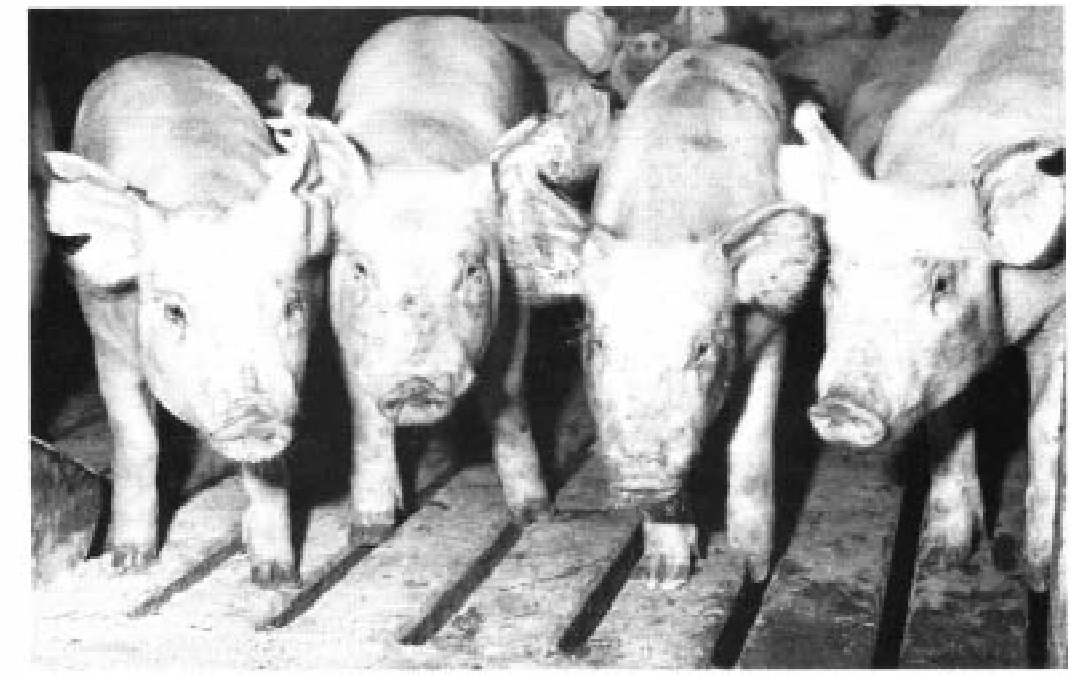
ISSN 0097-0484



Frequency of Profitable Hedging Opportunities and Improved Returns for Feeder Pig Finishers, 1980-1988

Bulletin 657

Agricultural Experiment Station • Kansas State University, Manhattan
Walter R. Woods, Director

FREQUENCY OF PROFITABLE HEDGING OPPORTUNITIES AND IMPROVED RETURNS FOR FEEDER PIG FINISHERS, 1980-1988[1]

Ted C. Schroeder[2]

ABSTRACT

This study examines the potential profitable hedging opportunities that the live hog futures market has offered feeder pig finishers over the 1980 through 1988 period. Results indicate that profitable hedging opportunities were frequent. However, high frequencies of profitable hedging opportunities were not generally sustained beyond 6 months. Opportunities to improve returns by hedging relative to cash marketing were often present, although not always at a profit. Overall, the results suggest that, although not a panacea, the live hog futures market is a valuable tool for a feeder pig finisher to consider in a marketing plan.

[1] Contribution no. 90-483-B from the Kansas Agricultural Experiment Station.

[2] Assistant Professor, Department of Agricultural Economics, Kansas State University, Manhattan, KS 66506-4011. The author acknowledges the helpful comments of Jim Mintert and Bryan Schurle on an earlier draft of this paper.

CONTENTS

INTRODUCTION

The futures market is a pricing alternative that livestock producers can use in their marketing scheme. However, frequent controversy has surrounded the usefulness and economic value of futures markets. Questions have arisen about the impact of the futures price on the cash price, the ability of the futures price to adjust to new information, the usefulness of the futures market to producers, and the possible manipulation of futures markets by large traders. This study focused on the economic value of the futures market to producers by examining recent profit opportunities available to hog producers through hedging.

It is often argued that the primary purpose of hedging is to reduce price risk. Several studies have empirically verified that routine or selective hedging can significantly reduce price risk relative to cash marketing (e.g., Schroeder and Hayenga; Davis and Franzmann; Erickson; Spahr and Sawaya; Holland et al.). However, several other studies have more explicitly recognized that hedging affects both risk and return and that a measure of hedging performance requires the incorporation of both components (Nelson and Collins; Berck; Elam and Vaught). Others have promoted a quite different role of futures markets, arguing that they act as a form of monetary exchange to facilitate borrowing and lending of commodities (Telser; Williams).

The purpose of this study was to examine the potential profitable hedging opportunities that the live hog futures market has offered feeder pig finishers in recent years. In particular, the objectives of this study were: 1) to determine the frequency of profitable short hedging opportunities in recent years for Corn Belt feeder pig finishers and 2) to compare the profit opportunities available to short hedgers in the live hog futures market with the cash market returns. Though this analysis did not explicitly address price variability, it considered an issue often of more interest to producers, i.e., how frequently hedging feeder pigs could have guaranteed a profit or a higher return than cash marketing.

Hayenga et al. examined the frequency of profit opportunities available to cattle and hog producers during the 1972 through 1981 and 1974 through 1981 periods, respectively. This study used data from 1980 through 1988 to examine the profitable hedging opportunities that have been present in more recent years for hog producers.

