NCCC-134
APPLIED COMMODITY PRICE ANALYSIS, FORECASTING AND MARKET RISK MANAGEMENT

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Suggested citation format:

Sartwelle, J., III, D. O'Brien, W. Tierney, T. Eggers, R. Wisner, J. Lawrence, and W. Barker. 1998. "Producers' Marketing Practices and Decision Making Processes." Proceedings of the NCR-134 Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management. Chicago, IL. [http://www.farmdoc.uiuc.edu/nccc134].

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A survey of Kansas, Texas, and Iowa agricultural producers and agribusiness was taken to examine the factors affecting their grain and livestock marketing practices. Qualitative choice models (multinomial and binomial logit) were used to determine whether marketers' choices of cash market, forward contract, or futures and options oriented marketing practices were significantly affected by their individual characteristics. These individual characteristics include years of experience, enterprise specialization, attitudes toward risk, management decisions, local market conditions, and preferences for alternative types of market-related information. Results indicated that years of experience, risk attitude, on-farm storage practices, and preferences for alternative types of futures and cash market information had significant effects upon respondents' choice of grain marketing practices. However, few factors significantly affected respondents' choice of livestock marketing practices.

The marketing practices and underlying decision-making processes of crop and livestock producers and agribusiness are not well understood. The timing and quantities of farmers' cash grain and livestock sales can be observed from government market reports, but the factors that affect individual's marketing decisions and the degree to which advanced marketing tools are used have not been adequately studied. If the types of marketing practices used and associated decision making processes were better understood, then more effective applied research and extension educational efforts could be carried for the benefit of marketing decision makers.

Previous studies have examined farmers' preferences for marketing information (Schnitkey, et.al., Sartwelle, O'Brien and Barker). Other efforts have been made to examine the effectiveness of alternative grain marketing strategies (Wisner, et.al.). There is a need to integrate the identification of typical marketing practices together with analysis of factors that determine which marketing practices are used.

The objective of this study is to use survey methods to identify commonly used grain and livestock marketing practices and the factors affecting their use. Qualitative statistical models (i.e., multinomial and binomial logit analysis) are used to determine which of these factors have statistically significant effects upon decision makers' choice of marketing practices. A related objective is to identify the grain and livestock market outlook information sources used in the process of making marketing decisions.

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Survey Methods and Description of the Data

Kansas, Texas, and Iowa crop and livestock producers were surveyed about their level of adoption of various commodity marketing tools, strategies, and market information preferences in early 1998. The survey instrument was developed with the guidance of evaluation experts from Kansas State University (KSU), the University of Minnesota, and the University of Wisconsin. The survey was pilot-tested with agricultural producers to establish its clarity and validity, and was approved through KSU administrative channels.

Producers were sampled at random in 18 counties in northwest Kansas (350 surveys mailed out) and in eight counties in southwest Iowa (420 surveys mailed out). Four hundred subscribers of KSU's monthly AgUpdate marketing and farm management newsletter were surveyed, as were 255 graduates of Texas A&M University's (TAMU) Master Marketer program. Additionally, a limited number of producers attending Extension grain and livestock market outlook meetings in northwest Kansas received the survey instrument to take home, fill out, and return at their volition. All those surveyed were provided a postage-paid envelope to return their surveys. A total of 386 usable surveys were returned (239 from Kansas, 83 from Texas, and 64 from Iowa).

Many differences stand out when examining the five sources of data. Survey respondents from three distinct sources in Kansas (northwest Kansas random sample, northwest Kansas Extension marketing meeting attendees, and AgUpdate subscribers) had slight demographic differences from southwest Iowa and Texas producers. Additionally, the TAMU Master Marketer graduates were known to have at least one thing in common with each other but with none of the other producers in the sample set: completion of an intensive, 64-hour marketing education program. These differences are illustrated by the means of selected survey categories in Table 1. Average cropland acreage, for example, among the Texas producers was largest of the survey sources and more than three times larger than southwest Iowa producers. Conversely, the Iowa producers were, on average, the most experienced of the set with the Texas respondents indicating the least experience as farm operators.

