

# The Evolution of Structural Change in the U.S. Farm Sector

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# What We'll Do

- Structural Change Has a Long History
- We Focus on Two Recent Evolutions
  - Farm size distribution
  - Interactions between farms & non-farm community
- Link to Adjustment and Policy

# What Do We Know About Structure?

- Gardner's Elements, Starting in Mid-1930's
  - Sharply rising farm productivity
  - ↑ Farm sizes, ↓ Farm numbers until 1980's
  - ↑ Farm household incomes, toward non-farm USA
  - An “Expanding Web” of interactions with non-farm community

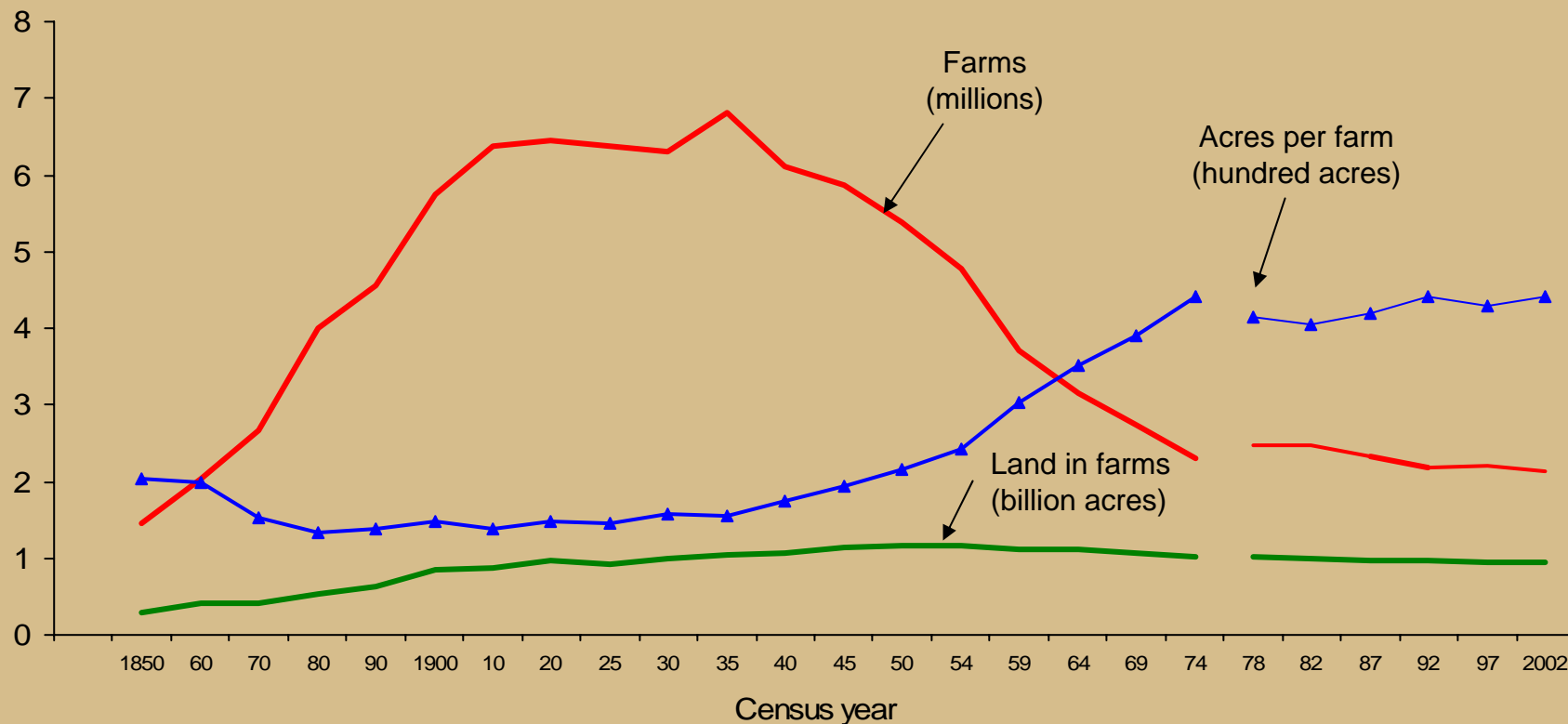
# What's The Evolution?