PROCEDURE

Computer simulation was used to compare futures market revenues with costs of production and cash marketing profits. Both ex ante and ex post analyses were conducted. The ex ante analysis used expectations about basis and production costs to infer expected profit opportunities. The ex post analysis was a summary of actual hedging profit opportunities using the actual cost of production estimates and the actual basis. This dual analysis made possible an examination of whether profitable hedging expectations resulted in actual profits. Basis is defined here as futures price minus cash price. The analysis included hogs placed on feed from January 1980 through December 1988. This period covers approximately two hog cycles, so any biases attributable to cyclical hog price influences should be minimal. This analysis should provide a retrospective picture of the frequency and magnitude of recent profit opportunities available to feeder pig finishers using the live hog futures market.

A 4-month feeding period, typical of feeder pig finishing, was used. It was assumed that each futures market trading day during the feeding period could be used to place a short hedge, with the exception of the first 2 weeks of the placement month. No hedges were allowed to be placed in the marketing month. The midpoint of the daily futures price range was used to represent the price at which the typical hedger could have placed a hedge. The assumed cash marketing price was the average cash price during the third week of the selling month.

Three types of simulations were conducted: 1) an ex ante analysis, in which the expected basis (the most recent 5-year moving average basis for the same month) and the expected cost of production (based upon a regression model explained later in the Production and Marketing Costs section) were used to determine whether a hedge might be profitable; 2) an ex post analysis of the frequency of hedging profits using the actual basis and actual costs of production; and 3) an ex post examination of the frequency of days that the futures market offered improved returns from hedging relative to cash marketing. The basic computations for these simulations are as follows:

Expected Profit

$$(1)\ (FP - EB - HC) \times 2.20 - EPC = EP$$

Actual Profit

$$(2)\ (FP - B - HC) \times 2.20 - PC = AP$$

Improved Return

$$(3)\ AP - CP = IR$$

where,

FP = current price of the hog futures contract expiring just after the delivery period ($/cwt),
EB = the expected delivery period basis, average of previous 5 years ($/cwt),
HC = hedging commissions, assumed to be $60/contract, or $.20/cwt,
EPC = expected cost of production and marketing ($/head),
EP = expected profit from hedging ($/head),
B = actual delivery basis ($/cwt),
PC = actual cost of production and marketing ($/cwt),
AP = actual profit from hedging ($/cwt),
CP = cash marketing profits ($/head), and
IR = improved returns from hedging ($/head).

PRODUCTION AND MARKETING COSTS

Representative Corn Belt feeder pig finishing costs of production were taken from several issues of the U.S. Department of Agriculture's (USDA) Livestock and Poultry Outlook and Situation Report. The feeder pigs are assumed to be purchased at a weight of 40-50 pounds, fed for 4 months, and marketed at a weight of 220 pounds. The per head estimated costs of production include the feeder pig purchase price, corn cost (11 bushel), protein supplement cost (130 pounds), charge for labor and management (1.3 hours), veterinary and medicine costs, interest charge, death loss (4% of purchase value), transportation (100 miles), marketing cost, and other miscellaneous and indirect costs.

The USDA cost of production estimates have several important characteristics worth noting. First, the USDA budgets use average feeder pig prices paid in Southern Missouri. Although average prices of feeder pigs in Kansas may differ from those in Missouri during any given period, over time they are similar and highly correlated. Sorghum rather than corn may be fed in Kansas, but feed costs of the two grains are very similar. The USDA budgets also assume a hog marketing weight of 220 pounds, which is lighter than most current slaughter hog marketing weights. This results in cost of production and revenue estimates that are probably understated relative to current hog finishers. Although transportation distance would be more than 100 miles in some parts of Kansas, this figure is reasonable for use in the analysis. Finally, the estimated budgets are intended only to provide a relative indication of hog finishing profits over time. Individual operations should make expense and revenue adjustments to the USDA budgets for management, production level, and locality of operation. The budgets are developed for feeder pig finishers; however, costs of production from feeder weight to slaughtering would be similar for farrow to finish operations. Despite these limitations of the USDA budgets, their use in this analysis is justified in that they are among the most comprehensive, most widely available, and most frequently referenced feeder pig finishing budgets published.

The expected costs of production were estimated assuming that the cost of feed (corn and protein) would be the most uncertain when feeder pigs were purchased. The feeder pig cost would be known, and the other costs would not be expected to vary much from one feeding period to the next. Thus, the expected feeding costs would be a function of the expected costs of grain and protein. Feed cost expectations were assumed to be a function of the current prices of corn and soybean meal in the nearby futures contracts. Thus, the expected costs of production at the time of placement were modeled as:

$$(4)\quad EPC_{t+4} - PFDR_t = b_0 + b_1 EPCORN_t + b_2 EPSBM_t + b_3 OCOST_t + b_4 FEB + b_5 MAR + b_6 APR + b_7 MAY + b_8 JUN + b_9 JUL + b_{10} AUG + b_{11} SEP + b_{12} OCT + b_{13} NOV + b_{14} DEC + e_t$$

where,

t = the placement month, t+4 = the selling month,

EPC = the expected cost of production ($/head),

PFDR = the purchase cost of the feeder pig finished in time t+4 ($/head),

EPCORN = the expected cost of corn, modeled as the corn futures price ($/bu) for the contract maturing in the nearest month after the placement month, converted to per head price by multiplying by 11 bushel ($/head),

EPSBM = the expected cost of soybean meal, modeled as the soybean meal futures price ($/ton) for the contract maturing in the nearest month after placement, converted to per head price by multiplying by 130 pounds ($/head),

OCOST = the remaining costs of production (actual cost–feeder pig purchase cost–corn cost–soybean meal cost = OCOST) from the most recently completed month, i.e., the last lot finished ($/head),

FEB, MAR, . . ., DEC = monthly dummy variables equal to 1 in that month and equal to 0 otherwise, used to allow for seasonal differences in the relationship,

e = a random error term, and

$b_0, b_1, \ldots, b_{14}$ are parameters to be estimated.

