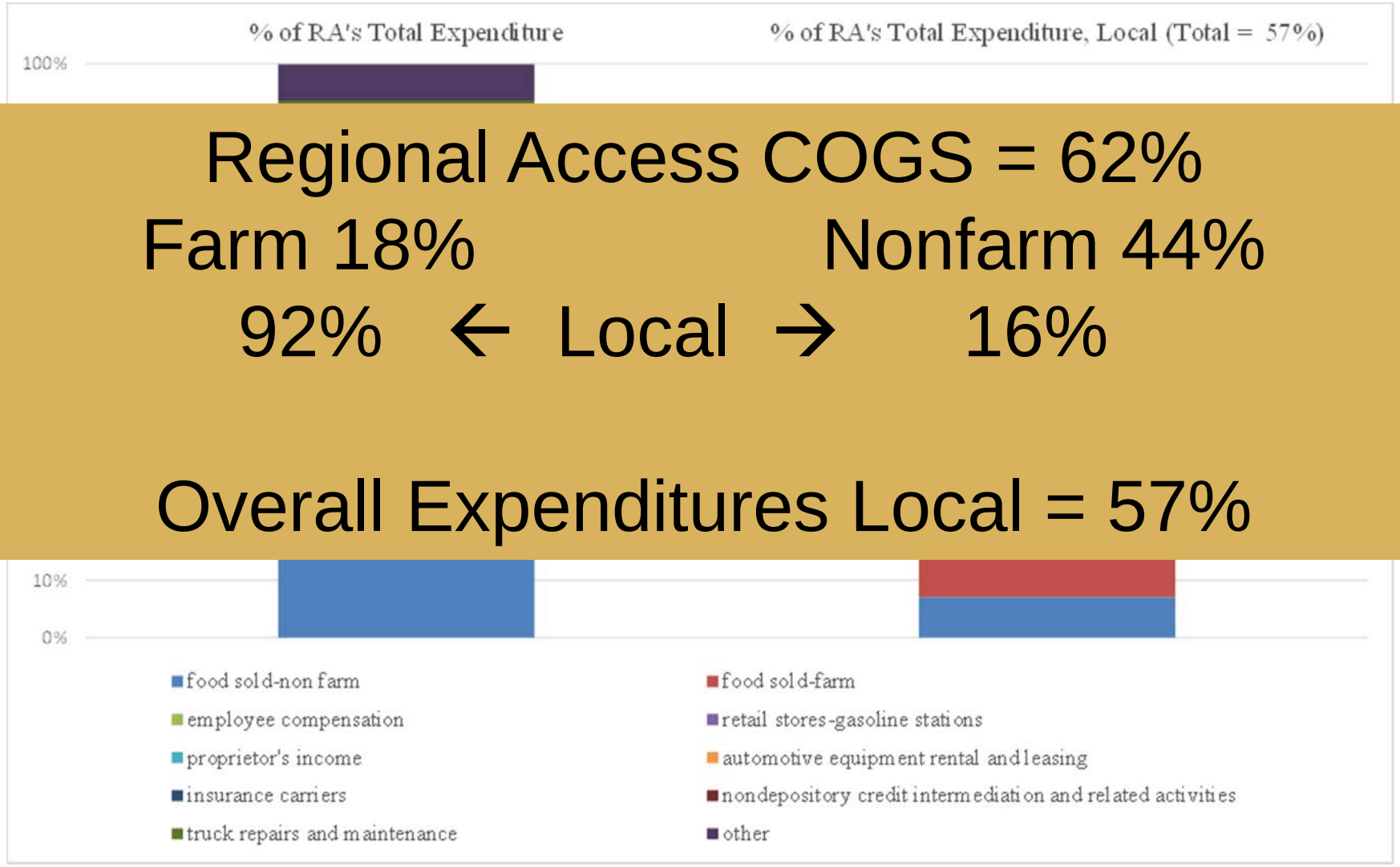
RA Expenditure Profile



Regional Access COGS = 62%
Farm 18%, Nonfarm 44%

MSU (forthcoming) Survey COGS = 61%
Mainstream Distributor COGS ~ 70-75%

RA Expenditure Profile



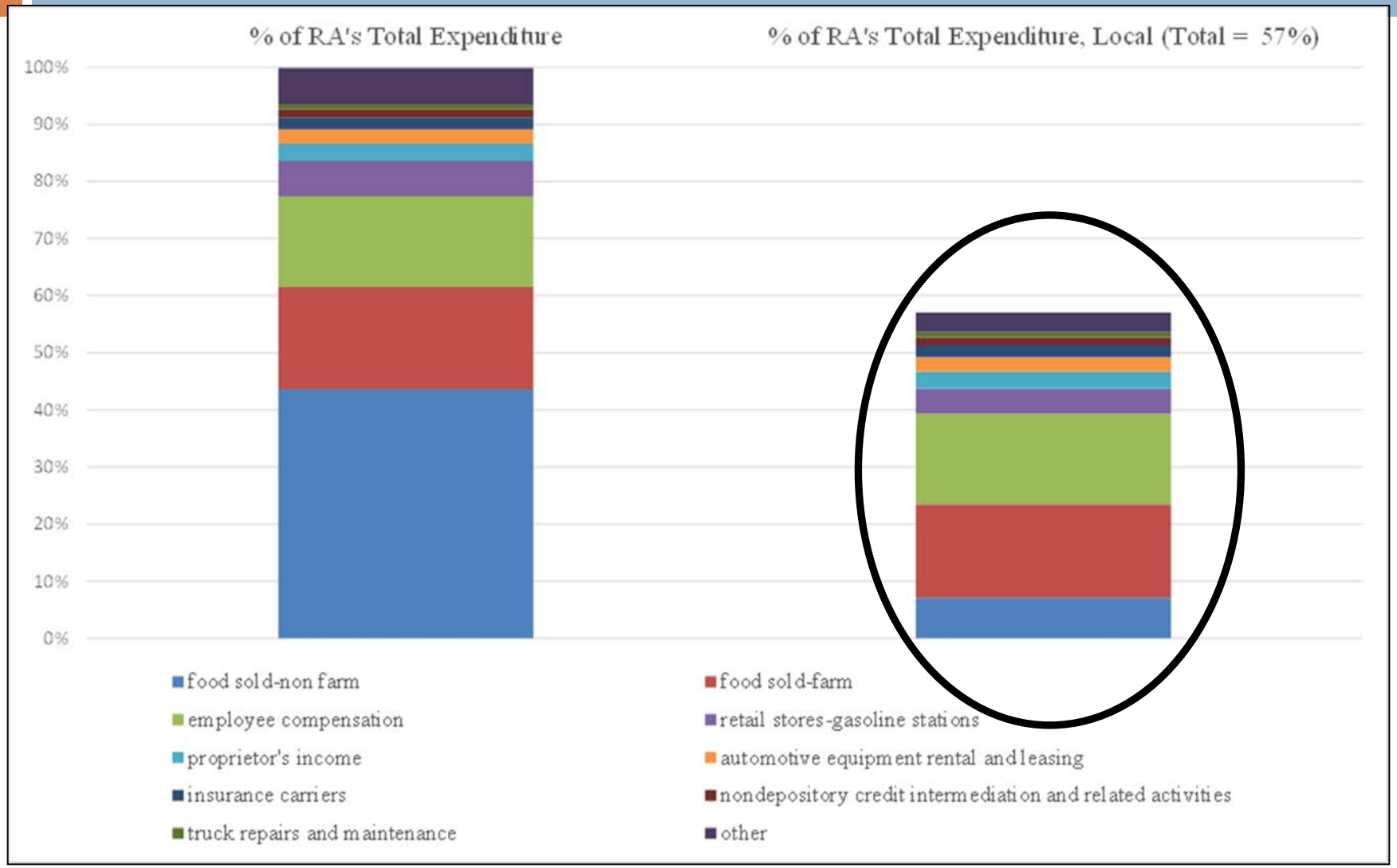
Regional Access COGS = 62%

Farm 18% Nonfarm 44%

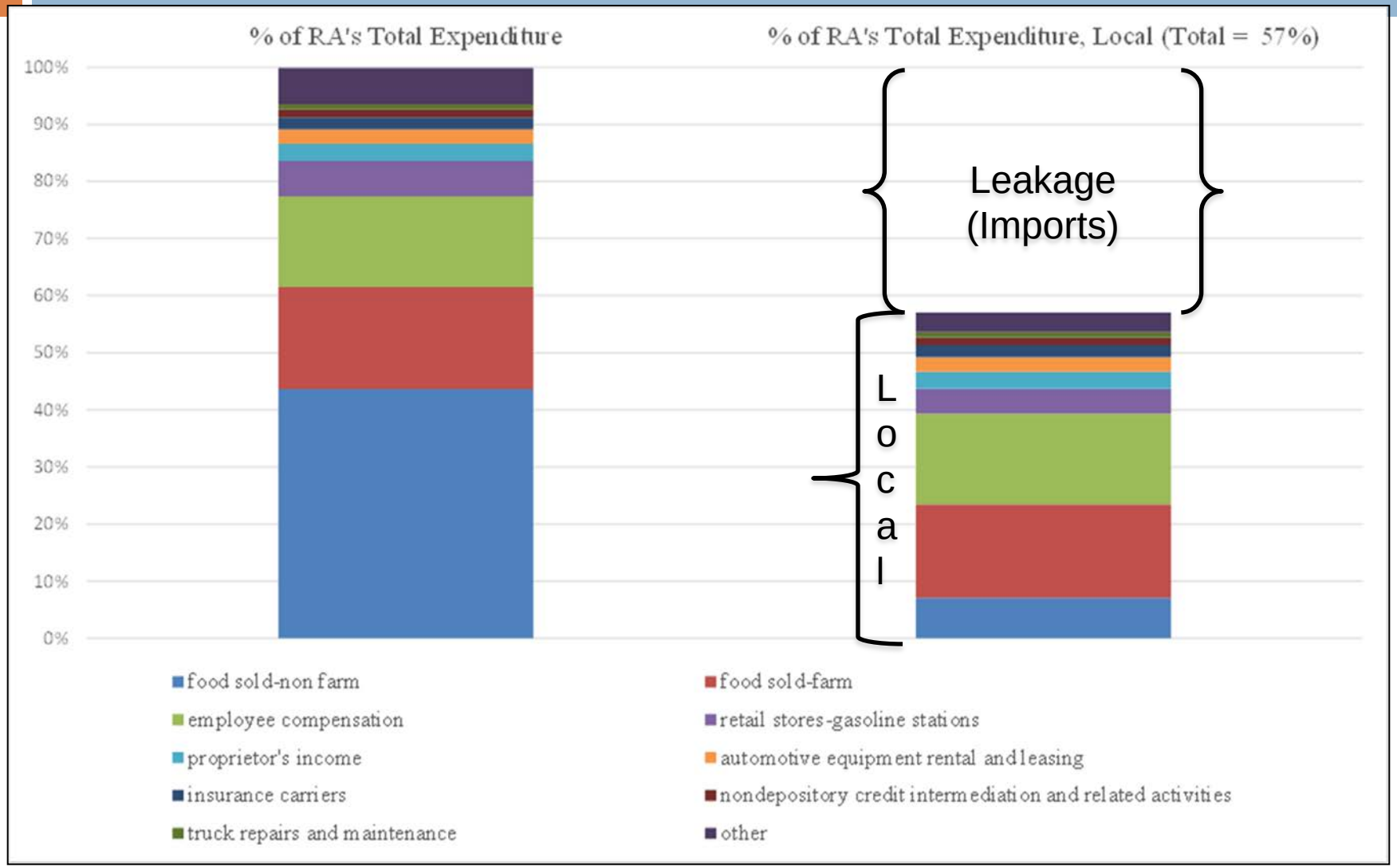
92% ← Local → 16%

Overall Expenditures Local = 57%

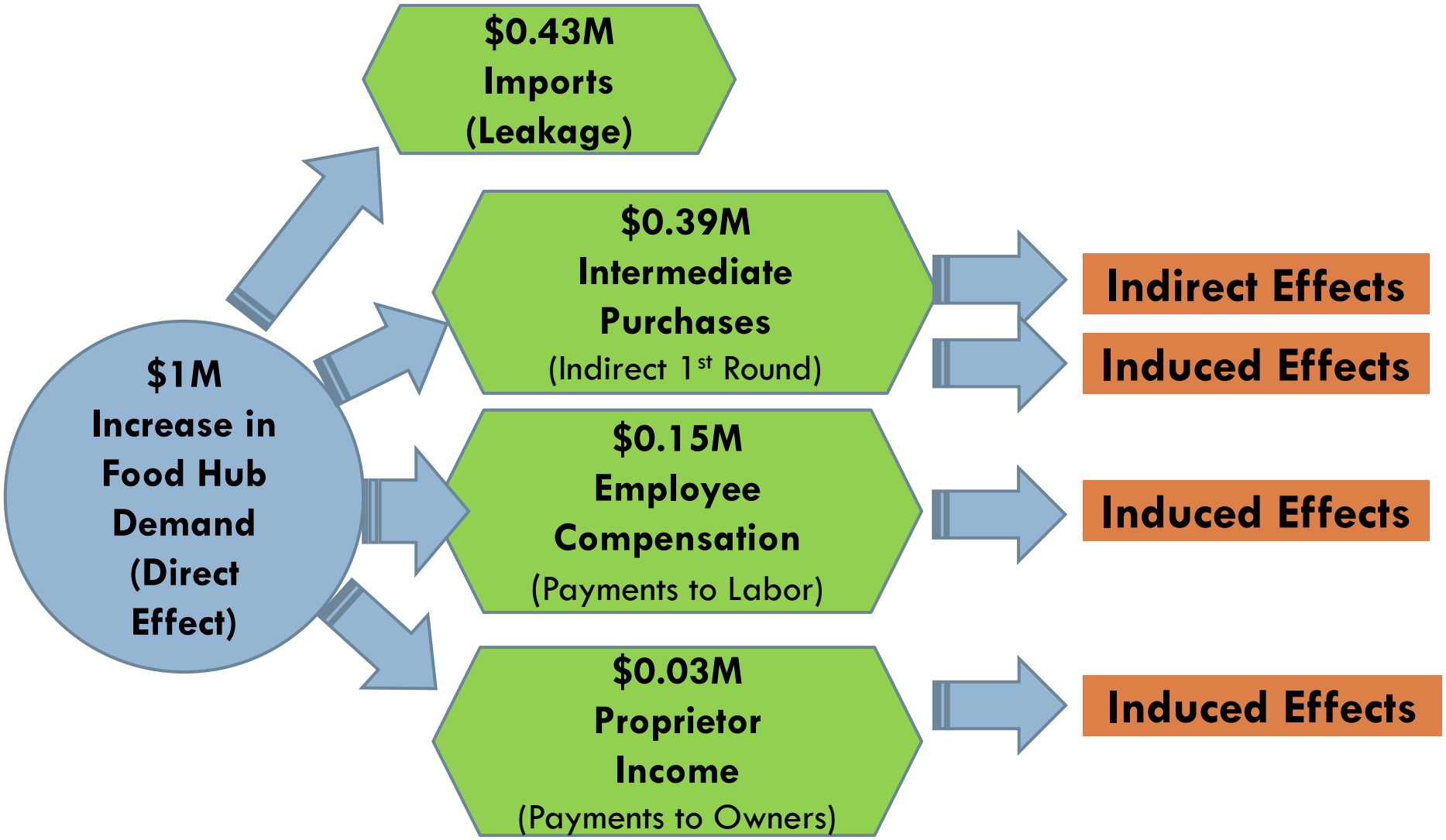
RA Expenditure Profile - Local



RA Expenditure Profile - Local



Estimating Local Impacts

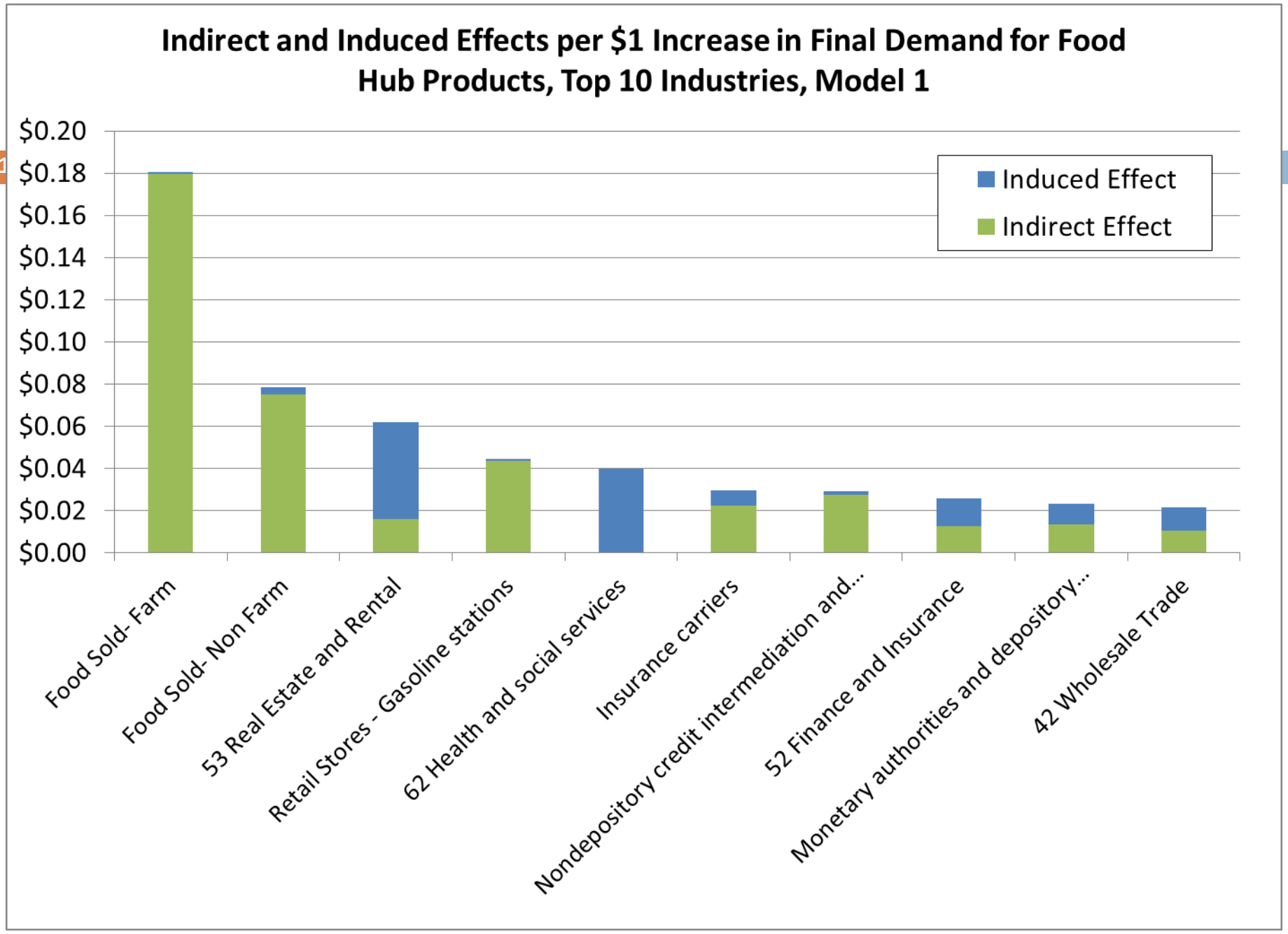


Results Model 1

Implicit Output Multiplier

- 1.75
  - For each dollar of food hub products/services delivered to final demand, an additional $0.75 of output is produced in related industries (indirect+induced effects).

