

Consolidation and Competition in the Seed and Agricultural Chemical Industries

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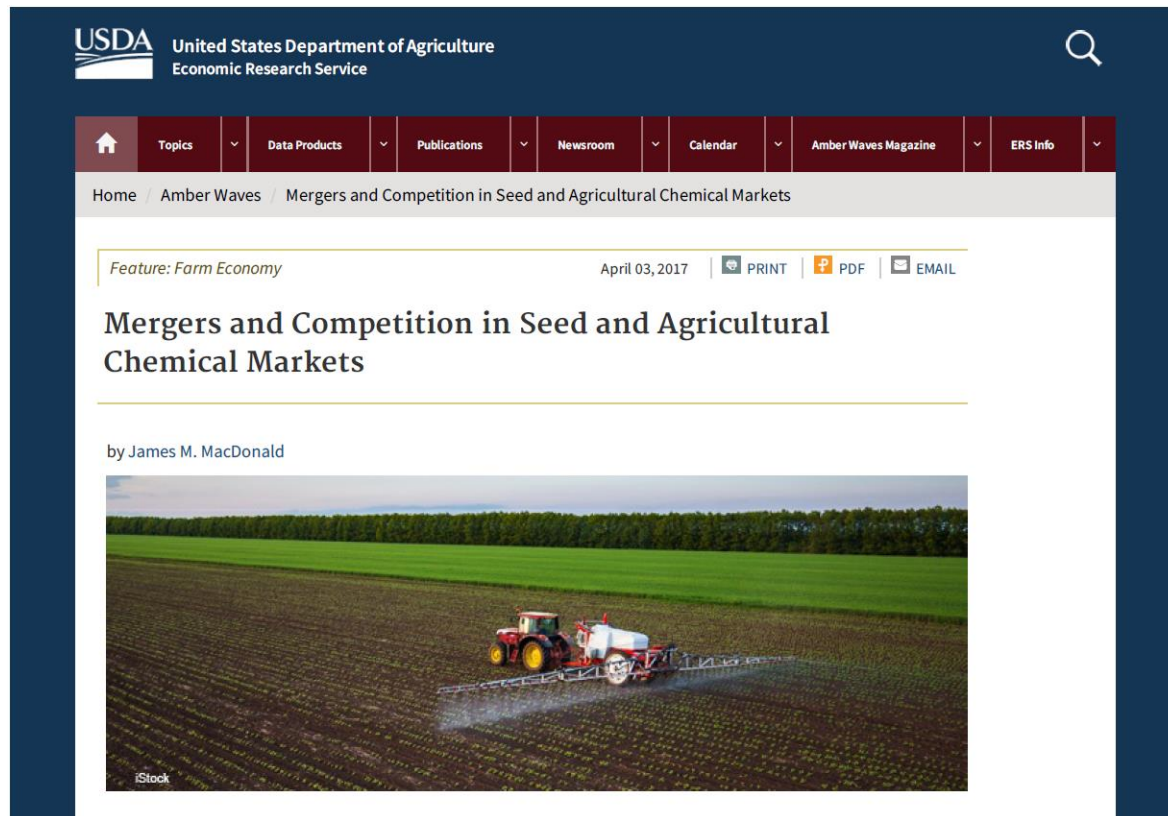
Council of Producers and Distributors of Agrotechnology

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I'm going to follow up on an April, 2017, article that I wrote for the USDA/ERS magazine *Amber Waves*.



The screenshot shows the USDA Economic Research Service website. The header includes the USDA logo and the text "United States Department of Agriculture Economic Research Service". A navigation menu contains links for Home, Topics, Data Products, Publications, Newsroom, Calendar, Amber Waves Magazine, and ERS Info. The breadcrumb trail reads "Home / Amber Waves / Mergers and Competition in Seed and Agricultural Chemical Markets". The article title is "Mergers and Competition in Seed and Agricultural Chemical Markets" by James M. MacDonald, dated April 03, 2017. There are icons for PRINT, PDF, and EMAIL. Below the title is a large photograph of a red tractor with a white sprayer attachment working in a field. The photo is credited to iStock.

