SUMMARY OF FEEDER CATTLE HEDGING PERFORMANCE

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Hedging Overview

A common method of managing feeder cattle price risk is to hedge the transaction price of physical feeder cattle by taking a position in the futures market, selling (buying) the CME Group Feeder Cattle Futures contract if planning to sell (buy) in the cash market at a later date. In doing so, losses in the cash market are offset by gains in the futures market and vice versa, subject to basis risk. This practice reduces uncertainty around the net price received or paid for feeder cattle, though it can lead to lower net profits at times relative to an unhedged position. This study compares the performance of various unhedged and hedged strategies for 700-799 lb. feeder steers in Joplin, MO; Oklahoma City, OK; and Salina, KS from 2007 through 2018. A similar study assessing Kansas live cattle hedging outcomes is available on AgManager here.

Hedging vs. Not Hedging

This study assumes hedges are held for 34 weeks (roughly 240 days). This is the time it takes a 500 lb. calf to reach 800 lb. at an average daily gain of 1.25 lb. Average daily gain and other beef farm management estimates can be found on AgManager here. Feeder cattle futures contracts are available with expirations in January, March, April, May, August, September, October, and November. For the best hedging performance, hedgers should use the futures contract that will be the nearby contract when the feeder cattle are to be bought or sold. The hedge is lifted (i.e., the futures position is liquidated) at the same time. For example, a hedge placed on January 4, 2017 will use the September 2017 contract and be lifted on September 1, 2017. A hedge placed on November 1, 2017 will be lifted on June 29, 2018 with the relevant futures contract being the August 2018 expiration. Using USDA AMS transaction-level data, we calculated weekly weighted-average cash prices for 700-799 lb. feeder steers sold in Joplin, Oklahoma City, and Salina. We also calculated weekly average feeder cattle futures with data obtained from Bloomberg. Weekly cash and futures prices were then used to simulate 34-week hedges from January 2007 through December 2018 for each of the three locations.

Figure 1 compares unhedged cash prices and net hedged prices from implementing a traditional hedge (discussed later) for 700-799 lb. Oklahoma City feeder steers. Net hedged price for a short hedger is the cash price received plus (minus) any gain (loss) on the futures position, and for a long hedger is the cash price paid minus (plus) any gain (loss) on the futures position. We simplify hedges in this study by omitting commissions, resulting in equal net hedged prices for short and long hedgers. Note that unhedged cash price and net hedged price move in similar ways over time. However, net hedged price tends to be lower (higher) than the unhedged cash price when prices are increasing (decreasing). While hedging can at times reduce overall profits, this does not mean market participants are strictly better off by not hedging. For instance, during the rapid downswing of feeder cattle prices in 2016, short hedging allowed producers to receive a significantly higher net price than by going unhedged.

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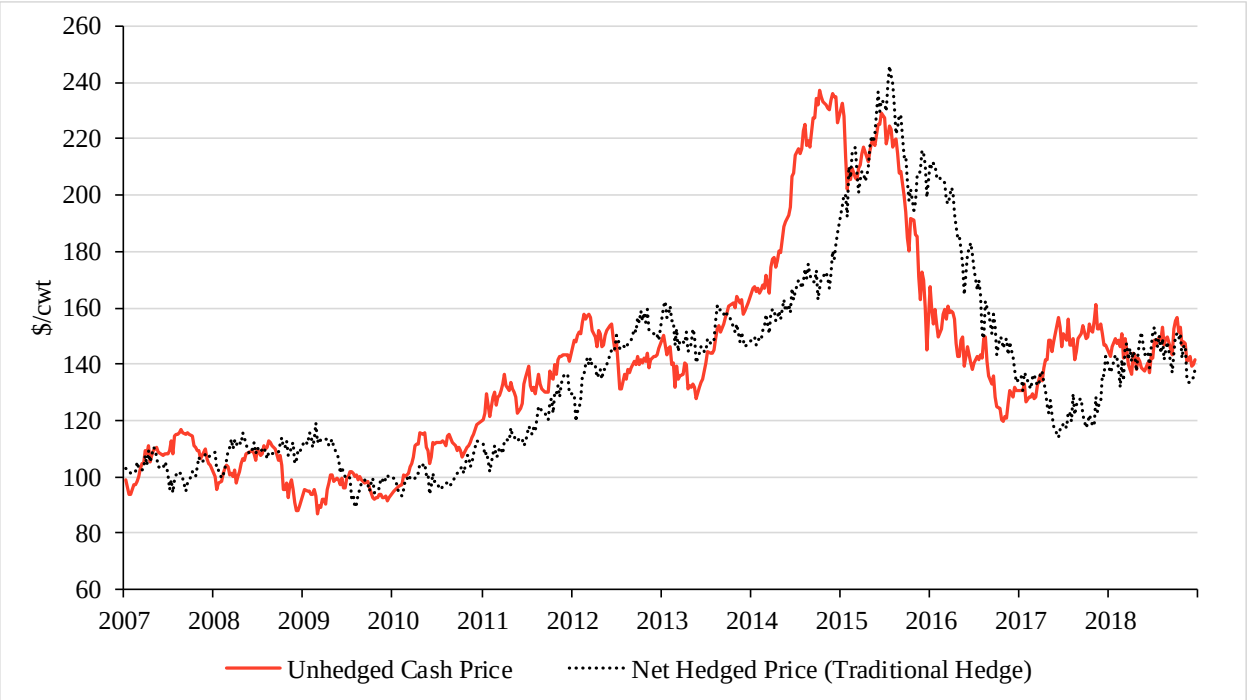
Figure 1. Oklahoma City 700-799 lb. Feeder Steer Unhedged Cash Price vs. Net Hedged Price



Data Sources: USDA AMS, Bloomberg

Table 1 depicts summary statistics of unhedged cash price and net hedged price (using a traditional hedge) for 700-799 lb. steers from 2007 through 2018, along with nearby feeder cattle futures. On average over the 12-year time span, net hedged price is below the unhedged cash price by just over $2.00 per cwt for each location. Standard deviation of the actual price received (paid) is lower for hedging than for not hedging by $0.98-$1.50 per cwt across the three market locations. These statistics show a hedged feeder cattle marketing strategy yields slightly lower average net prices than an unhedged strategy over time, but also lower variability in those prices. The goal of hedging is not increasing overall profits, but rather improving predictability of net price and providing a method of mitigating losses from adverse price movements.

