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# Consolidation and Competition in Agribusiness

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# Concentration & Consolidation in Agribusiness

- Concentration is high and rising in many agribusiness industries
  - An important issue across the economy
- I'll give some background
  - Evidence for agribusiness industries
  - Why should we care—what are the issues?
  - How policy has changed over time
- To set up today's discussion
  - Mergers and concentration in seeds and chemicals



# Concentration is High, and Rising, in Agribusiness

Largest four firms' share of:	Beginning year	Ending year
Manufacturing value of shipments (\$)	Year=1977	Year=2012
Fluid milk processing	18	46
Wet corn milling	63	86
Soybean processing	54	79
Cane sugar refining	63	95
Nitrogenous fertilizer manufacturing	34	69
Phosphatic fertilizer manufacturing	35	88
Pesticide manufacturing	44	57
Farm machinery	46	61
	Year=1980	Year=2007
Railroad grain shipments (Tonmiles)	53	84
	Year=2000	Year=2015
Seed value of shipments (\$)		
Corn seed	60	85
Cotton seed	95	91
Soybean seed	51	76
	Year=1980	Year=2015
Livestock procurement (animals)		
Steer and heifer slaughter	36	85
Hog slaughter	34	66

*The table shows selected four-firm concentration ratios (CR4) from various sources.*

*Not just agribusiness: growing concentration across the US economy is a topic of widespread current discussion*

*Key issue: does rising concentration imply less competition, reduced innovation, lower efficiency?*



# Why Should We Care? High Concentration Can Mean Reduced Competition

- Ability to raise price (as a seller) or reduce prices (as a buyer) from competitive levels.
  - Distorts signal provided by prices
  - Transfers income to stakeholders in firms with market power
- Absent competition, efficiency may erode and costs rise
  - “Best of all monopoly profits is a quiet life”.
- May have reduced incentives to invest in innovation
  - Although this is complicated



# Is High Concentration a Sufficient Indicator?

- Notice my use of “can mean” in the previous slide. Should it have been “does mean”?
- Past some threshold level of concentration, *does* increased concentration *mean* reduced competition?
  - With a high level of confidence (i.e., almost always)?
  - A key issue in research in industry economics in the 1970’s and 1980’s, and in policy debates
  - The original merger guidelines (1968) suggested that the answer was “yes”: concentration was a sufficient indicator



# Is High Concentration Sufficient? No

- This was the conclusion of the industrial economics literature by 1990.
  - Concentration matters...
  - But the threshold at which we think concentration matters is higher.
  - And other factors matter: ease of entry into a market; presence of substitute products; ease with which buyers can switch among sellers.
  - And the relation between concentration and price is very noisy



# What's More, Rising Concentration Can Reflect Reduced Costs and Prices

- Scale economies in production, marketing...
  - Then larger firms, higher concentration can ↓ costs & prices
- Differential efficiency across firms...
  - Research shows a wide range of costs across producers
  - If lower cost producers expand, then ↑ concentration could mean ↓ costs and prices
- In some circumstances, firms with market power are more likely to invest in innovation
- So there are risks to merger policy that's “too tight”





# Merger Policy Changed with Research Findings

- Policy in the 1960s-70s focused heavily on concentration: opposed mergers of competitors where concentration exceeded certain (low) thresholds.
- Contemporary merger policy:
  - Substantially eases the concentration threshold of concern
  - Considers other market attributes
  - Has been one contributor to rising concentration
- That does not imply that current standards are ideal.
  - Some current empirical work argues that policy is too accommodating, and that we should restrict more mergers and be more concerned with concentration



# The current issue: 3 major mergers among the world's 6 large global seed & agricultural chemical companies.

Company	Country	2015 sales (\$ millions)		Proposed merger partner
		Seeds and Biotech	Agricultural Chemicals	
BASF	Germany	Small	6,211	None
Bayer	Germany	819	9,548	Monsanto
Dow Chemical	U.S.	1,409	4,977	DuPont
DuPont	U.S.	6,785	3,013	Dow
Monsanto	U.S.	10,243	4,758	Bayer
Syngenta	Switzerland	2,838	10,005	ChemChina

Note: BASF does not separately report seed sales, placing them under an “other” category.  
 Source: USDA, Economic Research Service using data from Company Annual Reports.



