

Do Ag Economists Ask the Right Questions?

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Abstract

How can economists and farmers seek an answer to the same question and yet come to such seemingly different conclusions? Maybe the economists aren't asking the right questions or, maybe, the questions can't be easily answered. The goal of this session is twofold. First, to try and help non-economists understand what economists do and how they do it. Second, to solicit the views of participants to help guide future research.

Key Words: farm policy, agricultural economics

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Do Ag Economists Ask the Right Questions?

The title of this paper is “Do Ag Economists Ask the Right Questions?” but it could just as easily have been, “If Ag Economists are Asking the Right Questions, Why do Their Answers get People So Upset?” It is rare to find an agricultural journal or newspaper without at least one letter to the editor criticizing the findings of agricultural economists.

In a recent article in the *Kansas Farmer* (March 2002, p. 46), Barry Flinchbaugh, an agricultural economist at Kansas State University, was quoted, “Net farm income is at or near the record. If you add farm-program payments to market prices, we’ve nearly had \$7 beans, \$4 wheat and \$3 corn. If farmers can’t make money on that, some people might suggest that they do something else.” Flinchbaugh’s statement provoked a letter to the editor in the *High Plains Journal* (March 25, 2002, p. 5-B) by a farmer in Argonia, Kansas: “From the above mentioned phrase ‘some people might suggest they do something else,’ maybe ‘they’ should stand for economists.”

Agricultural economists do affect agricultural policy, thus it is not surprising that the people who are directly affected by that policy might have strong opinions about what the economists say. These differences of opinion can be healthy for both sides if they lead to discussion and improvements in the understanding of farm issues.

Dialog is important especially for clearing up misunderstandings, but what if the differences arise from something more fundamental? To many people what economists do in order to answer questions is a bit of a mystery. In this paper we seek to address the sources of misunderstanding when the confusion comes from how economists go about answering questions.

The paper is separated into four sections. In the first section we ask, “Why can’t economists see what appears to be obvious to non-economists?” using an example of market power in the beef industry. In the second section, we ask why economists have a hard time providing specific answers to certain questions, with an application to the question of risk in agriculture. In the third section, we briefly explore why economists use economic models and how the choice of model can affect the answers found. Finally, we end the discussion by asking why economists focus on answering questions related to efficiency when farmers may be seeking answers to questions about equity.

Why Can’t Economists See the Obvious? Market Power and Captive Supplies.

The cattle/beef industry is one area in particular where many producers seem to think economists are out of the loop. The recent arguments on banning packer ownership of cattle and hogs during the Farm Bill debate saw several economists asserting that the ban would be bad for the livestock industry; yet the American Farm Bureau Federation, the nation’s biggest farm lobbying group, supported the ban (*High Plains Journal*, March 18, 2002, page 26-B). How can farmers and economists look at the same issue and see things so differently?

Since the 1970s, there has been declining demand for beef, with per-capita demand falling from 95 lbs. in 1976 to about 60 lbs. during the 1990s. At the same time, packing houses were becoming bigger and bigger in order to take advantage of scale economies (“scale economies” refers to a fall in long-run average cost as the quantity of output increases). The two events have led to rapid consolidation in the packing industry. In 1976, the biggest four firms had a 25% market share. Today, the biggest four firms control over 80%.

Isn't it obvious that declining cattle prices are the result of the increased market power of the packing industry resulting from the consolidation of buyers? What surprises a lot of producers who ask this question is that many economists don't seem to think so.

Two articles by Azzam and Anderson (1996) and Ward (2002) summarize a great deal of the economics literature on this issue. Looking at the studies that have been performed, researchers have generally found little in the way of market power in the cattle/beef industry. Ward, for example, finds that price distortions from market power account for only about three percent of the price that is seen in the market. Azzam and Anderson's review of all of the economic literature on this subject is, “That the body of empirical evidence ... is not persuasive enough to conclude that the industry is not competitive” (p. 124).

Still, this seems like a conundrum. Market concentration has gone up, there is greater and greater use of captive supplies by packers (“captive supplies” is a general term used for animals that are secured by packers outside of the regular spot market) and the spot prices seem to be lower. Can't economists just look at the relationship between captive supplies and spot prices to determine if one is driving the other?

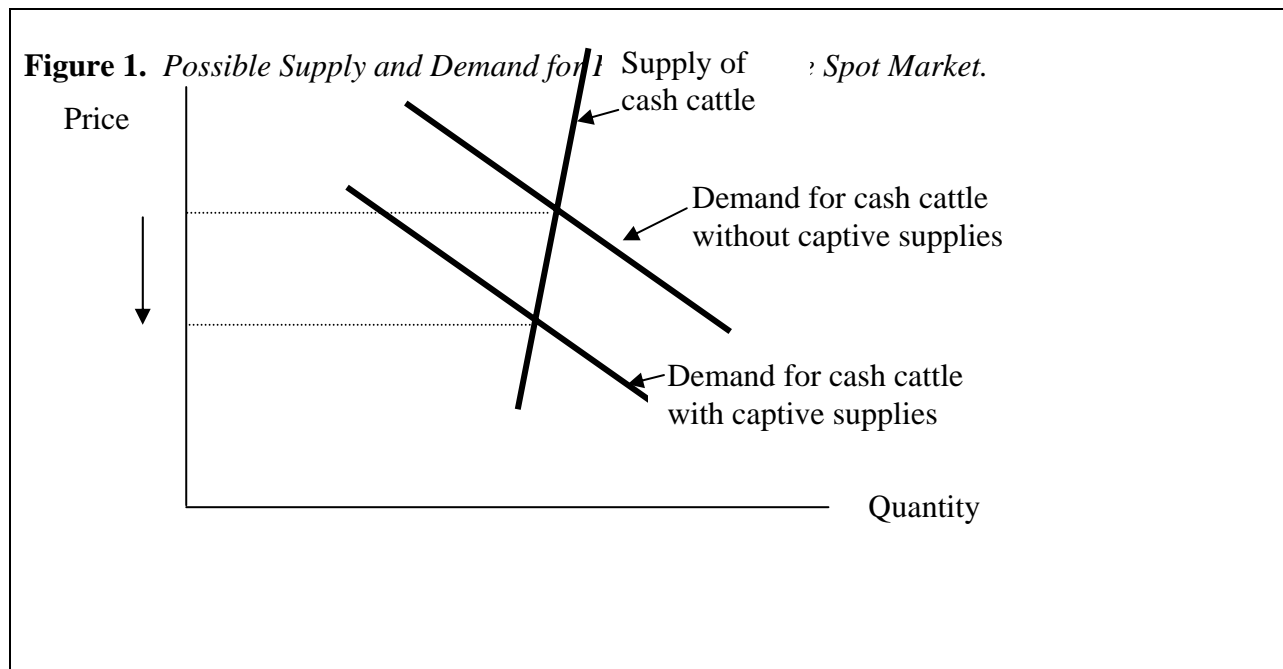
In 1999, the USDA/GIPSA funded a study to look at just such a relationship using a data set on cattle purchases in the Texas Panhandle (Schroeter & Azzam, 1999). This study corroborated previous findings that there was a correlation between increased use of captive supplies and lower spot prices, but found non conclusive evidence that the captive supplies are causing the lower spot prices. To cattlemen this may seem like a “no-brainer”: If the packers can get their volume through captive supplies, the packers can use this as leverage to lower prices in the spot markets. For instance, the *Abilene Reporter-News* simply asserted such power in a 1997 article titled “Captive supplies squelch bidding for cattle.”

