

THE ARMS DATA: THINKING LOCALLY

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Potential ARMS Data Uses in Outreach and Extension

- Annual farm-level financial indicator distributions (benchmarks)
- Changes in land use, production practices, marketing decisions
- Financial vulnerabilities (and educational opportunities) of farms in your state

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- Financial vulnerabilities (and educational opportunities) of farms in your state
- Understanding historical government program participation in advance of possible changes
- Trends in farming community households and educational opportunities

Agricultural Resources Management Survey

- One of the most unique and powerful datasets on agricultural production and management.
- For a long time, largely by USDA researchers and personnel.
- Increasingly becoming available to more researchers (though still a costly process).

The Basics

- Administered annually through joint effort of USDA ERS and NASS
- Began as “ARMS” in 1996; preceded by Farm Costs and Returns Survey

Question categories include:

- Land characteristics and ownership type
- Crop and livestock production and sales, including risk and conservation management
- Marketing practices
- Government payment receipts and program participation
- Operating expenses, farm assets, and farm debts
- Farm labor management
- Farm household characteristics and behaviors

How are data collected?

- Phase I: selection of farm operators and pre-screening
- Phase II: field-level data collected for a subsample of selected operators who qualify for that year's "in-depth" topic
- Phase III: all selected farm operators complete whole-farm cost of production and returns questionnaires

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How much data are collected?

Will differ slightly across years, but here are a few examples:

| Survey Year | Variables | Surveyed Farms |
|-------------|-----------|----------------|
| 2016 | 2,011 | 18,545 |
| 2015 | 1,993 | 19,623 |
| 2014 | 2,060 | 29,733 |
| 2013 | 2,152 | 17,427 |

ARMS Data Use in Research

Around 300 citations in Google Scholar. Topics include:

- Impact of price information on nitrogen fertilizer use.
- Effect of farm commodity programs on land values.
- Farm efficiency as a determinant of producers' off-farm employment.
- Risk management using market and government tools.
- Land ownership and the business structure of a farm operation.

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Researchers at 20–25 land grant universities use ARMS.

If I were to write an “ARMS Data Quick Start Guide,”
what would it include?

Where to Begin: Navigating the Variables

- With $\sim 2,000$ variables, can be overwhelming
- My approach:
 1. Go through actual [CRR Phase3 Questionnaire](#): variable name in data will be the same as question ID number in questionnaire response box
 2. Look through variable labels in dataset
 3. Examine variable definition documents

A few more notes:

- After 2002, question IDs much more consistent across years; 2002 and earlier, need closer attention
- USDA ERS calculates many additional financial metrics
- Some questions appear on Phase III questionnaires during only some years (e.g., health insurance)

Data Structure: Cross-sectional

- Each year, operations are selected to into ARMS sample based on value of sales
- USDA NASS intentionally attempts not to select same operators each year
- So, multi-year analyses are based on pooled cross-sections, not true panel

Weighting

As with any survey data, correct weighting is critical

(Reminder: only discussing Phase III data; Phase II is different)

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- Goal of weighting: U.S. farm population based on Census of Agriculture
- Applying weight to an observation generates additional identical operations
 - If an operation is unique (relative to population), few identical operations are generated
 - If an operation is similar to many other farms, more identical operations are generated

A few more notes on using subsamples:

- Almost always need to apply weights
- Examining a single major commodity? Apply weights
- Examining a specific geographic region? Apply weights, but cannot disaggregate too much:
 - United States
 - Multi-state region
 - Single state

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 - Multi-state region
 - Single state
 - Multi-county region
 - Single county

How do I get access to ARMS?

- Researchers at 20–25 land grant universities use ARMS: worth asking others in your department about availability and being added as a user
- Starting from scratch?
 1. Contact Bob Dubman at USDA ERS
(bdubman@ers.usda.gov)
 2. Complete and submit Project Agreement and MOU documents
 3. State NASS representative will contact you to arrange meeting

4. Choose how you will access the data

- ERS office in Washington, D.C. (no additional access fees)
- State NASS office (no additional access fees)
- Remote access from anywhere via NORC Data Enclave (additional annual access fees)
 - First license: \$4,250
 - Additional licenses: \$2,250

Thanks!

Look forward to questions/discussion later on

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