

WAEA Presidential Address

Evolution toward Private Negotiation as a Dominant Institution in Agribusiness Supply Chains: Implications, Challenges, and Opportunities

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This paper discusses the implications, challenges, and opportunities arising from increased contracting and the use of private negotiation as a trading institution within agribusiness supply chains. I address the following questions: (i) As these changes occur and private negotiation becomes a dominant institution, are market signals and economic performance improved?; (ii) Are we preparing our students to be successful in this agribusiness market environment?; and (iii) Are we helping our extension clientele be successful as these changes occur?

Key words: bargaining power, contracting, vertical coordination

Introduction

Agribusiness supply chains continue to evolve to satisfy changing preferences and related product demands. Concerns regarding personal health, environmental impacts from food production, moral acceptability of company behavior, the ethical treatment of people, and desires to purchase food produced from a geographical area impact purchasing decisions for various segments of consumers (Saitone and Sexton, 2017; Naasz, Jablonski, and Thilmany, 2018). Moreover, consumers are demanding more convenience and increased time utility associated with grocery shopping and food consumption (Berning, Ernst, and Hooker, 2005; Rahkovsky, Jo, and Carlson, 2018). These concerns and preferences shape perceptions and desires associated with quality and product attributes that require agribusiness firms to not only produce or acquire agricultural inputs satisfying these demands but also to prove their products provide any promised credence attributes while meeting safety standards. Additionally, firms producing agricultural commodities used to manufacture this broad array of food products and related attributes face a number of exogenous factors that create supply volatility. Overall, this market environment creates incentives for firms acting in these supply chains to manage production costs, mitigate risks, and reduce transactions costs associated with product provision.

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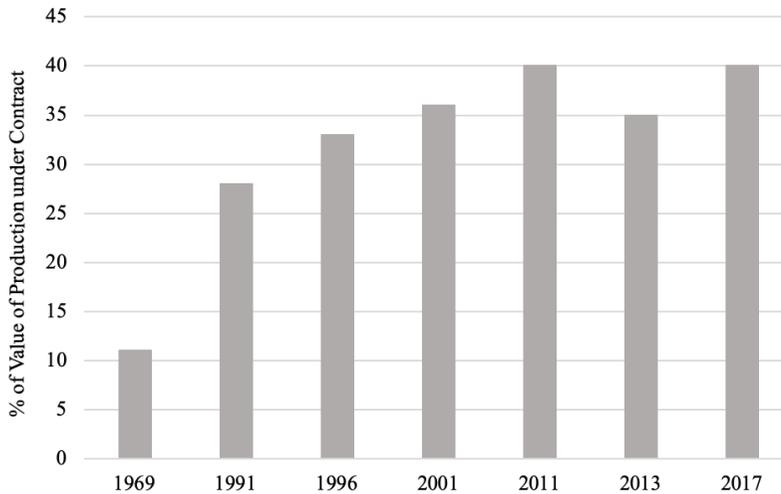


Figure 1. Share of Agricultural Commodity Production Secured via Contracts

Structural changes throughout agribusiness supply chains continue as firms adapt to this changing market environment. Food retailing concentration intensified dramatically in recent decades as supermarkets and discount stores became the norm. Sales by the 20 largest food retailers accounted for 66.6% of grocery store sales in 2016, and over 500 mergers and acquisitions were recorded in 2016, representing a 15-year record high (Martinez and Elitzak, 2018). Concentration of firms processing commodities and manufacturing food continues to increase. The four-firm concentration ratio (CR4) and Herfindahl–Hirschman Index (HHI) increased an average of 13% and 30%, respectively, for commodity processors and food manufacturers overall from 1997 to 2007 (Crespi, Saitone, and Sexton, 2012). Additionally, producers of agricultural commodities continue to grow in terms of sales and acreage. The share of the value of commodity production sold from farms with over \$1 million in sales grew from 31% to 51% in 2015 compared to 1991, and the midpoint acreage of farms grew from 650 acres in 1987 to 1,201 acres by 2012 (MacDonald, Hoppe, and Newton, 2018). These structural changes are attributed largely to firms striving for increased economic efficiency and profitability in response to market forces.

Procurement of consistent product supplies with the proper attributes drives the changes in marketing practices and firm coordination being observed in today's agribusiness supply chains. Coupled with structural change, firms continue to increase coordination via contracting while agricultural commodity sales in traditional spot or cash market outlets decline (MacDonald, 2015; MacDonald and Korb, 2011; MacDonald et al., 2004). The value of agricultural commodity production coordinated by either marketing or production contracts has increased from 11% in 1969 to nearly 40% by 2011 and 2017 (Figure 1; MacDonald, 2015; MacDonald and Korb, 2011; MacDonald et al., 2004; Whitt, 2019). Cattle production contracting increased from 18.6% in 1991–1993 to 32% in 2013 (MacDonald and Korb, 2011; MacDonald, 2015). Contracted corn production increased from 3.5% in 1991–1993 to 17.2% by 2013 (MacDonald and Korb, 2011; MacDonald, 2015). The value of fruits, nuts, and berries contracted was nearly 50% of the value of production, and the value of contracted poultry was 84% in 2013 (MacDonald, 2015). Vertical coordination through contracts offers market actors opportunities to ensure desired product and related attribute supplies, reduce transactions costs, mitigate risks, and increase efficiencies (Adjemian et al., 2016; Crespi, Saitone, and Sexton, 2012; MacDonald et al., 2004). This change in marketing practices, however, also raises concerns about the thinness of markets, reduced price transparency, the potential for commodity buyers to exert market power, and resulting market inefficiencies (Adjemian et al., 2016; Crespi, Saitone, and Sexton, 2012; MacDonald et al., 2004; Saitone and Sexton, 2017).