On its web site, the Organization for Competitive Markets (OCM), a Lincoln, Nebraska-based group claiming to represent “independent farmers, ranchers and rural communities” pointed to the Schroeter & Azzam study as enough evidence to call for the then Secretary of Agriculture's banning of captive supplies:

The Organization for Competitive Markets today called for Secretary Glickman to ban captive supply of livestock as a mechanism for packers to manipulate farm gate prices. A recently released study by USDA found a “robust correlation” between higher captive supplies and lower spot cattle prices “in every case.” Yet, Jim Baker, administrator of USDA's Grain Inspection, Packers and Stockyards Administration, maintained his implausible refusal to protect open markets by stating, “That's not collusion” (OCM, March 9, 2002, p. 1).

The rationale, at least among those who would like to see captive supplies banned, is that bidding on the cash market can be milder because of the captive supplies. The OCM article quotes Mike Callicrate, a Kansas feedlot operator and OCM vice president: “Independent feedlots used to have several buyers competing for their cattle every day of the week. Now, with extremely high levels of captive supplies, the packers do not need to bid aggressively for cattle” (p. 2).

The economics here does seem straightforward and the question that seems obvious is, “Do captive supplies cause lower spot prices?” If we were back in the classroom, we might begin by drawing a familiar supply and demand for live cattle as shown in figure 1.



This seems obvious, but, the OCM quote above also brings up the question of collusion. What is not evident in figure 1 is where collusion comes in. So far, all that is apparent here is a market adjustment... and there is nothing illegal about that.

But, might not captive supplies be used, as the OCM assert, “as a mechanism for packers to manipulate farm gate prices”? Again, this does seem possible, but the economists Schroeter and Azzam who did the study offer a different scenario based on the scheduling of deliveries:

[W]hen the capability exists for packers and feeders to intertemporally shift non-cash deliveries in response to economic incentives dictated by changing market conditions, deliveries of marketing agreement and forward contract cattle will tend to be “high”, other things equal, when ex ante forecast of the spot market price is “low.” But because the experienced market participants who make the scheduling decisions are undoubtedly quite good forecasters of price (at least over a relatively short forecast horizon such as one or two weeks), their ex ante forecasts are likely to be quite highly correlated with ex post realizations of price. So the tendency for weekly non-cash cattle deliveries to be negatively correlated with the unobservable ex ante two- (or one-) week-ahead forecasts of

price could manifest itself in a negative correlation between weekly non-cash cattle deliveries and the observed ex post realizations of price.

In other words, the deliveries of non-cash cattle correspond to low spot prices not because of any exercise of market power but simply because of timing issues.

Still, the conventional wisdom outside of economics seems to be that market share and market power are one and the same. “Doesn’t it seem obvious,” producers might ask, “that if concentration increases and cash prices go down, that there must be something ‘fishy’ going on?”

The problem here is that the economists and non-economists are looking at the same data but answering different questions. The economists are answering the question, “Are spot prices low when captive supplies are high?” Schroeter and Azzam’s answer is that there is a negative correlation between captive supplies and lower cash prices: when captive supplies go up, spot prices tend to go down.

The non-economists want an answer to the question, “Are spot prices lower because the packers are using their captive supplies to manipulate the market?” This is a very different question. Still, Schroeter and Azzam’s answer was taken by the OCM as evidence enough of something more nefarious, and here may be the root of the miscommunication.

Although economics is far from an exact science, it tries to be as exact as possible. Correlation does not mean causality and, moreover, correlation does not prove collusion by packers to lower the cash prices through the use of captive supplies. Wouldn’t negative correlation be a sign of such collusion? Yes. But, you can also get the correlation without the collusion as Schroeter and Azzam’s explanation above shows.

As noted above, demand for beef has been going down since the 1970s, thus the consolidation in the packing sector and the lower prices may simply be two sides of the same demand coin: consumers are buying less beef... packers go out of business... and the ones that remain get larger to take advantage of the scale economies in the packing industry. This would be the competitive hypothesis. In order to refute this competitive hypothesis, we need to find evidence that is inconsistent with what would be expected under competition but consistent with what would be expected under some sort of price manipulation by the packers. But before starting, we need to make the question as specific as possible, otherwise we run the risk of finding an answer that fits several questions. All right, then, if economists want the question to be specific, then let’s give them a specific question to answer.

In the case of cattle markets, are the packers manipulating the spot prices?