	Output ($M)	
Direct Effect	$1.00	
Indirect Effect	$0.51	1.75/1.00 = 1.75
Induced Effect	$0.24	
Total Effect	$1.75	


Indirect and Induced Effects per $1 Increase in Final Demand for Food Hub Products, Top 10 Industries, Model 1
$0.20
$0.18
$0.16
$0.14
$0.12
$0.10
$0.08
$0.06
$0.04
$0.02
$0.00
Induced Effect
Indirect Effect
Food Sold- Farm
Food Sold- Non Farm
53 Real Estate and Rental
Retail Stores - Gasoline stations
62 Health and social services
Insurance carriers
Nondepository credit intermediation and...
52 Finance and Insurance
Monetary authorities and depository...
42 Wholesale Trade

Results Model 1- Distributional Effects

- Industry Sectors with Greatest **Indirect** Impacts:
  - Food sold farm (35%)
  - Food sold nonfarm (15%)
  - Retail stores –gasoline stations (9%)
  - Nondepository credit intermediation (5%)
  - Insurance carriers (4%)
- Industry Sectors with Greatest **Induced** Impacts:
  - Real estate and rental (19%)
  - Health and social services (16%)
  - Retail trade (8%)
  - Meals and entertainment (7%)
  - Finance and insurance (5%)

Model 2: Farm Interviews

- 30 interviews with RA's farmer vendors out of a population of 86 located in NYS (35% response rate).
  - Provided information on 2011 annual expenditures by item category and the proportion of each expenditure purchased within NYS.
- Commodity (by primary sales):
  - Meat/Livestock (37%), Fruit and Vegetable (30%), and Value Added Products (including cheese, butter, yogurt, honey, maple syrup, wine and juice) (33%).
- Operation Size ($):
  - Small (50%), Medium (20%) Large (10%), Very Large (10%)

Model 2: Food Hub Farm Expenditure Pattern

Item	% of total expenditure	% of total expenditure local
Ag commodities from other farms	16.3%	14.6%
Ag services	9.6%	8.8%
Utilities	4.4%	4.4%
Repair and maintence of farm buildings	2.6%	2.6%
On farm processing	9.4%	3.8%
Off farm processing	1.5%	1.1%
Wholesalers	6.1%	3.2%
Tractor/machinery repair	3.0%	2.8%
Items purchased from retail stores	4.1%	3.3%
Transportation	4.3%	3.4%
Warehousing -rented	0.2%	0.2%
Information services	0.7%	0.7%
Insurance	1.6%	1.6%
Rented/leased land	1.3%	1.3%
Rented equipment	0.3%	0.3%
Professional services	0.4%	0.4%
Veterinary services	0.3%	0.3%
Waste disposal	0.2%	0.2%
Education/training programs	0.2%	0.2%
Taxes	5.9%	5.9%
Labor (not contracted)	26.3%	26.3%
Other	1.3%	0.8%
Total Local Expenditure		86.3%