The model for expected cost of production was initially estimated using monthly data for hogs finished from 1975 through 1979. This model was used to predict finishing costs for hogs placed on feed during 1980. The model was re-estimated for each year through 1987 by dropping the oldest year's data and adding the most recent year's costs to the estimation set. Thus, the model was estimated each year using data from only the most recent 5 years. The expected cost of production was assumed to be unchanged for each lot of hogs throughout the 4-month feeding period. Though one may argue that the typical producer could update estimates for these costs, the fact that corn and soybean meal costs could be hedged at the time of placement could conceivably make this cost known up to the point of basis risk. In addition, given the stability of the other nonfeed cost estimates from one month to the next, the extra work of updating these cost expectations probably outweighs any added accuracy.

The parameter estimates of the cost of production model for each period are reported in Table 1. The cost forecasts were generally close to the actual values. The out-of-sample forecast, root mean squared error of the expected cost of production models was $2.62/head over the 1980 through 1988 period. A comparison of the actual and out-of-sample predicted costs of production are illustrated in Figure 1. As can be observed, the model predictions often coincide with the actual costs. However, occasional errors in the predictions are as large as $5/head. For example, the predicted costs underestimate the actual values by approximately $5/head during parts of early 1981, late 1982, and late 1988. The performance of the cost expectations model most likely would be less accurate for any individual hog producer whose costs of production are less predictable than the "typical" costs estimated by the USDA. The actual total cost of production estimates used in this study are reported in Table 2.

Table 1. Estimated Models Used to Forecast Costs of Feeder Pig Finishing in the Corn Belt (4-Month Feeding Period)

	Estimation Period								
Item	1975 to 1979	1976 to 1980	1977 to 1981	1978 to 1982	1979 to 1983	1980 to 1984	1981 to 1985	1982 to 1986	1983 to 1987
Intercept	11.67*	1.14	5.38	-0.15	-4.43	-5.74	-8.21	13.71	23.77*
	(2.45)[a]	(0.30)	(1.93)	(-0.05)	(-1.13)	(-1.15)	(-0.79)	(1.61)	(2.92)
$OCOST_{t-4}$[b]	1.06*	1.22*	0.91*	1.34*	1.48*	1.50*	1.60*	0.74*	0.38
	(5.49)	(5.89)	(5.61)	(14.03)	(14.06)	(10.82)	(4.97)	(2.51)	(1.33)
$EPSBM_{t-4}$	0.60*	0.80*	0.55*	0.96*	1.03*	0.67	0.99*	0.91*	0.77*
	(4.46)	(5.10)	(3.02)	(2.81)	(2.90)	(1.97)	(4.11)	(5.17)	(5.56)
$EPCORN_{t-4}$	0.75*	0.95*	1.10*	0.82*	0.84*	1.02*	0.89*	0.96*	1.02*
	(8.71)	(10.05)	(11.77)	(7.52)	(7.47)	(8.09)	(7.67)	(16.10)	(25.42)
Feb.	-1.27	-1.30	0.38	0.63	-0.01	-0.48	-0.35	-1.37	-2.12*
	(0.92)	(-0.93)	(0.35)	(0.52)	(-0.01)	(-0.36)	(-0.28)	(-1.37)	(-2.20)
Mar.	-0.51	0.35	1.81	1.61	1.51	0.72	0.79	-0.20	-1.55
	(-0.37)	(0.25)	(1.62)	(1.33)	(1.22)	(0.54)	(0.61)	(-0.20)	(-1.58)
Apr.	0.48	0.12	0.46	1.06	1.28	0.28	0.93	-0.95	-2.44*
	(0.35)	(0.08)	(0.41)	(0.87)	(1.03)	(0.21)	(0.72)	(-0.93)	(-2.51)
May	0.85	1.31	1.35	1.79	1.91	2.05	2.32	0.89	-0.03
	(0.60)	(0.91)	(1.17)	(1.48)	(1.52)	(1.51)	(1.80)	(0.87)	(-0.03)
Jun.	1.95	2.27	2.76*	3.15*	3.14*	2.94*	2.95*	1.01	0.28
	(1.39)	(1.60)	(2.39)	(2.61)	(2.52)	(2.17)	(2.30)	(0.99)	(0.29)
Jul.	2.49	2.28	2.65*	3.08*	2.56*	3.09*	3.71*	1.96	1.24
	(1.77)	(1.60)	(2.28)	(2.55)	(2.06)	(2.28)	(2.85)	(1.87)	(1.26)
Aug.	3.40*	2.62	3.76*	4.31*	4.19*	3.89*	5.00*	2.47*	1.41
	(2.41)	(1.86)	(3.31)	(3.60)	(3.36)	(2.88)	(3.81)	(2.31)	(1.41)
Sep.	2.84	2.18	2.17	2.99	2.77*	2.32	2.70*	1.50	0.64
	(1.99)	(1.52)	(1.87)	(2.48)	(2.23)	(1.72)	(2.09)	(1.42)	(0.64)
Oct.	3.09*	2.24	2.41*	3.35*	3.28*	2.39	2.61*	0.93	-0.40
	(2.19)	(1.58)	(2.11)	(2.79)	(2.63)	(1.78)	(2.03)	(0.89)	(-0.41)
Nov.	1.41	0.42	0.84	2.24	2.94*	2.58	2.53	1.89	-0.72
	(1.01)	(0.30)	(0.75)	(1.88)	(2.37)	(1.92)	(2.01)	(1.87)	(0.75)
Dec.	-0.51	-1.55	-0.55	0.38	1.53	2.13	1.79	1.61	1.20
	(-0.37)	(-1.12)	(-0.49)	(0.32)	(1.24)	(1.59)	(1.44)	(1.61)	(1.25)
R-Squared	.76	.91	.97	.95	.93	.90	.91	.96	.97
RMSE ($/hd)	2.17	2.20	1.76	1.88	1.94	2.10	1.95	1.58	1.51
Durbin-Watson	1.14	1.18	1.21	0.97	1.15	0.88	0.80	0.99	1.05