Due to the geographic diversity of the survey audiences, large-sample hypothesis tests (Z tests) were performed to test for statistically significant differences among geographic sites for selected survey items. Table 2 provides z-statistics for selected survey variables. Those results confirm what simple visual analysis of the means reported in Table 1 revealed: there are significant differences among the five survey audiences for the selected demographic attributes but comparatively less difference when comparing attitudes toward price risk and preferences for market information. Bearing these key differences in mind, these diverse survey audiences can be pooled for purposes of analysis.

Table 1. Means of selected independent variables by survey source [a]

Location	Selected Model Variables				
	CROPAC	EXPERIENCE	RISK ATTITUDE	FUTURES$	CASHFC$
KS Random	1973	3.473	2.242	3.374	3.033
KS AgUpdate	1602	3.804	2.235	3.020	2.706
KS Direct	1472	3.818	2.182	3.091	3.318
SW Iowa	817	3.898	2.220	2.763	3.017
Texas	2664	3.141	2.192	3.357	3.014

[a]: See Table 4 for definitions of variables. The RISK ATTITUDE variable is defined here as 1 – strictly avoiding risk, 2 – accepting some price risk in exchange for the possibility of better prices, 3 – accepting a greater than average amount of price risk in exchange for the possibility of better prices.

Table 2. Z-tests between means of selected survey items by pairs of survey locations [a]

	Selected Model Variables				
	CROPAC	EXPERIENCE	RISK ATTITUDE	FUTURES$	CASHFC$
Location Comparison					
KS Random vs. KS AgUpdate	1.17	-2.45*	0.09	2.81**	2.33*
KS Random vs. KS Direct	1.37	-1.24	0.51	1.33	-1.23
KS Random vs. SW Iowa	3.82**	-2.51*	0.24	3.65**	0.10
KS Random vs. Texas	-1.97*	0.33	0.04	0.02	0.02
KS AgUpdate vs. KS Direct	0.52	-0.05	0.45	-0.33	-2.59**
KS AgUpdate vs. SW Iowa	5.41**	-0.57	0.17	1.47	-1.81
KS Ag Update vs. Texas	-2.85**	4.77**	0.48	-2.47*	-2.11*
KS Direct vs. SW Iowa	2.82**	-0.27	-0.30	1.34	1.20
KS Direct vs. Texas	-2.88**	2.42*	-0.13	-1.21	1.29
SW Iowa vs. Texas	-5.13**	4.40**	0.25	-3.39**	0.02

[a]: * and ** indicate statistical significance at 0.05 and 0.01 levels, respectively. See the definition of RISK ATTITUDE in the footnote of Table 1.

Qualitative Model Dependent and Independent Variables

Definitions of alternative dependent variable categorizations are given in Table 3. Survey respondents were asked to indicate the percentage of their annual grain and livestock marketings that are made using alternative marketing tools. For example, grain marketers were asked to identify the percent of their annual marketings made using strictly cash grain markets, and then using forward contracts, basis contracts, hedge-to-arrive contracts, minimum price contracts, delayed price contracts, futures hedges, agricultural options (puts and calls), and production contracts. Similarly, livestock marketers were asked to identify the percent of their annual marketings made using strictly cash livestock markets, and then the percent marketed using direct sales (to feeders or packers), order buyers, electronic markets, forward contracts, futures hedges, agricultural options (puts and calls), and production alliances.

The many combinations of alternative grain and livestock marketing tools used forced a further categorization of the dependent variables. For grain marketing related surveys, two alternative dependent variable categorizations were developed. Of these two, the more narrowly defined categorization involved splitting responses into three categories for use in a multinomial logit analysis. These categories are (1) cash grain marketings, (2) cash plus forward contract grain marketings (including regular forward contracts plus basis, hedge-to-arrive, minimum price, delayed price, and production contracts), and (3) futures/options plus forward contracts

