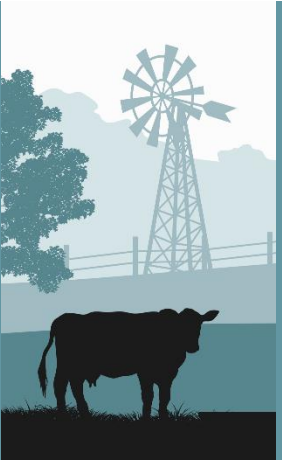

Cattle Markets, Price Discovery, and Emerging Issues

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How Do Fed Cattle Markets Incorporate New Information?

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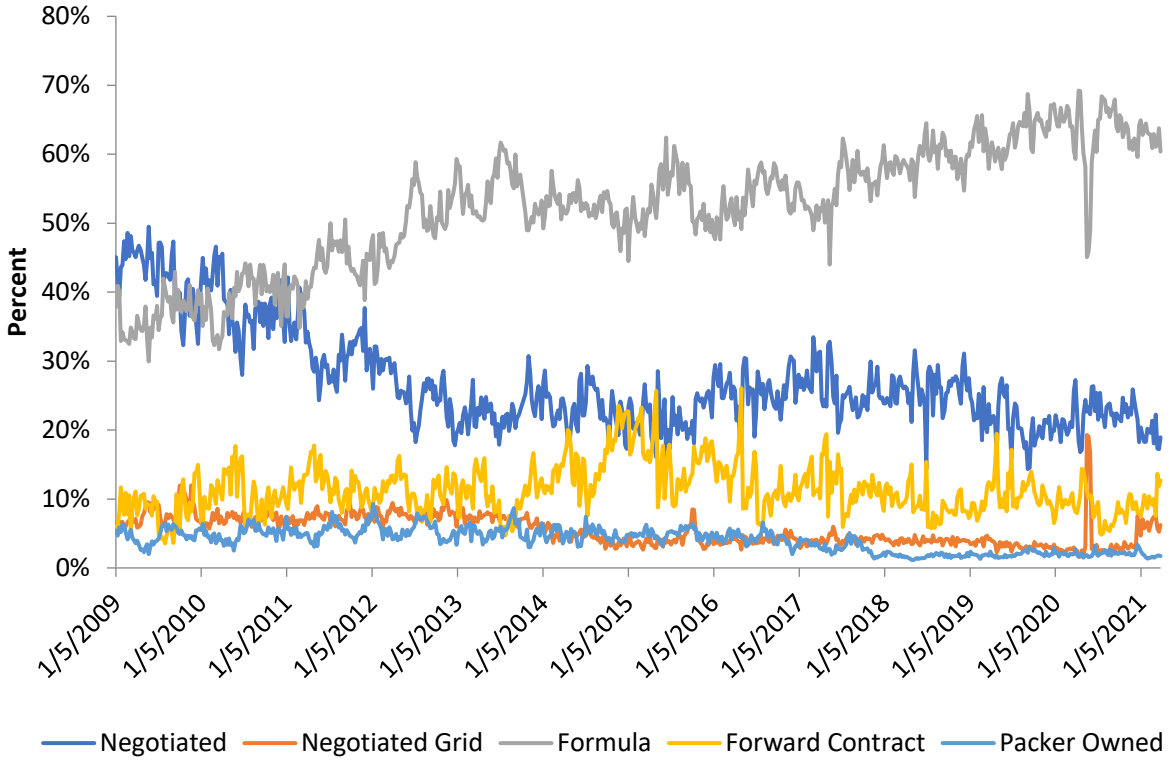
Prices reflect information about the underlying commodity (or, more broadly, asset) being traded. Price changes occur as new information arrives. Markets are where information gets incorporated into prices, and efficient markets incorporate all available information (Fama, 1970). Price discovery is the process by which this information gets incorporated into prices. Buyers and sellers of a commodity perform the price discovery task. It is the means by which they arrive at a price on a specific transaction.

Effective price discovery accomplishes the task of reflecting underlying information in a timely manner (Janzen and Adjemian, 2017). When more than one market trades the same commodity, questions arise about which market is the first to incorporate new information. That is, which market dominates price discovery? What role does each market play in the price discovery process? Answers to these questions are dynamic. A market's role in the price discovery process will change over time—this has undoubtedly been the case for fed cattle markets.