* Estimated coefficient is significantly different from zero at the .05 level.

[a] t-statistics are in parentheses beneath respective coefficients.

[b] OCOST is all nonfeed costs excluding the feeder pig purchase price; EPSBM and EPCORN are the expected soybean meal cost and corn cost, respectively, modeled as the nearby futures prices times the quantity to be fed per head.

Figure 1.
Comparison of Actual and Predicted Cost of Finishing Feeder Pigs (Placed on Feed Jan. 1980 - Dec. 1988)

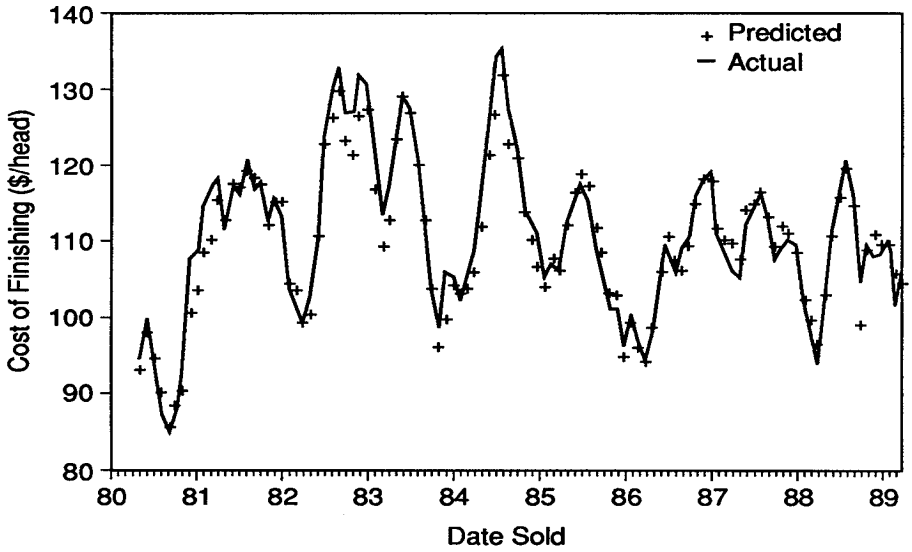


Table 2. Cost of Production Estimates for Feeder Pig Finishing in the Corn Belt 1980-1988[a]

Month Placed on Feed	Month Sold	Year Placed on Feed								
		1980	1981	1982	1983	1984	1985	1986	1987	1988
		($/head)								
Jan.	May	94.89	111.43	103.23	124.37	115.41	112.47	98.01	105.05	102.13
Feb.	June	100.16	117.66	111.31	129.22	124.70	115.32	104.62	111.78	110.97
Mar.	July	94.10	115.94	124.72	127.41	134.12	117.69	109.23	113.86	115.25
Apr.	Aug.	87.23	121.18	130.13	121.60	135.32	114.96	105.48	116.39	120.69
May	Sep.	84.89	116.97	133.04	113.32	126.52	109.21	108.74	113.27	115.78
Jun.	Oct.	87.99	117.99	127.04	103.35	122.37	105.64	110.30	107.39	104.27
Jul.	Nov.	93.90	112.68	127.03	98.39	114.80	101.05	115.03	108.95	108.90
Aug.	Dec.	107.55	115.85	131.99	105.89	112.14	101.14	118.11	109.94	107.73
Sep.	Jan.	109.02	112.74	130.41	105.38	110.35	96.02	119.02	109.22	108.20
Oct.	Feb.	114.64	104.94	120.56	102.06	105.26	100.84	110.77	102.53	109.94
Nov.	Mar.	116.94	101.56	113.35	105.05	107.15	97.11	108.61	97.99	100.75
Dec.	Apr.	118.58	99.23	117.19	108.57	105.81	94.47	106.56	93.85	107.50

[a] Per head costs include feeder pig purchase price; corn (11 bushel); soybean meal (130 pounds); labor and management (1.3 hours); vet. and medicine; interest; power, equipment, fuel, shelter and depreciation; death loss (4% of purchase cost); transportation (100 miles); marketing expenses; and miscel. and indirect costs.

Source: U.S. Dept. of Agriculture, ERS, Livestock and Poultry Outlook and Situation Report, Various Issues 1980 - 1989.

RESULTS

Profit Opportunities

The percent of trading days offering an expected profit opportunity for feeder pigs placed on feed over the January 1980 through December 1988 period is reported in Table 3. The numbers in this table represent the percentage of trading days that the typical producer could have hedged an expected (at the time of hedge placement) profit. For example, in 1987 for feeder pigs purchased in February, 20% of the trading days during the ensuing 4-month feeding period offered an expected profit opportunity by hedging the finished hogs. The percentage of trading days that actually ended up offering a profit (ex post) over this period is summarized in Table 4. The distributions of the expected and actual profit opportunities are illustrated in Figure 2.