Table 1. Summary Statistics of Price Series ($/cwt): January 2007–December 2018

Market	Price Series	Average	St. Dev.	Minimum	Maximum
Joplin	Unhedged Cash Price	139.07	36.07	81.51	233.76
	Net Hedged Price	136.92	35.09	83.74	245.27
Oklahoma City	Unhedged Cash Price	139.89	36.07	87.04	237.11
	Net Hedged Price	137.75	34.95	89.15	245.72
Salina	Unhedged Cash Price	141.27	35.99	86.82	240.87
	Net Hedged Price	139.14	34.49	92.02	250.62
	Nearby Futures	141.14	35.30	87.32	241.19

*Using two-sample t-tests, Joplin average net hedged price and Salina average unhedged cash price are statistically different at the 95% confidence level. All other average unhedged cash prices and net hedged prices are not statistically different from each other in the same location or across locations.

Comparison of No Hedging and Hedging Outcomes

Expected Price

Feeder cattle buyers and sellers generally make production decisions in the present based on expectations of price in the future. Expectations of feeder cattle price can be made numerous ways, such as with forecasting techniques or simply a hedger's intuition. This study implements four methods of determining an expected price.

The first method is a naïve expectation that cash price of feeder cattle 34 weeks forward will be the same as it is presently. It may be more attractive for producers to purchase calves or background heifers when current feeder prices are high. Conversely, low feeder prices may discourage backgrounders from buying calves or cause them to hold heifers back for breeding if they believe prices will remain the same. The second method is an expectation that cash price in 34 weeks will be the same as the current futures price of the relevant contract—that is, the current price of the contract for the month in which the transaction will take place. In other words, the expected price is the market's current forecast of supply and demand conditions (reflected in the futures price) 34 weeks out.

The third method is a hedger's calculation of expected price. This is simply the current relevant futures contract price plus a prediction of basis 34 weeks into the future. The predicted basis used here is the average of the actual basis experienced over the prior three years and for each calendar week. For example, predicted basis for Salina 700-799 lb. steers in week 10 of 2018 is the average of the basis experienced for this type of cattle in week 10 of 2015, 2016, and 2017. Because of holidays, some calendar weeks rarely have feeder cattle auctions (i.e., week 52) and, as such, have no corresponding cash price from which to derive the basis. In these instances, predicted basis was not calculated. Appendix Tables 1 through 3 provide three-year average basis values for each location.

The final method of deriving an expected price can be used when hedging feeder cattle that do not meet futures contract specifications and, as such, have cash prices that move differently than futures prices. Similar to

the third method, this method implements the current relevant futures contract price plus a prediction of basis. However, the entire calculation is adjusted by a "hedge ratio." A hedge ratio is used when cash price of a commodity does not move one-to-one with futures price. The hedge ratio can be interpreted in two ways: 1) the ratio of the futures to cash position volumes needed to hedge the cash position value, or 2) the dollar per cwt movement in cash price per $1 per cwt movement in futures price. In addition to the use of a hedge ratio, this method of developing an expected feeder cattle price varies from the third method in that the predicted basis is not simply the previous 3-year average for the same calendar week. Rather, it is a longer-term average calculated for the same length of time as the hedge ratio (see the following section).

A Note on Hedge Ratios and the Fourth Expected Price Method

We do not go into detail on how hedge ratios were calculated. Put simply, we implemented regression analysis to measure how weekly feeder cattle cash price moved relative to weekly futures price over periods of 10 years and used that relationship as the hedge ratio for the subsequent ("11th") year. For instance, the hedge ratio estimated for 700-799 lb. Salina steers in 2018 of 1.02 means that, over the course of 2008 through 2017, the cash price of those type of cattle moved $1.02 per cwt for every $1 per cwt move in futures price. Table 2 provides hedge ratios for each location.

In addition to a hedge ratio, the regression analysis provided an average basis over the same length of time. For instance, and similar to the hedge ratio, the predicted basis for 700-799 lb. Salina steers in 2018 is the average basis experienced for this type of cattle over the course of 2008 through 2017. Note in the third method of formulating an expected feeder cattle price, basis predictions are 3-year moving averages by calendar week. In contrast, basis predictions used in the fourth method are 10-year moving averages. The level of aggregation used in the fourth method has certain tradeoffs. Aggregation allows more transactions to be utilized in the calculation of an expected price, which is beneficial in the occurrence of a thinly-traded cash market and limited data. However, expected feeder cattle prices using this method are not as responsive to shorter-term market trends and are not affected by seasonal variation in feeder cattle markets.

Table 2. 700-799 lb. Feeder Steer Hedge Ratios

	Joplin	Oklahoma City	Salina
2007	1.02	1.03	1.03
2008	1.00	1.02	1.01
2009	0.97	0.99	0.99
2010	0.95	0.97	0.98
2011	0.96	0.96	0.98
2012	0.94	0.95	0.96
2013	0.93	0.93	0.95
2014	0.92	0.92	0.95
2015	0.97	0.98	0.99
2016	1.01	1.01	1.02
2017	1.01	1.02	1.02
2018	1.01	1.02	1.02

Notice hedge ratios are generally around 1.0 for all locations, meaning that 1 pound of futures volume should be bought (sold) for every 1 pound of cash volume exposure in order to minimize financial risk. This is expected as cash price of 700-799 lb. feeder steers should vary in similar ways to the feeder cattle futures contract, which specifies a 700-899 lb. steer. Pragmatically, fixed futures contract sizes rarely allow for a one-to-one futures-to-cash volume relationship and most hedgers can simply treat hedge ratios this close to 1.0 as 1.0.