- More Complex Changes in the Farm Size Distribution
- The Expanding Web...
  - Off-farm employment, on-farm residences
  - Contracting for farm output
  - Off-farm production of farm inputs
- Our Data: ARMS & FCRS (1989, 1995, 2002)

Figure 1

# Farms, land in farms, and average acres per farm, 1850-2002

*Most of the decline in farms occurred between 1935 and 1974*



Note: The break in the lines after 1974 reflects the introduction of an adjustment to estimates of the farm count and land in farms, with the data adjusted to compensate for undercoverage by the Census of Agriculture.

Source: Compiled by ERS from Census of Agriculture data.



# Aggregate Farm Numbers Changed Little

- 2.15 million farms in '89 and '02 (FCRS/ARMS data)
- Most Farms Were, and Are, Tiny
  - 1.10 million in '89 had less than \$10,000 in sales,
  - Rose slightly to 1.19 million in '02
- But a Growing Number of Very Large Farms
  - 32,000 in '89 had \$500,000 or more in sales,
  - Rose to 64,000 in 2002

# Production Shifted Sharply to Large Farms...

Sales Class (\$000)	-Share of Value of Production-	
	<u>1989</u>	<u>2002</u>
<10	2.4	1.9
10-99.9	21.3	11.9
100-249.9	22.2	17.0
250-499.9	19.0	16.8
500 and up	28.9	43.9

## ...The Shift Was Widespread...

Commodity	-Share of Largest Farms-	
	<u>1989</u>	<u>2002</u>
Grains, Soybeans	10.9	24.4
Cotton	40.7	55.5
Peanuts	17.9	30.5
Tobacco	12.2	20.0
Fruits, Veg., Nursery	45.3	57.3

## ....And Not Entirely Expected

- There's a history of interest in farm structure...
- ..& a flurry of analyses & projections in early '80s
- Does the shift match projections?
  - Qualitatively, yes for large farms
  - Quantitatively, pace of consolidation is faster
  - And, survival of very small farms is a surprise

# Consolidation Of Production Should Continue

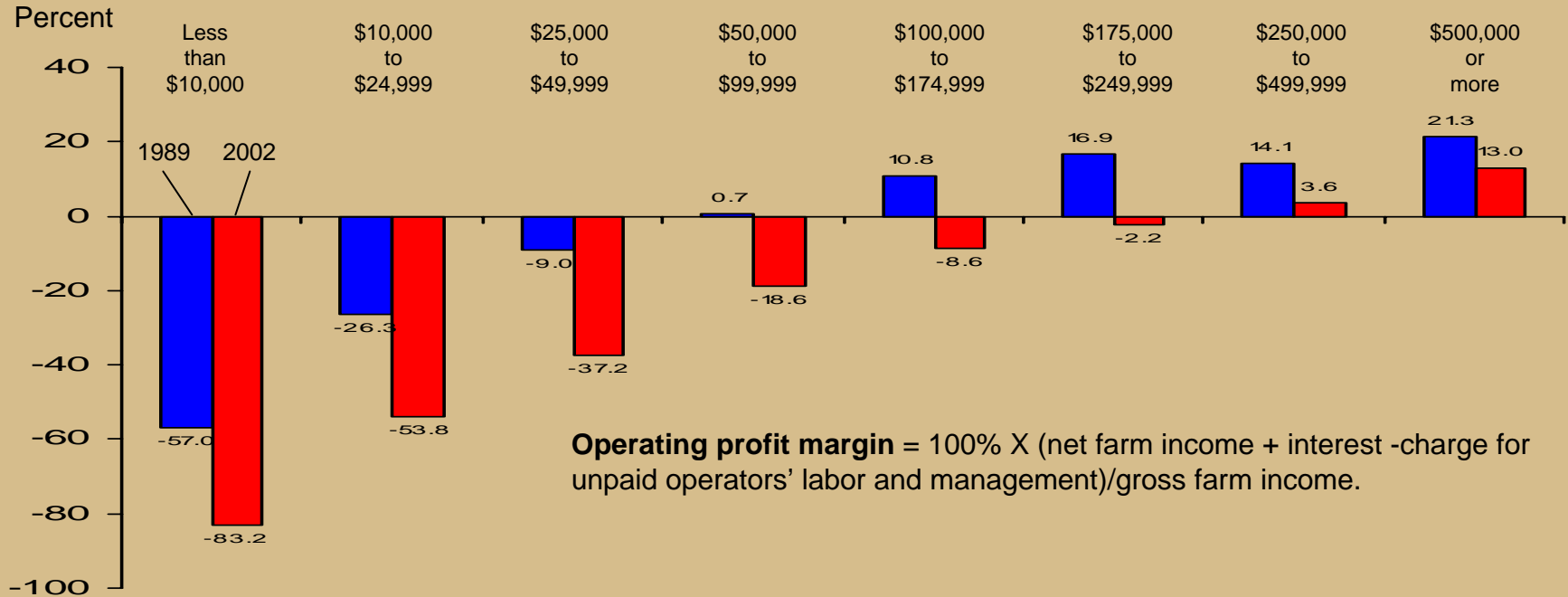
- **Small Commercial Farm Operators Are Aging**
  - \$10,000-\$250,000 in Sales
  - Over time, and compared to larger farm operators, substantially more are 65 or older
- **Operating Margins Vary Directly with Farm Size**
  - Substantial losses among small farms
  - Consistent relation between margins & size

