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THE RELATIONSHIP BETWEEN FUTURES AND OPTION PRICES AND THE EXPECTATIONS OF FARMERS AND GRAIN MERCHANDISERS IN ILLINOIS

S.R. Thompson, R.J. Hauser, B.K. Engel, and J.S. Eales*

One of the most important roles of organized markets is to provide a forum where information can be easily incorporated into price. Market prices serve as guides for resource allocation by indicating the relative scarcity of goods. Forward and futures prices are often thought of as forecasts of eventual cash market prices as well as serving as guides for resource allocation. Because of their forecasting ability, they are often termed "anticipatory" prices. A direct relationship between the forecasting and allocative performance of anticipatory prices is often assumed by economists. For instance, an explicit (and often implicit) assumption underlying many marketing and production studies is that the futures price is simply a forecast of the spot price or that the futures price represents the market's expected price. However, an equilibrium allocative price may not always equal the market's best forecast (see Just and Rausser for example). Moreover, little empirical attention has been given to the relationship between anticipatory prices and expectations to test the validity of assumptions regarding the forecasting role of anticipatory prices.

The research herein focuses on the extent to which futures and option prices reflect the price distribution expectations of market participants. This issue is central to the validity of many studies that use the futures price as a proxy for expected price. (Some well-known examples include Gardner; Helmberger and Akinyosoye; and Just and Rausser.) Tomek and Gray, and later Peck, suggest that futures markets are not primarily price forecasting agencies. They maintain the forecasting ability of futures markets is only a by-product of providing efficient storage allocation for storable commodities, and efficient resource allocation for non-storable commodities. The forecasting performance of futures markets may be dominated by their allocative function.

Method for Determining Price Expectations

During the summer and fall of 1987, farmers and grain merchandisers in Illinois were surveyed to obtain their expectations of cash corn and soybean prices for dates in the 1987-88 crop year. Table 1 lists survey groups, elicitation periods, forecast dates, and number of respondents in each survey group.

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Table 1. Composition of Survey Groups, Number of Respondents, Elicitation Periods, and Forecast Dates

Group	Description of Groups	Number of Respondents	Period of Elicitation	Forecast Dates
1	IL Farm Bureau Meeting; random selection of producers in exhibit hall	44	Dec 8, 1987	Jan 1, 1988 March 1, 1988
2	IL Farm Bureau Meeting; random selection of producers prior to outlook meeting	51	Dec 7, 1987	Jan 1, 1988 March 1, 1988
3	Relatives of U of I undergraduate students; Thanksgiving vacation	47	Nov 25-27, 1987	Jan 1, 1988 March 1, 1988
4	Farmers in Farina, IL cafe	22	Nov 12, 1987	Jan 1, 1988 March 1, 1988
5	WILL Radio Outlook Meeting; random selection prior to meeting	59	July 14-17, 1987	Nov 1, 1987 March 1 ,1988
6	Elevator Merchandisers in East Central IL; random selection	14	July 14-17, 1987	Nov 1, 1987 March 1 ,1988
7	Whiteside County, Options Extension Meeting; random selection prior to meeting	14	June 25, 1987	Nov 1, 1987 March 1 ,1988

Using a technique suggested by Bessler and Moore, survey respondents were asked to provide a "distribution" of expected cash corn and soybean prices, as well as a distribution of their local basis. A copy of the survey is contained in the appendix. A distribution of the expected futures price was constructed for each forecast horizon on every survey by combining each respondent's cash and basis distributions as follows:[5]

$$\sum_i \sum_j p_i p_j \, (C_i - B_j)$$

where C_i = the mean value of the cash price in interval i.
B_j = the mean value of the basis in interval j.
p_i = the subjective probability associated with cash interval i.
p_j = the subjective probability associated with basis interval j.

Each possible value obtained in this summation was assigned a subjective probability based on the sum of $p_i p_j$ for each value (e.g. if $p_i p_j$ for \$2.00 + \$.20 is .04 and $p_i p_j$ for \$2.10 + \$.10 is .25, then the subjective probability for \$2.20 is .29). This method of combination assumes independence between p_i and p_j.

Individual distributions of expected futures prices were aggregated by summing over individuals surveyed during the same time period the probabilities associated with each possible futures price value. These probabilities and respective price values were then used to calculate the moments of the aggregate distributions of expected futures prices. For comparison, the market's price distribution is assumed to be consistent with the assumptions underlying the Black option pricing model. The futures price is assumed lognormally distributed. The price expected by the futures market for the forecast date is the current futures price and, as suggested by Gardner, the option premium can be inverted to provide a forecast of the market's price distribution variance.

