# Structural Changes in U.S. Agriculture: Financial Performance of Farms in Transition

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# Presentation outline

- Structural changes in US agriculture: transitioning of farms from retired to beginning farmers
  - Issues, farmer needs, and research questions
  - Trends and statistics for the U.S.

- Analysis of the financial condition of transitioning farmers
  - Regression analysis predicting financial stress
  - Recommendations for educational programs

# Structural changes in US agriculture: the issues

- Over the next decade half of the farmers will retire and will be replaced by beginning farmers.
  - Farmers face financial,  production, price, legal, and human risk
  - Need to ensure farm sustainability, reduce risk and avoid disruptions

- Definitions
  - Beginning farmers:  with 10 years or less of experience
  - Retired farmers:  consider themselves retired from farming

# Structural changes in US agriculture: farmer needs

- Beginning farmers need to:
  - Develop managerial skills
  - Obtain financing to acquire capital
  - Operate a profitable business
- Retiring farmers need to:
  - Implement farm succession and estate planning
  - Provide income stream for their retirement
- Network is needed that matches beginning and retiring farmers

# Current projects

- Beginning Farmer Project in Kentucky, USA
  - Funded by USDA
  - 3 year project
- Farm Transitions Project in Kentucky, USA
  - Funded by the Southern Risk Management Education Center
  - 1 year project
- Activities
  - Provide production, management, financial, and legal training
  - Training to farmers and county extension agents
  - Develop mentorship programs and farm transition network
  - Need for applied research

# Structural changes in US agriculture: research questions

- Who are transitioning farmers? What are their characteristics?
- What determines their financial performance and stress?
- How do they start or exit farm businesses? Farm transfers?
- What is the structure of their businesses? Enterprise choices, financing, asset acquisition?
- What educational materials, knowledge, and skills will help them be successful?

# Objectives of this study

- To provide benchmark characteristics and demographics of transitioning farmers
  - Demographics, choice of enterprises, land tenure, etc.
- Analysis of financial performance
  - Study the factors affecting their financial performance and financial stress
  - Use of critical zones of financial ratios to indicate stress