For fed cattle, questions about price discovery focus on the role of the five major Livestock Mandatory Reporting (LMR) regional fed cattle markets. Price discovery is primarily performed through negotiated cash trade in the five regional fed cattle markets (Texas/Oklahoma/New Mexico, Kansas, Nebraska, Colorado, and Iowa/Minnesota). The relative role of each market in the price discovery process has changed and is well documented in the literature. Bailey and Brorsen (1985) found that the Texas Panhandle dominated price discovery. Several years later, research found that Colorado played a major role in contributing information (Coffey, Pendell, and Tonsor, 2019). Fed cattle futures also serve as a source of price discovery (Wright et al. 2021).

The use of negotiated cash trade as a method to price cattle has also changed over time. Figure 1 shows the percentage of total weekly fed cattle transactions accounted for by each transaction type reported by

USDA Agricultural Marketing Service (AMS) from January 2009 through March 2021. The change in the proportion of negotiated cash transactions is significant. For example, in 2010, 45 percent of all fed cattle transactions were negotiated (either negotiated cash or negotiated grid); 39 percent were formula-based transactions. In 2020, just 26 percent of fed cattle transactions were negotiated while 63 percent were formula-based.



Data Source: USDA Agricultural Marketing Service, Livestock, Poultry & Grain

Figure 1. Weekly Live Cattle Transactions by Type: Percent of Total Weekly Transactions

To a large extent, formula-based transactions rely on some previous negotiated price as a key component of the pricing formula (Coffey, Pendell, and Tonsor, 2019). Thus, more and more formula transactions are dependent on negotiated prices that reflect fewer and fewer underlying sales. As Adjemian, Saitone, and Sexton (2016) point out, this has the potential to propagate any pricing inefficiencies more broadly, thus magnifying any pricing problems that already exist. This is not a new concern. LMR was intended to alleviate at least some of these concerns. For example, LMR made it impossible for packers to manipulate the base price in formulas by only reporting some of their negotiated prices (Matthews et al., 2015). However, as the negotiated side of the market has thinned further, concerns over pricing accuracy related to formula pricing have intensified.

A natural question to ask, in light of the increased use of formula pricing and associated concern over the effectiveness of price discovery in an increasingly thin negotiated market is which, if any, of the major LMR regional markets contribute in a meaningful way to fed cattle price discovery? One way to answer this question, among many others, is to examine how each cash market reacts to the arrival of new, unanticipated information. In their analysis, Anderson, McKenzie, and Mitchell (2021) conduct an event study to determine how each of the five regional fed cattle markets respond to unanticipated information

about on-feed inventory, placements, and marketings, contained in USDA *Cattle on Feed* (*COF*) reports. Market surprises, or the unanticipated component of the reports, were measured as the percentage difference between the USDA numbers and the median analyst forecasts for on-feed inventory, placements, and marketings with respect to each monthly report over the sample period (2004-2020). By isolating specific supply and demand shocks, Anderson, McKenzie, and Mitchell (2021) are able to examine the extent to which market prices respond in a rational manner; that is, in a manner consistent with effective price discovery.

In their analysis, Anderson, McKenzie, and Mitchell (2021) find that fed cattle markets behave as should be expected if price discovery is taking place. Consistent with economic theory, on-feed inventory and placement surprises – supply side shocks – are negatively correlated to LMR cash price changes. Marketings surprises – demand side shocks – are positively correlated to LMR cash price changes. In other words, when on-feed inventory and feedlot placements are larger than expected, fed cattle prices decrease. When fed cattle marketings are larger than expected, fed cattle prices increase. The results in Anderson, McKenzie, and Mitchell (2021) hold even during times characterized by low volumes of cash trade.

Because the fed cattle market has become a highly concentrated market characterized by a relatively low volume of negotiated cash transactions, questions about the efficiency and accuracy of prices ought to be taken very seriously: such markets are undoubtedly susceptible to price discovery problems, including intentional manipulation. Evidence of such problems in the fed cattle market is sparse, however, despite intense investigation by numerous researchers using varied data and methodology over many years. Results presented in Anderson, McKenzie, and Mitchell (2021) are broadly consistent with those previous findings. Analysis of fed cattle cash price response to unanticipated information in the monthly *COF* report suggest that all regions respond to such information in a manner consistent with active price discovery – that is, prices adjust quickly and consistent with the expectations of economic theory in response to unanticipated information.

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