These marketing changes, particularly relating to privately negotiated transactions between agricultural commodity producers and processors or intermediaries procuring inputs into food or biofuel production, raise a number of important issues that agricultural economists have and must continue to address if we are to remain relevant as a discipline. The purpose of this paper is to highlight what I believe are the major implications, challenges, and opportunities agricultural economists need to consider as we face this evolution toward private negotiation as a dominant trading institution in agribusiness supply chains.¹ I address three basic questions regarding this topic that encompass the land-grant mission in this paper: (i) As these changes occur and private negotiation becomes a dominant institution, are market signals and economic performance improved?; (ii) Are we preparing our students to be successful in this agribusiness market environment?; and, (iii) Are we helping our extension clientele be successful as these changes occur?

Are Market Signals and Economic Performance Improved?

Market Power Research

King et al. (2010) conclude that agricultural economists played a pivotal role in developing and applying theoretical and empirical analyses to explain the market structure and related performance of the food system. Much of the work done in the United States during the 1980s and into the early 2000s focused on empirical analyses based on the structure, conduct, performance (SCP) framework and shifted to new empirical industrial organization (NEIO) methods guided by imperfect competition theory (Sheldon, 2017). Generally, earlier studies regarding food processing, particularly U.S. meat and poultry processing, find some statistically significant evidence of market power, but the levels are relatively small (Sexton, 2000; Sheldon and Sperling, 2003; Sheldon, 2017).

Later literature has worked to address at least some of the criticisms of earlier NEIO-based work. Despite empirical advances, these methods and reported analyses still face challenges. Perekhozhuk et al. (2017) investigate several updated NEIO approaches and argue that results from market power models can vary due to the estimation approach (production theoretic approach versus general identification method) as well as estimation procedures. Much of the later work still points to the existence of market power, but—despite improved methodology—many of the estimates suggest relatively low levels of divergence from perfect competition outcomes (Sheldon, 2017). Similar findings of small or nonexistent levels of market power exerted by buyers exist for European Union (EU) agricultural markets as well (McCorriston, 2014).

Conclusions exist in the literature suggesting that while small levels of market power exist, gains from improved cost efficiency and a broader set of products and associated attributes have actually enhanced economic welfare overall as these structural changes have occurred (U.S. Government Accountability Office, 2009; Sexton, 2013; Saitone and Sexton, 2017). Despite these findings, agricultural economists and producer groups remain concerned about the economic implications of sustained structural and vertical coordination trends throughout agribusiness supply chains (Crespi, Saitone, and Sexton, 2012; Sexton, 2013). Questions remain as to why empirical results do not show more pronounced levels of market power given structural changes, and—if these results are accurate—why do producer groups continue to call for investigations and potential policy prescriptions?

A number of concerns have been raised about whether the more traditional NEIO approaches used to measure market power are able to adequately capture essential features in these changing markets. Product quality, product differentiation, asymmetric information, resource constraints, co-

¹ In his own presidential address paper, Brorsen (2017, p. 1) states, "... I then use this as a springboard to say some things I want to say. Some of them fit together and some do not, but that is the beauty of giving a talk like this. I do not have to follow all the rules." I follow his precedent here.

Table 1. Private Negotiation Outcomes in Experimental Market Studies

Insitution and Delivery Method	Market Outcome					
	Price ^a	Quantity Traded	Avg. Seller Earnings per Period	Avg. Buyer Earnings per Period	Total Earnings or Market Surplus	Market Efficiency (%)
Predicted equilibrium	80.00	20–24	150.00	150.00	1,200.00	100%
English auction spot ^b	93.25	18.72	211.50	77.07	1,153.76	96.15%
Double auction spot ^b	83.34	20.22	160.25	130.51	1,162.80	96.90%
Private negotiation forward ^b	82.20	16.58	143.56	124.80	1,076.63	89.72%
Private negotiation spot (PNS) ^b	72.21	14.59	97.91	155.82	1,013.09	84.42%
PNS 5 matches ^c	77.64	17.28	133.00	154.72	1,150.88	95.91%
PNS 3 matches ^c	72.94	14.61	107.26	158.84	1,064.40	88.70%
PNS 50% in prior bargaining period ^d	77.67	12.27	82.20	89.93	481.33	— ^e
PNS 75% in prior bargaining period ^d	76.60	13.00	59.93	83.07	572.00	— ^e

Notes: ^a Price reported in currency called tokens, with an exchange rate of 100 tokens per US\$1. ^b Results reported in Menkhaus, Phillips, and Bastian (2003). ^c Results reported in Menkhaus et al. (2007); earnings are calculated using reported prices and quantities. ^d Results reported in Sabasi et al. (2013). ^e Results are for a market in which 50%–75% of participants had a prior bargaining opportunity.

operative behavior, and the use of contracting for vertical coordination are all issues that impact the usefulness of traditional market power models in today's agribusiness markets (Bonanno, Russo, and Menapace, 2018; Sexton, 2013). Several conclusions from recent literature reviews authored by Sheldon (2017) and Bonanno, Russo, and Menapace (2018) stand out, in my opinion, regarding the use of contracting. On the subject of vertical coordination, Sheldon (2017, p. 36) states that

Although there is an extensive body of contract theory focusing on agency costs and incentives, it has yet to rigorously incorporate downstream processor buyer power, and data constraints make it difficult to conduct any robust empirical analysis of contracting.