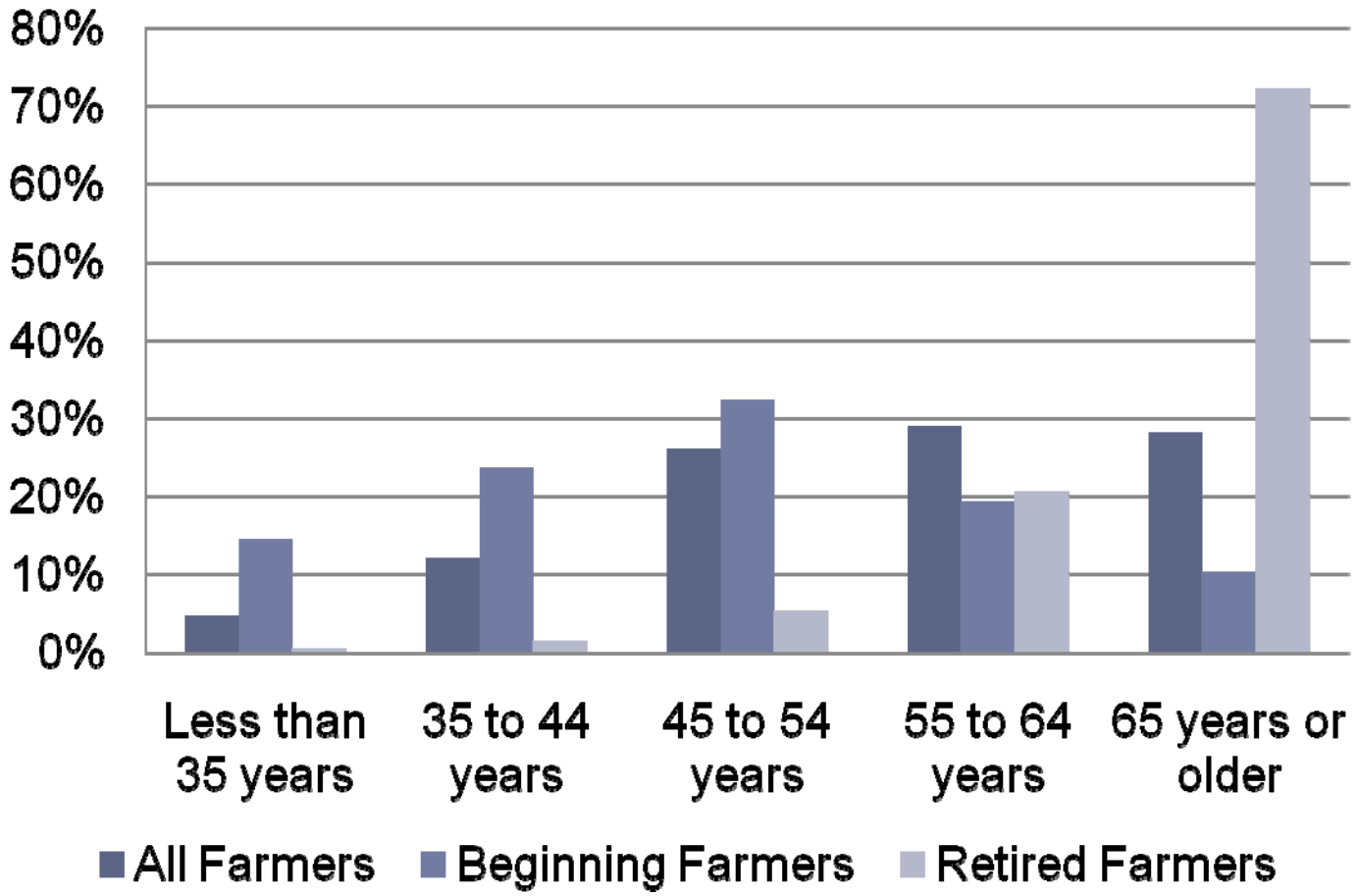
# Data

- USDA's Agricultural Resource Management Survey (ARMS)
  - National farm-level survey data for approximately 20,000 farm households every year.
  - USDA's primary source of information.
  - Data on the financial condition, production practices, resource use, and economic well-being of America's farm households.
  - Allows for regional analysis
  - Statistics for years 2005-2008