Results

The first two moments (mean and variance) of the aggregate distributions are reported for each survey group, elicitation period, forecast date, and commodity in Tables 2a and 2b. Variances are also reported as annualized expected volatilities, or "annualized percentage standard deviations."[6] Tables 3a and 3b report the closing, or settle, futures price quoted during the elicitation period (or average closing futures price over the days within a multi-day survey period) for each survey group, commodity, and forecast date, as well as the realized futures price and cash price in Chicago for each forecast date, survey group and commodity. Also reported in Tables 3a and 3b are the annualized volatilities implied by the option premia quoted for the forecast dates for each commodity. Volatilities were calculated using Black's model and call premiums with the strike nearest to but out of the money (the first strike above the relevant futures price).[7] In addition to the implied volatility from the ending date of each elicitation period, an average implied volatility is reported using the implied volatility on the ending date of

Table 2a. Moments of the Expected Price Distributions for Soybeans

Group	Observations	Elicitation Period	Forecast Date	Mean [a]	Variance [b]	Annualized Expected Volitility [c]
1	35	Dec 8, 1987	Jan 1, 1988	$5.9116	0.10144	22.53
	34		March 1, 1988	$6.2330	0.14992	13.49
2	46	Dec 7, 1987	Jan 1, 1988	$5.8987	0.08424	20.89
	46		March 1, 1988	$6.0985	0.10064	11.52
3	44	Nov 25-27, 1987	Jan 1, 1988	$6.0052	0.15254	21.50
	43		March 1, 1988	$6.1069	0.20648	15.01
4	18	Nov 12, 1987	Jan 1, 1988	$5.6108	0.08831	15.48
	18		March 1, 1988	$5.7890	0.09100	9.91
5	52	July 13-15, 1987	Nov 1, 1987	$5.1960	0.18717	19.46
	51		March 1, 1988	$5.4936	0.18169	10.05
6	13	July 13-15, 1987	Nov 1, 1987	$5.1140	0.12405	17.37
	13		March 1, 1988	$5.4035	0.12408	8.37
7	12	June 25, 1987	Nov 1, 1987	$5.4327	0.16645	13.12
	12		March 1, 1988	$5.7642	0.22040	10.08

a. Dollars per bushel.
b. Variance of expected ending lognormal distribution.
c. Units are expressed as annualized percentage standard deviations, a standardization used by the industry to quote volitilities.

Table 2b. Moments of the Expected Price Distributions for Corn

Group	Observations	Elicitation Period	Forecast Date	Mean [a]	Variance [b]	Annualized Expected Volitility [c]
1	37	Dec 8, 1987	Jan 1, 1988	$1.8950	0.02732	36.55
	36		March 1, 1988	$1.9903	0.02966	19.49
2	47	Dec 7, 1987	Jan 1, 1988	$1.9360	0.02780	35.80
	46		March 1, 1988	$1.9914	0.03682	21.17
3	44	Nov 25-27, 1987	Jan 1, 1988	$1.9169	0.04796	34.48
	44		March 1, 1988	$2.0169	0.08388	26.62
4	18	Nov 12, 1987	Jan 1, 1988	$1.9436	0.02514	24.17
	18		March 1, 1988	$2.0281	0.02925	16.89
5	51	July 13-15, 1987	Nov 1, 1987	$1.6735	0.04672	25.49
	52		March 1, 1988	$1.8559	0.04851	15.73
6	13	July 13-15, 1987	Nov 1, 1987	$1.7724	0.01954	15.61
	13		March 1, 1988	$1.8920	0.02807	11.65
7	14	June 25, 1987	Nov 1, 1987	$1.7679	0.08251	27.77
	14		March 1, 1988	$1.9551	0.05132	14.32

a. Dollars per bushel.
b. Variance of expected ending lognormal distribution.
c. Units are expressed as annualized percentage standard deviations, a standardization used by the industry to quote volitilities.