Figure 2

# Operating profit margin by sales class, 1989 and 2002

*Operating profit margin increases with size and fell between 1989 and 2002*

Sales class, 2002 dollars



Source: Compiled by ERS from the 1989 Farm Costs and Returns Survey (FCRS) and the 2002 Agricultural Resource Management Survey (ARMS).

# The Expanding Web on the Input Side: Farm Size and Farm Organization

- Large Farms Are More Likely to Use:
  - Production & Marketing Contracts
  - Equipment Leasing
  - Custom Services
  - Hired Labor
  - Multiple Operators/Multiple Households
  - Land Rental

# Production & Marketing Contracts

- Substantial Growth Through Time
  - 12% of VOP in '69; 37% in '02
  - Dramatic in some commodities
- Closely Tied to Size
  - Half of VOP in largest farms
  - Causality may go from contracting to size

# Other Business Arrangements

- Among the largest farms,
  - 76% use hired labor
  - 32% lease equipment
  - 70% rent land

# Do Rentals, Contracting, & Leasing Create Greater Resource Mobility?

- An illustration from Census data...
  - Striking mobility within farm size distribution
- 176,000 farms in '97 with at least 1,000 acres...
  - Half (48.6%) operated at least 1,000 in 1992
  - 8,600 (5%) operated less than 500 in 1992
  - 1,300 operated less than 50 acres in 1992
  - Pattern also works in reverse