Source: 2012 primary data collection by the authors

Model 2: Food Hub Farm Expenditure Pattern

Item	% of total expenditure	% of total expenditure local
Ag commodities from other farms	16.3%	14.6%
Ag services	9.6%	8.8%
Utilities	4.4%	4.4%
Repair and maintence of farm buildings	2.6%	2.6%
On farm processing	9.4%	3.8%
Off farm processing	1.5%	1.1%
Professional services	0.4%	0.4%
Veterinary services	0.3%	0.3%
Waste disposal	0.2%	0.2%
Education/training programs	0.2%	0.2%
Taxes	5.9%	5.9%
Labor (not contracted)	26.3%	26.3%
Other	1.3%	0.8%
Total Local Expenditure		86.3%

Source: 2012 primary data collection by the authors

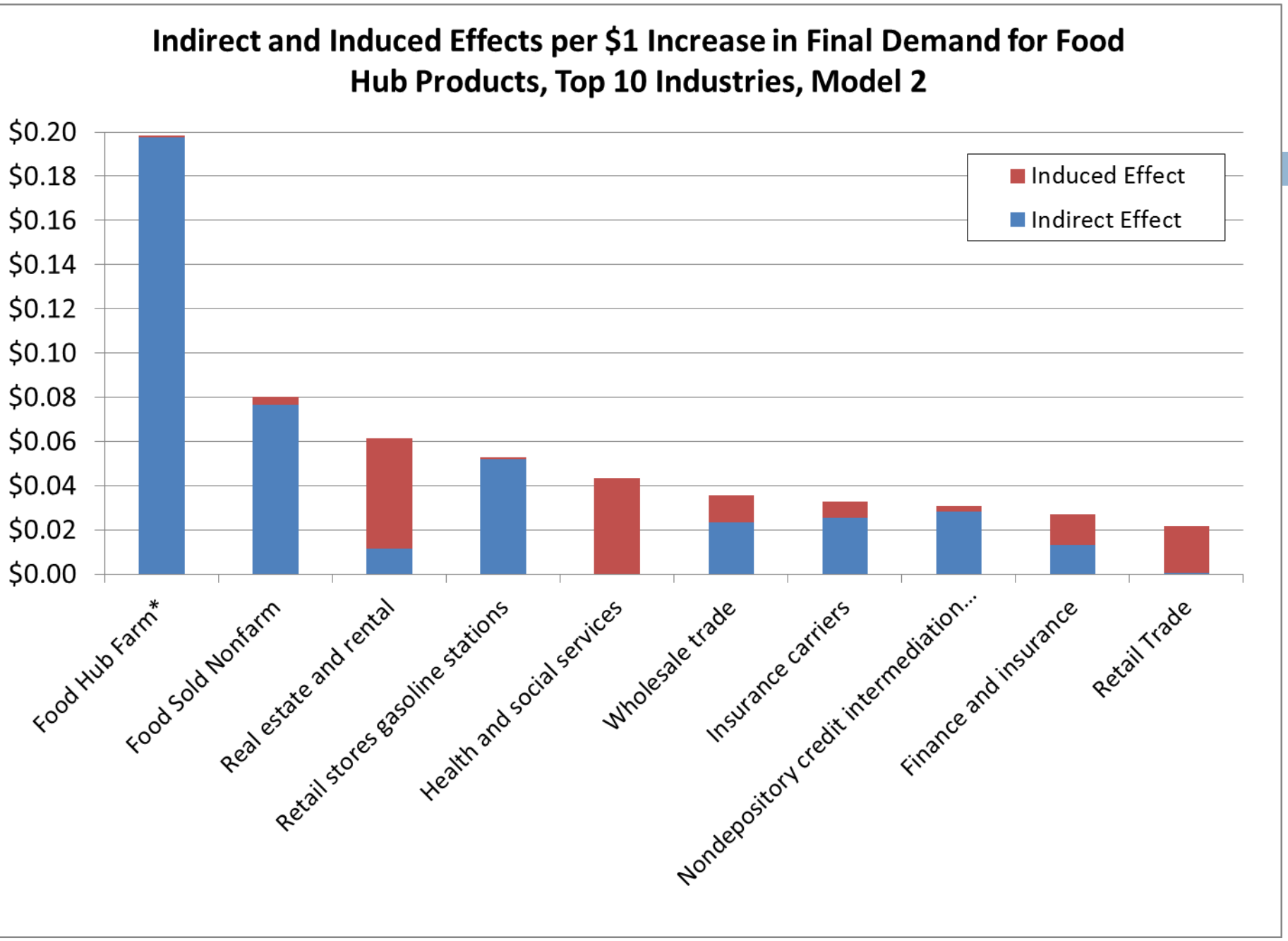
IMPLAN Farm Sector:
15% Expenses on Labor
70% Local (NYS)

Results Model 2

Implicit Output Multiplier

- 1.82 (recall multiplier for model 1 = 1.75)
  - For each dollar of food hub products/services delivered to final demand, an additional $0.82 of output is produced in related industries (indirect+induced effects).