For comparison purposes with the distributions of hedging profits, the average cash marketing return over the 1980 through 1988 period was a loss of $3.63/head, the standard deviation was $14.60/head, and the minimum and maximum cash profits were -$30.59/head and 36.97/head, respectively. The trend and distribution of actual cash market profits from finishing feeder pigs are shown in Figure 3. As can be observed, profitability was volatile over this period, with profit changes as large as $50/head occurring frequently within a 6-month period or less. The distribution of profits also confirms the volatility present, as well as suggesting a skewness of profits towards negative values.

As can be seen in Table 4, frequent profitable hedging opportunities existed, especially during the mid-1980 through 1982 period. In 1980 for example, more than 60% of the trading days during each feeding period for hogs placed on feed during May, July, August, and September offered profitable hedging opportunities. Similarly, more than 70% of the trading days for each feeding period for hogs placed on feed in December 1981, January, February, and March 1982 offered profitable hedging opportunities. However, the profitable hedging opportunities do not appear to sustain high frequency levels for periods beyond 6 months. In addition, periods of no profitable hedging opportunities (paralleling periods when finishing feeder pigs was not profitable) are also common. For example, as a result of high feed costs together with relatively low slaughter hog prices, very little opportunity to hedge hogs profitably existed throughout most of 1988. This also contributed to the losses observed for hogs sold in the cash market (Figure 3).

These results differ somewhat from those of Hayenga et al. for the two years of overlap between the two studies and suggest a gloomier profit picture during 1980 and 1981. The primary reason for the differences is the greater cost of production figures used in this study, including charges for management. Costs of production used by Hayenga et al. did not include a return to management. For example, for hogs placed on feed in 1980, the charges for labor and management used here are $8.63/head, whereas the labor charges used by Hayenga et al. were $2.70/head. The cost estimates used in this study also include a cash marketing charge for the finished hogs in addition to transportation costs; Hayenga et al. did not consider an explicit cash marketing fee.

The percent of expected profit opportunities that resulted in actual profits is reported in Table 5. This table provides a measure of how close the 5-year average basis and the expected costs of production were to the actual values and also provides an estimate of how many of the expected profit opportunities that a hedger could have placed would have been profitable. The majority of the expected profit opportunities resulted in actual profit opportunities. In only a few instances did the percent of expected profit opportunities that were actually profitable drop below 70%. The instances when it did drop below 70% generally correspond to periods when very few expected profitable hedging opportunities were present.

The results reported in Table 5 can be further evaluated by examining more closely what factors contribute to the instances where the expected profit opportunities do not result in actual profits. These cases can be attributed to errors in either cost of production or basis expectations. As discussed earlier, variations occur between the actual and predicted cost of production estimates (Fig. 1). For any observation in which the actual cost of production is greater than the predicted, the expected profit opportunity from placing a hedge will be greater than the realized profit from the hedge (all else constant). Similarly, if the expected cost of production is greater than the actual by an amount large enough to suggest that hedging would result in a loss when actually it would not, a profitable hedging opportunity is foregone because it is not anticipated to be profitable. The earlier case results in an expected profit opportunity not being profitable, indicated by a smaller number in Table 5. The latter case results in no profit opportunity being expected, indicated by a smaller number in Table 3.

An error in basis expectations is the second factor contributing to differences between expected and actual profits. A comparison of the 5-year moving average basis, used as the basis predictor, and the actual basis is shown in Figure 4. Analogously to the cost of production estimates, any predicted basis value that is greater than the actual will result in a lower expected profit than actual, reducing the values in Table 3. Any predicted basis less than the actual results in reducing the values in Table 5. As can be seen by comparing Figures 1 and 4, the 5-year average basis does not predict the actual basis as well (in a relative percentage sense) as the cost of production estimates predict its actual value. The predicted basis is quite often in error by as much as $2/cwt to $3/cwt and more. For each $1/cwt in which the predicted basis is in error, the effect on net profits is $2.20/head. Thus, an unpredictable basis can be hazardous to hedgers.

These comparisons of the relative predictability of costs of production and basis risk and their impacts suggest a reason why more feeder pig finishers do not hedge, i.e., the difficulty in predicting basis. This indicates that more work is necessary in investigating what factors impact basis and in developing models to predict basis. It should be pointed out that these comparisons between basis risk and cost of production risk are somewhat distorted in that rates of gain, death losses, and animal efficiency are all held constant in the cost of production estimates, which probably results in their variability being understated. However, this does not negate the impacts of basis risk.

