Obstacles in Planning Establishment Survey Experiments:

Census of Agriculture Content Test and Agricultural Resource Management Survey

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FCSM Research and Policy Conference
March 2018
NASS Experiments in Establishments Surveys

• Give concrete examples of setting up experiments

• Discuss implications and impacts of decisions

• Not about the results, about the process!
National Agricultural Statistics Service

- Statistical agency within U.S. Department of Agriculture
- Conducts several hundred agricultural surveys a year, and the Census of Agriculture every five years
  - Crop and livestock production
  - Yield
  - Production practices
  - Economics
- Farm and ranch operations = any place where $1000 of agricultural products is produced and sold
Information Available for Our Establishments (farms)

• Characteristics of the individual unit (farm)
  • Commodities grown, production practices used, demographics, etc.
  • Measure of size (such as acreage, value of sales, number of x, etc.)

• Past survey response of individual unit (farm)
  • Number of past surveys
  • Timing of past surveys
  • Outcome of survey request
  • Survey data
Obstacles and Considerations in Planning Experiments in Establishment Surveys

• Two experiments presented
  • Census of Agriculture (COA) Content Test
    • Stand alone experiment
    • 30,000 records
  • Agricultural Resource Management Survey (ARMS) Tests
    • Embedded experiments in operational environment
    • Approximately 800-1,500 targeted records
Census of Agriculture

• Conducted every five years

• Mailed to 3 million farms and potential farms

• 2012 COA identified approximately 2 million farms
COA Content Test Experiment Purpose

• Primary goal was to test several versions of the questionnaire
  • Unit nonresponse
  • Section nonresponse
  • Item nonresponse
  • Comparable data
  • Placement of sections
  • New questions
COA Content Test Experiment Design

- Mailed out in late 2015, data collected through March 2016
- No estimates produced, no data publications released
- Stand-alone experiment, larger sample than most NASS experiments = 30,000
- Obstacles and considerations for this test in an establishment survey:
  - Overall universe creation
  - Universe split (for use of two forms)
  - Sample selection
Obstacle/Consideration #1

Overall Universe Creation

- Consideration of large operations
  - Importance to annual survey programs
- Consideration of burden
  - Operations in 12 or more surveys in 2015
  - Removed operations selected for any survey conducted between December 2015 and March 2016
Overall Universe Creation (continued)

• Result: Reduced the potential universe for the experiment by 20%
  • Lost operations with largest acreage or value of sales
  • Lost certain types of operations such as many dairy farms (monthly survey) and all organic farms (survey conducted at the same time)

• Implication:
  • Findings from our study do not include these types of records
Obstacle/Consideration #2

Universe Split

• Auxiliary information used to target specific establishments
  • Short(er) form universe
    • Cattle, horses, hay, no more than 3 field crops
  • Long form universe
    • Everyone else

• Result:
  • Able to create a form that is targeted to specific operations and then identify the universe of eligible cases
Obstacle/Consideration #3

Sample selection: set minimum thresholds for sample

- Test every section of the questionnaire
  - Type of farm - Bees, aquaculture, cotton, Christmas trees, etc.
  - Practices - Production contracts, participation in government programs

- Include operations across varying demographics/operating arrangements
  - Race, gender, age, more than four operators, year began operating
Sample Selection (continued)

• Result: Able to ensure that we met minimum thresholds in our sample for a variety of variables
  • Met almost all thresholds
    • Missed thresholds for aquaculture, cotton, Hispanic origin, but within 10% of threshold
    • Some types of production contracts were very rare, had to add more to our sample
Agricultural Resource Management Survey

• Annual survey run by National Agricultural Statistics Service (NASS) and Economic Research Service (ERS) of the U. S. Department of Agriculture.

• Three stage survey:
  1. First stage is a screening process
  2. Second stage captures production expenses, chemical use, and area-specific commodities
  3. Third stage focuses on financial data such as expenses and income

➢ Stage 3 is the focus of embedded experiments 2011-2015
Purpose and Methods

Purpose: Increase response rates with alternative data collections

• Early stages (2011-2013) – targeted “highly unlikely to respond” operations
  • Too small of samples to statistically test, maybe “too” hard to get
• Later stages (2014-2015) – targeted “unlikely to respond” operations
  • Larger samples, more likely to cooperate
• Experimental design with alternative data collection strategies
  • In-person enumeration using State Statisticians, Deputies Directors, etc.
  • In-person drop and collect method
Obstacles and Considerations

1. Propensity scoring of operations
   Modeling response on characteristics of operations and not an individual

   Solution – Use proxy data from past Census of Agriculture

2. Large establishments with special handling were excluded
   These operations already have special data collection procedures

   Solution – Not part of standard collection procedures regardless
Obstacles and Considerations

3. Confounding data collection coordination efforts
   Establishments can get multiple surveys during the same time period

   Solution – Follow-up measures on how treatment was handled
   • 15% of sample did not receive experimental data collection efforts

4. Voluntary and mandatory requirements
   Household survey generally voluntary, while establishment surveys
   more likely to be mandatory

   • Test data collection efforts multiple years to examine effect of
     years when voluntary or mandatory
What happened.....?

• Unlikely responders to ARMS III are not easily influenced by alternative data collection procedures

Or...

• Unlikely responders to ARMS III are already being captured, to the extent that they can, with standard data collection procedures

➢ These findings were strengthened with multiple tests over time
Summary

• There are several obstacles and implications in planning for experiments in establishment surveys
  • Use of auxiliary data
    • Universe creation
    • Sample selection
    • Modeling non-response for establishments
  • Data collection
    • Data collection coordination
    • Excluding large units
Thanks!

References