Bonanno, Russo, and Menapace (2018, p. 17) conclude,

As the focus shifts from the 'traditional' market power framework to one that includes concepts such as bargaining power, countervailing power, buyer power, and the role of contracts as governance tools to manage relationships in the agrifood chains, new modeling approaches will be needed, requiring an expansion of the scope of existing empirical techniques.

Certainly, I agree with these conclusions, but I note they focus specifically on the potential to improve empirical analyses in the future. Such analyses will require data generated from an agribusiness market environment moving toward more privately negotiated contracts, suggesting increased potential for data constraints, as noted by Sheldon (2017).

Table 2. Unit Redemption Values and Costs Used in Market Experiments

Unit	Unit Redemption Value for Buyers	Unit Cost for Sellers
1	130	30
2	120	40
3	110	50
4	100	60
5	90	70
6	80	80
7	70	90
8	60	100

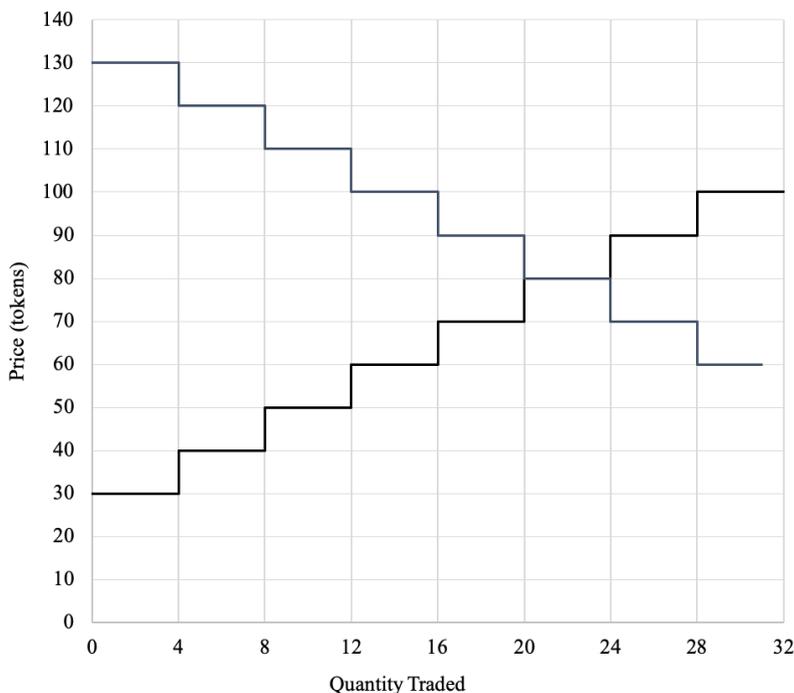


Figure 2. Predicted Competitive Market Equilibrium in Laboratory Market with Four Buyers and Four Sellers

Market Experiments and Private Negotiation as Trading Institutions

The literature reviewed above generally does not discuss findings from studies using experimental techniques.² Economic experiments offer the potential to complement theoretical and empirical work regarding market design and outcomes (Roth, 2015). Laboratory markets allow researchers to define relevant trading institutions, delivery methods, structural assumptions, and agent incentives (Holt, 1995). Participants are paid based on their actual earnings, creating incentive compatibility with real-world phenomena (Friedman, 1994). Researchers can observe behavior, analyze data from repeated experimental sessions, and understand how changes to a market may alter economic outcomes. As such, experiments offer agricultural economists another method with which to understand how transformations in agribusiness supply chains may impact economic performance.

² Sheldon (2017) briefly discusses an unpublished experimental paper by MacDonald and Wu (2014) that analyzes varying competition levels where buyers make take-it-or-leave-it offers to sellers.

Increased vertical coordination through contracting involves individual buyers and sellers negotiating the terms of trade (i.e., a buyer and a seller bilaterally negotiate price and other relevant contract features). This private negotiation institution has been the subject of several experimental studies reported in the agricultural economics literature. I summarize the observed equilibrium results from those studies in Table 1. Comparison across these studies is possible because each had a laboratory market with the same demand and supply schedule for buyers and sellers, respectively (see Table 2). Summing across the schedules for the number of buyers and sellers in the market allows researchers to predict the competitive equilibrium (Figure 2) and compare across treatment effects. All of these experiments use a fictitious currency called tokens, with an exchange rate of 100 tokens to \$1. The predicted competitive price with a market that has four buyers and four sellers is 80. Given the discrete nature of the unit cost (supply) and redemption value (demand) schedules, a quantity tunnel of 20–24 units is predicted (Figure 2). Competitive market equilibrium generates 1,200 tokens of surplus that is perfectly split between buyers and sellers, who can each earn 150 tokens (Table 1).