Hedge ratios and the fourth method of calculating an expected feeder cattle price become more important when hedging cattle that differ from futures contract specifications. For instance, research has demonstrated that cattle lighter than contract weight specifications generally have hedge ratios greater than 1.0 because these cattle have cash prices that vary more than futures prices. The more feeder cattle differ from contract specifications (i.e., weight, sex, etc.), the more the hedge ratio will likely differ from 1.0 and the more important it is to have a hedge ratio that accurately equates movement in cash prices of those animals to futures prices. Over- or under-hedging is likely if the hedge ratio differs from 1.0 and the relative movement in cash price to futures price is not accounted for.

Prediction Errors

A benefit of hedging feeder cattle with futures is that it provides a better ability to predict the net price received (paid). This predictability refers to how closely the actual price for feeder cattle aligns with the price the hedger had expected. To illustrate this benefit of hedging, we calculate and compare "prediction errors," defined as:

$$Prediction\ Error = Net\ Price - Expected\ Price$$

Net price is the actual feeder cattle price received (paid), either the unhedged cash price or the net hedged price if using a hedging strategy. Expected price is the transaction price the market participant had expected and can be estimated in various ways, detailed previously. A positive prediction error means the actual price of feeder cattle exceeded the hedger's expectations, and vice versa for a negative prediction error. Feeder cattle sellers benefit from a positive prediction error because they receive a higher unhedged cash price or net hedged price for their cattle than they expected. Feeder cattle buyers benefit from a negative prediction error because they pay a lower unhedged cash price or net hedged price than they expected.

Marketing Scenarios

Prediction errors are calculated for four feeder cattle marketing scenarios, corresponding to the four methods of calculating an expected transaction price. Scenario 1 is a no-hedging strategy with the naïve expectation that cash price will not be different from today in 34 weeks. Scenario 2 is also a no-hedging strategy, but with the expectation that selling price will be the same as the current price of the relevant futures contract in 34 weeks.

Scenario 3 is a traditional hedging strategy. A traditional hedge entails taking a futures position that is equivalent in volume to that of the cash position. For instance, a feeder cattle producer wishing to hedge 200,000 lb. of expected production will short 200,000 lb. (4 contracts) of feeder cattle futures. The expected price of such a hedge is the relevant futures price at the start of the hedge plus the predicted basis at time of sale (the third method of calculating an expected price).

Scenario 4 is a ratio hedging strategy. Ratio hedges are used when cash price of the underlying commodity does not move in a one-to-one fashion with futures price. For instance, feeder cattle that are lighter than futures contract specifications typically have cash prices that are more variable than futures prices. Using a

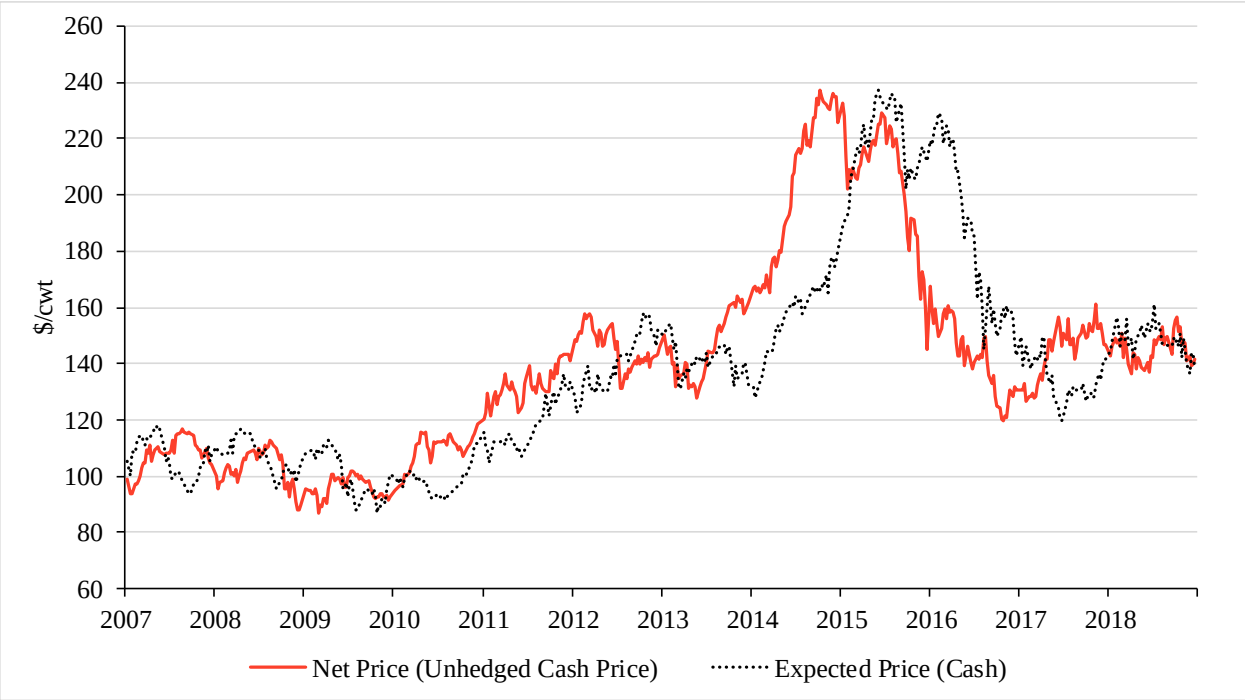
hypothetical example, a producer wishing to hedge 200,000 lb. of 600 lb. steers may know from a hedge ratio calculation that cash price of 600 lb. steers moves $1.25 per cwt with every $1 per cwt move in futures (this 1.25 relationship is the "hedge ratio"). He will short 250,000 lb. (5 contracts) of feeder cattle futures to hedge his physical position of 200,000 lb. (1.25 hedge ratio x 200,000 lb.). The expected price of a ratio hedge is the relevant futures price at the start of the hedge multiplied by the hedge ratio plus the predicted basis at time of sale (the fourth method of calculating an expected price). Summarized below are the four marketing scenarios with a brief description of how net and expected prices are calculated.