Table 3. Dependent variable categories for grain and livestock survey responses

Qualitative Models and Dependent Variable Categories	Description of Categories	No. Obs.
Grain Multinomial Logit Model		
1. Strictly Cash Marketings	≥ 95% Cash Marketings, ≤ 5% Forward Contracts, ≤ 5% Futures/Options	74
2. Cash + Forward Contracts	5%-100% Forward Contracts ≤ 15% Futures/Options	144
3. Futures/Options + Forward Contracts	10%-100% Futures/Options Futures/Options % > Forward Contract %	127
	Total Usable Survey Observations:	345
Grain Binomial Logit Model		
1. Cash + Forward Contracts	< 10% Futures/Options	181
2. Futures/Options + Forward Contracts	≥ 10% Futures/Options	164
	Total Usable Survey Observations:	345
Livestock Binomial Logit Model		
1. Cash & Direct Marketings	> 95% Cash Marketings, ≤ 5% Futures/Options	194
2. Futures/Options Marketings	5%-100% Futures/Options	50
	Total Usable Survey Observations:	244

grain marketings (including futures, options, and the forward contract designations indicated in (2)). The parameters used to define alternatives (1), (2), and (3) are given in Table 3 for the grain multinomial logit model. In this model, 21% (74/345) of the observations were determined to be in category (1), 42% (144/345) were in category (2), and 37% (127/345) were in category (3).

The binomial logit model for grain uses more broadly defined categories for dependent variables. These two dependent variable categories include (1) cash plus forward contract marketings, and (2) futures/options plus forward contract marketings. The proportions of each of these marketing tools for alternatives (1) and (2) are given in Table 3 for the grain binomial logit model. In this model, 52% (181/345) of the observations were determined to be in category (1), and 48% (164/345) were in category (2).

The binomial logit model for livestock uses broadly defined categories for dependent variables that differ from the grain models. These two dependent variable categories include (1) cash plus direct marketings, and (2) futures/options marketings. The cash plus direct marketing category includes cash, direct, and electronic markets, order buyer transactions, forward contracts and production alliances. The futures/options marketings category includes use of futures and agricultural options together with limited amounts of cash and forward contract marketings. The proportions of each of these marketing tools for alternatives (1) and (2) are given in Table 3 for the livestock binomial logit model. In this model, 80% (194/244) of the observations are determined to be in category (1), and 20% (50/244) are in category (2).

Independent variables for the grain and livestock logit models are listed in Table 4. For the grain models, independent variables can be subdivided into three general groups. The first group describes the respondents and their involvement in grain enterprises (i.e., CROPAC, SCALEOPN, SPECIALIZED, EXPERIENCE, RISKATT—LOW, RISKATT—HIGH). The second group describes respondents' grain storage practices and local influences, as well as the impact of crop insurance purchases on their pre-harvest marketing decisions (COMLSTOR%, FARMSTOR%, DMNDCNTR, MPCI, and FWRDPRIC). The third group of explanatory variables describes respondents' preferences for marketing related information (FUTURES$, SPLYDMND#, $CHARTS, CASHFC$, $FRCST, STRATEGIES, FRMROPNS). Independent variables for the livestock binomial logit model can be similarly grouped with the exception of the SIZECAT variable replacing CROPAC, and the exclusion of variables measuring grain storage, demand center location, and crop insurance influences.

Analytical Methods

Because of the categorical nature of the dependent variables in this analysis, a qualitative choice analysis tool was used. Logit analysis provided the ability to analyze qualitative models with two or more discrete dependent variables. In this application, multinomial and binomial logit models are used to analyze how respondent specific information affects their discrete, categorical choices of marketing practices. A description of multinomial and binomial logit analysis, its underlying theoretical and distributional assumptions, and the relationship between binomial logit, probit, and linear models is given in Maddala, and in Pindyck and Rubinfeld.

