Uses of ARMS Data

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ARMS Phase 3
Major ERS Uses of ARMS Data

- Financial reporting & other data releases
  - On farm sector, farm businesses, farm households
  - Via ERS webinars, web data-tool, & NASS & ERS postings
- ERS reports on policy-relevant issues
  - Posted on website and available to all
- ERS custom reports (staff analyses)
  - Unpublished, for policymakers; Quick turnaround
ARMS Uses: Financial reporting

*Net Farm Income expected to decline in 2018*

Note net farm income vs. net cash income

Net farm and net cash hit records in 2013, fell sharply to 2016, and fluctuated since

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Note: F = forecast.
Data as of November 30, 2018.
Our Forecast Goes Into Details of Revenues and Expenses

Change in farm cash receipts, 2017-2018F, by component of change

<table>
<thead>
<tr>
<th>Component</th>
<th>2017-2018F Change</th>
<th>Price change</th>
<th>Quantity change</th>
<th>Other changes</th>
<th>Total change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed purchases</td>
<td>6.8</td>
<td>-5.0</td>
<td>0.8</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livestock/poultry purchases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net rent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pesticides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel/oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property taxes/fees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed purchases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note: modest price declines offset modest quantity increases to leave cash receipts stable. Increases in most expenditure categories led to increased total cash expenses.
ERS Farm Financial Reporting

• That’s the 2017 *forecast*. ERS also provides *estimates of what did happen*.
  – For the headline numbers, as well as for component expense and revenue items.
  – For farm sector, and breakouts

• ARMS provides about ¾ of the data used in the farm sector accounts.
ARMS Data Also Underlie ERS Balance Sheet Analyses

Note rising debt ratios since 2013.

But, compare to 1980’s farm crisis. This is far less serious.

But debt stress varies widely across types of farms, and ARMS allows for detailed analyses of where risks may be most pronounced.
Debt Exposure Varies Across Commodities

- Farms in hogs, poultry, and dairy carry more debt, on average...

- And higher shares of those farms carry risky levels of debt
Who Wants This Information?
Not Just Policymakers

• Input providers
  – Cash income drives equipment purchases. What will equipment/chemical/seed/feed demand look like?

• Lenders & Investors
  – What are the risks? What guidelines should I use?
  – Poor information is worse than pessimistic info

• Extension and farm advisors
  – They are how information and advice get to farmers
Use in Policymaking

- Congress, USDA, and others use ARMS-based data
  - Including National Corn Growers, American Soybean Association, National Pork Producers, American Farm Bureau, and other farm groups
  - **Easy access** to fundamental & detailed finance data
  - ERS reports are widely available; Congress and USDA also ask for custom reports

- Informs Farm Bill discussions, & implementation
  - And other agriculture-related policy
ERS Also Uses ARMS to Estimate Farm Household Income

Net of farm expenses, and including income from off-farm sources

Provides a direct measure of how farmers are doing, not just farm businesses

Household income needed to assess:
1) How tax proposals work
2) Full impacts of farm policies
3) How changes in the farm economy—from crop prices, drought, an export boom—affect farm households
Farms vary a lot; detail, provided by ARMS, matters

### Table: Farm Income Details

<table>
<thead>
<tr>
<th>Farm Type</th>
<th>Share of all farms (%)</th>
<th>Median Household Income ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small farms (sales&lt;$350,000)</td>
<td>10.7</td>
<td>47,578</td>
</tr>
<tr>
<td>Operator is retired from farming</td>
<td>10.7</td>
<td>47,578</td>
</tr>
<tr>
<td>Primary occupation is non-farm</td>
<td>40.8</td>
<td>90,869</td>
</tr>
<tr>
<td>Primary occupation is farming:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales&lt;$150,000</td>
<td>31.7</td>
<td>55,382</td>
</tr>
<tr>
<td>Sales of $150,000-349,999</td>
<td>5.7</td>
<td>94,245</td>
</tr>
<tr>
<td>Midsize farms (sales of $350,000-999,999)</td>
<td>6.3</td>
<td>163,289</td>
</tr>
<tr>
<td>Large-scale farms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales of $1,000,000-4,999,999</td>
<td>2.4</td>
<td>328,555</td>
</tr>
<tr>
<td>Sales of $5,000,000 or more</td>
<td>0.3</td>
<td>756,483</td>
</tr>
<tr>
<td>All family farms</td>
<td>97.9</td>
<td>75,994</td>
</tr>
</tbody>
</table>