Table 3a. Market Prices and Implied Volatilities for Soybeans

Elicitation Period	Forecast Date	Period Settle Price [a]	Realized Futures Price [b]	Realized Cash Price [c]	Annualized Volatilities Implied by Option Premia IV1 [d]	IV2 [e]
Dec 8, 1987	Jan 1, 1988	$5.8725	$6.1625	$6.1275	33.4	30.1
	March 1, 1988	$5.9550	$6.3500	$6.2150	23.5	26.9
Dec 7, 1987	Jan 1, 1988	$5.8975	$6.1625	$6.1275	34.4	30.1
	March 1, 1988	$5.9875	$6.3500	$6.2150	24.3	27.8
Nov 25-27, 1987	Jan 1, 1988	$6.0213	$6.1625	$6.1275	32.4	29.8
	March 1, 1988	$6.1050	$6.3500	$6.2150	27.9	27.0
Nov 12, 1987	Jan 1, 1988	$5.6150	$6.1625	$6.1275	21.5	22.3
	March 1, 1988	$5.6900	$6.3500	$6.2150	21.9	22.0
July 13-15, 1987	Nov 1, 1987	$5.2675	$5.3100	$5.2550	24.8	27.6
	March 1, 1988	$5.4283	$6.3500	$6.2150	-----f	-----f
June 25, 1987	Nov 1, 1987	$5.5800	$5.3100	$5.2550	30.1	32.3
	March 1, 1988	$5.7750	$6.3500	$6.2150	-----f	-----f

a. Futures contract settle price for day survey was completed, quoted from The Wall Street Journal.
b. Futures price on forecast date or subsequent trading date.
c. Cash price on forecast date, quoted from the Grain Market News.
d. Implied volatilities of call option on survey date.
e. Average volatilities of call option on survey date and four previous trading days.
f. March option premiums not quoted.

Table 3b. Market Prices and Implied Volatilities for Corn

Elicitation Period	Forecast Date	Period Settle Price [a]	Realized Futures Price [d]	Realized Cash Price [f]	Annualized Volatilities Implied by Option Premia IV1[g]	Annualized Volatilities Implied by Option Premia IV2[h]
		[b]				
Dec 8, 1987	Jan 1, 1988	$1.8639	--- [e]	$1.8850	--- [i]	--- [i]
	March 1, 1988	$1.9100	$2.0375	$2.0200	36.0	35.9
		[b]				
Dec 7, 1987	Jan 1, 1988	$1.8722	--- [e]	$1.8850	--- [i]	--- [i]
	March 1, 1988	$1.9175	$2.0375	$2.0200	34.9	36.4
		[b]				
Nov 25-27, 1987	Jan 1, 1988	$1.9222	--- [e]	$1.8850	--- [i]	--- [i]
	March 1, 1988	$1.9613	$2.0375	$2.0200	37.8	36.5
		[b]				
Nov 12, 1987	Jan 1, 1988	$1.8281	--- [e]	$1.8850	--- [i]	--- [i]
	March 1, 1988	$1.8700	$2.0375	$2.0200	25.7	23.9
		[c]			[j]	[j]
July 13-15, 1987	Nov 1, 1987	$1.7758	--- [e]	$1.7600	25.0	25.6
	March 1, 1988	$1.8658	$2.0375	$2.0200	25.5	25.5
		[c]			[j]	[j]
June 25, 1987	Nov 1, 1987	$1.9925	--- [e]	$1.7600	31.4	33.9
	March 1, 1988	$2.0650	$2.0375	$2.0200	36.2	37.3

a. Futures contract settle price for day survey was completed, quoted from The Wall Street Journal.
b. January futures settle price calculated by ln (Jan) = ln (Dec) + (r * s) where r = (ln (March) - ln (Dec)) / t, s = 1/12, t = .25
c. December futures settle price.
d. Futures price on forecast date or subsequent trading date.
e. Futures contract does not exist.
f. Cash price on forecast date, quoted from the Grain Market News.
g. Implied volatilities of call option on survey date.
h. Average volatilities of call option on survey date and four previous trading days.
i. January corn options do not exist.
j. December corn options used to calculate IV's.

the elicitation period as well as the implied volatilities from the four preceding trading days. Tables 4a and 4b report the differences between realized prices on the forecast date and the futures prices quoted during the elicitation period, between realized prices and the means of the survey groups' futures distributions, between mean expectations for the different forecast dates (yielding an expected carrying charge), and between the futures prices for the different forecast dates quoted during the survey period (yielding a futures market carrying charge). Also reported in Tables 4a and 4b are the differences between the futures and expected carrying charges. Table 5 reports the differences between the market's implied volatilites and the annualized expected price volatilites derived from the distributions of survey respondents. An F-test of the ratios of the related variances was used to test for differences between the variances implied by option premia and the variances of the survey respondents. Differences that are not significantly different from zero are denoted with an asterisk.[8]

