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The Influence of IRS Tax Policy on Use of Livestock Cattle Futures and the Effectiveness of the Price Discovery Process

Wayne D. Purcell*

Current IRS policy on deductibility of losses on futures trades discourages cattle feeders from being fully involved in the price discovery process. Analysis suggests the policy hurts the effectiveness of price discovery and imposes a cost on society at large. Cattle feeders are forced to make all adjustments in the cash side of their business by changing placements, and when negative margins are being offered, they must function as cash market speculators or allow unused capacity and absorb the costs of investment. There is no economically rational way cattle feeders can participate in the price discovery process under current IRS policy when the margins being offered are negative. A change in policy is proposed that would allow feeders to be long in cash cattle and/or distant live cattle futures up to feedlot capacity with losses in futures trades being treated as a deduction for tax purposes. The change should improve the price discovery process, produce a significant consumer surplus, increase market share for the beef sector, and it could increase revenues to the IRS. Conceptual and empirical support for a change in policy is presented. Research results that show the impact of different trader groups, including cattle feeders, on the effectiveness of price discovery are presented in support of the proposed change. More research on the impact on IRS revenues, where the results of a policy change are less definitive, and the related implications of the elasticity of demand for slaughter cattle is needed.

Introduction

Trade in any futures occurs because of two economic needs. First, there is the need for a risk transfer instrument. This is the role of the futures markets that is widely discussed. The second role of futures trade is to contribute to price discovery. There is less widespread discussion with regard to this function, but it is arguably the more important one. The futures market for a commodity such as live cattle discovers a price for a future time period. The current quote on a distant futures contract is a widely available price expectation. If decision makers react to those discovered prices, then resource allocation, supply, and the resulting prices for a given level of demand are all affected. If effective and efficient resource allocation is important to society, then it is not difficult to develop an intuitive assessment that effective and efficient trade in futures and in price discovery is also important to society.

Koontz and Purcell show that cattle feeders do in fact respond by changing placements when distant live cattle futures prices move up or down. This is not surprising since not only are the feeders reacting to a price expectation, they are also sometimes reacting to the opportunity to place cattle and forward price them at some assured level of profits subject to cash-futures basis variability. It is important, then, that the prices being discovered in live cattle futures be consistent with the underlying supply and demand balance that is likely to develop as the

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maturity date of a particular futures contract approaches. Given the importance of the discovered prices in futures, the efficiency and effectiveness of the price discovery process takes on a parallel level of importance. The effectiveness of the price discovery process, in turn, would be expected to be a function of the available information on supply and/or demand and the analytical effectiveness of traders in the futures complex.

Koontz, *et al.* show that trade in live cattle futures and the level of prices being discovered is related to feeding costs and expected feeding costs, important components of supply. Hudson and Purcell show that cash and futures prices react on a daily basis to a common set of supply-demand information. Information that is being brought into price discovery in the cash markets is also simultaneously having an influence on prices discovered in the futures markets, especially the nearby futures contract. Fundamental information on cost of production, on inventory numbers, on supply indicators such as cattle on feed, and on measures of demand are thus impacting both the cash and futures markets. In their reexamination of the alleged presence of a systematic downward bias in live cattle futures prices, Elam and Wayoogagtr show that the trading rule developed earlier by Helmuth suggests that the discovered price in cattle futures will start to decline as soon as it equals projected costs of production. The costs of production are thus identified as an important determinant of trading behavior and price discovery in futures. Irwin, *et al.* tests the effectiveness of futures markets as a predictive mechanism, vis-à-vis econometric models. Econometric models to forecast prices to guide resource allocation and supply response decisions would be typically built on traditional supply and/or demand shifters. The authors find that the futures prices for distant live cattle futures are essentially as accurate in prediction as are the econometric models.

Tests of the efficiency of trade in futures markets are widespread in the published literature. An efficient market is generally seen to be one in which the discovered price is capturing all of the publicly available information in the context of a semi-strong test of marketing efficiency or public plus private information in the context of a strong-form test of efficiency. An example of a recent study looking at the efficiency in live cattle futures is the effort by Kastens and Schroeder. The authors test the live cattle futures and compare them to comparable measures of price in the stock market and offer a significant bibliography of the recent literature in this general area.

A common element in the vast literature on price discovery in futures markets and efficiency of futures markets is the information base upon which price expectations are being built. It is clear that the richness and adequacy of the information base will be a determinant of what prices are discovered and how effective those prices turn out to be in a marketing efficiency context. Cattle futures react to inventory numbers, to cattle on feed reports, and to quantity of finished product moving into consumption. Any unexpected changes in the underlying supply-demand situation, especially changes in underlying supply side numbers, will cause live cattle futures to increase or decrease significantly in post-report trading. The adequacy of the database on which the price discovery function is being based is an important determinant of how effective or efficient the futures market will be.