Today: I'll focus on what's happened in the 9 months since; the process for antitrust/competition review; and the major issues at hand in those reviews.



The issue: in a nine-month period (12/15-9/16), 3 major mergers were announced among the world's 6 large global seed & agricultural chemical companies.

The World's "Big Six" 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.



Why Merge?

- ↓ Costs, ↑ Efficiency
 - Scale economies?
 - But they're already large
 - Differential efficiency?
 - Not referenced here
 - But, role of activist investors
 - Fixed costs and scale
 - Regulatory costs
 - Research costs
 - Complementary assets
 - Reason for earlier wave
- Eliminate a competitor
 - “efficiencies on the revenue side”: ↑ price
 - Cutting research
 - Cutting quality/products

Important caveat. These are intentions; but mergers have a high failure rate



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



There are Two Major Competition Issues

- 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 Prices

- Concentration matters: will a merger leave 2, instead of 3, competitors? 3 instead of 4? Will prices then \uparrow ?
 - Competition among products also matters. Can buyers easily shift to a competing chemical product?
 - Note that this question also encompasses buyers' perceptions and ease of switching among sellers.
 - Ease of entry also matters: if a merger combines the only two rivals, and they raise price, how likely is it that another firm, active in another region or in related products, would enter the market?
 - Low concentration, easy entry, ease of buyer switching, and substitute products all limit the opportunity to \uparrow prices
 - And make it less likely that a merger will be opposed



More on Competition and Prices

- Concentration (# of rivals, post-merger) was a dominant factor in merger policy through 1970's
- Policy Changed Since Then
 - High concentration alone isn't sufficient
 - Other factors matter
 - Threshold for concentration concern is tighter
 - Focus is on markets with 2, 3, 4 rivals, post-merger
 - Efficiencies taken more seriously



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?