This is now a very specific question; unfortunately, it is still a bothersome one. How exactly would packers manipulate spot prices? After all, if one packer used its captive supplies in a way that allowed it to bid low on spot cattle, why wouldn’t a feedlot just switch to another packer who is offering a higher bid? Cattle are cattle and IBP would presumably have the same desire for a feedlot’s cattle as Excel or National would so if IBP were bidding low, why wouldn’t Excel come in and bid just a little bit higher? Presumably Excel could then get the cattle for a little

more than IBP is bidding but still less than Excel's valuation. Then again, why wouldn't National bid just a little higher than Excel? Eventually you would expect IBP to see the error of its ways and prices would go back to their competitive level, even if there are only a few firms in the market... unless, of course, the firms are colluding together to either allocate the market (whereby firms don't bid on a rival's cattle) or to set prices. Either way, the firms could then use their market power to manipulate prices. So, now, we have a very specific question for the economists to answer:

Are the packers colluding to manipulate the spot prices?

Well, that is a very good question, but it turns out that this is actually an extremely difficult test to perform. Here's why. It is a rather straightforward analysis to look at prices over time and ask if there is a negative correlation between prices and captive supplies (which was just part of the analysis that Schroeter and Azzam undertook). To test this, you are simply performing a statistical analysis, and you don't even need an economist to do it: if you had the data, any spreadsheet computer program could give you the answer.

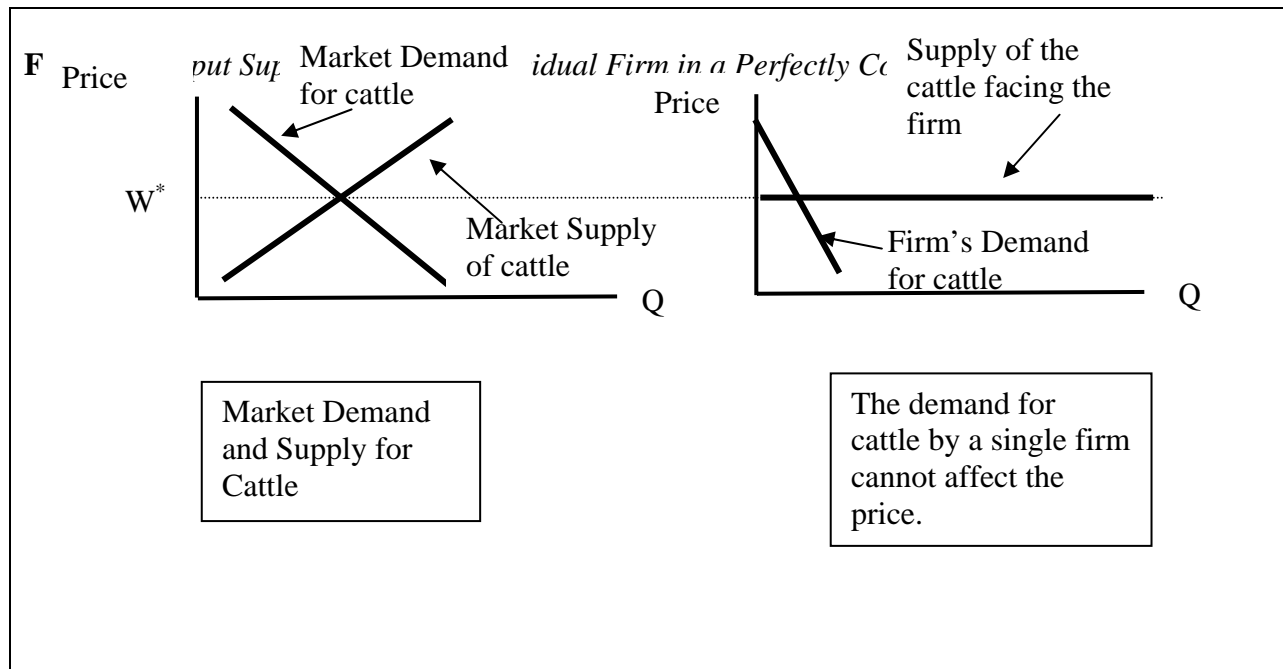
But, when you ask the question that you are really interested in, "Is there collusion?" or even more generally, "Is there market power?" Now your spreadsheet program is of little use. After all, there is nothing in statistics to guide one in measuring market power. Economic theory of firm behavior, though, can be a very good guide... up to a point. Thus, it is worth taking the time to review a little of the theory.

Market power on the buying side refers to whether a buying firm can set a price lower than what would be set under perfect competition, so let's consider two extremes. First, let's refresh our memories about firm behavior under perfect competition and then let's consider the extreme case when the firms get together and act collusively as a cartel.

Perfect Competition.

Perfect competition on the buying side is essentially no different than perfect competition on the selling side. All it means is that a firm has no power over the price that it will pay to obtain a product. Suppose the price for cattle is W^* . This W^* comes from the intersection of the packers' market demand for cattle (the combined of all of the demand curves from all of the packers who need the cattle) and the market supply curve for this input (the summation of all of the supply curves of all of the feedlots selling cattle).

Under perfect competition on the buying side of the market, the demand for cattle from any individual firm has no effect on the price of the input (either because there are many packers or because feedlots can always find another buyer). In this situation, an individual packer cannot offer a price lower than the market price because a feedlot can always sell the cattle somewhere else at the market price of W^* . Figure 2 shows the effective supply curve facing a packer under perfect competition in the fed cattle market.