1) Naïve Expectations
   - Net price is the actual transaction price (unhedged cash price).
   - Expected price is the cash price at the start of the 34-week period.
2) Relevant Futures Expectations
   - Net price is the actual transaction price (unhedged cash price).
   - Expected price is the relevant futures contract price at the start of the 34-week period.
3) Traditional Hedge
   - Net price for a short (long) hedger is the actual transaction price plus (minus) the gain on the futures position.
   - Expected price is the relevant futures contract price at the start of the 34-week period plus the predicted basis (previous 3-year average by calendar week) for 34 weeks into the future.
4) Ratio Hedge
   - Net price for a short (long) hedger is the actual transaction price plus (minus) the gain on the futures position multiplied by the hedge ratio.
   - Expected price is the relevant futures contract price at the start of the 34-week period multiplied by the hedge ratio plus the predicted basis (previous 10-year average) for 34 weeks into the future.

Results

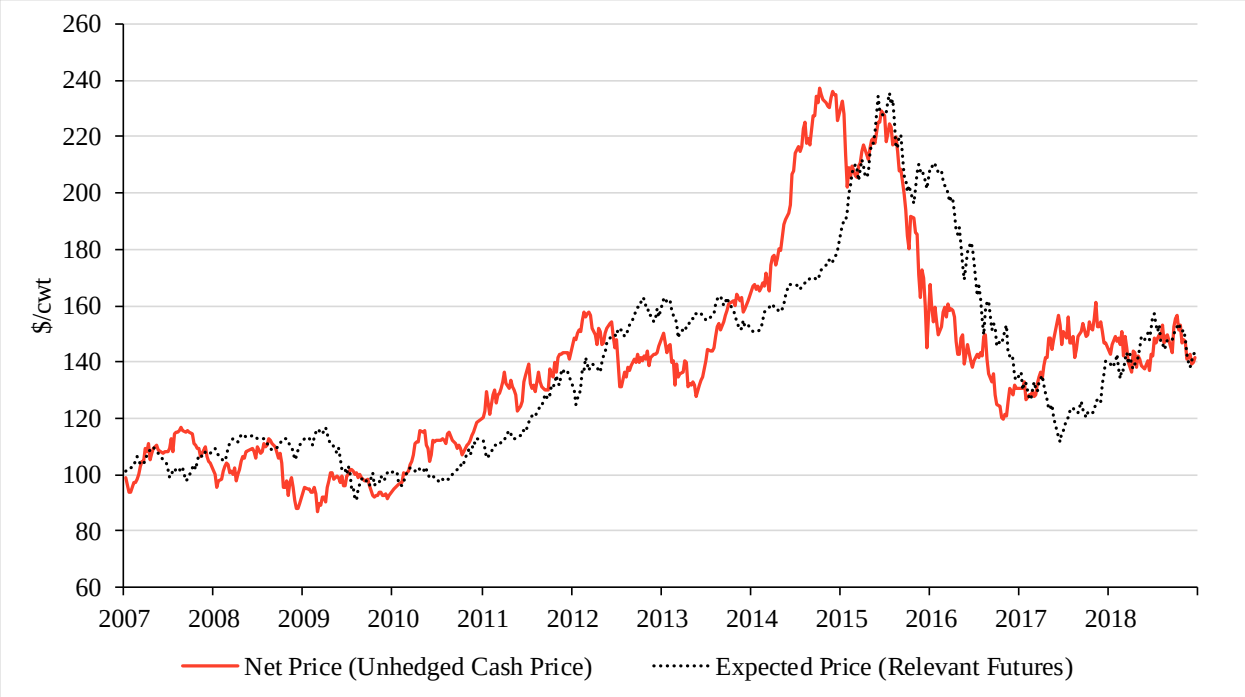
Figures 2 and 3 depict net and expected prices for 700-799 lb. Oklahoma City feeder steers for the two unhedged scenarios, naïve expectations and relevant futures expectations. The difference in the net price, or unhedged cash price, and the expected price is the prediction error. The prediction error is positive at times and negative at others. Net price is typically greater than expected price (positive error) when prices are increasing. The opposite is true when prices are decreasing (negative error). Differences in predictability of net price between the two scenarios can be better evaluated with summary statistics, discussed later.

Figure 2. Net Price vs. Expected Price: Scenario 1 (Naïve Expectations)