Table 4. Independent variables for grain and livestock models

Independent Variables	Variable Descriptions	Mean: Grains	Mean: Livestock
CROPAC	Number of acres of annual crop production (Grains only).	1775.82	
SIZECAT	Livestock operation size categories. Range: 1 'small' to 4 'very large'.		2.16
SCALEOPN	Respondents' opinion of the size of their farming operation in relation to others in their county or region. Range: 1 'small' to 3 'large'.	2.02	2.00
SPECIALIZED	0 – diversified with both grain and livestock enterprises, 1 – specialized in either grain or livestock enterprises.	0.34	0.06
EXPERIENCE	Years of experience in agriculture. Categories: 1. < 5 years, 2. 5-14 years, 3. 15-24 years, 4. 25-34 years, 5. 35 years or more.	3.60	3.64
RISKATT-LOW	0/1 variable for strictly avoiding any price risk in buying and/or selling agricultural products	0.03	0.04
RISKATT-HIGH	0/1 variable for willingness to accept a larger amount of price risk than other people in buying and/or selling agricultural products	0.26	0.30
COMLSTORE%	Percentage of annual grain production that is stored commercially prior to marketing.	0.37	
FARMSTORE%	Percentage of annual grain production that is stored on-farm prior to marketing.	0.31	
DMNDCNTR	0/1 variable for location near a major grain demand center. Examples include livestock feedlots, grain/feed processor, unit train elevator, etc.	0.57	
MPCI	0/1 variable indicating whether respondent regularly purchases Multiple Peril Crop Insurance (MPCI) coverage.	0.63	
FWRDPRIC	0/1 variable indicating whether purchases of MPCI or CRC insurance affects producer's willingness to preharvest forward price grain.	0.22	
FUTURES$	Preference for Futures Price information. Range: 1. Do not use, 2. Low preference, 3. Medium preference, 4. High preference	3.14	3.04
SPLYDMND#	Preference for Supply-Demand Fundamentals information. Range: 1-4 (See FUTURES$ description)	2.91	2.84
$CHARTS	Preference for Charts of Futures Prices. Range: 1-4 (See FUTURES$ description)	2.35	2.23
CASHFC$	Preference for Cash and Forward Contract Price information. Range: 1-4 (See FUTURES$ description)	2.95	2.85
$FRCST	Preference for Price Forecast information from Marketing Experts. Range: 1-4 (See FUTURES$ description)	2.62	2.53
STRATEGIES	Preference for Buy/Sell Recommendation information. Range: 1-4 (See FUTURES$ description)	2.06	1.98
FRMROPNS	Preference for Opinions of Other Farmers About Market Analysis or Buy/Sell Strategies. Range: 1-4 (See FUTURES$ description)	1.78	1.82

The logit analysis in Table 5 reports the impact of the set of independent variables in each model upon the log-odds ratios of a particular discrete, categorical choice relative to a base categorical choice (i.e., category 1). For the grain multinomial logit model, the following log-odds ratio models are calculated, with choice category #1 (strict cash marketings) serving as the base category for normalization:

$$\ln(P_i/P_1) = B_{0i} + B_{1i}X_{1i} + B_{2i}X_{2i} + \ldots\ldots + B_{18i}X_{18i} + e_i + e_0$$

Where i = Categories 2 and 3; k = Explanatory variables 1, 2, .. 18

This results in two log-odds equations being calculated. A third log-odds equation ($\ln(P_3/P_2)$) is derived from $\ln(P_2/P_1)$ and $\ln(P_3/P_1)$ based on the underlying assumptions of the logit model. The asymptotic variances and covariances from $\ln(P_2/P_1)$ and $\ln(P_3/P_1)$ are used to calculated t-statistics for $\ln(P_3/P_2)$. For the binomial logit grain and livestock models in Table 5, only one log-odds ratio equation is calculated with choice category #1 serving as the base category for normalization in both instances:

$$\ln(P_2/P_1) = B_0 + B_1X_1 + B_2X_2 + \quad + B_kX_k + e_i + e_0$$

Where k = Explanatory variables 1, 2, .. 18 for grains, and 1, 2, . 13 for livestock

The model parameter estimates represent marginal log probabilities. For instance, in Table 5 a value of 0.00017 for the CROPAC coefficient in the $\ln(P_2/P_1)$ grain multinomial logit model indicates that a small increase in acres results in a 0.00017 increase in the log probability of category 2 (Cash + Forward Contracts) marketing practice relative to a category 1 (Strictly Cash Marketings) practice. In general, a positive model coefficient indicates that increases in the value of the explanatory variable (or a nonzero value of a 0/1 dummy variable) will increase the probability of the selection of the marketing practices category represented by the numerator relative to the category represented in the denominator. Conversely, a negative model coefficient indicates that increases in the value of the explanatory variable (or a nonzero value of a 0/1 dummy variable) will decrease the probability of the selection of the marketing practices category represented by the numerator relative to the category represented in the denominator. The t-tests associated with each independent variable coefficient are used as indicators of the level of significance of each model explanatory variable.