# Implications of Structural Change

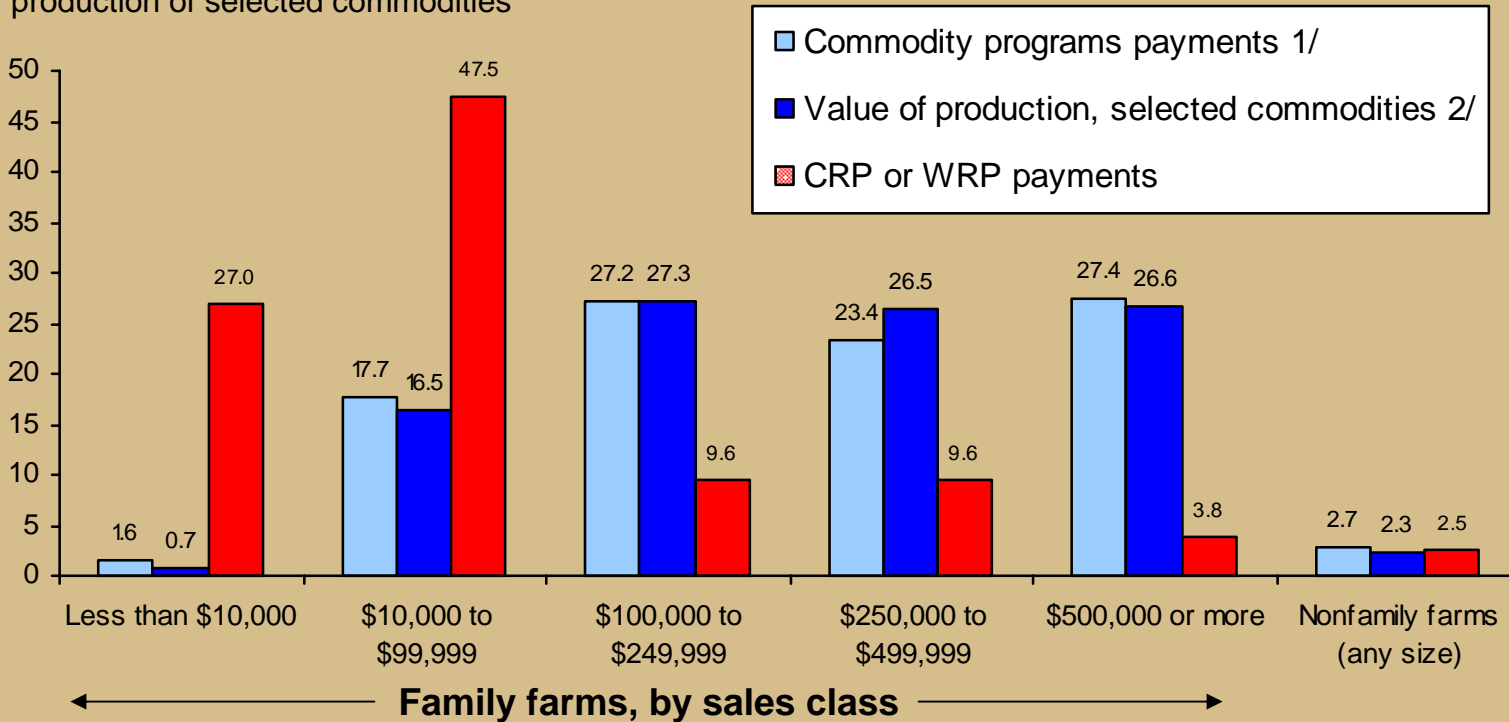
- Policy Can Impact Measures of Structure
- Structural Change Can Impact Farm Policy
  - Specifically, can affect how benefits are distributed
- The Expanding Web Affects the Size Distribution
  - Specifically, decisions of whether to farm, and how much

Figure 3

## Distribution of total payments from commodity programs and CRP & WRP, 2002

*Production of program commodities explains the distribution of commodity program payments*

Percent of total payments or total production of selected commodities



1/ AMPTA, direct payments, counter-cyclical payments, loan deficiency payments/marketing loan gains, net value of commodity certificates, peanut quota compensation payments, national dairy market loss payments, agricultural disaster payments.

2/ Barley, corn, cotton, rice, sorghum, soybeans, wheat, and oats.

Source: Compiled by ERS from the 2002 Agricultural Resource Management Survey (ARMS).



# Structural Change and the Distribution of Government Payments

- Commodity program payments closely match program commodity v.o.p.
- Recall that v.o.p. has shifted to largest farms
- Largest sales class (>\$500,000) received 27.4% of commodity payments in 2002, up from 11.7% in 1989.

# Farm Organization and the Benefits from Commodity Payments

- Does Resource Mobility Lead to “Pass-through” of Payments to Higher Input Prices?
- More than Half of Cropland is Rented...
  - Although, no strong trend, and no strong pattern by size
- Large Farms More Likely to Rent Services & Equipment

# The Expanding Web and Farm Sizes

- Gardner Emphasizes “Expanding Web” of Interactions Between Farm Households and the Off-farm Community
- That Web Continues to Grow: Consider Farm Household Income and its Sources, Particularly the Role of Off-farm Income.