It is clear from Tables 2a and 2b that although the respondents expected a larger price variance for the March distribution than for the nearby date, their annualized expected volatilities are lower for March than for the nearby date. Likewise, the respondents' annualized expected volatilities are higher for forecasts with shorter time horizons (e.g., December forecasts of March 1) than for longer time horizons (e.g., July forecasts of March 1). Respondents are therefore implicitly assuming a decreasing variance rate over time. The market volatilities implied by option premia (Table 3) are not uniformly smaller for the more distant forecast date. The difference between the respondents' annualized expected volatilites for different forecast dates appears inconsistent with the diffusion process underlying Black's formula. The implied volatilities, on the other hand, seem consistent.

Tables 4a and 4b indicate that all respondents expected the market to provide a positive return to storage between November and March and between January and March for both corn and soybeans. However, the size of the expected carry differs substantially across elicitation periods, and only in part due to differences in the length of the storage period. Furthermore, although the futures market consistently offered a positive return to storage in each elicitation period, the futures carry is always less than the respondents' expected carry.

The difference between the futures price quoted during elicitation periods and mean survey expectation is in general smallest for group 3, the relatives of U. of I. College of Agriculture undergraduates. It is likely that this group's agreement with the futures market is in part due to the much longer time interval that respondents had to complete the survey. Respondents had time to check market prices during the period as well as perhaps an extra incentive to complete the survey with care, given that their children asked for their participation over a vacation period. Large price moves in soybean futures (greater than $.10) occured during the July survey period and within the five previous trading days during the June and December survey period. These price moves may explain some of the differences between futures prices and survey expectations insofar as in

Table 4a. Differences between Realized Prices and Futures and "Expected Prices" During the Elicitation Periods; the Expected and Futures Carrying Charges and their Differences, Soybeans

Elicitation Period	Forecast Dates	Realized Minus Futures	Realized Minus Expected	Forecast Length (Days)	Expected Carry	Futures Carry	Carry Difference
Dec 8, 1987	Jan 1, 1988	$0.2900	$0.2509	23	$0.3214	$0.0825	($0.2389)
	March 1, 1988	$0.3950	$0.1170	82			
Dec 7, 1987	Jan 1, 1988	$0.2650	$0.2638	24	$0.1999	$0.0900	($0.1099)
	March 1, 1988	$0.3625	$0.2515	83			
Nov 25-27, 1987	Jan 1, 1988	$0.1412	$0.1573	34	$0.1018	$0.0838	($0.0180)
	March 1, 1988	$0.2450	$0.2431	93			
Nov 12, 1987	Jan 1, 1988	$0.5475	$0.5517	49	$0.1781	$0.0750	($0.1031)
	March 1, 1988	$0.6600	$0.5610	108			
July 13-15, 1987	Nov 1, 1987	$0.0425	$0.1140	108	$0.2976	$0.1608	($0.1368)
	March 1 ,1988	$0.9217	$0.8564	228			
July 13-15, 1987	Nov 1, 1987	$0.0425	$0.1960	108	$0.2895	$0.1608	($0.1287)
	March 1 ,1988	$0.9217	$0.9465	228			
June 25, 1987	Nov 1, 1987	($0.2700)	($0.1227)	128	$0.3315	$0.1950	($0.1365)
	March 1 ,1988	$0.5750	$0.5858	248			

Table 4b. Differences between Realized Prices and Futures and "Expected Prices" During the Elicitation Periods; the Expected and Futures Carrying Charges and their Differences, Corn