	Output ($M)	
Direct Effect	$1.00	
Indirect Effect	$0.56	1.82/1.00 = 1.82
Induced Effect	$0.26	
Total Effect	$1.82	


Indirect and Induced Effects per $1 Increase in Final Demand for Food Hub Products, Top 10 Industries, Model 2
$0.20
$0.18
$0.16
$0.14
$0.12
$0.10
$0.08
$0.06
$0.04
$0.02
$0.00
Induced Effect
Indirect Effect
Food Hub Farm*
Food Sold Nonfarm
Real estate and rental
Retail stores gasoline stations
Health and social services
Wholesale trade
Insurance carriers
Nondepository credit intermediation...
Finance and insurance
Retail Trade

Results Model 2- Distributional Effects

- Industry Sectors with Greatest **Indirect** Impacts:
  - Total farm sectors (food hub farm and other farm) (36%)
  - Food sold nonfarm (14%)
  - Retail stores gasoline stations (9%)
  - Nondepository credit intermediation (5%)
  - Insurance carriers (4%)
- Industry Sectors with Greatest **Induced** Impacts:
  - Real estate and rental (19%)
  - Health and social services (16%)
  - Retail trade (8%)
  - Meals and entertainment (7%)
  - Finance and insurance (5%)

Comparison of Distributional Impacts from Models 1 & 2

INDIRECT AND INDUCED IMPACTS

Selected INDUSTRY SECTORS	MODEL 1	MODEL 2
TOTAL FARM (FARM + FOOD HUB FARM)	$180,274	$198,294
FOOD SOLD NONFARM	$78,398	$80,241
WHOLESALE TRADE	$21,749	$35,604
SUPPORT ACTIVITIES FOR AGRICULTURE	$3,264	$8,540

VALUE ADDED COMPONENT	MODEL 1	MODEL 2
EMPLOYEE COMPENSATION	$198,991	$246,620
PROPRIETOR INCOME	$57,593	$48,088

Demand Expansion (RO2)

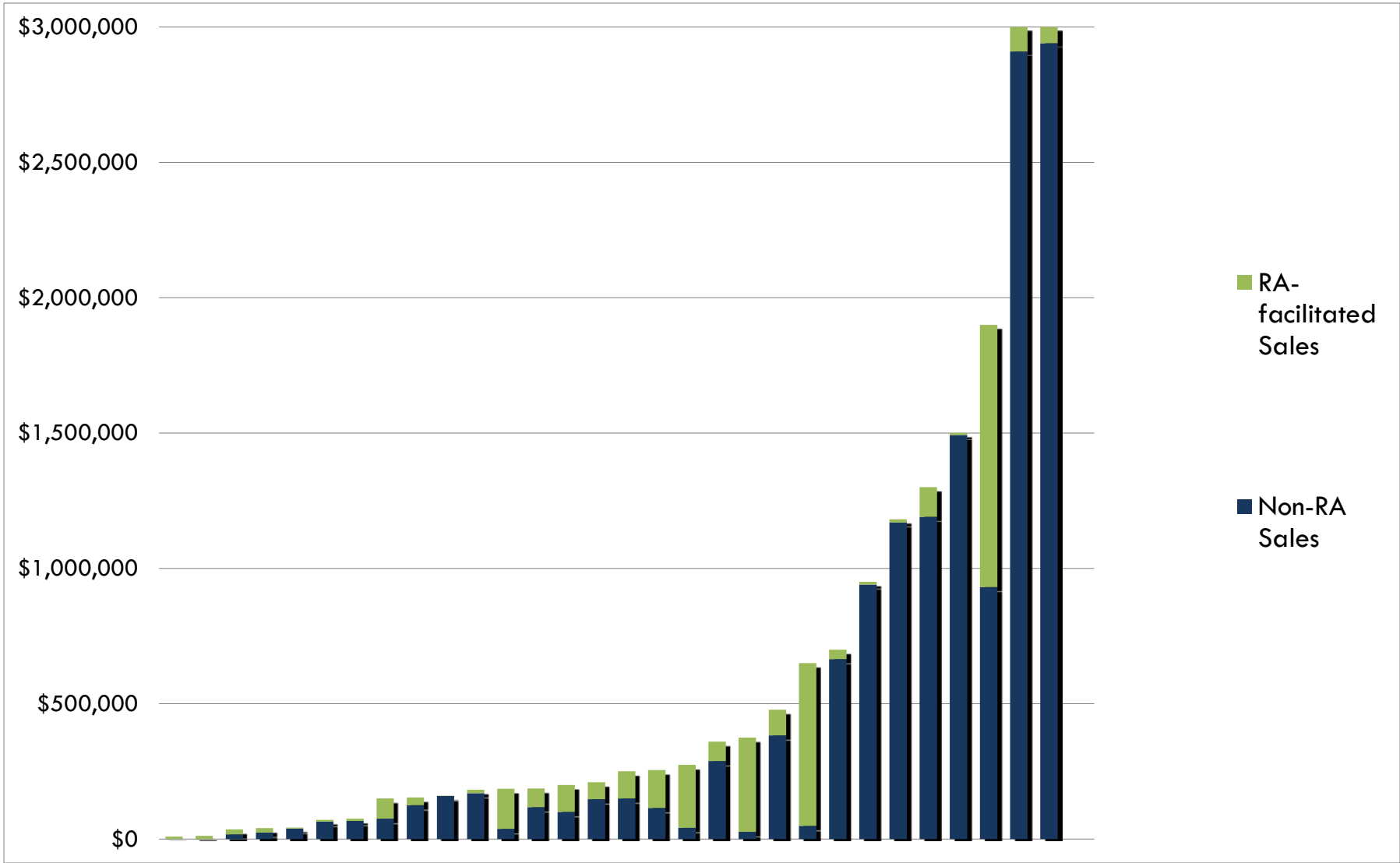
- Need to understand the extent to which Regional Access is:
  - Creating new or increased demand for local farm products versus diverting sales from one market to another – e.g., farm now sells product to RA rather than at a farmers' market
  - Diverting market share from another local business (i.e., another distributor) – this is the opportunity cost and must be subtracted from total output impact
  - Scalability of the food hub sector