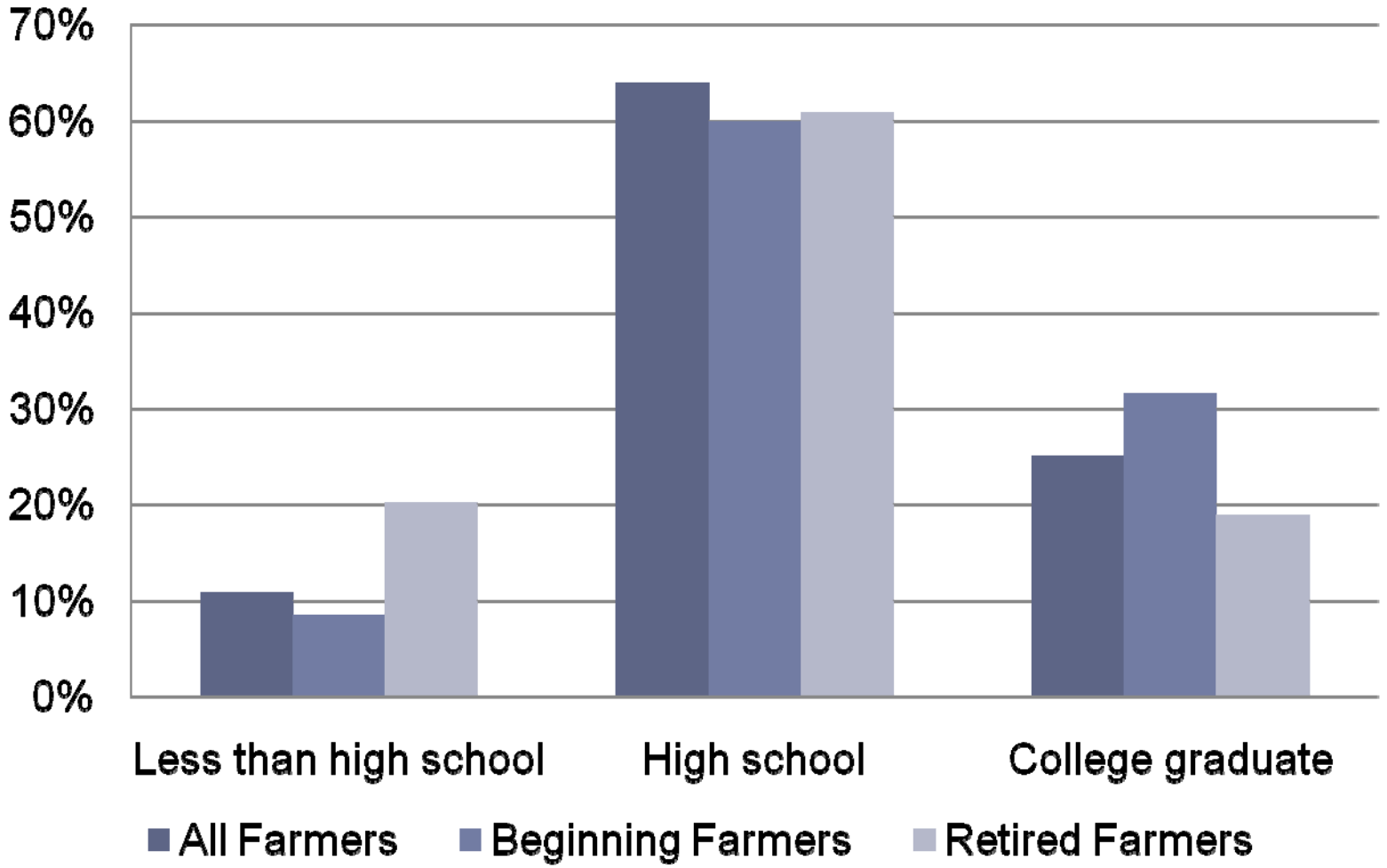
# Farmer benchmark characteristics

| | All Farmers | Beginning Farmers | Retired Farmers |
|---|---|---|---|
| Male | 90% | 85% | 85% |
| Female | 10% | 15% | 15% |
| | | | |
| Age (years) | 56.9 | 48.2 | 69.6 |
| College graduate | 25% | 32% | 19% |
| | | | |
| White | 96% | 95% | 95% |
| Black | 2% | 2% | 2% |
| Hispanic | 2% | 4% | 2% |