The first study analyzes how outcomes may differ across trading institutions and delivery methods relevant to agribusiness supply chains (Menkhaus, Phillips, and Bastian, 2003). The trading institutions analyzed include double auction (all buyers and sellers simultaneously make bids and offers until a trade price is agreed upon—the same institution as futures markets), English auction (ascending bid auction—the same institution as livestock markets), and private negotiation (buyer and seller pair make bids and offers to each other until agreement on trade price is reached—the same trading institution as contracts). Two delivery methods, spot and forward delivery, were also investigated.³ Spot delivery requires a production decision, and production costs are incurred to produce the product for sale prior to trading. This delivery method is common across many commodities sold through both auction and marketing contracts, where price is negotiated prior to market delivery. The forward delivery institution requires agents to negotiate price and then production occurs to meet the market demand. This would be similar to what is seen in production contracts for poultry or for products such as vegetables.

The English auction trading institution with spot delivery results in the highest price (93.25) and greatest trading period earnings for sellers with an average of 211.50 per period compared to the other reported trading institution and delivery method combinations (Table 1). The English auction spot (EAS) market environment results in price being higher than predicted, higher than predicted earnings (150) for sellers compared to buyers, less quantity traded than predicted, and is 96.15% efficient in extracting the available surplus. The double auction spot (DAS) environment provides agents with an observed equilibrium price of 83.34, near the predicted equilibrium, and results in predicted trades near the equilibrium as well. This market environment generates the highest efficiency, extracting nearly 97% of the potential surplus. These results are consistent with other experimental studies using the double auction institution, which constantly generates competitive outcomes (Holt, 1995). Overall, both EAS and DAS tend to result in overall market results that are very close to extracting nearly all of the potential economic welfare that is available. However, the EAS tends to favor sellers in terms of earnings. This points to the potential for a change in institution alone to generate different outcomes for market actors.

The private negotiation institution indicates more severe divergences from the competitive equilibrium compared to the EAS and DAS market environments. The private negotiation forward (PNF) market generates an equilibrium price of 82.20, near the predicted equilibrium of 80, but less than 17 units are traded. This reduction in product being traded results in an efficiency drop to slightly below 90%, but sellers earn more than buyers in this setting, given prices are slightly above equilibrium. The private negotiation spot (PNS) environment results in the lowest observed equilibrium price (72.20) and the lowest number of units being traded (14.59). Moreover, given these price and quantity outcomes, this environment results in the least total surplus generated and

³ For purposes of brevity, I do not report the results found by the authors for double auction forward.

is only about 84% efficient. Merely changing to a trading institution where outcomes are bilaterally negotiated, *ceteris paribus*, results in less efficient market outcomes. Part of this stems from the fact that in the EAS and DAS environments buyers are competing with each other for units and all the bid and offer information is available to all traders during price discovery. The private negotiation institution suffers from lack of price information and lack of competition from other buyers compared to the English auction and double auction institutions. Additionally, the act of producing the product prior to entering market negotiations results in sellers receiving the lowest price and average earnings in private negotiation. Part of the explanation for the drop in prices in PNS offered by the authors is that in a market where sellers have limited opportunities to match with buyers, coupled with no potential for inventory carryover (mimicking a market for perishable goods), the predicted Nash equilibrium outcome is for buyers to pay 0 in a single production cycle (Menkhaus, Phillips, and Bastian, 2003).

A later paper investigates the impact of limited ability to match with trading partners. Menkhaus, Phillips, and Bastian (2003) only allowed three opportunities to randomly match with a buyer or seller per trading period. The simple addition of increased opportunities to match with economic agents (going from three matches to five matches) in the PNS environment (PNS 5 matches versus PNS 3 matches in Table 1) improved market outcomes (Menkhaus et al., 2007). Market price increased from about 73 tokens to nearly 78 tokens and number of units traded increased from 14.61 to a little over 17 units (Table 1). This improved overall efficiency to nearly 96%, and it reduced the disparity in earnings between sellers and buyers. The authors also concentrate the market by reducing the number of agents as buyers or sellers and doubling their demand or supply schedules (Menkhaus et al., 2007).⁴ They find such concentration enhances outcomes for the concentrated agents even if there are five matching opportunities per trading period. The authors obtain price levels consistent with predicted monopsony prices when buyers are concentrated in this PNS environment. Overall, the authors conclude that matching risk (i.e., the ability to match with a willing trade partner—someone who can still make profitable trades given their respective schedule), coupled with sellers facing the chance to lose invested production costs (termed inventory loss risk), gives buyers a significant bargaining advantage in the PNS environment. Structural concentration of buyers exacerbates this impact.

Alternative marketing arrangements that allow some market agents the opportunity to trade (or forward price a portion of supply) prior to the rest of the market were modeled in another experimental paper. Concerns raised over alternative marketing arrangements or captive supplies include potential buyer exertion of market power when purchasing in spot markets and reduced cash prices (Koontz and Lawrence, 2010). The experimental study allowed only a portion of buyers and sellers to trade in a bargaining period prior to the main marketing period (Sabasi et al., 2013). The authors' main objective in the study was to compare the market outcomes for those allowed to trade in the prior bargaining period versus those who were not. The authors conclude that those who were shut out of the first bargaining opportunity were disadvantaged (Sabasi et al., 2013). Overall, the authors find that the additional bargaining period improved total market efficiency compared to a market without the additional bargaining period. My purpose here is to illustrate results in the second bargaining period (modeled as the spot market in that paper). Results from that second bargaining period, in which all buyers and sellers trade, generates prices below predicted competitive levels even though available supplies are constrained (see PNS 50% and PNS 75% in Table 1). The opportunity to trade in a prior bargaining period for some but not all traders exacerbates the impact of matching risk and inventory loss risk for agents shut out of the previous bargaining window. These risks help drive prices below the predicted equilibrium (Sabasi et al., 2013). This outcome occurs even though some of the buyers had been shut out of the previous bargaining period and must trade to earn any profits. These results further illustrate the potential for outcomes to be less than desirable for sellers when private negotiation is the dominant trading institution.