# The proposals are subject to antitrust review, which is quite complex in these cases

- Multiple products
  - Many specific seed and chemical markets...
  - Judgment as to how they interact (ie, is one chemical a good substitute for another?)
  - Plus research platforms
- Global markets
  - Implying many jurisdictions, and many agencies involved
  - US and EU antitrust authorities
  - Plus antitrust reviews in Australia, Brazil, Canada, China, India, South Africa



# Two Major Competition Issues

- In these cases, with some highly concentrated markets, will a merger lead to reduced competition and higher prices for seed and chemical products?
- Will a merger lead to reduced competition in innovation, and less research and innovation in the future?



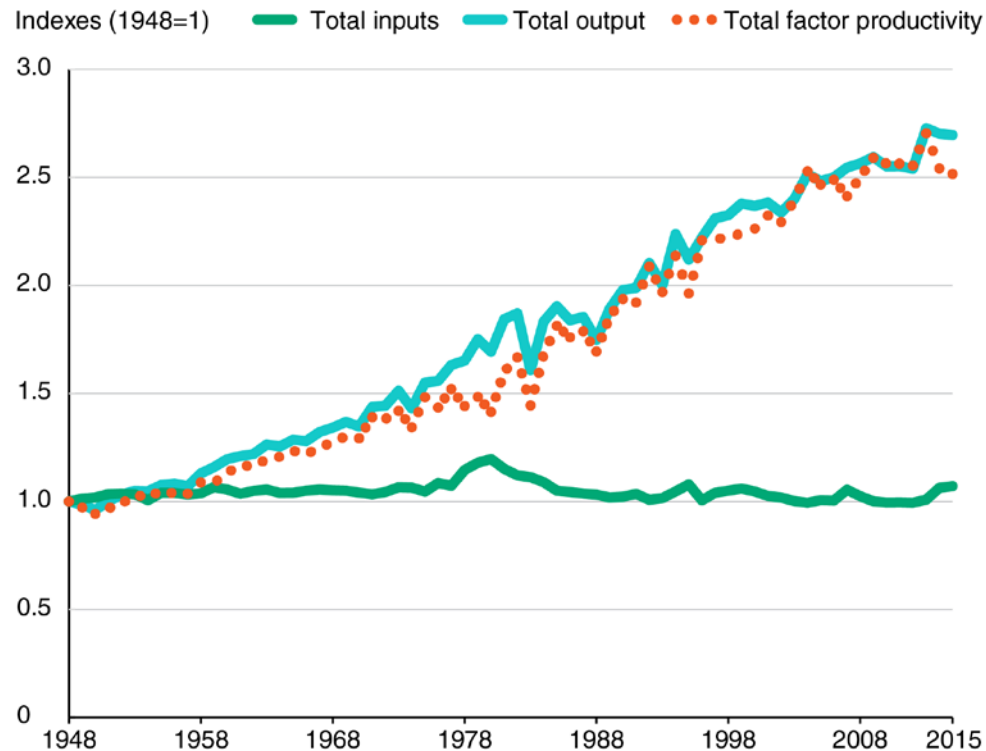
# Competition and Innovation

- Will a merger enhance the ability to innovate?
  - Perhaps by combining complementary research organizations?
  - Or by providing size and scale for research?
- Alternatively, will it reduce the incentive to innovate?
  - Consider the extreme: your new product simply cannibalizes sales from your old products.
    - Example: merger between the only two rivals
    - The likely gains from a research investment will then be much smaller than if sales were going to be drawn from rivals
    - In that case, why invest in research?



# Innovation Matters to Agriculture

## U.S. agricultural outputs, inputs, and total factor productivity



Source: USDA, Economic Research Service, Agricultural Productivity in the U.S. series.