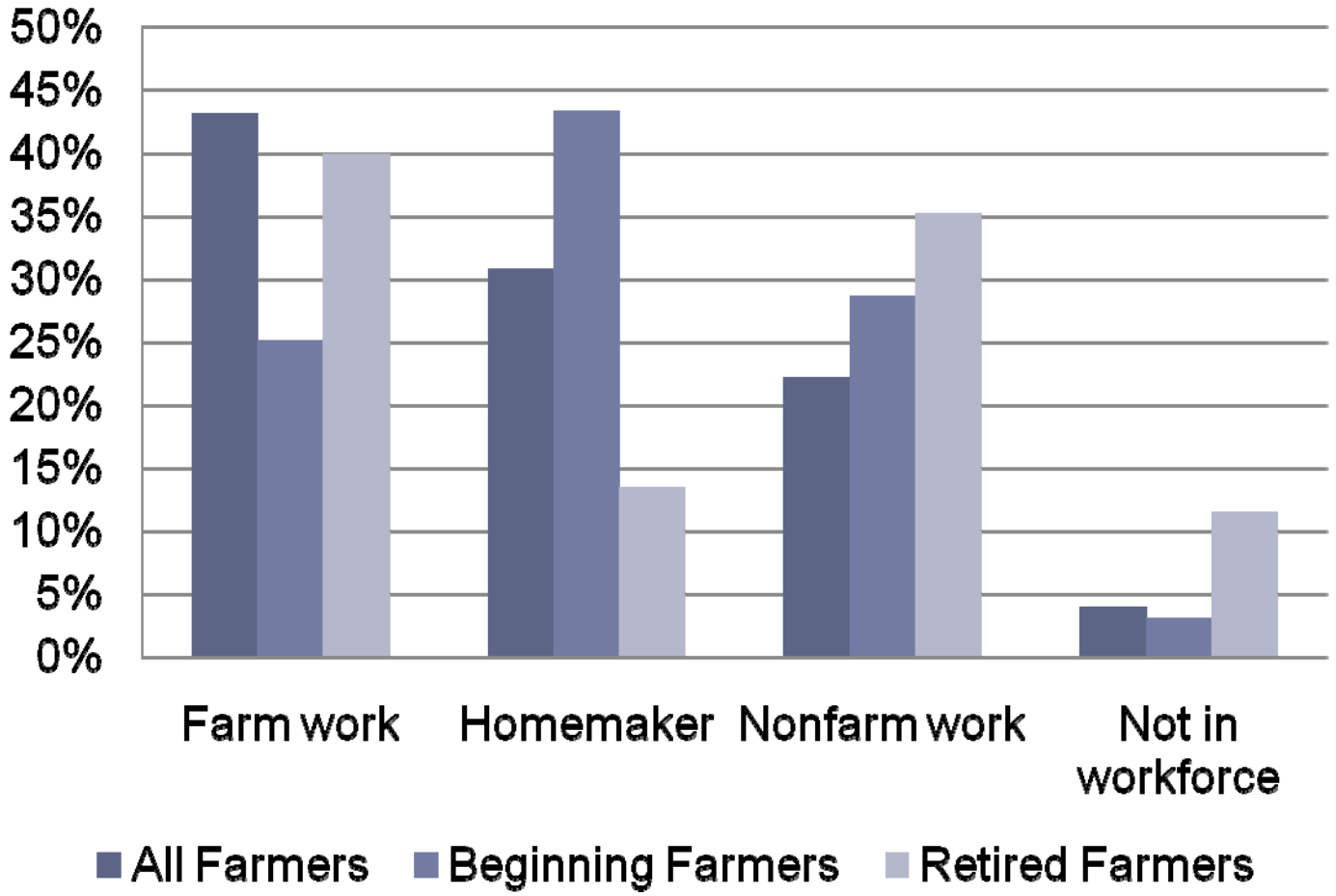
# Operator age distribution



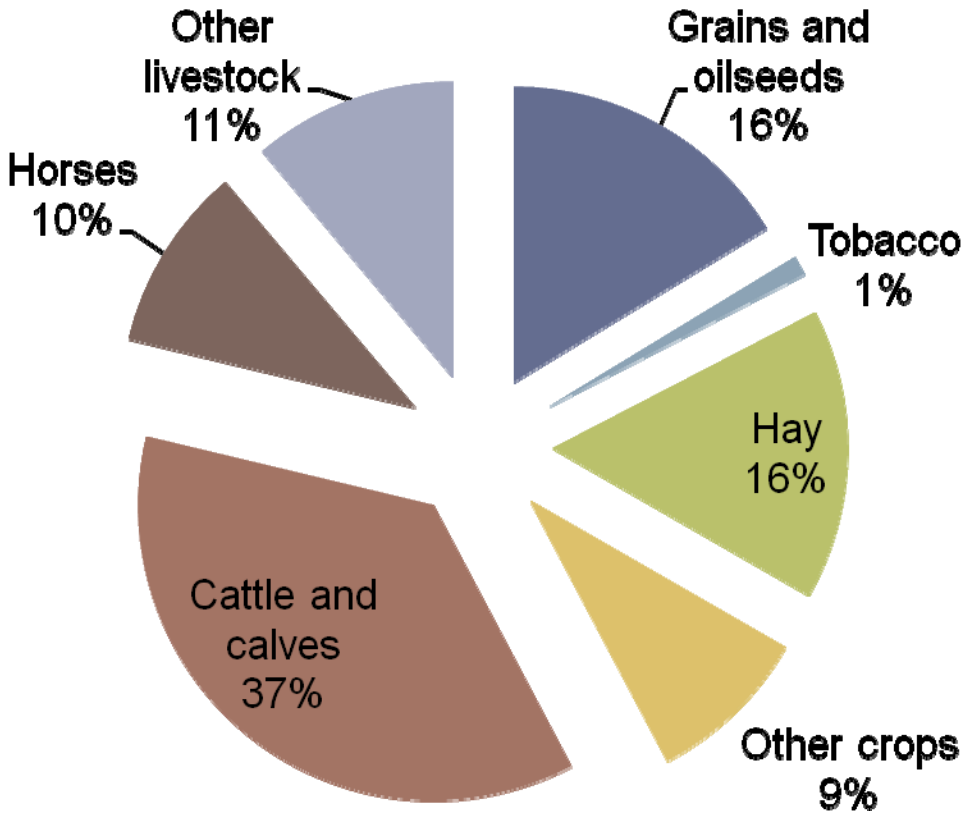
# Farmer education



# Farmer primary occupation



# Farm types

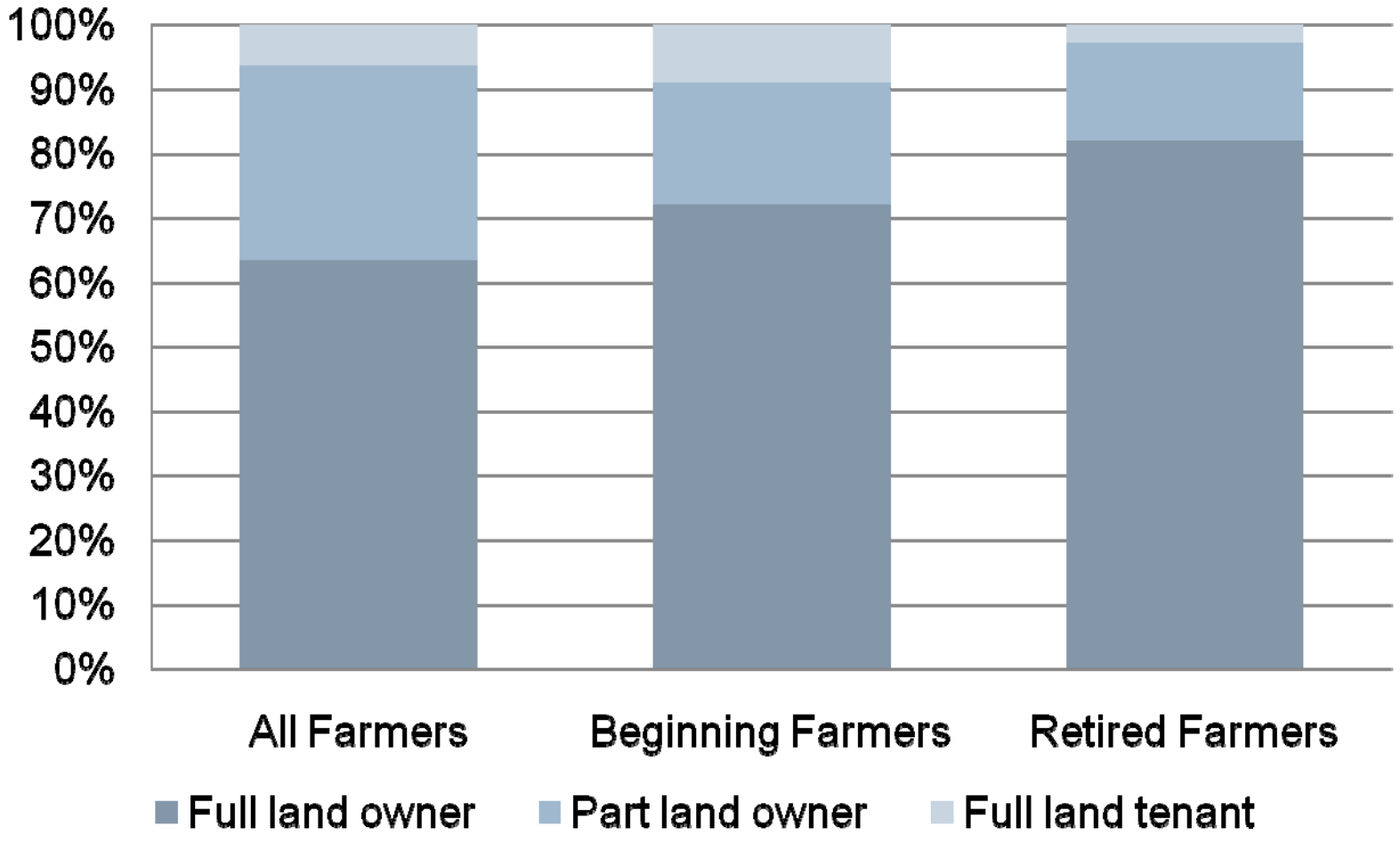

Other livestock 11%
Grains and oilseeds 16%
Horses 10%
Tobacco 1%
Hay 16%
Cattle and calves 37%
Other crops 9%

# Land ownership and tenure

| | All Farmers | Beginning Farmers | Retired Farmers |
|---|---|---|---|
| Acres operated | 422 | 231 | 182 |
| Land tenure | 89% | 89% | 114% |

Land tenure is the proportion of owned land to all land operated.