Data Source: USDA AMS

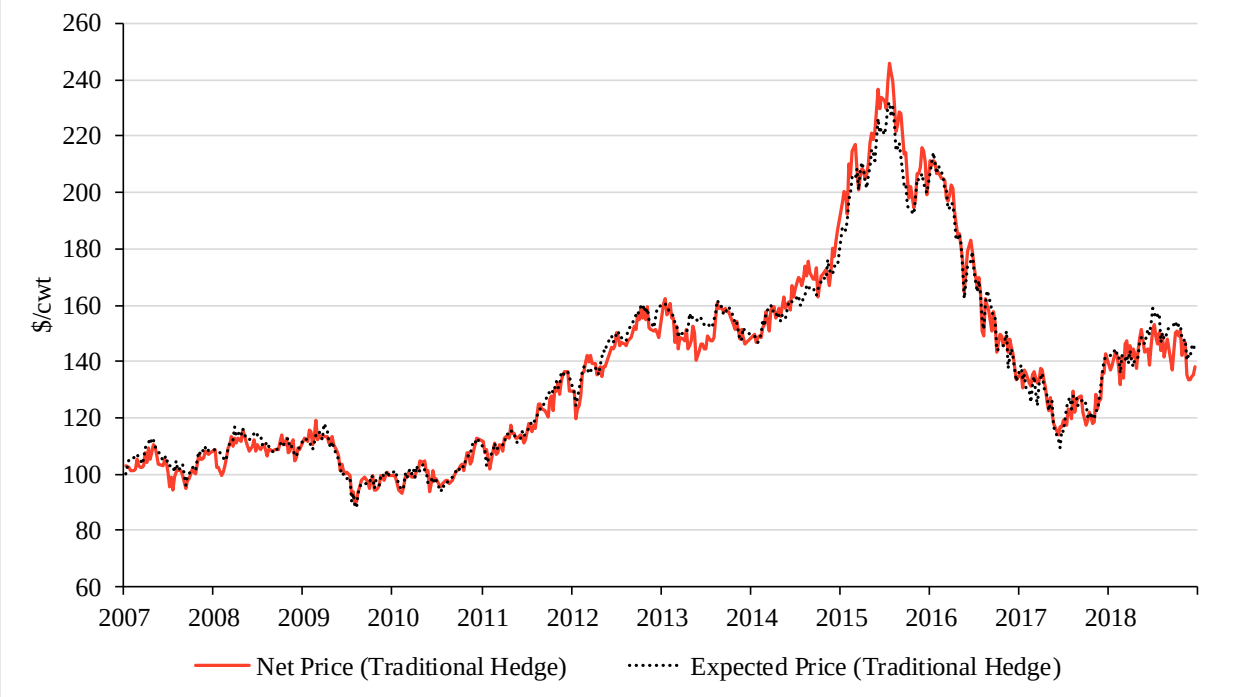
Figure 3. Net Price vs. Expected Price: Scenario 2 (Relevant Futures Expectations)



Data Sources: USDA AMS, Bloomberg

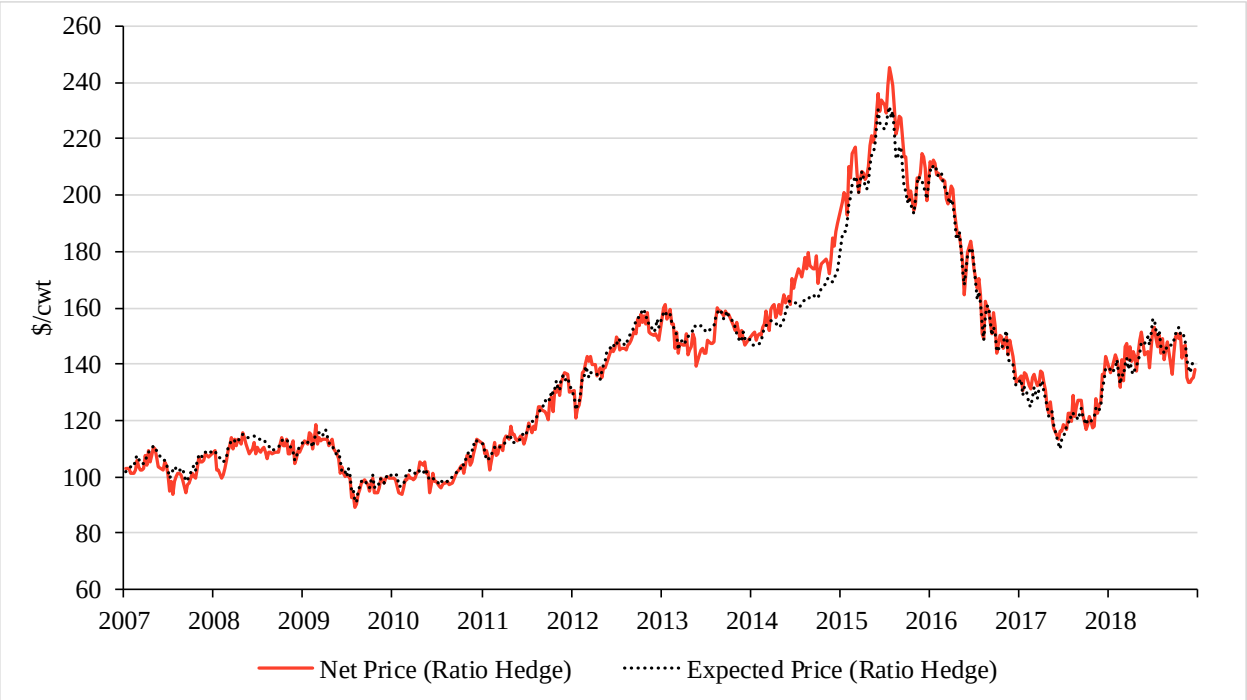
Figures 4 and 5 depict net and expected prices for 700-799 lb. Oklahoma City feeder steers for the two hedged scenarios, traditional hedging and ratio hedging. Notice that when traditional or ratio hedging, net price aligns much more closely to expected price relative to the unhedged scenarios (Figures 2 and 3). In other words, hedging reduces the prediction error, or difference in net and expected prices, compared to not hedging. This suggests hedging results in better predictability of net price, alluded to previously.

Figure 4. Net Price vs. Expected Price: Scenario 3 (Traditional Hedge)



Data Sources: USDA AMS, Bloomberg

Figure 5. Net Price vs. Expected Price: Scenario 4 (Ratio Hedge)



Data Sources: USDA AMS, Bloomberg

Table 3 depicts summary statistics for prediction errors under the four marketing scenarios. On average over the 12-year time frame prediction errors are positive or close to zero, meaning producers (short hedgers) generally receive a higher actual price from feeder cattle transactions than was expected, while buyers (long hedgers) pay a higher actual price than was expected. Of the four marketing scenarios, traditional hedging generally resulted in prediction errors closer to zero on average across all locations (though relevant futures expectations is closest to zero in Joplin). This indicates a traditional hedging strategy yields a more predictable net price relative to other hedging and non-hedging alternatives. Standard deviations of prediction errors show both hedging scenarios result in less variation between net and expected prices compared to the non-hedged scenarios, further illustrating the improved price predictability that hedging provides.