⁴ For purposes of brevity, I do not report these additional treatments in Table 1.

Producers and Bargaining

Research using experimental methods often faces skepticism from agricultural economists. One of the primary causes of suspicion stems from the use of college students as subjects. I recall a conversation with a colleague expressing general distrust of experimental research at a recent WAEA meeting. That individual concluded our conversation by saying, “Students don’t behave the same as producers.” If this is true, then the previously reported experimental results offer few insights into potential outcomes for agribusiness supply chains being dominated by privately negotiated contracts. In this section of the paper, I discuss research that investigates producers as sellers negotiating with buyers to address this skepticism.

Market transactions between producers and buyers traveling to communities in sub-Saharan African countries are the subject of a study by Courtois and Subervie (2015). Farmers typically have the choice to sell products to buyers traveling to their communities or to transport their products to nearby markets. The authors develop a theoretic bargaining model to guide their analyses. They then test hypotheses developed from their model by analyzing market price data gathered by a market information service and couple that with survey data. They find that farmers who have access to a market information service bargained for better prices for the year analyzed, and they conclude that buyers generally offer very low prices to farmers who don’t have access to this market information. The authors also point out that farmers are subject to negotiation failure as a risk, but they were unable to analyze results from negotiations in which this may have happened.

Iran’s dairy sector discovers raw milk prices via annual negotiations between dairy processors and fluid milk producers. Shokoohi, Chizari, and Asgari (2019) analyze annual raw milk prices to determine the bargaining power of processors versus producers by applying a Nash theoretic bargaining model. Econometric estimates indicate a bargaining power parameter for processors of twice the magnitude found for dairy farmers. The authors conclude processors have higher gains than producers as a result. Overall, these empirical papers point to the bargaining advantages buyers enjoy when private negotiation is the institution in which price is discovered.

Bastian et al. (2018) conduct focus group interviews with producers regarding negotiated sales at four locations in Wyoming. The authors conclude the following: (i) Producers generally did not spend much time bargaining for price but spent more effort on negotiating nonprice issues such as shrink and weighing conditions for livestock; (ii) Producers generally let buyers make the first move in a negotiation; (iii) Producers generally feel they have to take the price a buyer offers; and, (iv) Producers were generally behaving in a manner consistent with matching and inventory loss risks as reported in the literature. The authors deduce that producers in their sample may not give themselves the best chance to negotiate favorable prices.

Nagler et al. (2013) compare results across laboratory experiments with students and field experiments conducted at experiment station field days or various extension locations with agricultural professionals (comprised largely of producers).⁵ They use a private negotiation institution with forward delivery to evaluate subsidy incidence in factor markets. The authors find no statistically significant difference in subsidy incidence levels between the two subject pools. Agricultural professionals generally negotiated for lower prices but traded more units. Differences in converged price levels were not statistically significant, however. These results indicate similarities in private negotiation outcomes between the two subject pools. The authors conclude that using students as experimental subjects provides policy-relevant results.

I extend the work reported by Nagler et al. (2013) for this paper. I use individual transactions data that record all bids from buyers and offers from sellers in experimental replications where there is no subsidy.⁶ I then test for possible differences in indicators of bargaining strategy across data

⁵ The sample of agricultural professionals also included agricultural lenders and agricultural laborers, but well over 75% of participants were agricultural producers managing their own operations.

⁶ The software developed for these experimental sessions did not correctly record bid and offer data initially. Data were only available for two experimental sessions with students compared to four sessions with agricultural professionals.

Table 3. Bargaining Strategy Indicators and Outcomes for Students versus Ag Professionals

Strategy Indicator	Students		Ag Professionals		Difference between Subject Pools ^a
	Buyers	Sellers	Buyers	Sellers	
First 7 Periods					
Price	73.28	73.28	66.13	66.13	No
Number of bids/offers per trade	1.22	1.27	2.53	2.20	No
First move percentage by role	32.15	68.35	41.70	58.30	No
First concession	10.75	9.93	7.45	6.51	No
Last concession	12.91	12.38	8.25	7.08	Yes*
Average concession	11.88	11.09	7.81	6.77	Yes*
Average profit per trade	45.88	32.43	52.59	24.59	No
Number of transactions	130		192		
Last 5 Periods					
Price	76.09	76.09	70.25	70.25	No
Number of bids/offers per trade	3.29	3.31	3.09	2.44	No
First move percentage by role	60.00	40.00	72.90	27.10	No
First concession	11.15	9.68	8.06	12.01	No
Last concession	12.18	11.62	11.87	12.92	No
Average concession	11.67	10.64	9.81	12.42	No
Average profit per trade	42.58	34.76	45.95	32.03	No
Number of transactions	90		129		

Notes: Single asterisks (*) indicates significance at $\alpha = 0.10$. ^aWilcoxon sign rank test comparing outcomes by participant group by agent role.

from the two subject pools. I control for matching risk by only analyzing data recorded for trades completed during the first bargaining round of each trading period.⁷ I analyze data from trading periods 1–7 and 15–20 for each replication to see whether analyzed variable changes over time as traders gain experience. The following variables were developed from these data:

1. transacted price per trade;
2. number of bids from buyers and offers from sellers per trade;
3. agent making the first move (bid or offer) in the trade;
4. amount of first concession in negotiation by buyers and sellers (estimated as the absolute value in the change from the first bid or offer to the second bid or offer);
5. amount of last concession (estimated as the absolute value of the change from the next to the last bid or offer to the last bid or offer when agreement was reached);
6. average concession, estimated as the absolute value of the change in the first bid or offer and the agreed upon price divided by the number of bids (for buyers) or number of offers (for sellers); and
7. average profit per trade. I then test for differences across the subject pools for each role (buyer versus seller) by variable.