Source: 2017 ARMS Phase III

**Note the role of off-farm income (all sources minus from farming)**

**Note the huge range in income from farming**
Uses: ARMS in National Economic Accounts

• ERS farm income estimates enter into:
  – National Economic (GDP) accounts
  – State Personal Income & Local Area Income estimates

• GDP estimates used for national economy measurement and policymaking

• Farm income is small share of national GDP
  – But an important source of year-to-year variation
ARMS Uses: State & Local Income Estimates

- Formula allocation of federal funds
  - Medicaid, Supplemental Security Income
  - Agricultural research & extension, USDA ag lending

- Local planning of public investment
  - Public utilities, highways, hospitals

- Private investment
  - Local retail & wholesale facilities
ARMS Uses: NASS Reports

• Farm Production Expenditures report
• Field Crop Chemical Use data
• TOTAL Land Use report
ARMS Uses: ERS Reports
Research & Policy Topic: The Farm Bill

• The last Bill was passed in 2014
• Discussion throughout 2018
  – They won’t wait for 2020 (presidential election)
  – Then USDA must implement
    • Setting specific rules
  – ARMS-based data used to inform the Bill and the implementation
One issue: payment limits and program eligibility

Proposals to:

a) Limit total amount of payments received

b) Restrict eligibility for program to households with incomes at or below a threshold level

In 2008 Bill, a household with $>750,000 in income from farming would be ineligible.

Raised to $900,000 in 2014 Bill

We used ARMS to estimate the % of recipients and of payments that might be affected

A Current Application

• Payments to hog producers affected by Chinese tariffs
  – Direct payments to owners, based on hogs in inventory on August 1
    • Must meet USDA rules on income limits (<$900,000 AGI)
  – Commodity purchases ($558m targeted at pork)

• Query to ERS: How many hogs are produced under production contracts?
  – Answer: 67%
  – Question to you: why do production contracts matter here?
    • And, how do we know it’s 67%?
Why the Interest? Payments are Shifting to Higher-Income Households. Because production is shifting to larger farms

From 20 years of ARMS: Financial support, by household income

- Half of payments go to households with income at or above the blue/red lines
- Federal crop insurance indemnities
- Commodity-related payments

Today, farm policy places less emphasis on income support, and more on risk management
Farm Policy: Is Farming a Risky Business?

- Risk management is the rationale for commodity & crop insurance programs
- Heritage Foundation (a critic of current programs):
  - “Agricultural Risk is Not a Significant Issue for Most Farmers”
- American Enterprise Institute (also a critic)
  - “The evidence indicates that farming is in fact a much less risky financial enterprise than most other types of business...farm household incomes are relatively stable”
They use ARMS data, through ERS, to make these assertions.

Farm household income exceeds the U.S. average, after lagging behind for decades.

While farm household income fluctuates more than the US average, it doesn’t fluctuate all that much—you don’t see sharp declines.

But, this tracks the average over all farms; Individual households could realize wide year-to-year shifts.

We used ARMS to track household income risks

How? Some farms appear in ARMS in more than one year.

We measured the typical changes in household incomes for the same farm household, observed in different years.

We track that for the “typical commercial farm”, compared to the average across all commercial farms.

Commercial farms face striking income risks.
USDA, Congress, Farm Groups, Heritage, and AEI
All Use ARMS to Make Their Arguments

• Keeps the policy debate honest, and focused on important issues (rather than made-up facts)

• That’s a credit to NASS FO staff, enumerators, and respondents.
  – ARMS tells the story of US agriculture, and provides the facts needed to make for more effective policy.
Does crop insurance affect farmer crop decisions? Does that affect environmental quality?

ERS research, using ARMS & other data for 6 Midwestern states, found that subsidized crop insurance led to small effects on crop choice: total cropland up 0.06%, while corn acreage was up 1.7%.