The content of the information base and its interpretation will be a function of the mix of traders in the futures complex. Both hedgers and speculators trade the market. By definition access to information on a particular activity such as cattle feeding will vary across traders in terms of breadth, depth, interpretation, and timing of access. Accepting this quite logical notion establishes a base for inferring an impact to price discovery from IRS treatment of losses incurred in live cattle futures trade. The current IRS policy process has the effect of discouraging active participation by cattle-feeders in the price discovery process. A change in policy is needed. Costs of the current policy to society could be large. This paper deals with the implications of the current policy, why it should be changed, and the probable implications of any such change.

Conceptualization of the Issue

In futures trading, the discovered price undulates around an underlying but unobservable equilibrium price. In work by Yun, *et al.*, the average variable cost of feeding cattle was used as a proxy for the implicit equilibrium price for fed cattle. The authors argued that there existed excess capacity in feedlots during the 1980s, the period of analysis. Under those conditions, there is a tendency for those who hold investment in feedlot facilities to pursue placement of cattle into the feedlots so long as there is an expectation that final selling price will exceed the variable cost of production. Technically, the authors' analysis dealt with feeding margins, and a feeding margin of zero was defined as a situation where the price being offered by the distant live cattle futures was equal to the average variable cost of feeding cattle. Hedgers and speculators were observed to enter the market when there were significant departures from that underlying equilibrium, and there was roughly a plus and minus \$2.00 per hundredweight range around a zero feeding margin with little evidence of any systematic and consistent trading activity by either speculators or hedgers.

This finding by Yun, *et al.*, is potentially very important. Figure 1 shows a simple and conceptual look at price undulations around an underlying equilibrium price over time. Consider, to illustrate, a market that shows the price pattern ABCDE. The magnitude and duration of the departures from equilibrium during the time period A to C and again during the time period of C to E will be important determinants of the economic effectiveness of the price discovery process in live cattle futures. The prices discovered in B are well above the equilibrium price and will have an influence on producers' supply response, and the extremely low prices around D will also influence supply responses. A price above equilibrium price at B could prompt a later over supply of cattle. Indeed, it might be the overreaction to prices around B that pushes prices down to D. Around D the converse is occurring. Cattle feeders look at the low prices and the related negative feeding margins and reduce placements of cattle. The entire cyclical process, a process that can be completed within a single year, is starting all over again.

From a social well-being viewpoint, these large and/or prolonged price undulations can be quite negative. Brorsen, *et al.*, show that price fluctuations and the associated price risk tend to prompt reactions in the form of wider processor operating margins over time than otherwise

would be the case. In a market where the demand for a raw material such as slaughter cattle is a derived demand, the initial reaction to any increase in price risk would be lower prices to producers. Eventually, lower prices to producers prompt a reallocation of resources and a lower supply than would otherwise be the case. This transmits the economic implications to the consumer level, where prices to consumers are higher than might otherwise be possible.

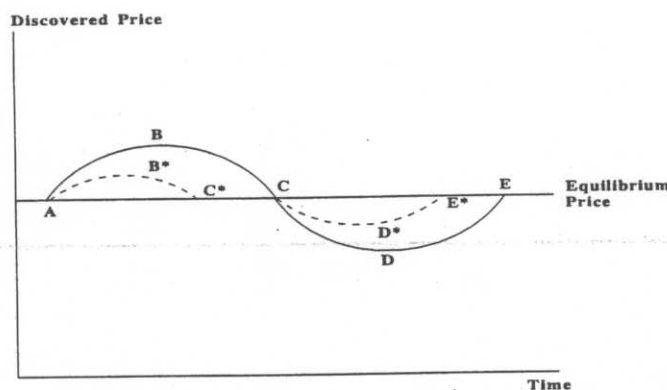


Figure 1. Potential Patterns in Decreased Prices in Live Cattle Futures

Conceptually, improved pricing performance by futures might follow the pattern shown by AB^*C^* in Figure 1. Similarly, for prices below equilibrium, the new pattern might be CD^*E^* . Note that the dynamics of the entire process would be changed because the quicker return to an equilibrium price at C^* would complete any modest excessive supply response and the lower prices it brings sooner than implied by D. A move to undulations such as those indicated by AB^*C^* and then, subsequently, the equivalent of CD^*E^* (which could start at C^*) would constitute an improved performance as measured in a recent analysis by Murphy and Purcell. The authors used mean square error around the final settlement price for each live cattle futures contract as a measure of the effectiveness of the price discovery process. Mean square error measures would be smaller for a pattern of behavior that implies smaller and less prolonged moves away from the underlying equilibrium price.