Given that the assumptions of independence and normality cannot be met in these individual transactions data, I use the nonparametric Wilcoxon sign-rank test as reported in previous experimental papers (see Nagler et al., 2013). Table 3 reports these results.

The analysis of these bargaining indicator variables reveals some interesting patterns. Average trade prices were below the predicted equilibrium in all cases, and they were the lowest for

⁷ Only transactions from the initial matched buyer and seller pairs for each trading period were analyzed.

agricultural professionals (76 versus 70 in the last five periods). There were no statistical differences in these price levels initially or in later periods, however. Buyers and sellers for each subject group generally increased the average number of bids or offers per trade going from the early periods to the later periods (Table 3). This suggests that agents initially spent less effort bargaining, but over time, all agents learned to spend more effort in bargaining for price. However, agricultural professionals in the seller role had the least increase, going from 2.20 to 2.44 offers per trade.

Sellers were the most likely to make the first move in the negotiation during initial trading periods (68.35% of students and 58.3% of ag professionals in the seller role). This changed over time. Buyers initiated bargaining 60% of the time among student subjects and 72.9% for agricultural professionals in the later periods (Table 3). No statistical differences existed across the subject groups for the early or later periods for this variable. This seems consistent with focus group results reported by Bastian et al. (2018): Producers indicated they generally let buyers make the first move in the negotiation.

The concession variables generally indicate that student subjects made higher first, last, and average concessions in initial trading periods. The last and average concession levels were statistically significantly lower for agricultural professionals for these early periods. Student subjects generally reduced the amount of their concessions over time, but agricultural professionals generally increased the amount of their concessions in the later periods (Table 3). These changes resulted in similar concession levels across the subject groups by role, and no statistical differences in these concession levels existed in the later periods. Consistent with an increase in average trade price from the initial to later periods, average profit levels per trade increased for sellers and decreased for buyers. There were no statistical differences in average profits by role across subject groups for early or later periods.

Several conclusions arise from the above research findings. Lack of market information compared to institutions such as auctions can negatively impact privately negotiated outcomes. Producers seem to perceive they have little bargaining power in this trading institution. Producers acting as sellers in private negotiation tend to spend less effort bargaining, and they allow buyers to make the first move in the negotiation. This may allow the buyer to set an anchor that can move the outcome of the negotiation in the buyer's favor (Ritov, 1996). Consistent results for market outcomes and bargaining strategy indicators are found across students and agricultural professionals (largely made up of producers) in an experimental setting. This suggests findings from experimental markets offer insights into real world behavior and outcomes. Moreover, consistencies exist between empirical and experimental studies regarding privately negotiated prices. Overall, these results indicate producers as sellers generally seem to be at a disadvantage compared to buyers in the private negotiation institution.

Implications

Despite evidence of market power exertion in agribusiness supply chains, current research suggests economic welfare may have been enhanced as structural changes occurred. Research regarding the use of contracts to coordinate product provision is evolving, but the continued trend toward vertical coordination suggests private negotiation will grow in its dominance as a trading institution. Current research suggests market outcomes for sellers in this environment may be diminished even in the absence of market concentration, however. This institution can facilitate increased bargaining advantage or power for buyers. This phenomenon may help explain why concerns continue to be expressed regarding market power (rather than bargaining power) by producers as concentration and vertical coordination increase in agribusiness supply chains. These issues continue to surface despite empirical results suggesting relatively low levels of market power exertion and increased efficiencies. Continued trends toward increased vertical coordination will likely generate increased apprehensions and requests for policy prescriptions related to perceived market or bargaining power

in the future. Current research points to the potential for welfare reduction in this environment, but whether that occurs also depends on other potential efficiency gains not adequately captured or estimated in the current literature.

Challenges and Opportunities

Requests to address concerns fueled by increased concentration and vertical coordination in agribusiness supply chains could come at a time when agricultural economists lack data and current research to adequately evaluate the economic consequences of these transformations. We are increasingly focused on the use of econometrics as a tool to answer economic questions (Brorsen, 2017). Yet as private negotiation becomes more dominant, data for market analyses at different points of the chain will become more difficult to find or obtain. Our traditional, imperfectly competitive, theory-based models and NEIO methods will likely continue to diminish in their ability to address relevant questions that arise in this environment.

Emerging literature regarding power (market and bargaining) and relationships in agribusiness markets—including topics such as contract governance—offers much promise (Bonanno, Russo, and Menapace, 2018; Sheldon, 2017). Efforts to improve empirical methods remain an important research focus. However, other methods such as economic experiments offer opportunities to make important contributions to our knowledge as well. Opportunities exist to combine concepts from the literature regarding negotiation, bargaining, and auctions to better understand market outcomes and performance of transactions dominated by private negotiation (see Subramanian, 2010, as an example of combining such concepts). Expansion of work in behavioral issues impacting bargaining power and outcomes could also improve our understanding of these evolving markets and offer insights to improve economic outcomes. Recent work by Tonsor (2018) using prospect theory to understand decisions regarding cattle purchases offers an interesting example of this in the literature.