Table 3. Percent of Trading Days Offering an Expected Profit Opportunity Using Live Hog Futures (Jan. 1980-Dec. 1988, 4-Month Feeding Period)

Month Placed on Feed	Year Placed on Feed								
	1980	1981	1982	1983	1984	1985	1986	1987	1988
Jan.	0	7	87	0	42	0	0	12	29
Feb.	0	0	68	0	0	0	0	20	17
Mar.	0	39	84	0	43	0	15	43	25
Apr.	35	49	93	0	9	0	42	53	6
May	75	42	53	0	36	0	63	21	0
Jun.	92	29	91	0	15	0	88	69	24
Jul.	94	40	78	1	0	1	30	0	0
Aug.	77	8	17	11	4	9	19	0	0
Sep.	95	7	7	21	63	75	5	0	0
Oct.	62	45	96	51	92	36	23	15	0
Nov.	47	28	96	50	19	0	0	28	0
Dec.	9	72	76	30	31	1	0	71	0

Table 4. Percent of Trading Days Resulting in an Actual Profit Using Live Hog Futures (Jan. 1980-Dec. 1988, 4-Month Feeding Period)

Month Placed on Feed	Year Placed on Feed								
	1980	1981	1982	1983	1984	1985	1986	1987	1988
Jan.	0	0	80	0	0	0	23	25	12
Feb.	0	0	71	0	0	0	13	39	0
Mar.	0	29	84	0	0	0	43	66	28
Apr.	35	33	46	0	0	0	70	79	0
May	76	24	34	0	31	8	66	63	0
Jun.	20	4	86	29	9	7	90	97	0
Jul.	65	7	34	1	0	1	92	0	0
Aug.	66	0	6	7	4	18	64	0	0
Sep.	78	7	7	13	50	84	7	0	0
Oct.	34	40	95	56	90	87	52	13	0
Nov.	15	41	96	33	16	5	4	11	0
Dec.	1	72	66	3	24	25	18	62	0

Table 5. Percent of Expected Profit Opportunities that Resulted in Actual Profits (Jan. 1980-Dec. 1988, 4-Month Feeding Period)

Month Placed on Feed	Year Placed on Feed								
	1980	1981	1982	1983	1984	1985	1986	1987	1988
Jan.	– [a]	0	92	–	0	–	–	100	41
Feb.	–	–	100	–	–	–	–	100	0
Mar.	–	73	100	–	0	–	100	100	100
Apr.	100	66	49	–	0	–	100	100	0
May	100	56	63	–	86	–	100	100	–
Jun.	100	14	94	–	64	–	100	100	0
Jul.	70	16	44	100	–	100	100	–	–
Aug.	12	0	35	64	100	100	100	–	–
Sep.	82	100	100	63	79	100	100	–	–
Oct.	54	88	99	100	97	100	100	91	–
Nov.	31	100	100	66	86	–	–	38	–
Dec.	14	100	86	9	78	100	–	87	–

[a]No expected profit opportunities were present.

Table 6. Percent of Trading Days Offering Improved Returns by Hedging Relative to Cash Marketing (Jan. 1980-Dec. 1988, 4-Month Feeding Period)

Month Placed on Feed	Year Placed on Feed								
	1980	1981	1982	1983	1984	1985	1986	1987	1988
Jan.	90	68	0	95	37	97	0	0	0
Feb.	9	0	11	92	16	12	0	0	5
Mar.	0	34	34	77	74	71	1	1	96
Apr.	0	74	0	0	90	94	0	4	60
May	0	53	14	33	97	74	15	38	100
Jun.	20	96	88	97	97	22	81	97	100
Jul.	31	97	95	80	10	5	28	99	89
Aug.	66	79	45	3	0	3	75	59	5
Sep.	95	61	16	100	59	55	96	0	81
Oct.	83	4	16	51	78	97	66	8	81
Nov.	95	0	96	25	95	58	0	30	53
Dec.	72	0	97	12	96	76	0	71	97

Opportunities for Improved Returns by Hedging

Perhaps more important to the hedger than profit opportunities are the opportunities for receiving improved returns by hedging relative to cash marketing. When the futures market is offering a profit, the cash market may be offering even higher profits. On the other hand, when the futures market is not offering a profit, a more severe loss may result in the cash market. The percentage of trading days that offered improved returns relative to the cash market is reported in Table 6. As can be seen, for at least some trading days, during the majority of the feeding periods (89 of 108) over the 1980 through 1988 placement dates, the futures market offered improved returns relative to the cash market. In addition, over several periods (45 of 108), the percentage of trading days offering improved returns by hedging exceeded 70%. Comparison of this with the earlier results implies that the futures market frequently offered a loss-reducing opportunity relative to the cash market. For example, for feeder pigs placed on feed in May and June of 1988, 100% of the trading days from the placement date through the end of the month prior to marketing offered improved returns relative to the cash market (Table 6), even though none of these hedges would have salvaged a profit (Table 4) for the feeder pig finisher. The hog cash market offered higher returns relative to the futures market for the majority of the trading days in 51 of the 108 feeding periods analyzed.

Figure 2.

Percentage Distributions of Expected and Actual Hedging Profit Opportunities for Feeder Pig Finishers (Pigs Placed on Feed Jan. 1980 - Dec. 1988)