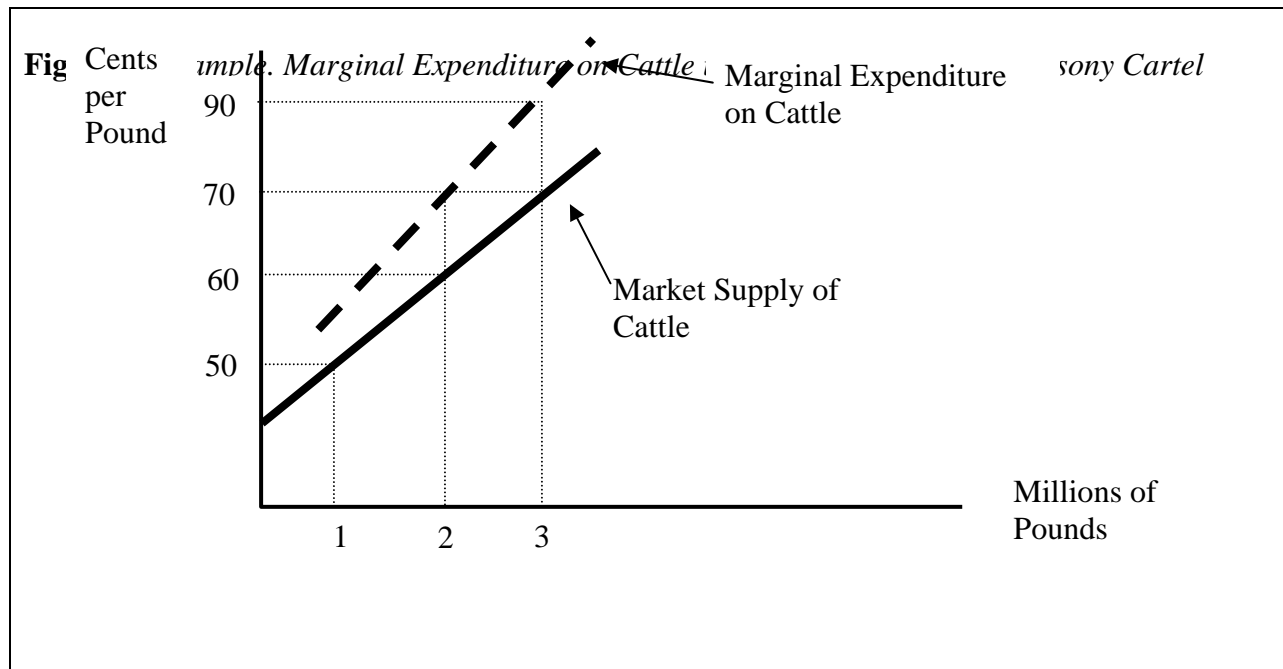


Cartel.

A monopsony cartel occurs if all of the packers collude so that there is essentially only one “firm” in the market to purchase goods (economists call this a monopsony as it is the counterpart to a monopoly on the selling side).

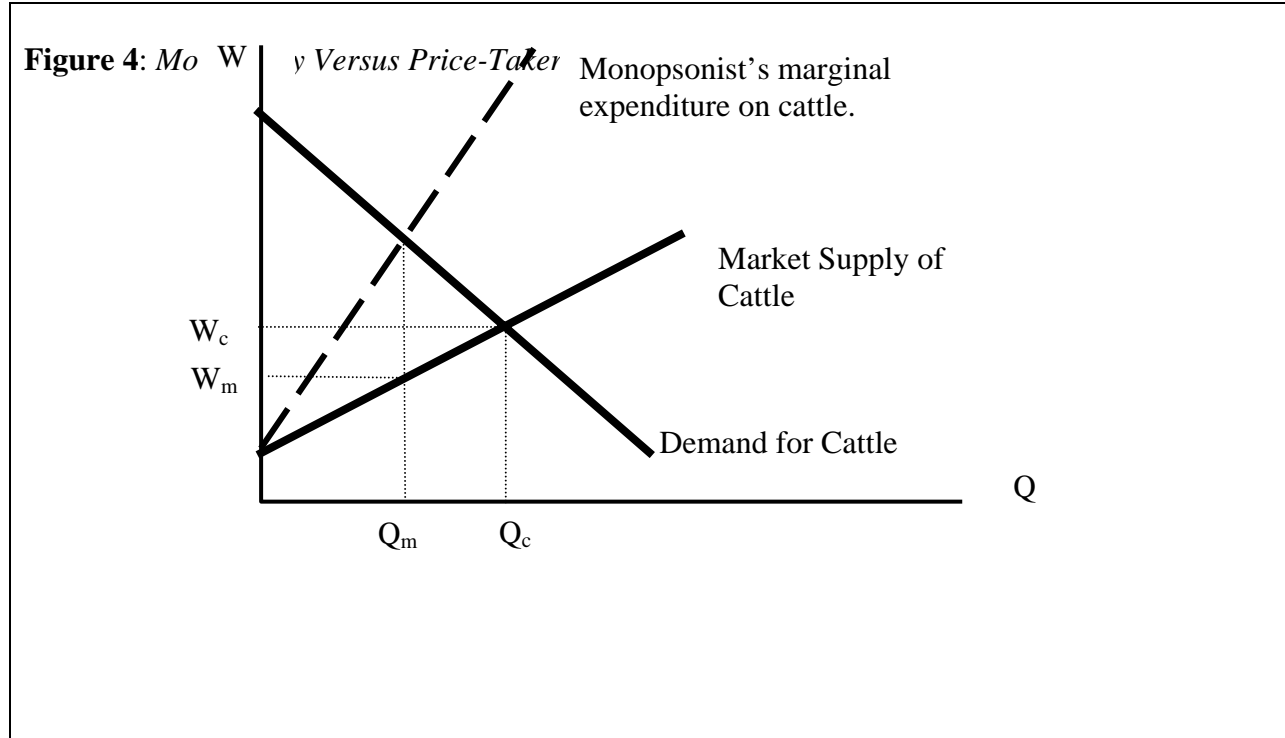
You may recall from your economics courses in college that *marginal revenue* is the addition to total revenue a firm receives from selling one more unit of a good. For a buyer of inputs, there is a related concept called *marginal expenditure*. The marginal expenditure on inputs is the addition to total cost that comes from buying one more unit of an input. For the perfectly competitive packer, this addition to total cost is simply the cost of a lot of cattle and there is nothing the competitive firm can do to change this cost. For a cartel, however, since it is the only buyer, this will not be the case.

Suppose our cartel is the only buyer of cattle and it can buy 1 million pounds of cattle for 50 cents per pound. If it wants 2 million pounds of cattle, it will have to offer more than 50 cents per pound, say 60 cents per pound. Why? Because it is the only buyer, *the supply curve the monopsonist faces is the market supply curve*, which is upward sloping. But, that means that the cost on the first 1 million pounds is also 60 cents per pound, not 50 cents per pound. There is, therefore, an additional cost to our cartel from buying more cattle. This additional cost is the *marginal expenditure*. In this example, the additional cost is $\$0.6 \times 2 - \$0.5 \times 1 = \$0.7$ per million pounds. Suppose 3 million pounds can only be secured for 70 cents per pound? The marginal expenditure from adding an additional 1 million pounds is now $\$0.7 \times 3 - \$0.6 \times 2 = \$0.9$ per million pounds, and so on. Figure 3 shows the supply curve and the marginal expenditure curve in this example. The marginal expenditure curve is above and steeper than the market supply curve.