An implication of these results is that beef operations can implement a hedger's calculation of expected price (and especially a traditional hedger's calculation) to inform their production decisions. This allows them to focus instead on operational efficiency with the peace of mind that the expected feeder price they are basing decisions upon will, on average, be nearly the same as what is actually experienced. For instance, a feedlot wishing to buy Salina steers with naïve expectations about price will have, on average, over the course of 2007 through 2018 paid $2.79 per cwt (positive and harmful prediction error) more than was expected. With production decisions likely having been made in advance, this unexpected additional cost may have adverse impacts on the business. Had the feedlot used a traditional hedger's expectation of price, it would have only paid $0.21 per cwt over expectations on average.

Table 3. Summary Statistics of Prediction Errors ($/cwt): January 2007–December 2018

Location	Scenario	Average	St. Dev.	Minimum	Maximum
Joplin	Naïve Expectations	1.69	23.60	-75.09	64.94
	Relevant Futures Expectations	-0.01	20.49	-57.96	62.04
	Traditional Hedge	-0.16	4.87	-25.17	17.09
	Ratio Hedge	0.76	4.92	-21.48	18.62
Oklahoma City	Naïve Expectations	1.38	23.49	-79.46	70.86
	Relevant Futures Expectations	1.00	20.48	-57.60	66.03
	Traditional Hedge	-0.23	4.31	-14.48	15.82
	Ratio Hedge	0.59	4.43	-13.94	16.30
Salina	Naïve Expectations	2.79	23.71	-77.24	77.99
	Relevant Futures Expectations	2.57	20.74	-59.55	71.68
	Traditional Hedge	0.21	4.66	-36.24	15.51
	Ratio Hedge	1.00	4.73	-33.92	18.00

*Using two-sample t-tests, the average prediction error of traditional hedging and ratio hedging was statistically different at the 95% confidence level in both Joplin and Oklahoma City. The average prediction error of traditional hedging and all other scenarios was statistically different in Salina.

Hedging also exhibits a better ability to protect against catastrophic adverse price movements. Note minimum and maximum prediction errors are smaller in magnitude for the hedging scenarios than for the non-hedging scenarios across all locations. For example, the minimum error for Joplin, MO going unhedged with naïve expectations was -$75.09 per cwt, meaning a feeder cattle producer received a cash price $75.09 per cwt below what they had expected. Compare this to the minimum error of -$21.48 per cwt using a ratio hedge. While certainly not ideal, the ability of the producer to survive extreme price movements is much greater using the ratio hedging strategy compared to going unhedged. The same conclusion can be drawn for feeder cattle buyers (long hedgers) by comparing maximum prediction errors across the four marketing scenarios.

Ratio hedging, though still generally outperforming unhedged scenarios in terms of predictability of net price, resulted in higher average prediction errors than did traditional hedging. Recall we are comparing hedging outcomes for animals that meet contract specifications in weight, sex, and location. We expect cash prices for the animals in this study to move nearly one-to-one with futures prices, meaning a traditional hedge and its corresponding calculation of expected price is an appropriate strategy. For cattle that deviate from contract specifications (i.e., weight, sex, location, etc.) and have cash prices that move differently than futures prices, it is possible ratio hedging results in smaller average prediction errors. Additional research could compare results of the four marketing scenarios for specifications of cattle not included in the feeder futures contract.

Considerations

This paper implements market-level data to demonstrate net price impacts of hedging using the feeder cattle futures contract. Though our study indicates risk reduction from hedging using futures compared to going unhedged, several important considerations should be made when designing a risk management strategy. The first such consideration is that our hedge simulations do not take into account commissions or margin

maintenance costs. Commissions alter hedgers' expectations of price, but are also an additional cash outflow that may or may not provide value to the beef operation's risk management strategy. Margin, although recovered after a hedge is lifted, may demand short-term cash outflows to maintain maintenance levels in the event of an adverse movement in futures price. Current maintenance margin requirements are $3,375 per feeder cattle futures contract. Margin requirements are a crucial aspect of a hedging strategy and the ability to maintain a margin account should be assessed.

Another consideration is that, to align with weekly feeder cattle auction data, this study implements weekly average feeder cattle futures prices in assessing hedging outcomes. With current daily price limits and expanded price limits of $5 and $7.50 per cwt, respectively, feeder futures price can fluctuate dramatically within a single trading session. Hedging performance depends on the timing of trade, both when placing and lifting the hedge. Though weekly futures prices are useful in assessing average hedging outcomes over time, futures price and associated performance of an individual hedge will fluctuate more than the weekly price series used in this study.

When discussing basis predictions previously, we briefly mentioned tradeoffs between aggregated and disaggregated data. Aggregated calculations of prices, basis, hedge ratios, etc. are useful when evaluating cash markets that can be thinly traded at times and lack extensive data. However, these measures can be relatively unresponsive to shorter-term market variation and may not reflect the experienced prices or hedging performance for a single market location or an individual lot. Disaggregated data (i.e., market-level, transaction-level) allows for more granular analysis across shorter time horizons, local market conditions, and feeder cattle characteristics. However, such data can be difficult to obtain and, even if accessible, may become progressively more thin if market information is dissected into smaller subcategories. In developing a risk management strategy, hedgers should use the most detailed data available to develop expected prices and basis predictions for their specific situations.