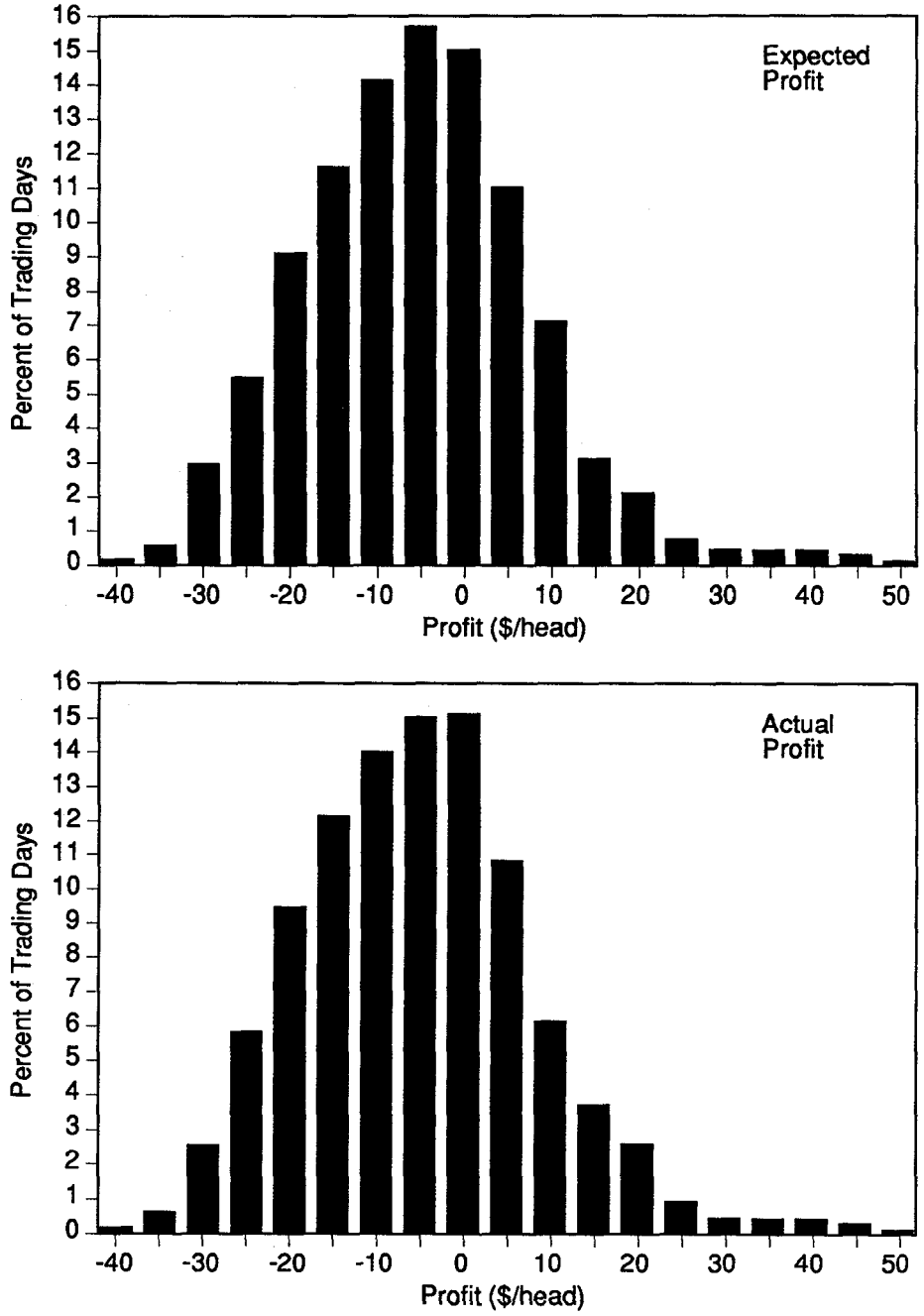


Figure 3.
Trend and Distribution of Profits from Selling Finished Hogs in the Cash Market (Pigs Placed on Feed Jan. 1980 - Dec. 1988)

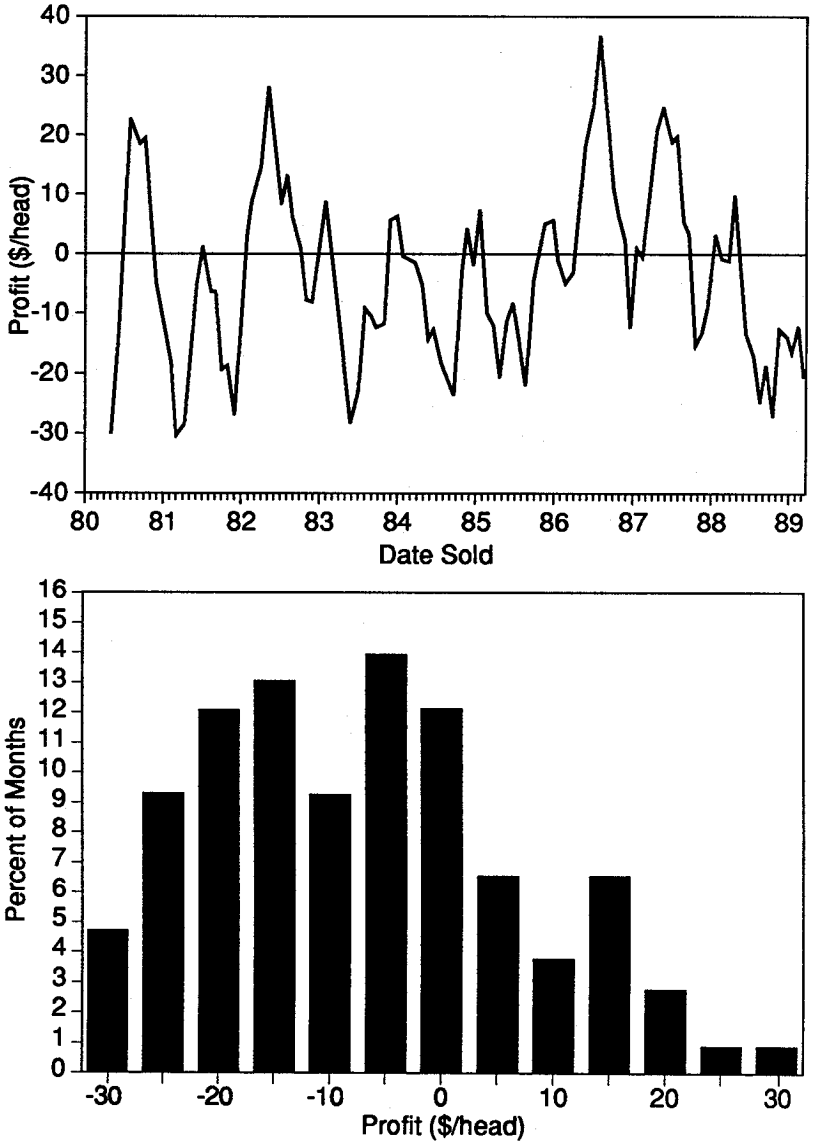
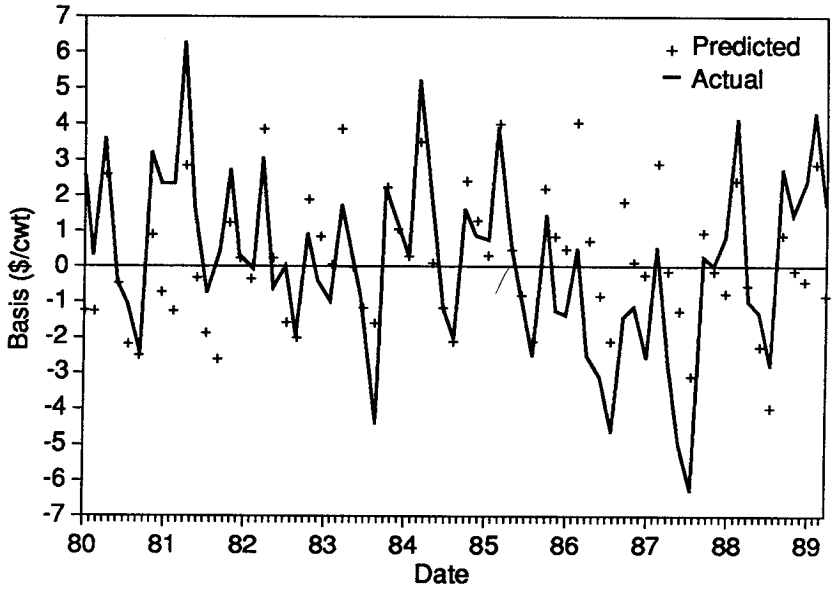