Elicitation Period	Forecast Dates	Realized Minus Futures	Realized Minus Expected	Forecast Length (Days)	Expected Carry	Futures Carry	Carry Difference
	[a]						
Dec 8, 1987	Jan 1, 1988	$0.0211	($0.0100)	23	$0.0953	$0.0461	($0.0492)
	March 1, 1988	$0.1275	$0.0472	82			
	[a]						
Dec 7, 1987	Jan 1, 1988	$0.0128	($0.0510)	24	$0.0554	$0.0453	($0.0101)
	March 1, 1988	$0.1200	$0.0461	83			
	[a]						
Nov 25-27, 1987	Jan 1, 1988	($0.0372)	($0.0319)	34	$0.1000	$0.0391	($0.0609)
	March 1, 1988	$0.0762	$0.0206	93			
	[a]						
Nov 12, 1987	Jan 1, 1988	$0.0569	($0.0586)	49	$0.0845	$0.0419	($0.0426)
	March 1, 1988	$0.1675	$0.0094	108			
	[b]						
July 13-15, 1987	Nov 1, 1987	($0.0158)	$0.0865	108	$0.1825	$0.0900	($0.0925)
	March 1 ,1988	$0.1717	$0.1816	228			
	[b]						
July 13-15, 1987	Nov 1, 1987	($0.0158)	($0.0124)	108	$0.1196	$0.0900	($0.0296)
	March 1 ,1988	$0.1717	$0.1455	228			
	[b]						
June 25, 1987	Nov 1, 1987	($0.2325)	($0.0079)	128	$0.1872	$0.0725	($0.1147)
	March 1 ,1988	($0.0275)	$0.0824	248			

a. The January 4, 1988 Chicago cash price was used to calculate differences.
b. The November 2, 1988 Chicago cash price was used to calculate differences.

Table 5. Differences Between IV's and Annualized Expected Volatilities of Survey Respondents[a]

Group		November Soybean Difference	January Soybean Difference	March Soybean Difference	November Corn Difference	January Corn Difference[d]	March Corn Difference
1	Dec 8, 1987[b]		10.87	10.01			16.51
	5 day ave		7.57	13.41			16.41
2	Dec 7, 1987		13.51	12.78			13.73
	5 day ave		9.21	16.28			15.23
3	Nov 25-27, 1987		10.9	12.89			11.18
	5 day ave		8.3	11.99			9.88
4	Nov 12, 1987		6.02 *	11.99			8.81
	5 day ave		6.82	12.09			7.01
5	July 13-15, 1987	5.34		--- c	-0.49 *		9.77
	5 day ave	8.14			0.11 *		9.77
6	July 13-15, 1987	7.43 *		--- c	9.39		9.89
	5 day ave	10.23			9.99		9.89
7	June 25, 1987	16.98		--- c	3.63 *		21.88
	5 day ave	19.18			6.13 *		22.98

a. Implied volatilities minus expected volatilities.
b. Average implied volatilities on elicitation date and four preceding trading days.
c. March options not quoted.
d. Most relevant IV's for Jan. corn are the March IV's. Though Dec. IV's are available for the dates, the expiration of Dec. options is nearby, making their IV's suspect as variance estimates.
* Denotes insignificant difference. F-test using annualized variances: (IV's / 100)squared

these volatile informational climates, information may not be fully transmitted between futures markets and survey respondents. It is also possible that the differences are due to different reactions, or adjustments, to market information in the futures market and by survey respondents.

A simple measure of the forecast performance of survey respondents as compared to futures prices is presented in Figure 1 for soybeans and in Figure 2 for corn. For each elicitation period and forecast date, both the difference between the realized price and the mean survey expectation, and the difference between the realized price and the futures price are plotted. There is no clear difference between the forecasting performance of survey respondents and the futures market for soybeans or corn. Forecast errors are generally larger for soybeans than for corn, but proportionally close relative to price levels. For soybeans there is an improvement of the forecast performance of both survey respondents and the futures market for the March 1 forecast date between the summer and late fall elicitation periods. The finding that both the futures market and respondents almost always underpredicted the March 1 price for both corn and soybeans is probably just an artifact of grain price behavior within the 1987-88 crop year. Finally, the realized prices are all within 95% confidence intervals constructed with the expected means and variances of survey respondents.

F-tests of the significance of the difference between the annualized variance implied by option premia and the annualized expected variance of survey respondents indicate that the variance expected by survey respondents for soybeans is usually significantly less than the implied variance for near forecasts, and always significantly less for distant forecasts. For corn, expected variances are not significantly different than implied variances for near forecasts, November 1, for groups 5 - 7. For the distant forecast, corn expected variances are significantly less than implied variances.

Conclusions

As shown by Hauser and Eales, the hedger's variance expectation relative to the implied volatility of the premium largely determines the expected risks and returns of different option hedging strategies. The differences between the variance forecasts of respondents versus the market indicate that respondents believe that options are overpriced. The variance results here indicate that the respondents would be reluctant to hedge by buying puts, but that the sale of calls may be attractive. Other things such as price expectations and levels of risk aversion also influence the choice of option hedging strategy. Because differences between futures expectations and survey expectations do not systematically differ, our results indicate that the differences in variance expectations may largely explain differences between prescribed and actual option hedging strategies.