A potential problem with multinomial logit analysis is the well known "Independence of Irrelevant Alternatives" (or IIA) property. This problem exists because when three or more discrete, categorical choices are available, multinomial logit analysis assumes that the ratio of probabilities between any two choices is unaffected by the availability of a third choice. Largely because of the need to further investigate the potential for IIA property using the Hausman and McFadden test and other procedures, the grain multinomial logit model results presented in Table 5 are preliminary in nature.

Results

The logit grain and livestock model estimation results are presented in Table 5. Discussion will first focus on the significant findings of the grain multinomial logit model (MLM) and the grain binomial logit model (BLM), and then upon the livestock BLM.

Multinomial Logit Grain Model Results. In review, the marketing practices categories for the grain multinomial logit model are: (1) strictly cash marketings (CASH), (2) cash + forward contracts (CASH/FC), and (3) futures/options + forward contracts (FUTOPT/FC). Specialization in crop enterprises increased the probability of respondents' marketing strategies being in category 2 (CASH/FC) relative to both cat. #1 (CASH) and cat. #3 (FUTOPT/FC). Also, the greater the years of experience in agriculture the higher the probability of respondents being in cat. #2 (CASH/FC) relative to cat. #3 (FUTOPT/FC). An attitude of strict risk avoidance increased the probability of respondents having cat. #1 (CASH) marketing strategies relative to both cat. #2 (CASH/FC) and cat. #3 (FUTOPT/FC). While increasing use of commercial grain storage had no significant effect upon respondents' marketing practice categorizations, increasing use of on-farm storage did. Greater use of on-farm grain storage decreased the probability of respondents' grain marketings in cat. #3 (FUTOPT/FC) relative to both cat. #1 (CASH) and cat. #2 (CASH/FC). Location near a major grain demand center had no significant effect, although the positive impact of demand center proximity upon the probability of being in cat. #3 (FUTOPT/FC) relative to cat. #2 (CASH/FC) was nearly significant.

Increases in the strength of respondents' preference for futures price information was related to significant increases in the probability of both cat. #2 (CASH/FC) and cat. #3 (FUTOPT/FC) marketing practices relative to cat. #1 (CASH). Higher preferences for futures price chart information did increase the probability of cat. #3 (FUTOPT/FC) marketing practices relative to those in cat. #2 (CASH/FC). Increases in the strength of respondents' preference for cash and forward contract price information was related to significant increases in the probability of cat. #2 (CASH/FC) relative to both cat. #1 (CASH) and cat. #3 (FUTOPT/FC) marketing practices. Increases in the strength of respondents' preference for expert's price forecast information was related to significant decreases in the probability of both cat. #2 (CASH/FC) and cat. #3 (FUTOPT/FC) marketing practices relative to cat. #1 (CASH). Increasing preference for buying and selling strategy recommendations was related to increased likelihood of cat. #3 (FUTOPT/FC) marketing practices relative to both cat. #1 (CASH) and cat. #2 (CASH/FC). Finally, an increasing preference for other farmers' marketing opinions significantly decreased the probability of cat. #3 (FUTOPT/FC) practices relative to cat. #1 (CASH).

The Maddala and McFadden R^2 measures of 0.38 and 0.23, respectively, are very acceptable in comparison to other published multinomial logit studies (Schnitkey, et.al.) and according to standard texts (Maddala, Pindyck and Rubinfeld). The overall model is significant at the 0.01 level as indicated by the Likelihood Ratio Test statistic of 167 (i.e., a chi-square statistic with 18 degrees of freedom). Prediction success measures for this model have not yet been calculated.