Finally, this study does not analyze hedging outcomes for cattle not meeting feeder futures contract specifications (i.e., heifers, cattle not meeting weight requirements, etc.). Though we do not expect the advantages of hedging over going unhedged to lessen for these cattle, we note that the benefits of ratio hedging over traditional hedging are more likely to be experienced for cattle not matching contract specifications relative to the 700-799 lb. steers analyzed in this study. That is, feeder cattle not meeting contract specifications are more likely to have hedge ratios that differ significantly from 1.0, making a ratio hedge more effective at minimizing price risk than a traditional hedge.

Appendix

Table 1. Joplin 700-799 lb. Feeder Steer Three-Year Average Basis ($/cwt)

Calendar Week	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018
1	-4.94	-	-	-	-	0.33
2	-4.47	-3.16	-0.65	-1.02	-1.17	-1.03
3	-3.85	-4.19	-0.38	1.51	1.54	-1.15
4	-4.19	-3.04	3.19	4.72	5.11	0.78
5	-4.91	-3.66	-2.86	-1.94	-1.02	-0.08
6	-	-0.20	3.16	5.13	5.29	2.28
7	-3.94	-4.22	0.88	1.57	4.13	-0.97
8	-2.61	-3.31	2.52	2.86	5.03	0.34
9	-4.02	-4.72	0.33	2.14	2.53	-1.65
10	-2.62	-	-	-	0.83	0.37
11	-0.55	-0.76	-1.03	-1.36	-1.23	1.16
12	-2.82	-3.26	-3.29	-0.71	-0.89	2.81
13	-6.70	-6.29	-4.89	-1.22	-0.25	-0.34
14	-1.42	-3.00	-2.76	0.73	2.78	0.39
15	-0.90	-1.40	-0.74	0.21	0.68	0.62
16	-	-	-	0.23	1.76	1.91
17	-2.66	-4.63	-4.13	-2.42	-1.78	-1.85
18	-1.08	-4.07	-1.33	-0.42	0.74	0.42
19	-1.81	-2.30	-0.14	0.70	3.18	3.91
20	-	-7.01	-1.13	0.55	-0.13	0.85
21	-11.18	-	-	-	-0.15	-2.26
22	-	-	-	-	-	-
23	-	-	-	3.31	4.67	0.41
24	-8.01	-16.28	-14.68	-9.84	0.88	-0.41
25	-6.04	-3.35	-2.02	1.74	0.93	-1.64
26	-7.14	-2.82	-0.18	1.24	0.15	-1.95
27	-	-7.45	-2.90	-	-	-
28	-7.14	-6.91	-3.06	1.01	-0.66	-2.61
29	-4.67	-4.70	-4.48	-3.83	-3.99	-5.48
30	-7.41	-10.39	-5.46	-4.31	-0.96	-2.58
31	-10.91	-7.81	-5.49	-3.44	-4.09	-2.03
32	-6.83	-3.15	-1.16	1.12	1.58	0.96
33	-3.94	-1.61	0.95	2.45	0.71	-0.12
34	-3.72	-2.25	2.79	4.56	2.45	-1.02
35	-4.36	-1.89	2.27	1.44	2.21	-0.77
36	-	-	-	-	-	-
37	-4.96	-1.84	-	-	-	-0.17

Table 1. Joplin 700-799 lb. Feeder Steer Three-Year Average Basis ($/cwt) continued

Calendar Week	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018
38	-4.91	-2.07	0.44	1.93	1.00	-0.78
39	-6.48	-3.17	0.71	3.69	3.03	-2.25
40	-5.28	-4.98	-2.49	-2.24	-0.03	-0.13
41	-1.77	-4.02	-6.61	-5.60	-2.13	1.87
42	-	-	-2.29	-0.46	2.17	-1.21
43	-4.38	-3.31	-3.31	-0.34	-1.59	-1.76
44	-4.16	-3.29	-3.65	-5.60	-4.92	-4.92
45	-3.93	-3.04	-4.49	-4.71	-3.50	-2.29
46	-2.71	-4.30	-3.86	-4.63	-1.46	-3.00
47	-3.12	-4.09	-0.68	1.65	4.11	0.13
48	-3.93	-2.06	0.90	4.28	2.56	1.26
49	-3.61	-3.77	-3.06	-2.14	0.53	0.58
50	-4.06	-5.23	-3.10	-1.88	1.29	-1.03
51	-7.10	-5.63	-4.88	-2.67	-0.14	0.09
52	-	-	-	-	-	-

Table 2. Oklahoma City 700-799 lb. Feeder Steer Three-Year Average Basis ($/cwt)

Calendar Week	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018
1	-	-	-	-	-	-
2	-1.18	-1.16	1.62	2.45	2.79	-0.56
3	-1.29	-2.41	3.02	3.46	3.89	0.39
4	-2.88	-3.94	0.52	2.11	4.67	2.61
5	-4.31	-3.35	-2.42	-1.96	-0.02	0.07
6	-	-2.32	2.36	2.61	5.07	1.73
7	-1.96	-2.54	-0.82	-0.94	1.68	-0.36
8	-0.27	-1.58	1.19	1.64	4.52	3.19
9	-4.97	-5.14	-2.21	1.44	4.08	0.59
10	-0.59	0.15	-0.86	-1.72	-0.43	1.55
11	-0.34	-3.22	-5.20	-4.92	-0.99	1.35
12	-0.21	-0.37	-2.47	-1.01	-0.21	1.51
13	-2.43	-1.51	-2.81	-0.34	1.04	3.25
14	-0.95	-1.00	-1.71	0.86	1.41	2.76
15	-1.39	-2.57	-1.98	-1.35	0.61	3.38
16	-3.98	-3.78	-3.21	0.34	1.71	2.52
17	-1.19	-1.65	-1.37	1.40	0.45	-1.44
18	-3.77	-5.05	-2.42	-0.48	0.23	0.02
19	-1.96	-2.15	0.33	1.28	2.14	2.10
20	-4.20	-3.44	-1.26	1.50	-0.20	0.31
21	-8.27	-9.51	-6.96	-2.92	-2.13	-3.96
22	-	-	-	-	-	-
23	-6.03	-8.05	-5.56	-1.30	1.02	-1.72
24	-5.94	-8.31	-6.77	-2.82	1.91	-1.22
25	-6.48	-5.13	-1.87	1.00	1.82	-2.08
26	-6.23	-6.67	-3.49	-0.33	2.35	-1.07
27	-	-3.88	-3.77	-	-	-
28	-3.08	-1.97	1.17	4.16	2.56	-1.13
29	-5.52	-3.34	1.89	5.69	5.51	0.36
30	-6.52	-4.54	0.87	4.38	4.29	-0.41
31	-4.83	-3.26	-0.28	1.06	-0.29	-3.35
32	-4.57	-1.17	2.06	3.63	3.60	2.65
33	-1.61	-1.51	1.80	3.88	3.08	0.08
34	-2.94	-0.61	3.61	4.30	2.80	0.07
35	-3.46	-2.46	1.96	2.27	3.53	0.71
36	-	-	-	-	-	-
37	-3.88	-2.38	-	-	-	-3.28