The empirical data suggests that the cattle feeding complex is characterized by uncertainty. Net profits per head in the Great Plains Feeding area, as reported by the USDA in its Livestock and Poultry Situation and Outlook reports, show tremendous volatility. There was a period of 29 consecutive months in the mid-1980s during which profits were at zero or below, and there were periods, especially in 1985 when the industry was caught holding cattle to excessive weights, where losses as estimated by the USDA ranged up to \$200 per head. There were also 27 consecutive months in 1980, 1981, and into 1982 where profits were negative. With the exception of 3 months in early 1990, profits were again also nonexistent from about mid-1988 through July 1991. Another major sequence of losses occurred in 1994. These results are not surprising given that cattle feeding is a competitive industry and there are no significant

barriers to entry. Some cattle feeders with more efficient operations than those employed in USDA's typical feedlot scenario would have been more profitable, and the discussion here does not consider any use of price risk management such as hedging. But it is clear that the situation facing the cattle feeder is charged with volatility, uncertainty, and periodic sustained losses.

Conceptually, the argument could be made that a more effective price discovery system in futures for live cattle would mitigate the volatility and the periods of losses. To the extent that adjustments to changing profit scenarios are made only in the cash market, as is now the case, the effectiveness of the price discovery process for live cattle futures will be a determinant of how effective placements, in terms of magnitude and timing of adjustments, are in the cash side of the business. If the discovered prices are too high given an underlying but unobservable equilibrium supply-demand scenario, then excessive placements can result. Conversely, if prices are too low and stay there for some period of time, then supply reductions might be too large and prompt periods of excessive profits. The period from late 1986 through mid-1988, for example, with the exception of 2 months around the first of 1988, was significantly positive for cattle feeders and showed profits ranging up to \$150 per head. When such a situation evolves because of supply-side reductions, some of the costs of this period of excess will be passed on to the consumer in the form of a decreased supply and increased prices.

Something approaching the same type of variability in realized profits is also demonstrated in the feeding margins being offered by the distant live cattle futures. Purcell presented evidence of the extreme volatility in the feeding margins being offered by the distant live cattle futures. The range during the 1980s was from -\$8.00 per hundredweight to \$6.00 per hundredweight when margins using AVC of feeding were estimated. Using ATC measures would shift the costs up by about \$5.00 per hundredweight. But whatever cost series is employed to calculate the margins, an inescapable fact remains: the discovered prices in cattle futures offer highly volatile and mostly negative feeding margins.

Some Research Findings

Impact of Traders By Type and Timing of Entry

The implicit question in this paper is whether or not this demonstrated variability in profits performance and in margins being offered by futures would be improved by more complete participation in the price discovery process by cattle feeders. To say that the mean square error around the final settlement price for a futures contract would decline if cattle feeders were more actively involved implies several positions that are worthy of examination. First, there is the question of whether or not cattle feeders have access to information that is not available to other traders. There is no empirical data set available that provides a definitive answer to this question, but there is an intuitive argument in favor of the cattle feeder's superior position in terms of timing of the information. Even if other traders do get information on numbers of cattle going into the feedlots, on performance of those cattle (as it varies by condition of the cattle on entry due to breed, size, weight, age, etc.), and on weather during the feeding period, there can be little argument that cattle feeders have access to this information in a more

timely fashion. Potentially, the quality and condition, and therefore expected performance, of cattle coming off the truck into a feeding pen can be transmitted into actions in appropriate futures contracts within a matter of minutes by the cattle feeder. It is difficult to argue that such immediate access to detailed information on how cattle will perform, what the quality considerations will be, when they will finish, etc., can be made available as quickly to the speculator or other trader who has no cash involvement.

The second argument surrounding what cattle feeders' more complete participation in the price discovery process would do to price discovery deals with when they would enter the market. Yun and Purcell (1993) report the results of a study looking at the impact of different types of traders on price discovery for live cattle futures. The authors argued that conceptually there would be a band around a zero margin, an underlying equilibrium margin, around which one would not expect to observe definitive patterns of trading behavior. But above some positive margin or below some negative margin, definitive patterns of behavior should be more nearly observable. At positive margins, cattle feeders would be expected to enter the market and place short hedges. Speculators might be slower to enter the market because their objectives differ. The cattle feeder factors concern about future price levels and what might happen if they continue to function as cash market speculators into a willingness to step into the marketplace and sell futures when possibly only small positive margins are being offered. A speculator might have the same analysis in terms of the expected equilibrium price but might need a higher reward/risk ratio before they are willing to enter. If cattle feeders sell the futures and they go up, they are covered in the cash market. Their loss is an opportunity cost. If speculators sell the market too quickly and futures prices go up, unless they are stopped out promptly, their losses are out-of-the-pocket losses.

