MICHIGAN STATE UNIVERSITY | Product Center Food • Ag • Bio

Michigan Craft Beer: An Economic Impact Assessment of the Locally Sourced Supply Chain

2017 Great Lakes Hop and Barley Conference
March 2-3, 2017
Detroit, MI

Steven R. Miller, Ph.D.
Michigan State University
Product Center Food-Ag-Bio
Center for Economic Analysis

MICHIGAN STATE UNIVERSITY | AgBioResearch MICHIGAN STATE UNIVERSITY | Extension

Michigan's Golden Barley Years

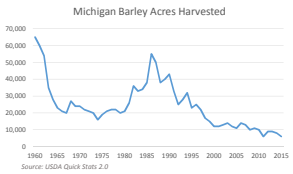
- Stroh's Brewery – Briefly the third largest domestic producer by sales, in a market characterized as:
  - Cut-throat price and marketing competition
  - Rapid market consolidation
  - Significant market concentration
  - And really bland beer
- National brands were considered premium beers, while local and regional brands were considered budget beers

Michigan's Golden Barley Years

- Price wars of the 70s & 80s: Volume (scale) was the key to profitability
  - Produce a beer with the broadest consumer appeal
  - Produce it in large batches to minimize costs
  - Out-sell the competition
- Frenzied merger and acquisitions
  - Successful regional brands were acquired by national brands, the rest weathered away
  - Leverage buyouts bankrupted most remaining national brands, leaving three (*AB, Miller and Coors*)

Michigan's Golden Barley Years

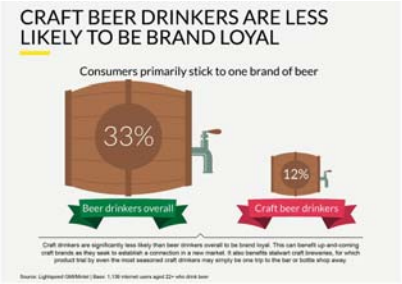
- Stroh's main and aging plant was located in today's Detroit Eastern Market
  - Stroh's Brewery purchased significant amounts of Michigan barley
  - Little, if any, Michigan hops was produced in past



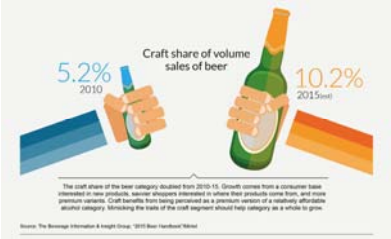
New Age of Craft Beer

- More selective and more affluent consumers are breaking away from conventional purchasing patterns
  - Growth of local food movement
  - Growth in experiential consumption and exposure to foreign beer styles
  - Growth of consumer consciousness and expectations of corporate social responsibility
- This may represent more of a segmentation of the economy rather than a sweeping change in consumer behavior

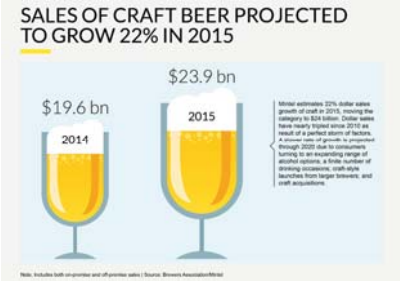
Craft Beer Drinkers



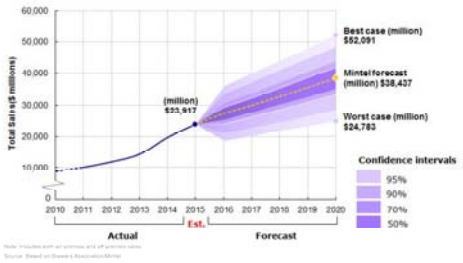
Growth in Craft Beer Sales



Growth in Craft Beer Sales



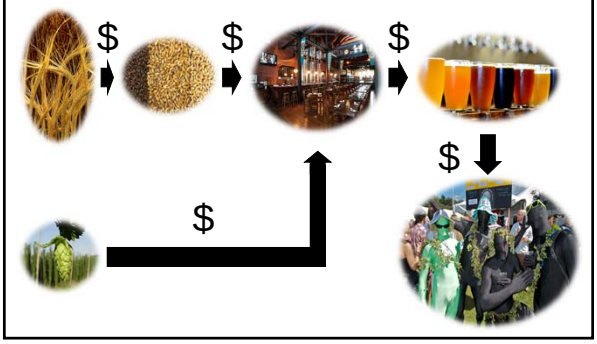
Growth in Craft Beer Sales



This Study…

- Objective: Measure the potential economic value of growth in Michigan Craft Beer Industry, especially as it relates to local sourcing of agricultural inputs
- Approach:
  - Interview malting house operators (and others) as a pivotal component of the value chain
  - Develop an existing literature narrative on production, transactions and market forces
  - Apply stylized production processes and transactions to estimate the actual and potential economic value of the Michigan craft beer sector.