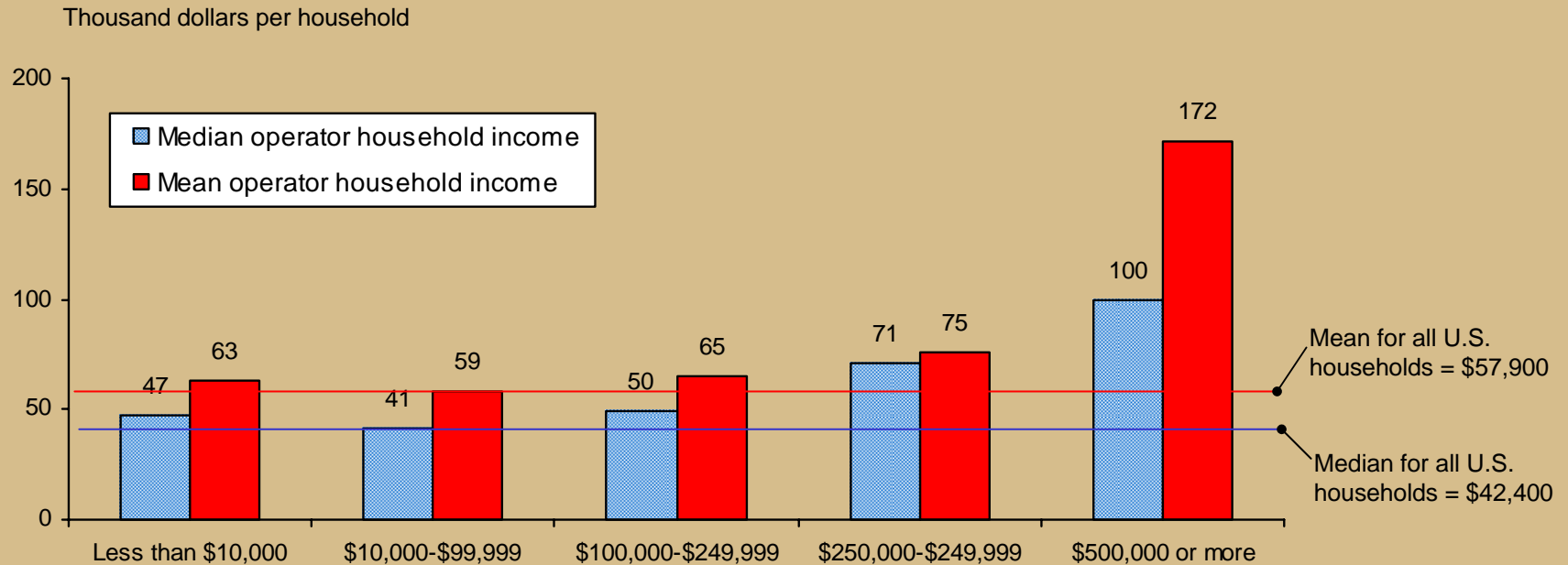
# Role of Off-farm Work, by Farm Size, 2002

Sales Class (\$000)	Share who work off-farm (%)	Mean earned off-farm income
<10	76.3	\$68,892
10-99.9	69.3	\$59,945
100-249.9	64.1	\$60,193
250-499.9	61.1	\$45,330
500 and up	54.5	\$51,820

Figure 4

## Median and mean operator household income, 2002

*Farm households have income near or above the U.S. median and mean*



Source: USDA, Economic Research Service, 2002 Agricultural Resource Management Survey, version 1), for operator households. Current Population Survey (U.S. Department of Commerce, Bureau of the Census, 2003) for all U.S. households.

# Off-farm Income and Farm Structure

- Sets an Opportunity Cost for Farm Work
  - Impact on small commercial operations
- Allows flexibility for farm households
  - Note link to multiple operator farms & mobility
- Provides support for farm avocations
  - Note link to very small farms

# Summary

- Farm Structure: Important Shifts of Production to Larger Family Farms
  - Very small farms retain share of farm numbers
  - Mid-size commercial farms hold declining shares
- Farm Organization: Deepening Ties to Outside Firms