For the negative margins, much the same argument could be made. The speculator would come in and buy the market, presumably, only at lower prices vis-à-vis the underlying equilibrium price than would cattle feeders acting as hedgers if they were allowed to replace some of their feedlot capacity with long positions in futures. These expected or hypothesized patterns of behavior were shown to exist during the four-year study period in the mid-1980s in the Yun and Purcell (1993) study. A detailed and unique data set on large trader activity was analyzed. Roughly speaking, cattle feeders entered the market at positive \$2.00 margins and occasionally came into the market to buy at negative margins that ran from -\$2.00 to -\$3.00. On both sides of the zero margin line, speculators needed bigger departures from the underlying equilibrium before they would enter. Thus, the empirical evidence tends to support the hypothesized behaviors. These findings suggest that the more influence that cattle feeders are exerting in the price discovery process, the less substantial would be the departures in the discovered prices from the underlying equilibrium price.

Correlations between changes in long and short positions for hedgers and speculators for different ranges in the margins being offered by the distant live cattle futures were also reported by Yun and Purcell (1993). When the expected margins are positive and still increasing, changes in short hedger positions are negatively correlated, suggesting those hedgers are lifting short hedges. That behavior, of course, would tend to expand the departure from equilibrium to the upside. The long speculator, as the positive margins increased, showed a modest negative

correlation, suggesting they were decreasing their positions. Short speculators, like short hedgers, were decreasing their positions. But when the margins turn, synonymous with evidence of topping action in the marketplace, short hedgers and long specs decrease their positions. This behavior by the short hedgers is not intuitive. It may be a matter of some taking profits on a selective hedging program too soon as prices turn down and reach levels below the short-hedge entry point. The behavior by the long specs would be expected, and it is one of the things that helps turn the market and push it back toward an equilibrium level. The short specs also increase their short positions and help to push the market back down toward the zero margin equilibrium level.

Arguably, the more important part of this discussion is the behavior of the different traders when margins are negative. After all, when margins are positive, cattle feeders can be legitimately involved in the futures market by selling to place hedges. Any losses that occurred in a futures account would be deductible under the long-standing policy of IRS that was changed only briefly in the wake of the *Arkansas Best* decision. By late 1994, the IRS was again allowing deductibility for losses involving short hedges on cattle. The widely used option fence, buying a put and selling an out-of-the-money call, was also approved as "legitimate." But the extension of tax favorable treatment for losses in futures has definitely not reached cattle feeders' behavior when the margins being offered are negative and the discovered futures prices are thereby presumably too low. Cattle feeders are caught in a position of either having to place the cattle and be cash market speculators, since no short hedge profits are available, or leave their pens at least partially empty and absorb at least part of their investment costs. The alternative of decreasing long positions in the cash market and increasing concurrently long positions in distant contracts in the futures market is not allowed under current IRS definition of what would be a deductible loss in futures.

With this perspective in mind, the correlations reported by Yun and Purcell (1993) for hedgers and speculators on both the long and short sides of the market are even more interesting. When the margins being offered are negative but have started to increase, which means the first differences in the margin would be positive, the short hedger is still adding to short hedge positions. With increasing but still negative margins, long speculators are increasing their positions. Adding to long positions would tend to boost the market price and push the market back up toward the zero equilibrium margin level. Perhaps more significantly in this subset of margins where the margins are negative but increasing, the changes in the short speculative positions are persistent and highly significant in a statistical sense. At a probability level of .001 for simple correlations, short speculators reduce their positions in association with increasing but still negative margins. This behavior pushes the market back up toward an equilibrium level and is consistent with the authors' finding that speculators in general tend to be much more important in the price discovery process when feeding margins being offered are negative. But this would be expected given the constraints placed on cattle feeders' participation by IRS policy with regard to deductibility of futures losses.

When the margins are negative and are still decreasing, synonymous with a market plunging to low price levels, it is again the speculator that tends to be actively involved as they

decrease their long positions. Short hedgers are decreasing their short hedge positions, perhaps taking profits. Overall, however, it tends to be speculators who eventually act near extreme -\$6.00 to -\$8.00 per hundredweight feeding margins to push the market back up toward an equilibrium. Long specs increase their positions and short specs decrease their positions. Cattle feeders as hedgers are not inclined to be involved in this type of market moving behavior. Long hedgers never enter the market with statistically significant correlations between changes in positions and the negative margins being offered.

The research mentioned earlier as reported by Murphy and Purcell deals with a sophisticated simulation of the impact of different trading groups on the effectiveness of the price discovery process. The influence of trading behavior by different trader groups was evaluated in terms of what it did to a mean square error measure around the final settlement price for a particular futures contract. In general, the research found that the small trader group tends to be a positive contributor in reducing mean square error. The groups that tend to increase the mean square error measurements are large commercial traders and trading funds. Initially, these results seem counterintuitive, but the authors offered explanations of what was occurring in the marketplace. In the context of contributing to less variation around the equilibrium price, small traders' influence tends to be positive because they are less likely to be involved in the market on a short-term basis where trading in and out can contribute to day-to-day price fluctuation. They take longer term positions based on long-run price expectations and hold those positions.