Order of Analysis



Interviews with Maltsters

- 12 interviews with maltsters and numerous interviews with others
  - Motivations for starting were financial and personal
  - Some had downstream linkages to growing
  - Most business philosophies are around service and relationship building
  - Artistry in production is a key value proposition for some. Others seeking efficiency
  - With today's commodity markets, no problem getting suppliers

Maltsters Expenditure Profile

- Developed a stylized budget based on Knudson's prior work (2016) as an expenditure profile
  - Various stages of development
  - Vastly different levels of initial investment
  - Estimated revenues and expenditures are likely to vary significantly across maltsters

Maltster Expected Annual Earnings and Expenses*

Sales and Grain Expense	
Sales	$260,000
Cost of Grains	$80,000
Net Sales	$180,000
Other Expenses	$161,821
Net Profit	$18,179
Costs per ton No Wages	$793
Costs per ton	$1,209
Costs per 50/bag	$30
Margins	8%

**200 ton per year capacity*

Other Expenditure Profiles

- MSU Hops grower enterprise budget (2016)
- Standard barley enterprise budget adjusted for local delivery
- Standard brewery enterprise budget adjusted for local purchases
  - Recognize more intensive use of barley and hops in craft beer
- Standard retail and food service budgets adjusted for local purchases

Estimating the Size of the Market

- Expenditures only tells us what is purchased per unit of output. We next need to estimate how much the expenditures take place.
- Data is short, so a lot of assumptions went into the estimates.

Estimating the Size of the Market

- Expenditures only tells us what is purchased per unit of output. We next need to estimate how much the expenditures take place.
- Data is short, so a lot of assumptions went into the estimates.
- So we work backward from the Brewers' Association of Michigan craft beer production estimates
  - *Barrels → Malt → Barley* & *Hops → Agricultural Acres*

Estimating the Size of the Market

- Brewers Association estimates 2015 production at 770k barrels. To completely self supply will require:
  - 53 million lbs of malt
  - 1.2 million bushels of barley
    - 50,000 acres of barley (assuming 50% acceptance)
  - 1.5 million pounds of dried, pelletized hops
    - 1,000 acres of hops

Estimating the Size of the Market

- Discussions suggests that about 7 percent of Michigan Craft beer production (54k barrels) is Michigan supplied based on barley purchases.
  - 3.7 million lbs of malt
  - 86,000 bushels of barley
    - 3,500 acres of barley (assuming 50% acceptance)
  - 104 thousand pounds of dried, pelletized hops
    - 70 acres of hops

Estimating the Size of the Market

- Assumed prices
  - $8.50 malting barley per bushel
  - $0.65 malt per pound
  - $12.00 hops per pound (dried & pelletized)
- We assumed 50%/50% split
  - $1.67 per 16oz bottle at retail
  - $3.75 per pint on-site

Estimated Transactions

- Given volumes and prices, we estimate the following flows of revenue
  - Potential represents outcome if all ag inputs are produced in Michigan
  - Actual represents best estimates the local value chain

	Potential	Actual
Growers' Revenue (Malt)	$10,406,976	$728,488
Growers' Revenue (Feed)	$2,601,744	$182,122
Growers' Lost Revenues (Feed)	$(7,805,232)	$(546,366)
Growers' Revenues (Hops)	$17,900,105	$1,253,007
Maltsters' Revenues	$34,379,751	$2,406,583
Retail Revenues	$151,458,757	$10,602,113
On-site Revenues	$340,102,000	$23,807,140

Economic Impacts

- IMPLAN Pro used to estimate economy-wide impacts
  - Subtract out lost revenues if wheat was grown in absence of barley
  - Subtract out retail sales of conventional beers supplanted by local craft beer
  - Assume hops would remain in national market

Estimated Economic Impacts

Estimated Actual Net Impacts

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	81	1,002,431	1,346,717	2,307,856
Indirect Effect	6	220,590	471,895	902,376
Induced Effect	10	335,762	605,462	1,053,288
Total Effect	96	1,558,784	2,424,074	4,263,518

Estimated Potential Net Impacts

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	1,150	14,320,447	19,238,819	32,969,376
Indirect Effect	81	3,151,284	6,741,367	12,891,084
Induced Effect	137	4,796,602	8,649,458	15,046,965
Total Effect	1,367	22,268,333	34,629,644	60,907,424

Discussions

- Impact may be larger as craft beer sales further gain market share
- Consumer demand for locally-sourced beer is largely untested
- A large number of maltsters are coming on line. Where scale economies matter, willingness to pay premiums for locally-sourced inputs will be a key factor of profitability

MICHIGAN STATE UNIVERSITY | Center for Economic Analysis