# Land ownership and tenure



# Demographic characteristics

| Variables | All Farmers | Beginning Farmers | Retired Farmers |
|---|---|---|---|
| Age | 57.07 | 45.74 | 68.53 |
| Education (category) | 2.15 | 2.24 | 2.02 |
| Male | 0.89 | 0.85 | 0.86 |
| Household size | 2.60 | 3.12 | 2.05 |
| Sole proprietor | 0.82 | 0.85 | 0.85 |
| Hobby farm | 0.68 | 0.76 | 0.87 |
| Livestock farm | 0.59 | 0.64 | 0.54 |
| Gross sales ($1,000) | 110.49 | 66.19 | 38.73 |
| Government payments ($1,000) | 4.63 | 2.08 | 2.72 |
| Total off-farm income ($1,000) | 71.95 | 85.79 | 59.48 |

# Summary of results

- Beginning famers are:
  - Younger
  - More educated
  - Have smaller farms
  - Have more off-farm income
  - Have lower participation in gov programs
- Retiring farmers are:
  - Older
  - Less educated
  - Have smaller farms
  - Have less off-farm income
  - Have lower participation in gov programs
- This information can help in the development of better targeted programs for beginning/retired farmers.

# Research on Financial Condition/Stress of Beginning farmers

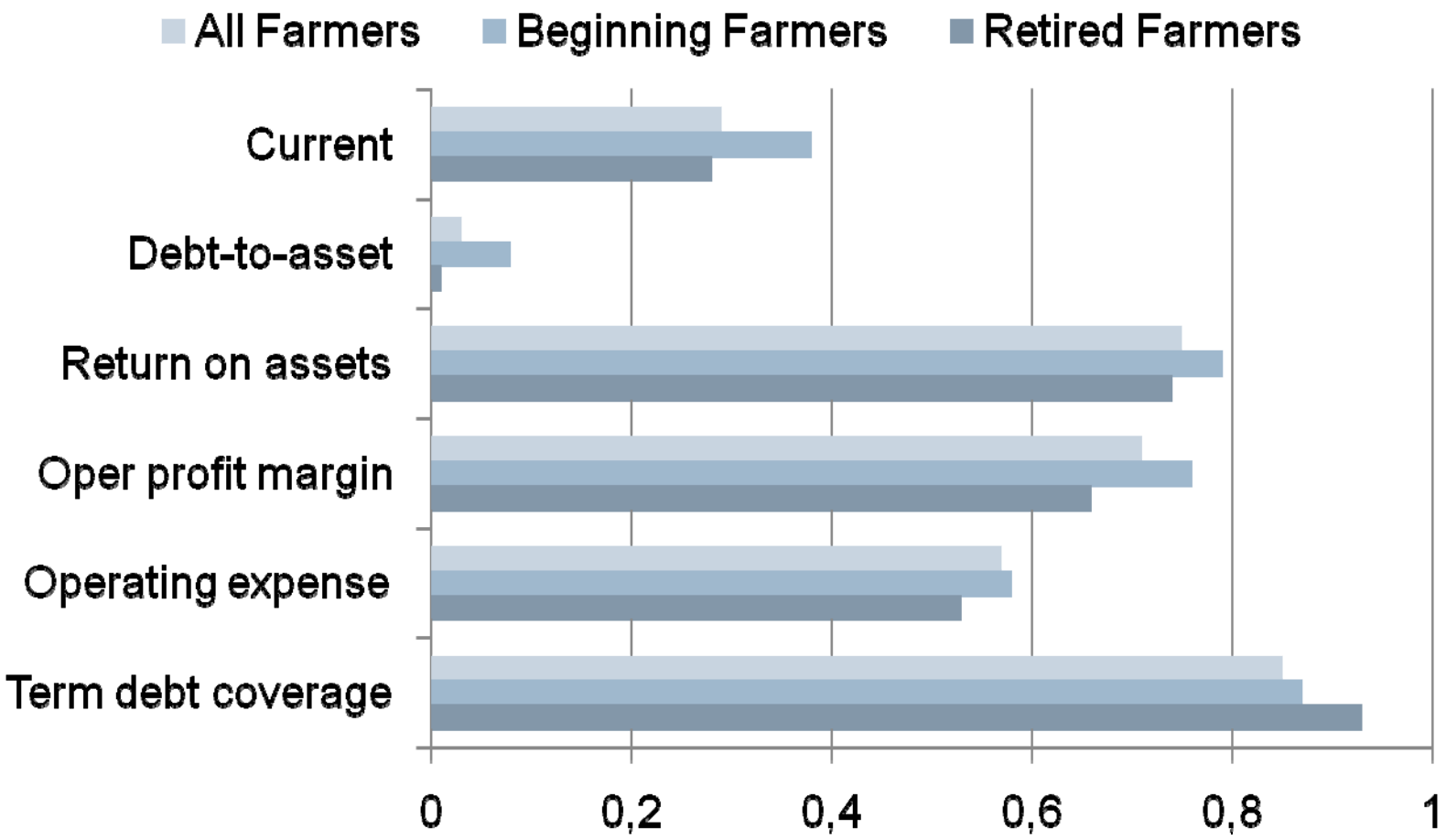
- Financial stress is when financial ratios (liquidity, solvency fall in the critical/red zone)