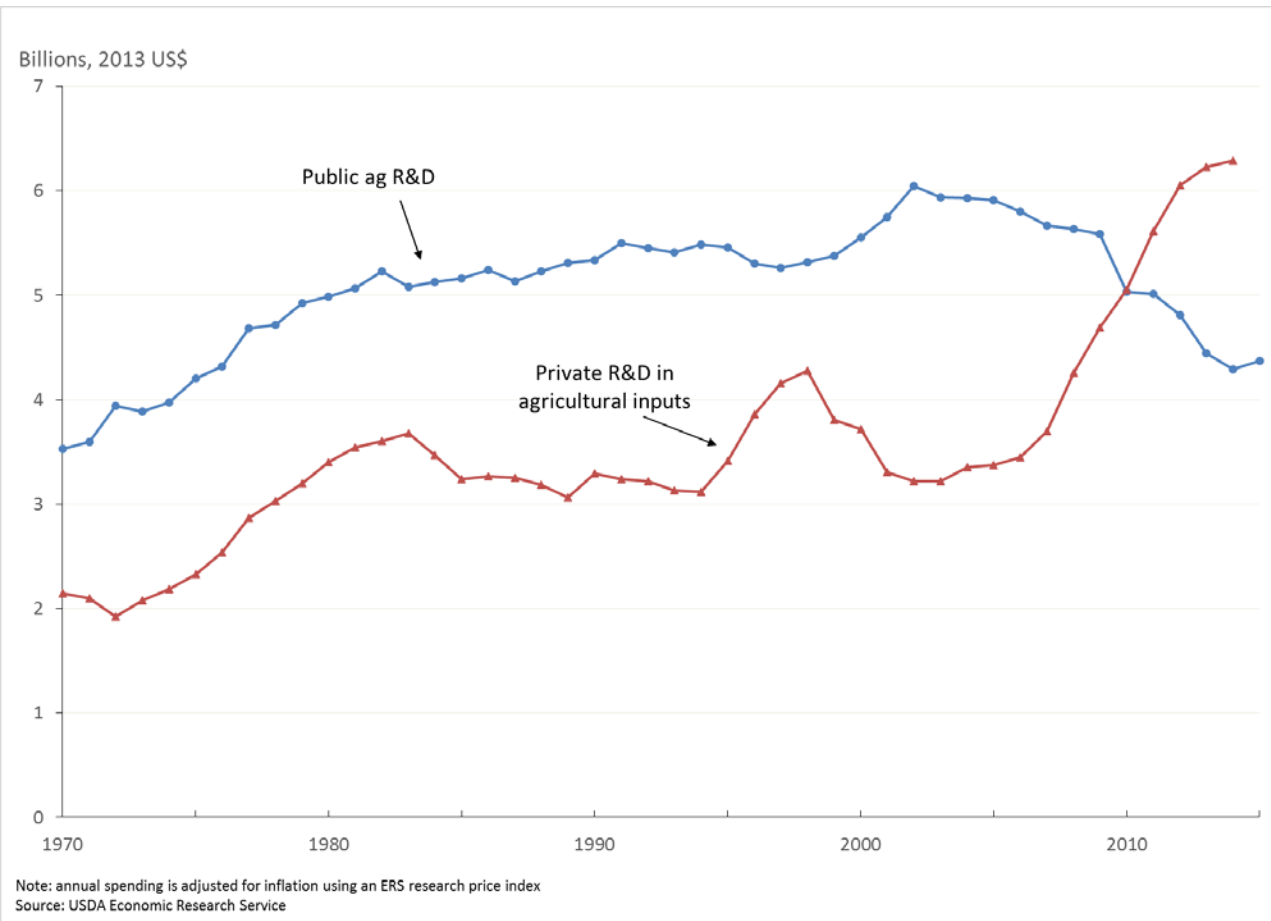
Total input use shows little growth over 1948-2016.

Output growth is driven almost entirely by productivity growth.

In turn, productivity growth is driven largely by biological, mechanical, chemical, and organizational innovations, which in turn derive largely from research investments.



# Private Ag R&D is of Growing Importance



Real public support for R&D has fallen back to its level in the 1970's.

Private R&D in ag inputs has risen sharply, and exceeds public R&D.

Private R&D responds to incentives:

- IP rules
- Market size
- Tax policy
- Competition



# Innovation Issues Receive Greater Attention in Antitrust Enforcement Today

- Few merger cases featured innovation concerns before 1995
  - But many have in past decade
- Most food system merger cases focused on competition and pricing issues
  - For example, JBS-National Beef, and Cargill-Continental Grain
  - But competition and innovation now play a growing role
    - For example, Precision Planting (Monsanto-Deere)
    - And now, Bayer-Monsanto and Dow-DuPont





# Conclusions: The Big Economic Issues

- Can high concentration reduce research incentives and investments? Under what circumstances?
- In what markets would mergers reduce price competition?
- Asset divestitures are common remedies
  - Actual in the two completed mergers, proposed in the other
  - Do divestitures work as a remedy for competition concerns in mergers?
- More speculative: Are there gains from combining digital, seed, & chemical?