Table 5. Logit model analysis results of grain and livestock marketing strategies [a]

Model Variables	Multinomial Logit Grain Model (Preliminary) Ln(P_2/P_1)	Ln(P_3/P_1)	Ln(P_3/P_2)	Binomial Logit Grain Model Ln(P_2/P_1)	Binomial Logit Livestock Model Ln(P_2/P_1)
Constant	−1.5090	−2.4323*	−0.9233	−1.4266	−3.6744**
	(−1.211)	(−1.751)	(−0.796)	(−1.509)	(−2.920)
CROPAC (Grains)	0.00017	0.00021	0.00004	0.00011	0.0267
SIZECAT (Livestock)	(1.039)	(1.297)	(0.674)	(1.407)	(0.136)
SCALEOPN	0.1748	0.4351	0.2603	0.4335**	0.2834
	(0.590)	(1.400)	(1.173)	(2.051)	(1.098)
SPECIALIZED	0.8535**	0.2836	−0.5699*	−0.1316	0.0725
	(2.150)	(0.674)	(−1.881)	(−0.465)	(0.104)
EXPERIENCE	0.1669	−0.1376	−0.3045**	−0.3116**	0.1107
	(0.933)	(−0.722)	(−2.023)	(−2.312)	(0.659)
RISKATT – LOW	−3.596**	−2.2641**	1.3321	−1.2900	0.4300
	(−2.976)	(−2.199)	(0.995)	(−1.457)	(0.491)
RISKATT – HIGH	0.1902	−0.1030	−0.2933	−0.3436	−0.3963
	(0.491)	(−0.240)	(−0.892)	(−1.118)	(−1.011)
COMLSTORE%	−0.7188	−0.7979	−0.0791	−0.5148	
	(−1.409)	(−1.537)	(−0.196)	(−1.369)	
FARMSTORE%	0.1998	−1.5255**	−1.7253**	−1.5364**	
	(0.364)	(−2.493)	(−3.634)	(−3.497)	
DMNDCNTR	−0.4072	0.0724	0.4796	0.0026	
	(−1.165)	(0.192)	(1.628)	(0.010)	
MPCI	0.3492	0.5158	0.1666	0.1067	
	(0.993)	(1.341)	(0.541)	(0.380)	
FWRDPRIC	0.6802	0.3603	−0.3200	0.0461	
	(1.498)	(0.760)	(−0.950)	(0.147)	
FUTURES$	0.7009**	0.9608**	0.2599	0.7730**	0.0078
	(3.316)	(3.919)	(1.191)	(4.051)	(0.036)
SPLYDMND#	−0.2237	−0.1910	0.0326	−0.1826	0.4255*
	(−1.019)	(−0.792)	(0.167)	(−1.014)	(1.846)
$CHARTS	−0.1626	0.2745	0.4371**	0.221	0.0663
	(−0.807)	(1.303)	(2.746)	(1.518)	(0.356)
CASHFC$	0.6001**	0.1316	−0.4685**	−0.2525*	−0.0731
	(3.158)	(0.642)	(−2.795)	(−1.671)	(−0.381)
$FRCST	−0.5797**	−0.4628*	0.1170	−0.1398	−0.0744
	(−2.309)	(−1.686)	(0.543)	(−0.722)	(−0.318)
STRATEGIES	0.1112	0.7026**	0.5914**	0.6210**	0.0026
	(0.505)	(2.923)	(3.029)	(3.488)	(0.012)
FRMROPNS	−0.3071	−0.5846**	−0.2775	−0.2943	0.1818
	(−1.234)	(−2.164)	(−1.258)	(−1.475)	(0.782)
Maddala R-Square		0.3841		0.2751	0.0353
McFadden R-Square		0.2280		0.2325	0.0355
Liklihood Ratio Test		167.19, 18 df		110.98, 18 df	8.78, 13 df
Prediction Success %		-----		72%	80%

[a]: t-ratios reported in parentheses. "*" and "**" indicate statistical significance at 0.10 and 0.05 levels, respectively