Murphy and Purcell also show that basic analysis and conceptual positions that have been widely documented in the E-V literature would argue that hedgers and speculators will exhibit different trading behavior, even if their price expectations are the same. When the variance of price expectations increases, hedgers tend to increase futures positions; speculators tend to decrease futures positions. This means that hedgers will have a larger market presence when they are least sure of the direction prices will take. The authors also note that the presence of a cash position can interfere with the representation of a price expectation in price discovery via trading behavior. The presence of a cash position results in an asymmetry with regard to willingness to act for hedgers. When the expected direction of a future price changes in a direction favorable to the cash position, the commercial trader has less incentive to take a futures position than would a speculator who has no cash position. These asymmetries also tend to reinforce the results reported earlier by Yun and Purcell (1993) that indicate that hedgers will often move into the market more quickly when disequilibrium is being observed than will speculators. Perhaps partly because of these considerations, Murphy and Purcell conclude that, overall, the presence of speculators in the marketplace tend to reduce rather than increase price volatility. This finding is consistent with the finding reported by Yun and Purcell (1993) that speculators tend to move the market back toward equilibrium, especially when negative margins are being offered. The constraints on participation in the market and in the price discovery process that are being faced by cattle feeders, the primary hedgers in live cattle futures, could be one of the reasons that it is the speculator that has to do the job of turning the market back toward equilibrium.

A recent research effort reported in Yun and Purcell (1995) dealt with the implications of any changes in IRS policy on the deductibility of futures losses to cattle feeders. The authors

found that any increase in the level of deductibility of any futures losses would increase the optimal cash position taken by cattle feeders. This finding is important because it suggests that supplies of beef would be increased if losses in futures positions to cattle feeders were deductible. It should be noted that this analysis was conducted under the presumption that cattle feeders could be long in cash cattle and/or long in the distant live cattle futures, but subject to a constraint that the long cash cattle and the long futures position could not exceed the capacity of feedlots in which the cattle feeder had an interest. An increase in the level of deductibility of futures losses also increased the optimal futures positions taken by cattle feeders. This finding is also very important because it is, arguably, the necessary condition for any assertion that changing their posture on deductibility of losses would not decrease revenues to the IRS.

Any increase in cash position due to the deductibility of futures losses would also, via a supply increase, decrease the mean of the equilibrium cash prices over time. An increase in the deductibility level would thereby tend to decrease the mean level of any measure of producers' welfare if demand for fed cattle is presumed to be inelastic. If demand is inelastic, total revenue (and therefore profits) will decrease with the increase in supply. As any price response from an increase in supply of cattle becomes more flexible or reflects a less inelastic demand, the impacts of any changes in tax policy become smaller.

It is abundantly clear that given the increase in cash and futures positions in the face of deductibility of futures losses, consumers' welfare would be increased by a change in policy. Yun and Purcell (1995) show that, without exception, allowing deductibility of futures losses on part or all of any losses in futures trade up to a feedlot capacity constraint results in an increased supply of beef and lower prices at the consumer level.

One of the most interesting, but still somewhat ambiguous, results from a change in policy on deductibility of futures losses is the impact on revenue flows to the IRS. If no accounting is taken of increased activity in the futures markets that would be expected under such a policy change, the increased supply of beef that prompts the increase in consumer well-being and decreases producer well-being would likely translate into reduced revenues at the IRS level. This is consistent with *a priori* expectations in that any (parallel) increase in supply of a commodity that faces an inelastic demand would tend to decrease profits from the cash side of the cattle feeding program.

It is important, then, that any consideration with regard to the revenue implications of a change in tax policy recognize that the optimal positions of cattle feeders was also found to involve larger positions in the futures markets. The deductibility of futures losses from increased cattle feeder activity in the price discovery process would thus tend to come on activity that has not heretofore been seen in the marketplace. If cattle feeders could respond to negative margins in some way other than placing cattle and being cash market speculators or by reducing placements, then their activity in the price discovery process in the futures would tend to increase. For example, if cattle feeders move to the long side of the distant live cattle futures when only large negative feeding margins are being offered, believing that this is a disequilibrium position, any move back up toward a zero feeding margin with the concurrent

higher futures prices would tend to be profitable trades for the cattle feeder. Tax revenues would be generated by those profits. Thus, as Yun and Purcell (1995) note, the question of what would happen to revenues at the IRS level would depend on how extensively cattle feeders would be inclined to be involved in the futures, and the extent to which at least some reasonable percentage of the trades that they might make in lieu of making all adjustments in the cash cattle market turn out to be profitable.