The cartel will choose the amount of cattle that it wishes to purchase by equating its marginal expenditure with its demand for the input. In other words, a cartel's profit will be maximized when the addition to cost from one more unit of input (the cartel's marginal expenditure curve) is equal to what the cartel is willing to pay for that unit (the cartel's demand curve). But, since the market supply curve reflects what feedlot suppliers are willing to accept in order to provide a certain number of units, the cartel can use its market power in order to pay a price *lower* than the perfectly competitive price.

This is illustrated in figure 4 below. Under perfect competition, the equilibrium price and quantity for the input is determined at the intersection of the market demand and market supply for that input: W_c and Q_c . Under a monopsony cartel, however, the *quantity* is determined at the intersection of the monopsonist's demand curve and the monopsonist's marginal expenditure curve: Q_m . However, the price the monopsonist will pay for the input is determined by where this quantity exists on the market supply curve since this is the price that the competitive feedlot industry is willing to accept for this quantity of cattle: W_m .



In order to answer the question of collusion, this is enough that we need by way of review. Getting back to our question for the economists, “Are the packers colluding to manipulate spot prices?”

Looking at figure 4, the answer is an easy one. If we know the supply and demand curves, then if we observe the price and quantity of cattle to be at W_c and Q_c , then the packers are not colluding and we would conclude that the prices and quantities we see are consistent with a market under perfect competition. On the other hand, if the price and quantity observed correspond to W_m and Q_m , then the packers are perfectly colluding to obtain monopsony prices (which is illegal under the Sherman Act). If the observed price and quantity are somewhere between W_c and W_m and Q_c and Q_m , respectively, then we conclude that the packers do have some market power, but not absolute market power.

Practically, however, things are not so simple.

What figure 4 shows is that it is not enough to measure the prices of cattle, what is needed is to determine whether the price one is seeing is W_c or W_m . Economists are extremely adept at estimating demand curve if they can get the data, but in order to answer the posed question about market power, they need to be able to estimate the supply curve (or something akin to it) as well. What’s so hard about that? It turns out that supply curves are hard to estimate at the firm level without very good data. Further, the data corresponding to those factors affecting the packers’ demand for cattle are quite likely proprietary, if they are kept at all. While it may be convenient

to say, “The price is lower today than ten years ago.” one still does not know if the price has fallen from W_c to W_m or whether W_c is simply lower today. In other words, knowing that a price is lower than it used to be tells us next to nothing about market power.

This is not to say that such an analysis is impossible and some economists have attempted such an analysis. The results, however, so far reveal that there is little market power being exerted by the packers. Muth and Wohlgenant (1999) and Morrisson Paul (2001), for example, attempted tests similar to what was outlined above and concluded that there was little market power being exerted by the packers, although, both analyses still had to rely on several assumptions where the data were limited. Could these economists be wrong? Of course, such is the nature of research, but as this example shows, the answer is not as simple as just determining whether captive supplies and spot prices are negatively correlated.

Now, before leaving the reader with the idea that the economists are all aligned with the view that there is no market power in the cattle industry, we point out that this is not, in fact, the case. The interested reader is referred to a paper by Connor, Carstensen, McEowen and Harl (2002) that discusses studies by other researchers.

Producers want Specific Answers, but Providing Answers can be a Risky Business

Economists are sometimes accused of offering answers to economic questions that are short on specifics. Producers may become frustrated with the results of an econometric study or the deduction from a model if all they want to know is what to plant and when to sell it. The literature on risk in agriculture is pertinent.

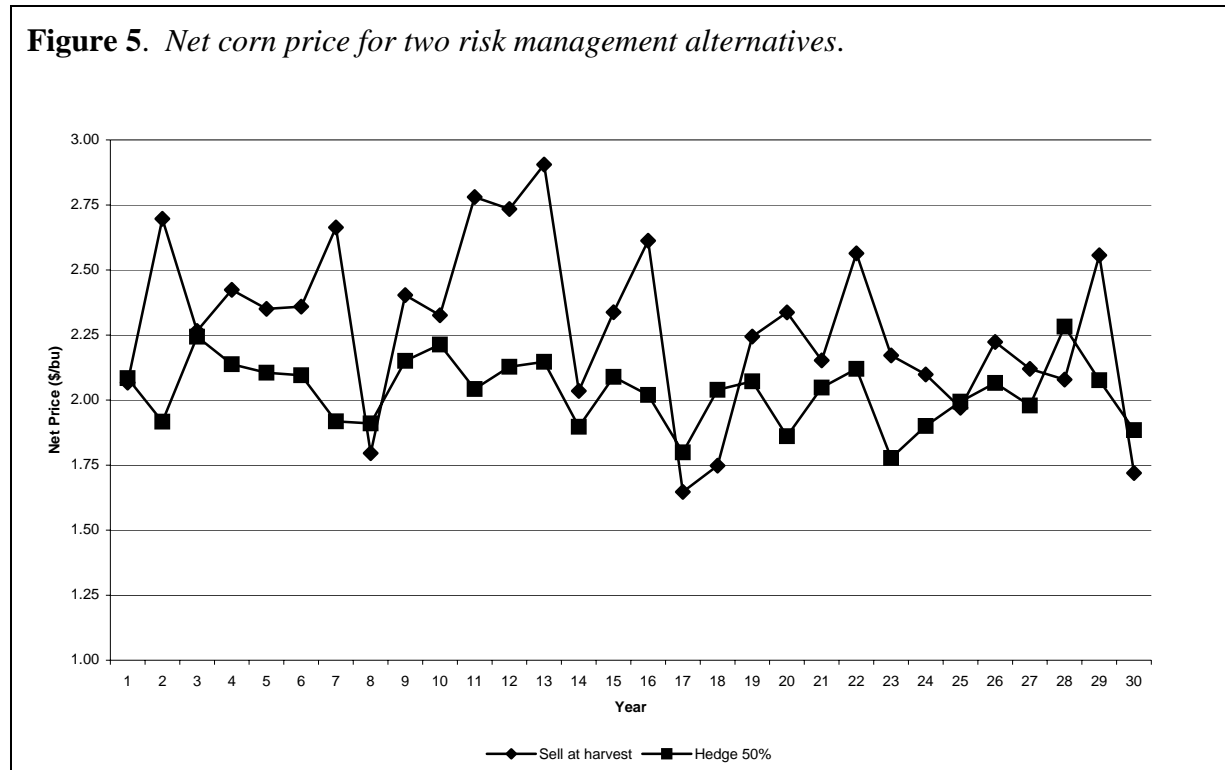
One of the most distinguishing features of agricultural production is chronic risk. Farmers do not know the prices they will receive when the production process begins. Due to uncertain weather conditions or pest populations, the quantity of output is unpredictable. Debt capital is acquired at interest rates that are subject to change.