Grain Binomial Logit Model Results. For the grain binomial logit model (BLM), the marketing practices categories are: (1) cash + forward contract (CASH/FC), and (2) futures/options + forward contracts (FUTOPT/FC). The differences between these two categories and the three categories in the previous multinomial model are defined in Table 5. The respondents' opinion about the size of their farm relative to others in their county or region did have a significant affect, increasing the probability of BLM category #2 (FUTOPT/FC) relative to BLM cat. #1 (CASH). More years of agricultural experience increased the probability of respondents being in BLM cat. #1 (CASH/FC) relative to BLM cat. #2 (FUTOPT/FC). Increasing use of on-farm storage decreased the probability of respondents grain marketings in BLM cat. #2 (FUTOPT/FC) relative to BLM cat. #1 (CASH/FC). Increases in the strength of respondents' preference for futures price information were related to significant increases in the probability of grain BLM cat. #2 (FUTOPT/FC) marketing practices relative to BLM cat. #1 (CASH). Increases in the strength of respondents' preference for cash and forward contract price information (CASHFC$) was related to significant decreases in the probability of BLM cat. #2 (FUTOPT/FC) relative to both cat. #1 (CASH/FC) marketing practices. Greater preference for buying and selling strategy recommendations was related to decreased likelihood of grain BLM cat. #2 (FUTOPT/FC) marketing practices relative to cat. #1 (CASH/FC).

Just as for the grain multinomial logit model, the binomial logit model Maddala and McFadden R^2 measures of 0.28 and 0.23, respectively, are very acceptable. The overall model is significant at the 0.01 level as indicated by the Likelihood Ratio Test statistic of 111 (i.e., a chi-square statistic with 18 degrees of freedom). Prediction success for this model is 72%.

Discussion of Qualitative Grain Model Results. The results of the grain multinomial and binomial logit analyses are largely consistent with many but not all of the authors' pre-analysis hypotheses regarding the effect of various factors upon individual's grain marketing strategies. That actual crop acreage size had no impact upon marketing practices was unexpected. However, the positive impact in the BLM of respondents' opinion about the relative size of their operation upon the probability of using more futures/options oriented strategies supports pre-conceived hypotheses although MLM results did not support this finding. In the MLM increased specialization in grain enterprises increased the probability of forward contract oriented strategies. This result may reveal the motivation of those specializing in grains to reduce price and financial risk on their single, primary income source through the use of contractual arrangements. The finding in both the MLM and BLM that those with more years of experience in agriculture are less likely to use futures and options strategies is consistent with pre-conceived hypotheses. It is also not unexpected that those who strictly avoid risk (i.e., who are very risk averse) have a strong tendency to be strictly cash marketers. Whether these people are actually limiting risk using a cash market only approach is debatable. However, their perception must be that they are limiting their grain marketing risk by avoiding the use of forward contracts, futures, and options.

That increased use of commercial storage had no significant impact on marketing strategies was mildly surprising. But the finding that increased use of on-farm storage decreased the probability of futures/options strategies in both the MLM and BLM is intuitively acceptable. In

other words, those who use on-farm storage to a greater degree are more likely to use cash and forward contract oriented marketing practices than futures/options. One unexpected finding was that location near a grain demand center had no significant impact on marketing strategies. The one marginally significant finding was that such a location increased the likelihood of using futures/options as opposed to forward contract oriented strategies in MLM. This particular finding is inconsistent with the authors' pre-study hypothesis that location near a grain demand center would increase the probability of cash and forward contract oriented strategies. Another counter-intuitive finding was that the use of multiple peril crop insurance had no significant impact upon respondents' willingness to enter into pre-harvest forward pricing arrangements.

The MLM and BLM findings that stronger preferences for futures price information were associated with higher probabilities of futures/options and even forward contract use relative to cash marketing practices are consistent with pre-study hypothesis. This is also true for the MLM finding that stronger preferences for futures price chart information were associated with a higher probability of futures/options marketing practices. However, the MLM finding that stronger preferences for futures price chart information did not increase the probability of futures/options strategies relative to strictly cash sales was counter intuitive. Neither the MLM or BLM indicated that stronger preferences for supply/demand fundamental information had a significant affect on grain marketing practices. This indicates that no differences existed among respondents using these various marketing practices in regard to their preference for supply/demand information. The MLM finding that stronger preferences for price forecast information existed among strictly cash marketers compared to those more oriented toward forward contracts and futures/options is consistent with the authors' pre-study hypotheses. This is also true for the MLM and BLM findings that stronger preferences for expert strategy information increase the probability of futures/options oriented strategies. This finding in itself may be at odds with the perception of efficient markets and with opinions about how these markets are perceived by users at any particular point in time. The MLM finding that stronger preferences for information about other farmers' marketing-related opinions increase the probability of strict cash strategies relative to futures is consistent pre-study hypotheses of the authors. The broader implications of these grain-related findings will be discussed in the summary and conclusions.