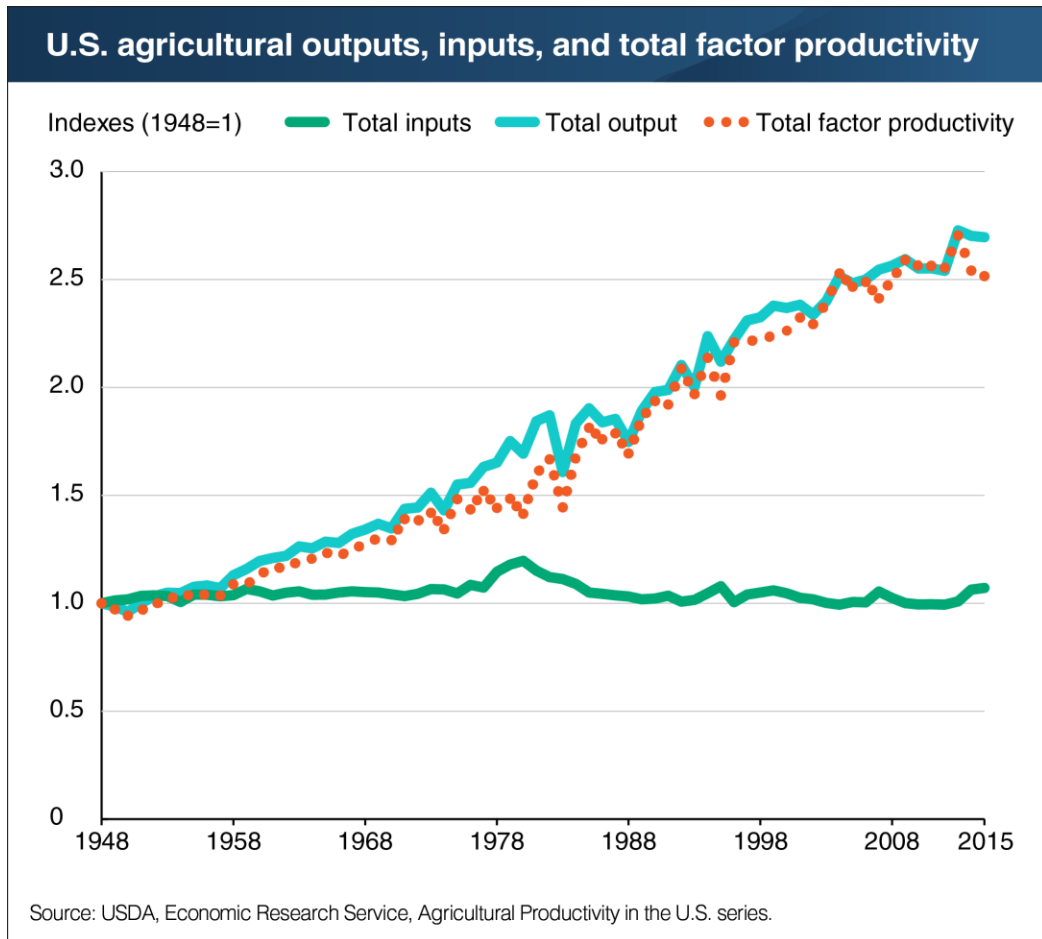


More on Incentives to Innovate

- Becomes an issue in highly concentrated markets
 - 2, 3, or 4 rivals
- Prospect of entry also matters
 - Does a firm fear “disruptive” innovation and entry?
 - Coming from a new technology, and someone not now in the market
 - In that case, a firm might have a strong incentive to innovate, even without direct rivals, to protect its position



Innovation Matters to Agriculture



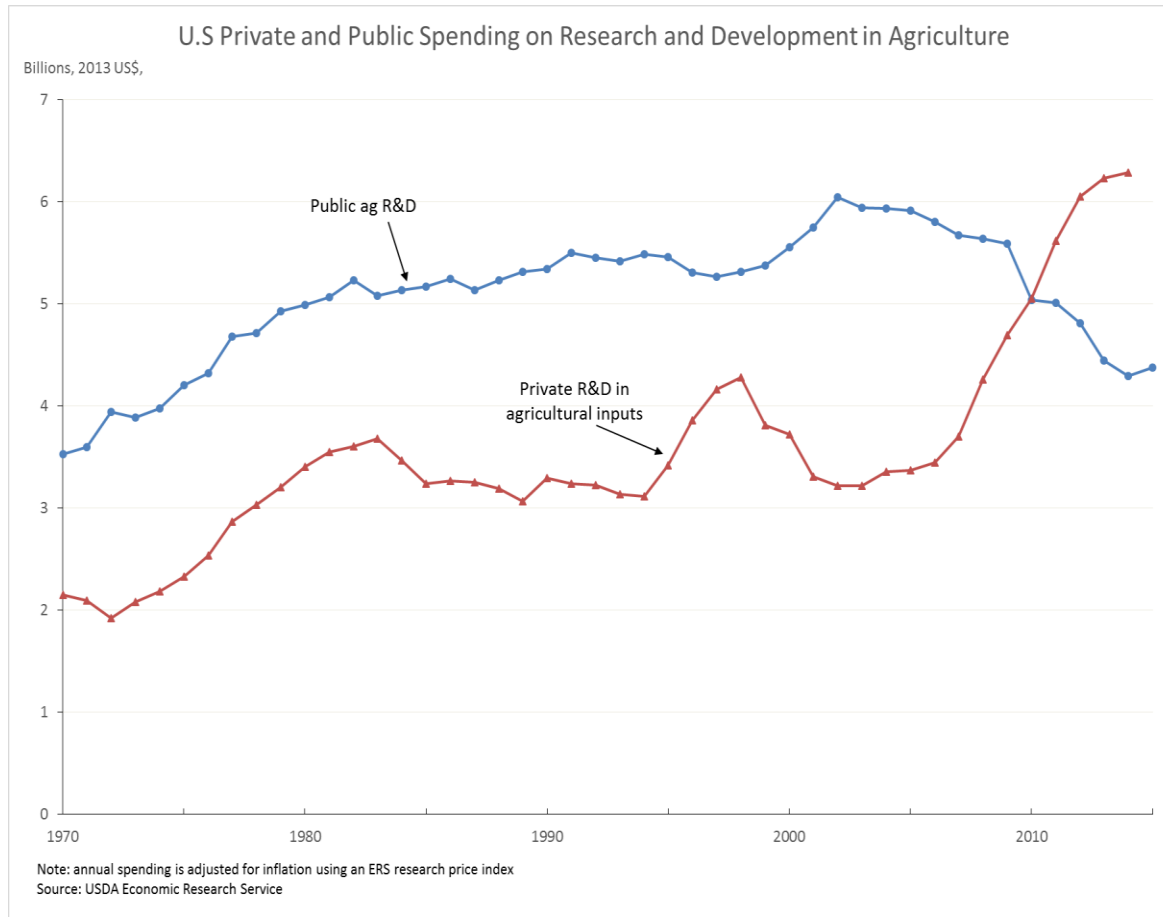
Total input use shows little growth over 1948-2016.