Are We Preparing Our Students to Be Successful in This Agribusiness Environment?

I examine agribusiness degree programs offered nationally to address this question. I survey all websites for land-grant universities and colleges (1862, 1890, and 1994) listed by the U.S. Department of Agriculture National Institute of Food and Agriculture (U.S. Department of Agriculture, 2014). I also include California Polytechnic State University and California State University-Chico in my sample. The sample consists of 114 institutions.⁸ I asked the following questions when searching the websites for agribusiness degree requirements and courses offered by these institutions:

1. Does the department responsible for the agribusiness degree offer a sales or negotiation course?
2. Is a sales or negotiation course available from another department at the institution?
3. Are such courses required for at least one of the agribusiness degree options being offered by the department?

My goal here is to assess the potential for agribusiness students to receive training directly related to negotiation, bargaining, or sales rather than assess quality of curriculum or instruction.

The website survey indicates that 33 departments delivering an agribusiness degree offer a sales or negotiation course. This amounts to 28.9% of the institutions in the sample (Figure 3). This

⁸ This survey of websites was completed in the fall of 2018. Any changes to published course catalogs, degree programs, or department websites after that time are not reflected in these results.

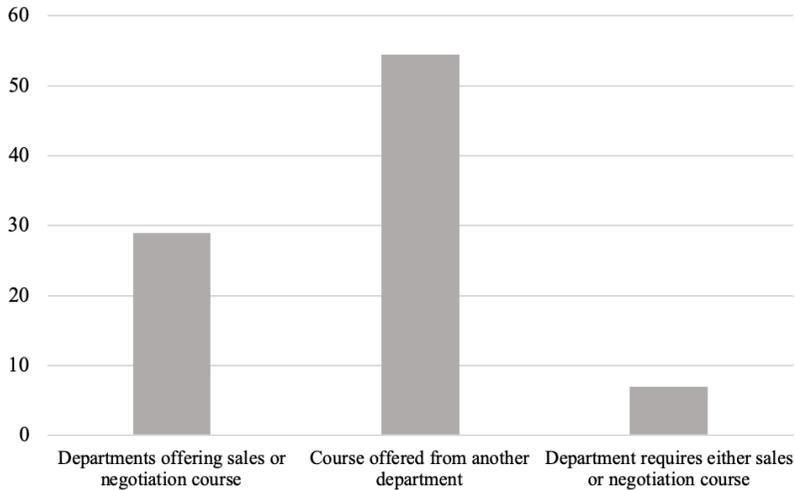


Figure 3. Percentage of Institutions Offering and Requiring a Sales or Negotiation Course

proportion increases when examining courses offered by other departments at these institutions. Just over half (62) of the sampled institutions have other departments (those departments not directly responsible for agribusiness curriculums) offering a sales or negotiation course. Most often this was a sales course offered by a business school or marketing department at the institution. When agribusiness degree requirements were examined, only 7% of the surveyed programs (8 institutions) required a sales or negotiation course in at least one of their agribusiness degree options (Figure 3).

Implications

Agribusiness careers requiring negotiation or sales skills will likely increase as vertical coordination intensifies. Generally, agribusiness programs nationwide are not providing or requiring courses that focus on negotiation concepts or personal sales skills, however. Over half of the institutions offer some type of sales course outside the departments responsible for agribusiness curricula, but agribusiness students are less likely to take such courses voluntarily. This suggests that most agribusiness program alumni interacting in these evolving agribusiness markets could face costly trial and error learning. Moreover, many agribusiness students seeking jobs may not consider applying for or be at a disadvantage when applying for positions requiring negotiation or sales skills. This suggests agribusiness programs may not adequately supply candidates for these types of jobs in the future.

Challenges and Opportunities

Agribusiness programs and their teaching faculty have an opportunity to improve the successes of future alumni in agribusiness supply chains evolving to more privately negotiated transactions. This would require offering agribusiness sales or negotiation courses and making such courses a requirement for appropriate undergraduate degree options. I also believe that graduate programs could improve agribusiness scholarship in this environment by offering additional coursework in topics such as bargaining theory, auction theory, and negotiation. Changing curriculums and course offerings is often a slow process in my experience. Budgetary, time, and teaching resource constraints likely exist within our current agribusiness programs nationwide. Despite these constraints and obvious costs, such changes could improve career opportunities for our graduates,

better economic outcomes for agribusinesses hiring these alumni, and improved economic welfare for society.

Are We Helping Our Extension Clientele Be Successful as These Changes Occur?

I use the prevalence of publicly available outreach publications related to negotiation, bargaining, or private treaty sales as an indication of resources dedicated to helping extension clientele be successful when privately negotiating a transaction.⁹ Those words (negotiation, bargaining, private treaty sales) were used in key word searches and title searches to achieve this objective. Only outreach or extension publication websites at the institutions indicated above were sampled. Once a publication was found, the text was skimmed. If relevant text existed, the institution, publication title, and website address were entered into a spreadsheet, and the publication was categorized as relating to one of three topic areas.¹⁰ The three summary categories for publications were as follows:

1. publication is related to private treaty sales;
2. publication contains at least some text that discusses negotiation; and,
3. publication has at least some text that discusses direct sales of products.