Livestock Binomial Logit Model Results. The marketing practices categories for the livestock binomial logit model are: (1) cash and direct marketings (CASH+DIR), and (2) futures/options (FUTOPT) marketings as defined in Table 5. The only independent variable that had a significant impact upon the livestock BLM findings was the preference for supply/demand fundamental information. Greater preference for supply/demand information was significantly related to increases in the probability of livestock BLM category #2 (FUTOPT) relative to category #1 (CASH+DIR).

Both the Maddala and McFadden R^2 measures equaled 0.035. Such low R^2 measures are not uncommon for logit models. However, the overall model is not significant at any reasonable level as indicated by the Likelihood Ratio Test statistic of 8.78 (i.e., a chi-square statistic with 13

degrees of freedom). Prediction success for this model is 80%, but this may be due to the predominance of category #1 observations (80% of the total).

The livestock results indicate that the set of independent explanatory variables do little to explain why some livestock marketers choose to market their livestock mainly through cash and direct markets as opposed to using future/options oriented strategies. Econometrically, the dominance of the use of cash and direct marketing strategies (80% of respondents) may have influenced the statistical findings. Implications of these livestock-related findings will be discussed in the summary and conclusions.

Summary and Conclusions

The findings of this study are of practical importance to farmers and agribusiness, as well as to University applied researchers and extension educators in the geographic regions covered by this survey and possibly beyond. The grain marketing strategy results indicate that grain marketers in Kansas, southwest Iowa, and in Texas are a diverse rather than a homogenous group whose marketing practices vary in accordance to their personal and farm characteristics and management practices, as well as their marketing information preferences. In comparison, the livestock marketing practices of these survey respondents are uniformly more cash market-oriented than are their grain marketing practices.

Grain related results indicated survey respondents that were more experienced and whose attitudes were more risk averse tended to use cash and forward contract oriented strategies as opposed to futures and options. Increased use of on-farm storage was also related to a higher probability of using cash and forward contract strategies. Those with stronger preferences for futures price and price chart information had a larger probability of using futures and options-oriented marketing strategies. Those having stronger preferences for cash and forward contract price information tended toward the use forward contract-oriented strategies. Grain marketers with stronger preferences for expert's strategy information tended to use futures and options, while those that had a stronger preferences for price forecast information and other farmer's opinions tended to use strictly cash grain marketing strategies. These results indicated that stronger preferences for supply/demand fundamentals information had no effect upon the type of grain marketing strategies used.

Livestock related results indicated that the independent factors included in this study have little impact from upon the probability of using cash and direct marketing practices as opposed to futures and options or vice versa. The only statistically significant factor was that of stronger preferences for supply/demand information increasing the probability of futures and options oriented marketing practices.

These findings are preliminary in nature due to the need to incorporate a small number of late surveys (10-15) into the analysis. Also, the grain multinomial logit model analysis needs to be extended to include testing for the "Independence of Irrelevant Alternatives" and calculation of the prediction accuracy of the model. The livestock binomial logit model may be extended to

account for the type of livestock enterprise (cow-calf, beef backgrounding, beef finishing, etc.) and its possible impact upon marketing practices. At issue would be whether livestock finishing or other enterprises have a greater probability of utilizing futures and options marketing strategies or cash and direct marketing strategies.

Much attention was given in this study to the derivation of appropriate categories for the grain and livestock marketing practices of survey respondents as well as to categorization of a number of the independent variables. This process of variable categorization was necessary due to the nature of the dependent and independent variables used in the study. The accuracy and appropriateness of the delineation of these categories ultimately determine the veracity of the study results. This is a factor that may need to be reexamined in the livestock model. If appropriate for the purposes of the particular study, the need for post-survey dependent variable delineation should be avoided by having survey respondents directly select which category best fits their practices or preferences.

Finally, an immediate use for this information will be in the development of educational programming for marketing and risk management clubs in Texas, Kansas, and possibly other states. This information may help club members understand their own tendencies and information preferences with regard to grain and livestock marketing and risk management. This understanding may help them to develop more effective marketing and financial risk management strategies.

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