Farm interview responses

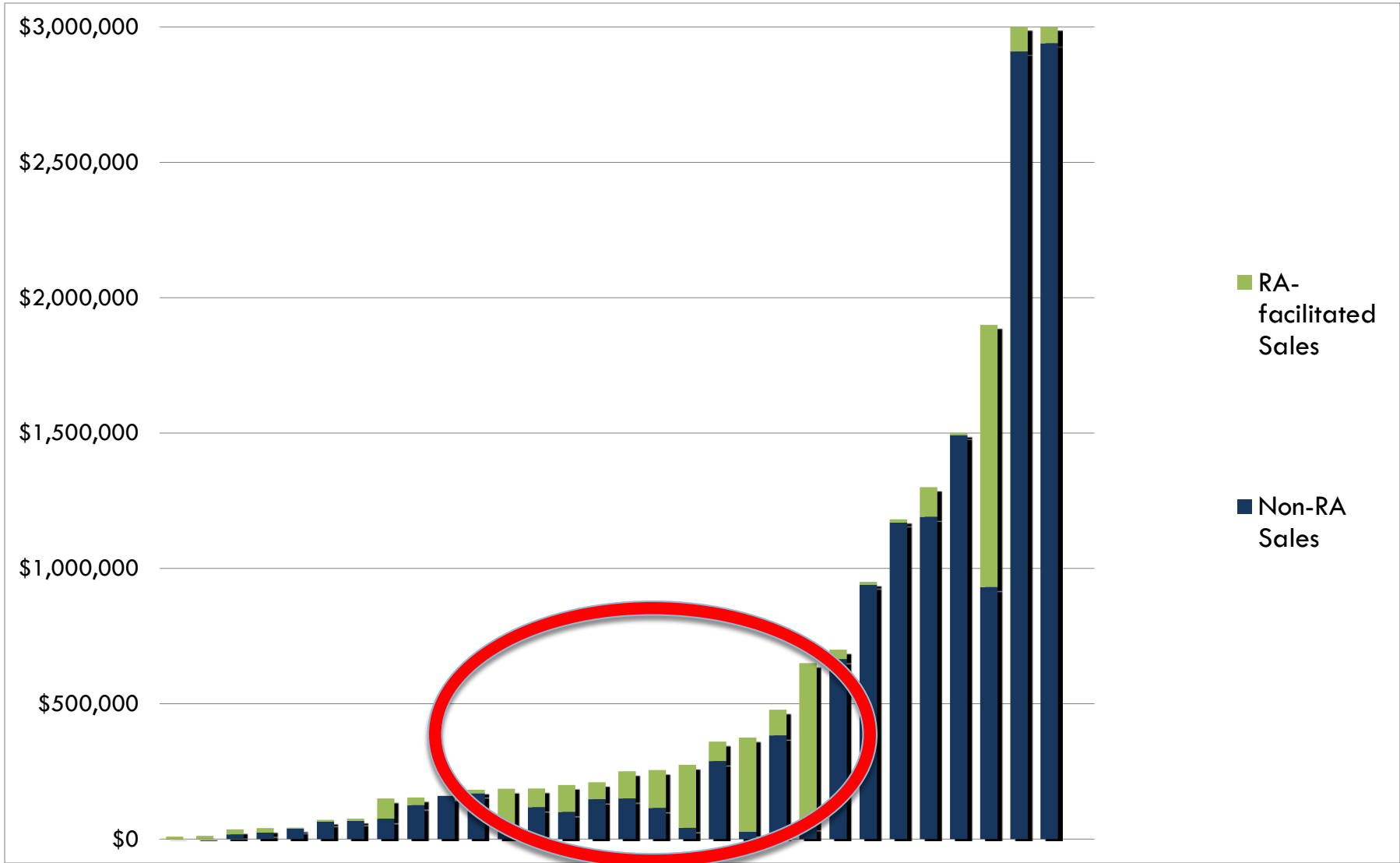
Has your relationship with Regional Access enabled your business to expand?

- "Increased market access"
  - 15% increase in sales in 2011, projecting a 25% increase in 2012
- Increased storage access, which supported more winter/year-round sales
- "Expanded customer reach"
- "Enabled sales in NYC"
- "Steady, but not increasing"
- "If it weren't for Regional, we wouldn't be here"
- "Dependable customer demand has allowed farm to expand with less trepidation"