Figure 4 illustrates the number of publications found in each category. Publications related to the above categories numbered just 35 in all. Only 9 publications had at least some discussion related to negotiation. Even fewer publications (6) had text discussing private treaty sales. The largest number of publications (20) dealt with direct sales of products to customers. Not all of the discovered publications were related to agriculture. Publications relating to negotiation included subjects such as negotiating with creditors, purchasing a house, pipeline rights-of-way in Pennsylvania, and managing personal conflicts with family members or at work. Frequently, the available publications only tangentially discussed bargaining for price, and legal or contractual issues were often discussed more thoroughly than price negotiation.

Implications

Despite the obvious flaws in this assessment, useful conclusions can be drawn. First, the public may have a difficult time finding educational information related to bargaining or negotiation in agribusiness markets. Second, agricultural economists are not providing much outreach education that will help extension clientele adapt to and be successful in this changing agribusiness environment. This lack of outreach education will likely exacerbate potential frustrations and resulting requests for policy prescriptions addressing structural change and perceived market power problems in the future.

Challenges and Opportunities

Extension economists are dwindling as real dollars at the federal and state levels decline (Lawrence, Hadley, and Henderson, 2019). Moreover, our discipline faces challenges in attracting and training graduate students to be extension economists (Taylor, Zhang, and Henderson, 2019). The increased emphasis on research and journal publications in academia likely has created real or perceived risks

⁹ I understand that how extension educators deliver information to clientele is evolving, and I fully recognize this is an imperfect statistic answering the above question. However, I think the results of my final survey offers some useful insights despite the survey's obvious flaws.

¹⁰ This spreadsheet is available upon request. I only provide the count totals of publications. This survey was completed by January 30, 2019.

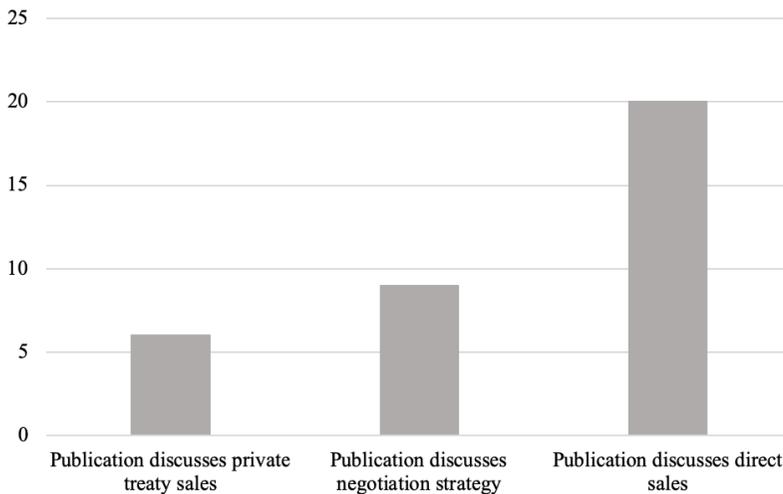


Figure 4. Number of Publications Containing Relevant Text

regarding successful tenure and promotion for those choosing careers as extension economists. Moreover, such emphases and potential risks may appear to devalue extension as a career choice during graduate training. These phenomena likely also weaken incentives for non-extension economists to collaborate with extension economists on applied research and development of educational programs aimed at helping agribusiness managers be more successful in privately negotiated transactions.

There is much room for improvement in outreach training related to negotiation and bargaining. Economists will respond to incentives targeted at addressing this problem. Increased grant funding opportunities that provide graduate student funding and integrate research with outreach education provision related to private negotiation would help. Many of the issues discussed and recommendations offered by Taylor, Zhang, and Henderson (2019) to attract and train farm management extension economists apply to the challenges and opportunities discussed here. Only the subject matter of the outreach education differs. Improved educational offerings related to private negotiation, in terms of both volume and content, offer opportunities to improve the welfare of those we profess to help in the land-grant system. Moreover, such training could improve market outcomes and reduce requests to address market or bargaining power exertion as vertical coordination increases throughout agribusiness supply chains.

Concluding Remarks

Current trends in agribusiness supply chains toward increased concentration, contracting, and privately negotiated transactions likely will continue as firms strive to purchase consistent supplies of inputs and provide products containing demanded attributes. Much of the agricultural economics research focused on structural change and market power measurement reports minimal magnitudes of market power exertion, and other publications convey enhancement of economic welfare. Despite these findings, concerns continue to be raised that such trends create opportunities for market or bargaining power exertion.

Research indicates that private negotiation facilitates the potential for buyers to exert bargaining power and hinders sellers trying to negotiate for competitive prices. Such phenomena could reduce the welfare of sellers and society overall as private negotiation becomes more prevalent as a trading institution. Many opportunities exist for agricultural economists to improve economic welfare as these trends continue. Expansion of theory, improved empirical procedures, and utilizing other

methods such as economic experiments related to contracts, bargaining power, and negotiation strategies must occur if agricultural economists hope to provide research viewed as relevant. Agribusiness faculty need to expand required course offerings related to negotiation and agricultural sales on a national scale. Such training should improve job opportunities and firm profits for agribusiness alumni interacting in these evolving markets. We must improve the volume and content of extension education regarding private negotiation to extension clientele. Such training could improve economic outcomes and reduce concerns regarding market or bargaining power problems within agribusiness supply chains. If agricultural economists do not seize these opportunities, we become less relevant to those we profess to help.

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