In turn, more corn led to small (0.33%) increase in soil erosion & nitrogen loss to groundwater.
ARMS Use in Conservation Policy & Practices

Here, ARMS tracks conservation tillage in four major field crops.

No-till and mulch-till can provide important benefits in the form of improved soil moisture and health.

Can also reduce erosion, providing benefits to farmers and the public. That’s why the Farm Bill provides incentives for adoption.

ARMS provides baseline estimates of use, and is used to assess where conservation tillage works and where it doesn’t.
Once a Bill is Passed, ARMS is Used to Implement

- Perhaps the Act directs USDA to provide support for small farms, or beginning farmers
  - Likely to occur in lending or conservation programs.
  - How should we define “small”, or “beginning” in the context of a lending, or conservation assistance, program?
  - Can we create a definition that’s easy to use?
  - How does the definition affect the cost? Does it reach the group that Congress intended to target?
- ARMS is used to help agencies implement laws effectively.
What’s New: Soybean & Cow-Calf Versions in 2018

• Previous ARMS Soybean Versions—2012, 2006, 2002, 1997 (much information from Phase II)
  – Cow-calf in 2008, 1996
  – Gives baseline for annual cost and returns (CAR) estimates
  – Tracks key production & conservation practices
  – Adoption of innovations
Take a look at these CAR estimates: soybeans vs. wheat, 2000-2018

What’s happened to planted acreage?

Notice narrowing net returns for soybeans, before 2018

This year’s survey will track:
• 2018 soybean costs and returns
• Seed use and pest management
• Precision agriculture in soybeans
The CAR Data Show a Wide Variation in Costs Across Farms

This chart shows the range of milk production costs in 2015

The pattern is typical, across many commodities.

Why?
When does size and scale matter?
Crops and drought?
Crops and location.
Adoption of technologies and practices

Who cares?
Farmers and advisors
Lenders
Equipment and service providers
How ARMS Circles Back to Producers

“My team at The Fertilizer Institute is responsible for our 4R Nutrient Stewardship efforts focused on fertilizer application practices tied to the right source at the right rate, the right time and in the right place. The ARMS supports our discussions with agronomic retailers when we want to point to the additional opportunities for practice adoption, and allows us to better understand trends in practice adoption by state. We are particularly interested in recent data to help us evaluate the impact of our amplified outreach efforts on fertilizer application practices.”

Lara Moody
Vice President, Stewardship and Sustainability
The Fertilizer Institute
A Summary: Major Uses/Users of ARMS data are ...

- **Farm Financial (Net Farm Income)** reporting and forecasts
- **Custom Reports** for policy makers who affect farmers everyday
- **Special Reports** that answer questions on current hot topics
- Major information source for **Farm Bills and Ag Policy**
- Agricultural Component of **GDP**
- Part of Formulas to **Allocate Tax Dollars**
- Crop **Insurance and Disaster** damage estimates
- **Lenders, Manufacturers, Suppliers, & Retailers** decisions
- Farm **Commodity groups**, for analysis and advocacy
- **Data Summaries Available** to all through the web tool
Why is ARMS Valuable?

• It’s Representative, Comprehensive, Objective

• Links Enterprise, Whole Farm, & Household

• Tracks Income Statement & Balance Sheet Items
  – Links to production and marketing decisions
That Value Comes from a Full Team

- **ERS**
  - Objective analyses & economic expertise

- **NASS**
  - Survey design, management, & production expertise

- **NASDA enumerators**
  - Producer cooperation & guidance, ground truthing

- **Producers**
  - Time, knowledge, thoughtfulness
Policy Decisions Will be Made with or Without ARMS

• Policymakers...
  • Some have farm backgrounds, most don’t
  • Those that do can’t just rely on background, experience
  • They’re all busy, so they rely on others for information

• ARMS provides accurate data on U.S. agriculture
  • Farmers: ARMS is your chance to tell the story of American Agriculture

• Better information makes for better decisions
Additional Information

• The Phase III Interviewers Manual
• ERS website: www.ers.usda.gov
• Charts of Note: read and sign up for free distribution at
• Farm Sector Income Forecast:
• Thanks!!