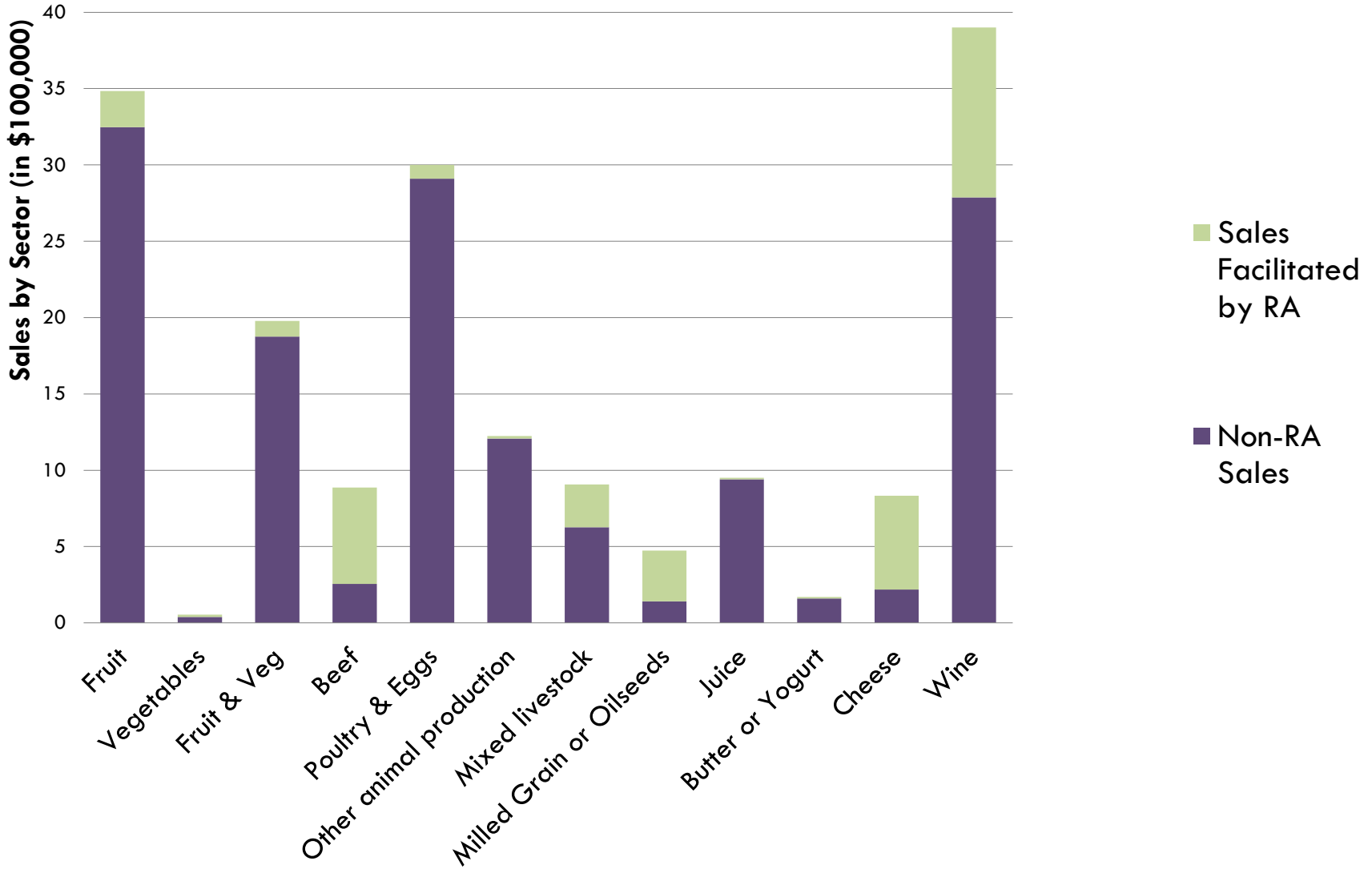
Regional Access facilitated sales as a proportion of total farm sales



Regional Access facilitated sales as a proportion of total farm sales



Regional Access facilitated sales by product sector (as a proportion of total farm sales)



Customer Surveys

- 305 surveys/interviews with RA customers (46% response rate) - 80% business customers, 20% households customers.
- Business customers:
  - Average sales = $5.7 million (median = $515,000)
  - Average years in business = 13 (median = 8)
    - range from new to over 130 years
  - Average FTE = 15 (median = 4)
  - Primary business function:
    - Retailer (34%), Restaurant (25%), Wholesaler (11%), Processor (9%), Grocery/meal delivery service (3%), Distributor (2%), other (17%)

Consumer responses

- 79% of business customers (n=166) reported expanding 'local' product sales due to relationship with Regional Access
  - When asked in response: "*By what percent has your business been able to expand its product offerings because of Regional Access?*"
  - Mean = 17% (n=110)

Customer responses

- 49% of RA's business customers reported that they purchased less product from other sources due to their relationship with RA
  - 46% said that they purchased the same amount and 5% said they didn't know (n=164)
  - Of those who reported they purchased less product from other sources, the average reduction in other purchases was 23% (n=69).

Customer responses: scalability

- 39% of business customers reported that they could not purchase products offered by Regional Access from another source
  - 42% could find them from other sources, 19% didn't know) (n=166)
- If RA expanded its product availability/delivery routes, etc. 66% of business customers reported they would increase sales
  - 15% would not, 19% didn't know (n=167)

Conclusions

- Proper food hub assessments require:
  - Detailed financial data by type and location from hub and farm suppliers.
    - Value of farm-level data will depend on:
      - Differential characteristics of farm suppliers relative to default IO data, and
      - Relative size of hub's costs allocated to local farm product procurement
  - Careful IO/SAM model construction and sector mapping of expenditures
    - Consider additional industry differentiation as appropriate

Conclusions

- Results from the case study suggest:
  - Availability of the food hub increased overall demand for 'local' products
  - Food hub particularly facilitates the distribution of products from mid-scale producers
    - Key component may be the ability to sell largely 'rural' products in urban core
  - Scalability is not pure; i.e., potential to increase number/size of food hubs, but will result in some diverted sales from other businesses
    - Offsets (opportunity costs) can be difficult to measure
    - Important priority for future research.

Thank You!

Becca B.R. Jablonski

314 W. Sibley Hall

Cornell University

Ithaca, NY 14853

215-817-2566

rb223@cornell.edu

beccajablonski.wordpress.com

Todd M. Schmit

340H Warren Hall

Cornell University

Ithaca, NY 14853-7801

607-255-3015

tms1@cornell.edu

agribusiness.dyson.cornell.edu

Agricultural Marketing Service