In recognition of all these sources of uncertainty, farm management and production economists have extensively studied farm level risk and the means to manage it, particularly during the last five decades. From this research has emerged a dominant model of decision-making under risk, which economists have used to make recommendations for farm risk management.

In this dominant model, farmers are assumed to have several management alternatives available to mitigate risk, and choose one of these alternatives each decision period (e.g., choosing a certain hedging strategy for a given year). The optimal alternative is the one that maximizes average profits minus a risk premium, where the latter depends on the degree of profit uncertainty as well as the farmer’s attitude toward risk.

To illustrate this model, consider a simple example where a corn producer considers only two alternatives to manage price risk: (a) sell the entire crop at harvest and receive the going price, or (b) hedge 50% of the crop with December futures contracts. Figure 5 depicts the (hypothetical) effective prices that a farmer would receive from each of these strategies over a 30-year period.

Selling at harvest has a higher effective price than hedging on average (\$2.30 per bushel versus \$2.00 per bushel), but also leads to more price variability or uncertainty.¹



In the dominant risk model, the two alternatives are compared by deducting the risk premium from the average price. For example, the sell-at-harvest strategy is better than hedging if

$$\$2.30 - (\text{Risk premium of sell-at-harvest}) > \$2.00 - (\text{Risk premium of hedging}).$$

Economists have learned that the risk premium depends on the variability of profits and the farmer's attitude toward risk, but the exact way to compute the risk premiums cannot be derived from theory.

Although the risk premium cannot be calculated, several qualitative statements about the optimal choice can be made. The risk premium is known to increase with the variability in profits. Thus, the sell-at-harvest strategy may not be the better choice if it leads to much greater price variability. A strong dislike for risk will also increase the risk premium, so that a very risk-averse farmer would be willing to choose a strategy with a lower average price if the variability of the price is also smaller. On the other hand, the risk premium would equal zero for a farmer who does not care at all about risk (a "risk-neutral" individual). In this case, the farmer only

¹ A common measure of variability/uncertainty is the standard deviation, which is \$0.30 and \$0.15 per bushel for the sell-at-harvest and hedging strategies, respectively.

cares about the average price received, and we can conclude with certainty that the sell-at-harvest strategy is preferred to hedging in the example above.

Unfortunately, obtaining a numerical value that measures a farmer's risk attitude is difficult, which renders the value of the risk premium unknown. While the dominant model of risk has its limitations, economists have generally viewed it as the most useful framework for analyzing risk, and put it into practice by developing various methods for approximating the risk premium from observable data.

Perhaps the primary limitation of the risk management model for farmers is that it rarely provides precise recommendations. Since the risk premium includes a psychological characteristic that is unknown, the model cannot make a definitive ranking even for the simple 2-alternative example above. The output of an economic risk analysis is often a statement such as, "The hedging strategy is recommended for farmers who are very averse to risk." In reality, farmers have many more than two risk management alternatives available, and the risk model can often narrow the field to only a small number of viable candidates. But narrowing to only one recommended strategy is extremely rare.

With modern computing capabilities, farm managers can implement the risk management model for their own situations. The model becomes much more powerful if it can be based on situation specific information and the decision maker's own knowledge of his or her attitude toward risk.

Pannell, Malcom, and Kingwell, have argued that the dominant risk model is not very well suited to farm-level decision making. It effectively assumes that farmers have only one opportunity to make a risk management decision each year, and that the management alternatives are fixed from one year to the next. The farmer is seen as making a series of choices, which consists of the same basic decision problem that is repeated annually. In Pannell, Malcom, and Kingwell's view,

Most farmers would be puzzled that as a discipline we focus so much on this aspect of risk management. For them, the main issue ... is how to respond tactically and dynamically to unfolding opportunities or threats to generate additional income or to avoid losses... [Desirable information] for risk management ... allows farmers to respond profitably to variations in prices or climate... (p. 71)

That is, most farmers manage risk by continually making tactical adjustments through time in response to unfolding events and new information. Rather than knowing how two fixed strategies compare over a long period, they place a higher priority on questions such as:

- Are there 'early warning signs' that indicate post-harvest prices will be unusually low (or high)?
- What is the best tactical response to these early warning signs? (e.g., if 50% of the crop is hedged early in what appears to be a low-price year, what percentage of the time would it lead to a higher effective price than selling at harvest?)
- What are the implications of making a large capital investment in different situations? Should profitable investments be delayed under certain circumstances (such as a low-price or high-interest rate year)?

Farmers in financial strain are likely to be those that made major adjustments at wrong times, which suggests that the timing of large investments may be more important than short term risk management decisions.

Naturally, this type of situation specific information is difficult to generate through conventional research. Nevertheless, some researchers have developed models that allow risk management decisions to be made tactically and dynamically (e.g., Schroeder and Featherstone). Computing advancements also allow researchers to construct ever more complex models. However, a single model with enough flexibility to address all conceivable decision scenarios is probably impossible.