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



Note that 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 Are of Growing Importance in Antitrust Enforcement

- 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



What's Happened: ChemChina-Syngenta

- They directly compete in only a few markets:
 - However, U.S. required sale of 3 ChemChina generic pesticide products;
 - And EC required divestiture of some Syngenta products, and ChemChina generic pesticide business
- A US regulator of foreign investment (CFIUS) approved the deal in August, 2016.
- Syngenta stockholders approved the acquisition in May, 2017.



What's Happened: Dow-DuPont

- US, EU, and Brazilian authorities raised competitive concerns over pesticide & seed markets and research
 - DuPont then agreed to sell certain herbicide and insecticide products to FMC, along with much of the firm's crop protection R&D organization
 - Dow agreed to sell Brazilian hybrid corn seed business
 - Merger completed in September, 2017;
 - New firm (DowDupont) will split into 3 over next 18 months (agriculture (Corteva Agriscience), materials, specialty products)
- Divestiture agreements are common in these cases
 - Do they work?
 - Will FMC become a real competitor?



What's Happened: Bayer-Monsanto

- Merger is still undergoing regulatory review
 - Conditional on approval of the merger, Bayer has agreed to sell certain businesses to BASF
 - Glufosinate herbicides, including LibertyLink technology for herbicide tolerance.
 - Cottonseed, canola seed, and soybean seed businesses
 - Bayer and Monsanto competed directly in the seed businesses, and BASF would be new
 - Bayer vegetable seed businesses may be divested, as well as its digital farming software business
 - None of these are part of an agreement with authorities
 - They are essentially offers to authorities



Conclusions: The Big Issues

- The mergers:
 - Big 6 likely to become a big 4-6 (FMC? BASF? Others?)
 - Bayer-Monsanto still up in the air. Who's taking spinoffs?
- The economics of competition policy
 - Can high concentration reduce research incentives and investments? Under what circumstances?
 - When do mergers lead to price \uparrow ? Is current policy too lenient?
 - Do divestitures work as a remedy for competition concerns in mergers?
 - Not key in this review, but in the background: Are there gains from combining digital, seed, & chemical?



Questions?

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 - James MacDonald
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- Links:
 - Amber Waves article: <https://www.ers.usda.gov/amber-waves/2017/april/mergers-and-competition-in-seed-and-agricultural-chemical-markets/>
 - My related mergers & competition article: <https://www.kansascityfed.org/~media/files/publicat/econrev/econrevarchive/2017/si17macdonald.pdf>
 - Charts: <https://www.ers.usda.gov/data-products/charts-of-note/charts-of-note/?page=1&topicId=14830>