- Need to understand the predictors of financial stress for beginning and retiring farmers
  - Understanding financial stress is particularly important in the current economic situation
  - Lenders are interested/ have programs for beginning farmers

# Financial ratios and critical zones

| Financial Ratios | Financial Measures | Critical Zones |
|---|---|---|
| Current ratio | Liquidity | <1 |
| Debt-to-asset ratio | Solvency | >55% |
| Return on assets ratio | Profitability | <1% |
| Operating profit margin ratio | Profitability | <10% |
| Operating expense ratio | Efficiency | >80% |
| Term debt coverage ratio | Repayment capacity | <1.1 |

# Percent farms in the critical zone for the following financial ratios



# Probit models

- **Dependent variables: critical zones for financial ratios**
  - Liquidity
  - Solvency
  - Profitability
  - Efficiency
  - Repayment capacity
- **Independent variables**
  - Age
  - Education
  - Household Size
  - Male
  - Livestock
  - Sole proprietors
  - Hobby farms
  - Gross Sales
  - Government Payments
  - Total Off Farm Income

# Probit model summary results

- Farmers who are *less likely* to experience financial stress:
  - Older farmers and larger farms
- Farmers who are *more likely* to experience farm stress:
  - Hobby farms and livestock farms
  - During recession year
- No significant effect
  - Legal structure of the farm (sole proprietorship or not) and household size

# Probit models by groups of farms

- Probit models predicting financial stress (financial ratios being in the critical zone)
- Analysis done for beginning farmers and retired farmers
- Seek to find differences between these two groups

# Probit model summary results for beginning farmers

- For beginning farmers:
  - Fewer characteristics show significant influences.
    - Homogeneity of beginning farmers
  - Most of the personal and farm characteristics do not affect the probability of farmers experiencing liquidity and efficiency problems.
  - Hobby farms and farms with higher off-farm income generally do not have significant effects on the financial stress.

# Probit model summary results for retired farmers

- For retired farmers:
  - Males are more likely to be in the critical zones for their profitability and efficiency ratios.
  - Being a hobby farm and receiving more total off-farm income generally do not have significant effects on the financial ratios being in the critical zones.
  - The dummy variables indicating prior years no longer have significant effects on the likelihood of farmers experiencing financial stress.

# Conclusions and recommendations

- Research can help beginning farmer educational programs to:
  - Provide benchmark characteristics of beginning farmers
  - Better target the programs based on farmers' characteristics (demographics, enterprise choices, etc.)
  - Understand recent trends in establishing new farms (farm transfers)
  - Understand what predicts financial performance and stress
  - Provide specific recommendations based on what makes farmers successful

# Thank you!