Evidence of the IRS Influence

All of this discussion presumes that the prevailing historical tax policy has in fact had an influence on cattle feeders' involvement in the price discovery process in futures. A 1992 release by Purcell was based on a survey of cattle feeders in Kansas and Texas. A total of 53 usable survey forms was returned. Figure 2 shows the responses to an important question which asked how cattle feeders have responded to situations in which the distant futures was offering only negative feeding margins. About 20 of the feeders indicated that the most important response was to reduce the number of cattle placed on feed. Ten of the cattle feeders said they didn't really make a response, they just kept buying cattle and hoping that things would work out over time. Eight of the feeders indicated that they tend to let at least some of their pens stay empty by way of response, and another seven feeders indicated that leaving pens empty was the second most important response. The category "buy/place" cattle shown in the graph dealt with the situation where cattle feeders were suggesting they have historically tended to buy and keep placing cattle on a regular basis and expect things to average out. The category "just keep buying" was one in which the cattle feeders were saying they continue to buy and place cattle and hope the price will improve during the production period. The important finding that can be gleaned from the responses is that cattle feeders are already, to a significant extent, facing the question of whether or not they are going to be long in cash cattle as cash market speculators or leave some of their capacity unused and absorb the fixed costs.

The response to a question to the cattle feeders dealing with what groups they thought would be effective in recognizing and correcting imbalances in the markets proved interesting. Importance was placed on the large speculators, a somewhat surprising result, but consistent with several of the research results reported in this paper. They also thought cattle feeders are in a good position to recognize and understand what is going on in the marketplace, and those responses support the thesis throughout this paper that cattle feeders would be expected to have access to information in a timely fashion.

The feeders were also asked what factors might influence their thinking about whether or not they might consider selling the nearby feeder cattle futures and/or buying the distant live cattle futures when negative margins are being offered in contrast to just continuing to place cattle and be cash market speculators or to allow pens to sit empty. Figure 3 shows that the biggest response in terms of the reason they are not inclined to do this was concern about how any losses would be treated by the IRS. This clearly indicates that the IRS policy has had an influence on whether or not cattle feeders have been involved in what might be called a "reverse feeding" approach to a market disequilibrium.

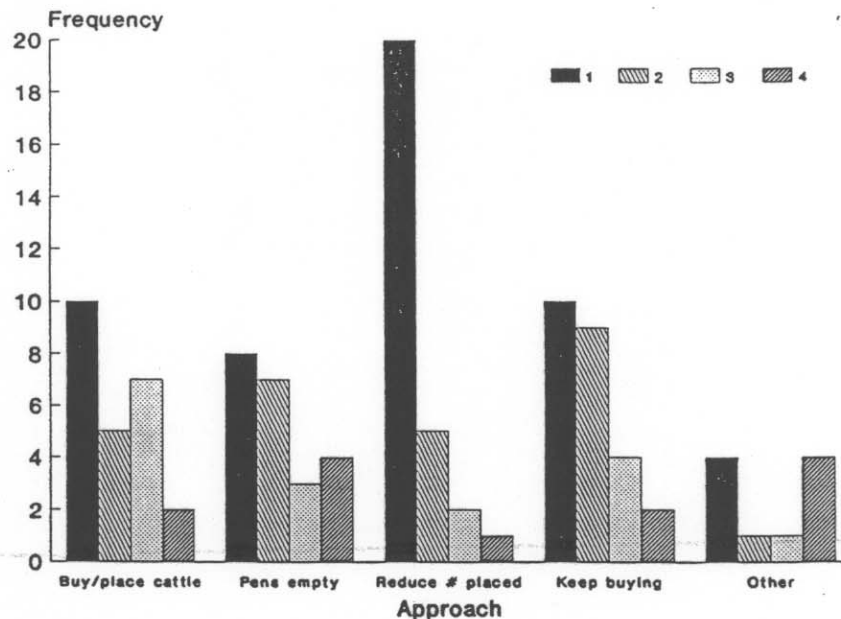


Figure 2. Responses to Market Conditions Which Offer Only Negative Feeding Margins by Rank of Importance (1=Most Important)

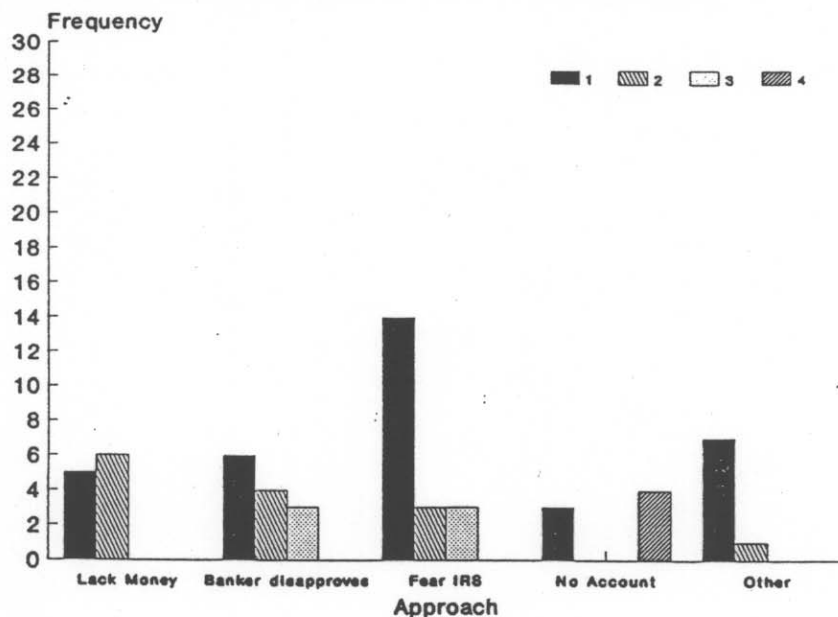


Figure 3. Ranking of the Importance of the Reasons Feedlots are Not Inclined to Sell Feeder Cattle/Buy Live Cattle Futures