Table 2. Oklahoma City 700-799 lb. Feeder Steer Three-Year Average Basis ($/cwt) continued

Calendar Week	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018
38	-5.16	-3.40	1.52	3.70	3.65	-0.85
39	-5.80	-1.44	2.72	4.80	2.50	-1.25
40	-3.55	-5.03	-1.87	-1.31	-0.14	-2.14
41	-	-	-	-1.97	-0.52	-0.79
42	-	-	-	0.63	1.09	0.20
43	-3.89	-3.97	-3.05	-2.32	-2.96	-5.38
44	-5.18	-3.89	-3.82	-3.33	-4.03	-4.21
45	-0.37	-2.17	-2.26	-3.41	-0.70	-1.14
46	-3.89	-5.78	-5.28	-4.12	-2.22	-3.52
47	-3.02	-2.86	-0.84	1.23	2.39	0.01
48	-4.30	-1.85	1.78	4.96	3.52	-0.41
49	-3.15	-3.42	0.72	3.42	4.72	0.11
50	-	-	-	4.75	3.35	-1.27
51	-5.77	-2.01	-0.38	1.41	0.13	-0.84
52	-	-	-	-	-	-

Table 3. Salina 700-799 lb. Feeder Steer Three-Year Average Basis ($/cwt)

Calendar Week	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018
1	-2.27	-	-	-	-	5.81
2	1.00	0.51	2.18	1.84	1.68	0.08
3	-3.07	-2.66	-4.74	-2.20	-1.08	3.31
4	-2.54	-2.20	0.22	-0.65	-0.77	-0.53
5	-3.63	-3.78	0.18	2.36	4.98	2.65
6	0.49	-2.28	-1.42	1.54	5.68	6.15
7	-1.52	-2.54	1.68	3.49	5.41	2.41
8	-	-	-	2.15	4.30	1.09
9	-1.09	-0.15	0.39	2.70	4.31	1.76
10	-1.20	-0.15	1.05	2.57	4.25	1.56
11	-2.45	-1.72	0.84	2.26	3.94	0.37
12	-0.06	0.38	4.52	6.07	6.73	3.69
13	-0.61	1.37	1.39	0.40	2.31	4.68
14	-1.03	-1.66	-1.10	0.24	2.98	8.80
15	-1.29	-1.80	-1.31	0.18	3.28	3.92
16	-3.46	-5.04	-2.95	1.04	4.30	1.73
17	-1.32	-2.34	2.63	3.24	9.09	6.73
18	-1.20	-1.16	0.62	1.01	3.13	4.20
19	-4.70	-3.46	-2.17	0.67	1.09	5.05
20	-4.63	-3.96	-1.78	1.03	1.60	-1.11
21	-6.34	-7.24	-2.94	0.99	2.07	-1.71
22	-	-	-	-	-	-
23	-	-	-	-	-	-
24	-	-	-	-	-	-
25	-	-	-	-	-	-
26	-	-	-	-	-	-
27	-	-	-	-	-	-
28	-4.98	-5.51	-0.72	4.07	7.42	4.62
29	-2.21	2.63	7.53	10.13	7.49	4.49
30	-1.99	1.37	4.26	7.96	6.79	5.72
31	-0.08	1.41	3.57	5.90	5.02	3.87
32	0.15	1.41	4.25	5.27	5.32	5.21
33	-1.56	1.53	3.36	4.48	3.84	6.09
34	-0.69	2.09	5.39	6.55	6.62	6.44
35	-1.68	1.72	7.16	6.40	6.07	4.21
36	-0.80	0.20	2.83	1.06	2.71	0.98
37	-1.50	-0.63	3.30	3.13	5.80	4.75

Table 3. Salina 700-799 lb. Feeder Steer Three-Year Average Basis ($/cwt) continued

Calendar Week	2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018
38	-3.43	-2.23	0.15	2.94	5.67	4.16
39	-3.38	-0.93	1.66	3.86	5.59	4.86
40	0.98	2.81	-1.12	-0.97	2.52	4.64
41	0.25	0.96	-0.04	-0.99	0.89	-1.75
42	-3.72	-2.33	1.50	4.18	4.80	1.19
43	-3.61	-2.98	-1.14	-0.37	0.91	-0.95
44	-1.82	-2.00	0.51	0.66	1.05	-2.09
45	-2.44	-2.70	-2.00	-2.19	0.78	-0.88
46	-2.51	-2.22	-1.83	-0.94	0.14	-0.87
47	-	-	2.42	-	-	-
48	-	-	-	-	-	-0.48
49	0.59	0.42	0.29	3.72	5.64	3.59
50	-1.93	-2.61	-1.66	1.03	2.65	1.54
51	-3.03	0.51	-0.60	1.08	1.58	1.93
52	-	-	-	-	-	-

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