Figure 4.
Comparison of Actual and Predicted (5-Year Average) Nearby Contract Basis for Omaha Slaughter Hogs (Jan. 1980 - Apr. 1989) (Basis is defined as Futures Price minus Cash Price.)



CONCLUSIONS

This study examined the frequency of profitable hedging opportunities that have been available to feeder pig finishers in recent years. The results indicate that there have been periods offering frequent opportunities to lock in a profit by hedging. However, there have not been many extended periods beyond 6 months offering frequent profit opportunities. Also, over several feeding periods, no trading day offered profitable hedging opportunities.

Though not necessarily always offering a profit, the futures market frequently offered improved returns relative to the cash market. During more than 30% of the feeding periods (34 of 108), opportunities for feeder pig finishers to improve returns by hedging relative to cash marketing were present in excess of 80% of the trading days. This suggests that in addition to the often cited risk-reduction opportunities offered by hedging hogs, opportunities to enhance profits (or reduce losses) by hedging were also present. Eighty-two percent of the feeding periods had at least one trading day offering an improved return relative to the cash market. However, it is likely that any time the frequency of improved returns was less than 50-60%, it would have been difficult for the producer to capitalize on the improved return opportunity by hedging. Selling hogs in the cash market offered higher returns than hedging for the majority of the trading days in 47% of the feeding periods evaluated.

REFERENCES

Berck, P. 1981. Portfolio Theory and the Demand for Futures: The Case of California Cotton. Amer. J. Agric. Econ. 63:466-474.

Davis, M. and J. Franzmann. 1985. Economic Analysis of the Impacts on the Lender Risk of Selected Hedging Strategies. Okla. St. Univ. Agric. Exp. Stn. Bull. B-775.

Elam, E. and D. Vaught. 1988. Risk and Return in Cattle and Hog Futures. J. Futures Mkts. 8:79-87.

Erickson, S. P. 1978. Selective Hedging Strategies for Cattle Feeders. Ill. Agric. Econ. 18:15-20.

Hayenga, M. L., D. D. DiPietre, J. M. Skadberg, and T. C. Schroeder. 1983. Profit Opportunities and Risk Premiums in Live Cattle and Live Hog Futures Markets. Working Paper Series #CSFM-59, Columbia Center for the Study of Futures Markets, Columbia Univ. Business School.

Holland, D., W. D. Purcell, and T. Hague. 1972. Mean-Variance Analysis of Alternative Hedging Strategies. So. J. Agric. Econ. 4:123-128.

Nelson, R. D. and R. A. Collins. 1985. A Measure of Hedging's Performance. J. Futures Mkts. 5:45-55.

Schroeder, T. C. and M. L. Hayenga. 1988. Comparison of Selective Hedging and Options Strategies in Cattle Feedlot Risk Management. J. Futures Mkts. 8:141-156.

Spahr, R. W. and W. J. Sawaya. 1981. A Prehedging Strategy for the Feedlot Operation. West. J. Agric. Econ. 6:31-41.

Telser, L. G. 1981. Why There Are Organized Futures Markets. J. Law and Econ. 24:1-22.

Williams, J. 1986. The Economic Function of Futures Markets. Cambridge University Press: New York.

KSU
KANSAS STATE UNIVERSITY

Agricultural Experiment Station, Kansas State University, Manhattan 66506-4008

Bulletin 657 July 1990

2M