The majority of the responding feeders indicated they do not get involved in selling the nearby feeder cattle futures and/or buying the distant live cattle futures when feeding margins are negative. Roughly two-thirds of the responding 53 packers indicated that they have not followed such a practice at any level. The minority of feeders who have already engaged in such trades, ignoring the tax ramifications, are likely the source of "hedgers" activities observed by Yun and Purcell (1993) when margins were negative.

Having explored the possibilities of doing something other than just being a cash market speculator or leaving pens empty, the feeders were asked whether or not they might be more inclined to get involved in the futures markets, to get involved in the price discovery process, and sell the nearby feeder cattle futures and/or buy the distant live cattle futures if IRS policies were changed to make it less restrictive. A majority of the cattle feeders said they would be more inclined to get involved. Whether or not they would follow through with that type of behavior and the extent to which they would actively pursue such a strategy is not entirely predictable, of course.

Summary and Conclusions

The price discovery process in live cattle futures goes forward without complete and active participation of the most important cash connected business. Cattle feeders have not been encouraged, historically, to participate in the price discovery process when prices for distant futures appear to be too low and the proffered feeding margins are negative. Intuitively, this seems to run counter to what is observed in the grain and oilseed sector, where the idea of a "reverse crush" in soybeans has been popular across the years. When soybean processors cannot realize a desired margin by paying prices that look too high for soybeans and turning them into soybean meal and oil, it has been widely reported that they often sell the soybean futures and buy either the soybean meal futures, the soybean meal futures, or both. To the extent that cattle feeders have engaged in such activities, what might be dubbed "reverse feeding," such strategies have received little attention. Survey results from the Texas and Kansas cattle feeders suggest any such use of the futures is modest at best.

There is reason to be concerned about the lack of involvement by the cattle feeders. The question of whether or not they have access to information that other traders do not have is debatable. A discussion about how effective different traders are in terms of filtering and interpreting available information, converting it into price expectations, and acting in the futures market could turn into a long and heated one. But there is little question that information does come to the cattle feeder by nature of day-to-day activity in the business that might not reach other traders in the price discovery process without at least some time lag. It is difficult to make an argument against cattle feeders being fully involved in the price discovery process, and it is difficult to argue that they could not bring a positive contribution to that price discovery process.

It is highly unlikely that the founders of the modern commodity exchanges and the regulatory agencies like the Commodity Futures Trading Commission ever intended to administer the price discovery process and/or to regulate it in such a way that the important cash connected businesses were discouraged from participating. But it is abundantly clear that most cattle feeders feel they are effectively excluded when the prices being discovered in the futures complex are low and the feeding margins being offered are negative. They see the probability that any losses they might incur by taking futures positions would be denied in terms of deductibility as a major barrier to participation in the price discovery process. Thus, the idea of

a policy change at Treasury as administered by the Internal Revenue Service (IRS) becomes one of considerable interest.

The analyses that have been conducted to date suggest, in net, that cattle feeders would make a positive contribution to price discovery. Most cattle feeders would fall either in the small (less than 100 contracts in any futures contract) category that Murphy and Purcell found to be positive contributors to the effectiveness of price discovery, or to the medium sized commercial firms that were also found to be positive contributors. Research by Yun and Purcell (1995) shows that consumers would benefit from any policy change that allowed deductibility of future losses in cattle feeders' activities. Supplies of cattle would increase as the cash position of cattle feeders increases, creating a positive consumer surplus.

Cattle feeders would see a change in net profits if IRS policy were changed. The cash side of the business would tend to grow, and so long as the demand for fed cattle is inelastic total revenues would tend to decline. This would manifest itself in the form of some reduction in the net profit from the cash side of the operation. But the cattle feeders' profit positions on the futures side of the equation and for the feedlot operation in total could definitely be helped by a policy change and the related opportunity to react more effectively to the volatility intrinsic to the cattle feeding complex. If cattle feeders were allowed to be long in the distant live cattle futures as at least a partial replacement for being long in cash cattle, the strings of sustained losses on the cash side of the business that can be easily documented should be reduced. In the process, the profit performance at the individual feedlot level could be enhanced. The gains from the capacity to react more effectively to the risk inherent to the marketplace could more than offset any negatives coming from lower prices from increased supplies of cattle. Thus, individual cattle feeders could benefit and contribute to the price discovery process. At the aggregate level, the beef sector would have a larger market share, other factors equal.