From the perspective of many economists, the purpose of farm-level research is to provide insight and understanding for how management decisions should be made, rather than creating tools that could be directly applied to all management situations. Still, even in the providing of that insight, economists need to be careful that the models used are pertinent to the question being asked.

Sometimes Our Models Keep us from Seeing Things the Way Producers See Them.

The discussion on risk above is a good example of how economists rely upon models to help them understand markets. Unlike physicists or biologists, economists cannot usually set up laboratory experiments to test markets. If we could, then it would be a rather simple matter to run a market experiment over and over until a result has been observed enough times to allow for some general theory to be formed. The stock market today, by which we mean all of the economic influences upon prices that are happening right now, will never happen again. Neither will today's cattle market nor even today's grocery purchases by a consumer in Manhattan, Kansas.

The mathematical analyses that economists are so fond of are necessary to help guide the research. A simple example will suffice. Suppose an accountant tells you that profit is the difference between total revenue and total cost. Seems reasonable. Now, suppose the firm you wish to study makes product, Q , and sells that product for a price of P . You want to know how much Q the firm should produce if the goal of the firm is to maximize profit. Since total revenue is just $P \times Q$ and there is some cost to producing Q , say, $C(Q)$ (which is some as yet unspecified functional form for the cost of producing Q). Then profit is just $P \times Q - C(Q)$. As more Q are sold, revenue is increasing and, we assume, costs are increasing, thus there is a tradeoff between revenues and costs in determining the optimal amount of product to produce.

Finding that optimal amount of Q is straightforward. If one has had calculus, all that is needed to find the Q that maximizes profit is to differentiate our profit function, set the results equal to zero and solve for Q .

But, here is where one can run into problems. If we have a perfectly competitive firm, then the correct specification of revenue is as above: $P \times Q$, since P is given in the market and the firm has no control over it. However, if our firm is a monopoly, then the firm's choice of optimal

quantity is some function of Q , so revenue is, say $P(Q) \times Q$, where $P(Q)$ represents some functional form (specifically, the inverse demand curve facing the monopoly). And, if there are only a few firms, an oligopoly, then things get even more complicated because in this case the profit maximization has to be performed in such a way as to take into account how other firms will react with each other. And, what if there are a few firms but the product, Q , is not quite the same for each firm? This adds a further wrinkle. Finally, what if we made a mistake at the very beginning in assuming that our firm seeks to profit maximize when our firm might be seeking some other, perhaps short-run, goal such as maximizing market share. Or, maybe our “firm” is a farmer who is motivated as much by the utility she receives from farming as by profits?

As can be seen, just as in the risk example in the previous section, our simple optimal output example can get very complicated very quickly as the realities of the situation are added into the problem. Luckily for each of the different scenarios we have listed above, economists over the years have come up with models to fit them and any perturbations could most likely be handled with a similar perturbation of the model. If we have come up with a model that, for the most part, approximates reality (or at least that part of reality that we think is most appropriate), the model can be very useful. The difficulty arises if we get trapped into thinking a problem looks like one model, when another model may be more appropriate.

Going back to the cattle example above, one place where some economists may (and we emphasize “may”) be using the wrong model is in the incorporation of capacity into their models. It is often quite common to find the argument that we gave above about economies of scale in the beef packing industry. It is also common to accept that if there are economies of scale, packers will operate at lower costs by operating at capacity. As Ward and Schroeder argue,

[O]ne of the driving forces in meatpacking is the need to be a low-cost, cost-competitive firm. One way to achieve lower costs is to operate larger, lower-cost plants at capacity. Several research studies dating back to 1962, have shown there are economies of size in cattle slaughtering and fabricating (p. 2).

One needs to be careful here, however. Showing that there are economies of size is not the same thing as showing that packers are operating at capacity. Under a model of perfect competition, economies of size would lead one to the result that plants are operating at capacity. However, under a model of *imperfect* competition, firms may build bigger plants in order to signal to outside firms to stay out of the business. These large plants could still have economies of size, but the firms would not operate at capacity.

While there have been studies showing firms have economies of size, what have not been seen are studies of whether or not the plants are actually operating at capacity. If they are then this might provide fodder to the idea of competitive firms. As discussed above, however, this may be difficult to determine, as the capacity data would need to be provided by the firms themselves. In fact, one could not simply use data on the number of cattle being slaughtered, because maximum daily throughput, for example, is not the same as capacity.

Another example in agricultural economics where economists may be letting their choice of model influence their conclusions has been in the area of commodity promotion programs, so called, “promotion checkoffs.”

Recently a majority of pork producers voted to end their checkoff promotion program for “Pork, the other white meat,” though the fate of that program is still being decided. Relatedly, a group of cattle producers successfully overturned the beef checkoff program that funded the advertisement, “Beef. It’s what’s for dinner.” All around the country nearly every commodity checkoff promotion program has been challenged by producers who feel the program is detrimental to their bottom line (Crespi). The pork vote is actually an exception to the rule, however, as most programs are favored by a majority of participants who continue to vote on referenda for the programs’ continuance. Thus, the challenges are coming in most cases from a minority of producers who want the programs ended.

Economists have examined the benefits and costs of these programs in dozens of studies (see the review of these studies in Crespi) and, with only a few exceptions arrived at the conclusion that the added revenues to producers greatly outweigh the costs of the promotion programs. So, why would groups of producers spend so much time, energy, and especially money trying to get rid of the programs?

The conventional argument from economists is that these minority producers either want to free ride on the programs without paying for them or are in some way irrational. In fact, in the case of *Glickman vs. Wileman* over California tree-fruit promotion programs, the plaintiffs did appear irrational by conceding that the advertising shifted demand for peaches and nectarines but then made the argument that their profits were hurt while their competitors were helped.

This seems to economists like double speak: if the demand curve shifts outward so everyone is selling more peaches, and all producers pay the same per-unit amount for the program, how can profits go down for one group of producers but up for others? Under an economic model where the entire product is homogeneous and consumers do not care whose peaches they are buying, this would be impossible. But there’s the rub. Because this is a model of commodity promotion it made sense, and arguably it still makes sense, for economists to assume that all of the commodities being sold were, just that, commodities.

Commodities are by definition homogeneous, so it is not surprising that nearly every commodity promotion study assumes homogeneous products. However, in recent years, some growers have attempted to differentiate their goods from those of other growers, thus, while a homogeneous product model may make sense for some commodities (like milk) it may not make sense for others (like peaches). Recently, Crespi and Marette (2002) showed that the key to the plaintiffs’ argument in the *Glickman* case might be in that simple modeling assumption of product homogeneity. If producers have different qualities of product then it is possible for high-quality producers to be harmed by a generic program if that program sends consumers the unintended message that all of the products are the same. The result is that the high-quality product’s demand not only shifts outward, it becomes flatter, as well. In this way, total demand can still increase, but the price (and hence, profits) for the higher quality product might begin to decline toward the price of the lower quality product. Simply, the plaintiffs might not be irrational at all.

The moral is twofold i) one must be careful that the model is not driving the results and ii) as markets change, models must also.

Economic Efficiency and Equity

The final topic we wish to discuss is that of equity and efficiency. Briefly efficiency has to do with how one should allocate scarce resources so that society gets the most it can out of their use. Most questions economists answer today concern efficiency. Equity, namely, who is entitled to what and how can things be divided fairly, however, is of great interest to producers. So, why don't economists spend as much time answering questions about equity as they do answering questions about efficiency? It helps to understand what efficiency means.

To introduce the idea of economic efficiency, consider the example of salt mining. In an area with several mine owners, the amount extracted from each mine undeniably affects other salt sellers as well as buyers: more extraction means more salt placed on the market, which translates to a lower price for all sellers. On the other hand, all buyers of salt benefit from a lower price.

If the salt market is left unregulated, then each mine owner has the right to mine and sell salt to “selfishly” maximize his or her own profits, without regard for the impact on other mine owners or consumers. This free market arrangement is one way society may choose to control the use of salt. Another possibility is for the government to systematically control the extraction of salt and its dissemination to consumers.

Assume for the sake of argument that the government planning agency is perfectly efficient and omniscient: it has precise knowledge of each household's demand for salt and is able to deliver that salt at the minimum possible cost. One of the most astonishing and important insights in all of economics is that the free market arrangement leads to the same amount of salt extraction and costs as the most efficient social plan. This conclusion holds not only for salt, but also for cars, restaurants, telephone service, or any other industry in the economy. To put the matter more succinctly, free markets are economically efficient. This idea is attributed to Adam Smith (in his book *The Wealth of Nations*, 1776), who used the metaphor of an “invisible hand” to describe the way free markets guide society to an efficient use of resources.

However, this so-called invisible hand conclusion is only true under certain conditions. The most important of these are:

- the market in question must be competitive—i.e., there must be many buyers and sellers;
- buyers and sellers must have perfect information about the quality of the good and its price; and
- the values of *all* the different effects of the good on consumers and producers must be reflected in the good's price.

In many markets, one or more of these conditions is violated. Many goods are produced by only a few sellers or consumed by only a few buyers, information about quality and price is usually

imperfect, and the market price of many goods does not account for some of the effects on market participants.

These latter “nonmarket” effects can be illustrated by comparing a stationary underground resource like salt to a fugitive resource like water. The amount of salt in mine A doesn’t depend on what is extracted from mine B, so the mines affect each other only through the price of salt. Therefore the market for salt will be efficient provided the other conditions are met. In contrast, groundwater pumped from any well comes from an aquifer that all neighboring wells share. An acre-foot pumped at a particular site leaves an acre-foot less to be pumped by others, and the owner at one site does not need to pay a market price for this implicit purchase of water. Groundwater pumping will not be economically efficient unless the nonmarket effects are somehow taken into account.

Even for markets where all the efficiency conditions are met, another limitation of Smith’s invisible hand is that free markets do not guarantee equity (i.e., fairness). Thinking of the economic gain to society as a pie, and each person’s gain as a slice of that pie, free markets make the social pie as large as possible but may or may not divide the pie into equitable slices. Naturally, this equity issue is an important consideration for policy and is of utmost importance in the minds of many agricultural producers (think of calls for “Fair Trade” versus “Free Trade”). However, Robert Frank argues that equity is not adequately addressed by most economists:

[M]any economists are reluctant even to discuss issues related to equity. Yet virtually every policy change will affect not only efficiency, but also the distribution of income. And we know that most societies seem prepared to reject efficient allocations if they do not pass muster on grounds of fairness. The result is that unless economists are prepared to work within social constraints on inequality, there will be little or no market for their policy recommendations. (p. 721)

There are two main reasons that economists have devoted most of their attention to analyzing the efficiency dimension of markets rather than equity. First, while efficiency can be quantified, measured, and modeled empirically, the question of what constitutes a fair distribution of resources is a deep philosophical question, which many economists today consider to be beyond the scope of their discipline. Though this was not always the case. See for example, F.A. Hayek’s admonishment of his fellow economists who were delving into the best way to “plan” economies back in 1940s.

Second, economists have argued that issues of inequality can best be addressed by concentrating on efficiency first. To make everyone as well off as possible, we must generate the largest social pie possible through an economically efficient allocation of resources, and then consider how to divide the pie into equitable slices... but, again, who should determine what is equitable?

Conclusion

The purpose of this paper was to help clear up some misunderstandings as to what economists do and how they do it. Along the way, we have tried to provide some answer to the question that is the title of this essay: Do Ag Economists Ask the Right Questions?

The motivation for the paper was simply the observation that the answers economists give to the questions in agriculture sometimes (often?) place the economists at odds with the people whose lives agricultural policy affects. What we hope to have shown is that the answers may not be the ones that non-economists expect for one or more of the following reasons. First, the economist may be looking at the same data as the non-economist but those data can only provide answers to limited questions. Second, the economist's model may only be able to provide insight into a question but cannot provide a specific answer. Third, it is possible that the economist's answer is to the wrong question because the economist has chosen the wrong model. Finally, non-economists may be seeking an answer to the question, "What is fair?" but the economist can only give the answer to the question, "What is efficient?"

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