The net impact of revenues to IRS is not easy to anticipate. To the extent that the cattle feeding side of the programs would be hurt by increased supplies and lower prices, their cash profits would go down and revenues to IRS would decline. To the extent, however, that cattle feeders can overcome any negatives of increased supplies and lower selling prices by better overall management of their operation in a volatile marketplace, profit streams could increase and revenues to IRS could be increased. Clearly, there is potential for profits from long positions in distant live cattle futures that are taken by cattle feeders who recognize a serious disequilibrium when large negative margins are being offered. Those futures positions would also mitigate concerns about increased supplies of cattle and lower cash prices since astute cattle feeders might, at any point in time, have part of their capacity covered by long positions in cash cattle and part covered by long positions in the distant live cattle futures. To the extent that this strategy occurs, the surplus at the consumer level might also be eroded somewhat, but there is no question that a reasonable scenario can be developed that would suggest that on a revision of IRS policy, revenues to IRS could go up and not down.

The policy that is currently extended by IRS, even as amended in the wake of the *Arkansas Best* controversy, is outdated. It is time to think about a more progressive approach

that would allow the important cattle feeding sector to be a more nearly complete player in the price discovery process in live cattle futures. The net benefits to society could be quite large.

References

- Brorsen, W. B., J. P. Chavas, W. Grant, and L. Schnake. "Marketing Margins and Price Uncertainty: The Case of the U.S. Wheat Market," *American Journal of Agricultural Economics*, Vol. 67, 1985. pp. 521-528.
- Elam, Emmett, and Chaw Wayoopagtr. "A Reexamination of the Systematic Downward Bias in Live Cattle Futures Prices," *Journal of Futures Markets*, Vol 12., No. 3 (1992). pp. 329-338.
- Helmuth, John W. "A Report on the Systematic Downward Bias in Live Cattle Futures," *The Journal of Futures Markets*, Vol. 1, No. 3 (1981). pp. 347-358.
- Hudson, Michael A., and Wayne D. Purcell. "Price Discovery Processes in the Cattle Complex: An Investigation of Cash-Futures Price Interaction," Va. Ag. Exp. Sta. Bul. 85-12. Fall 1985.
- Irwin, Scott H., Mary E. Gerlow, and Te-Ru Liu. "The Forecasting Performance of Livestock Futures Prices: A Comparison to USDA Expert Predictions," *Journal of Futures Markets*, Vol. 14. No. 7 (1994). pp. 862-875.
- Kastens, Terry L., and Ted C. Schroeder. "A Trading Simulation Test for Weak-Form Efficiency in Live Cattle Futures," *Journal of Futures Markets*, Vol. 15, No. 6 (1995). pp. 649-675.
- Koontz, Stephen R., and Wayne D. Purcell. *Influence of Trade in Live Cattle Futures on the Stability of Short-Run Cash Slaughter Cattle Prices*. Va. Ag. Exp. Sta. Bul. 88-3, Winter 1988. 36 pp.
- Koontz, Stephen R., Michael A. Hudson, and Matthew W. Hughes. "Livestock Futures Markets and Rational Price Formation: Evidence for Live Cattle and Live Hogs," *Southern Journal of Agricultural Economics*, July 1992.
- Murphy, Robert, and Wayne D. Purcell. *Impact of Hedgers and Speculators on the Effectiveness of the Price Discovery Process in Live Cattle Futures*, Res. Bul. 1-95, Research Institute on Livestock Pricing, Virginia Tech, Blacksburg, VA, October 1995. 51 pp.
- Purcell, Wayne D. "Research Implications of IRS Policies to the Effectiveness of Cattle Futures Markets: Part 1, Survey of Cattle Feeders," Res. Bul. 1-92, Research Institute on Livestock Pricing, Virginia Tech, Blacksburg, VA, February 1992. 33 pp.

Yun, Won-Cheol, and Wayne D. Purcell. "Research on Implications of IRS Policies to Effectiveness of Cattle Futures Markets: Part II, Impact of Different Types of Traders," Res. Bul. 3-93, Research Institute on Livestock Pricing, Virginia Tech, Blacksburg, VA, February 1993. 24 pp.

Yun, Won-Cheol, and Wayne D. Purcell. "Impact of Deductibility of Futures Losses on Cattle Feeders' Involvement and Effectiveness of the Price Discovery Process," Res. Bul. 2-95, Research Institute on Livestock Pricing, Virginia Tech, Blacksburg, VA, November 1995. pp.

Yun, Won-Cheol, W. Purcell, A. McGuirk, D. Kenyon. "Implications of Mix of Traders on Price Discovery and Market Effectiveness in Live Cattle Futures, *Journal of Futures Markets* Vol. 15, No. 4 (1995). pp. 373-394.