Results indicate that the carrying charge provided by the futures market differs from the carrying charge expected by survey respondents. This finding pertains to the issue of the forecast versus allocative

Figure 1

Forecast Performance of Survey Respondents as Compared to Futures Prices for SOYBEANS

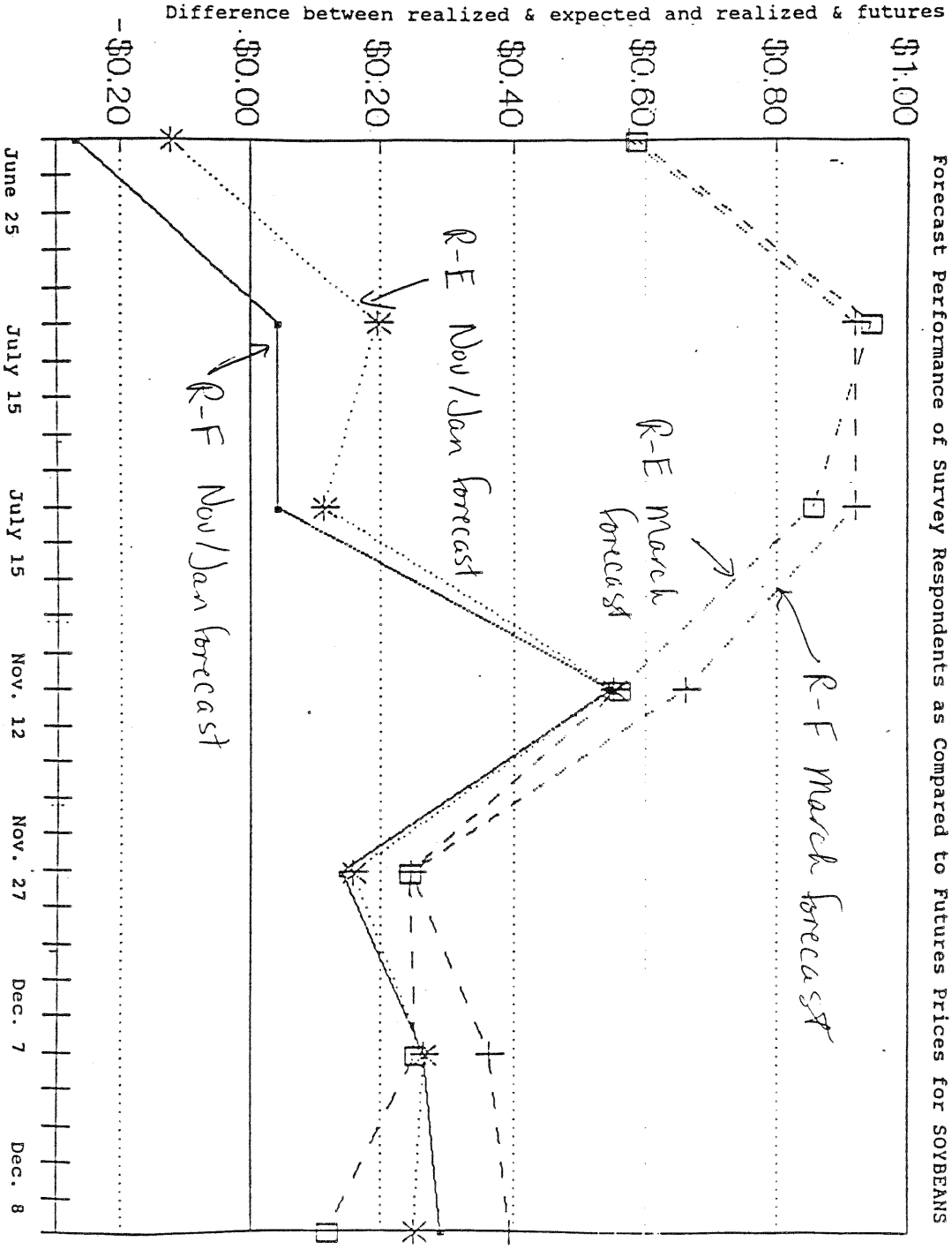
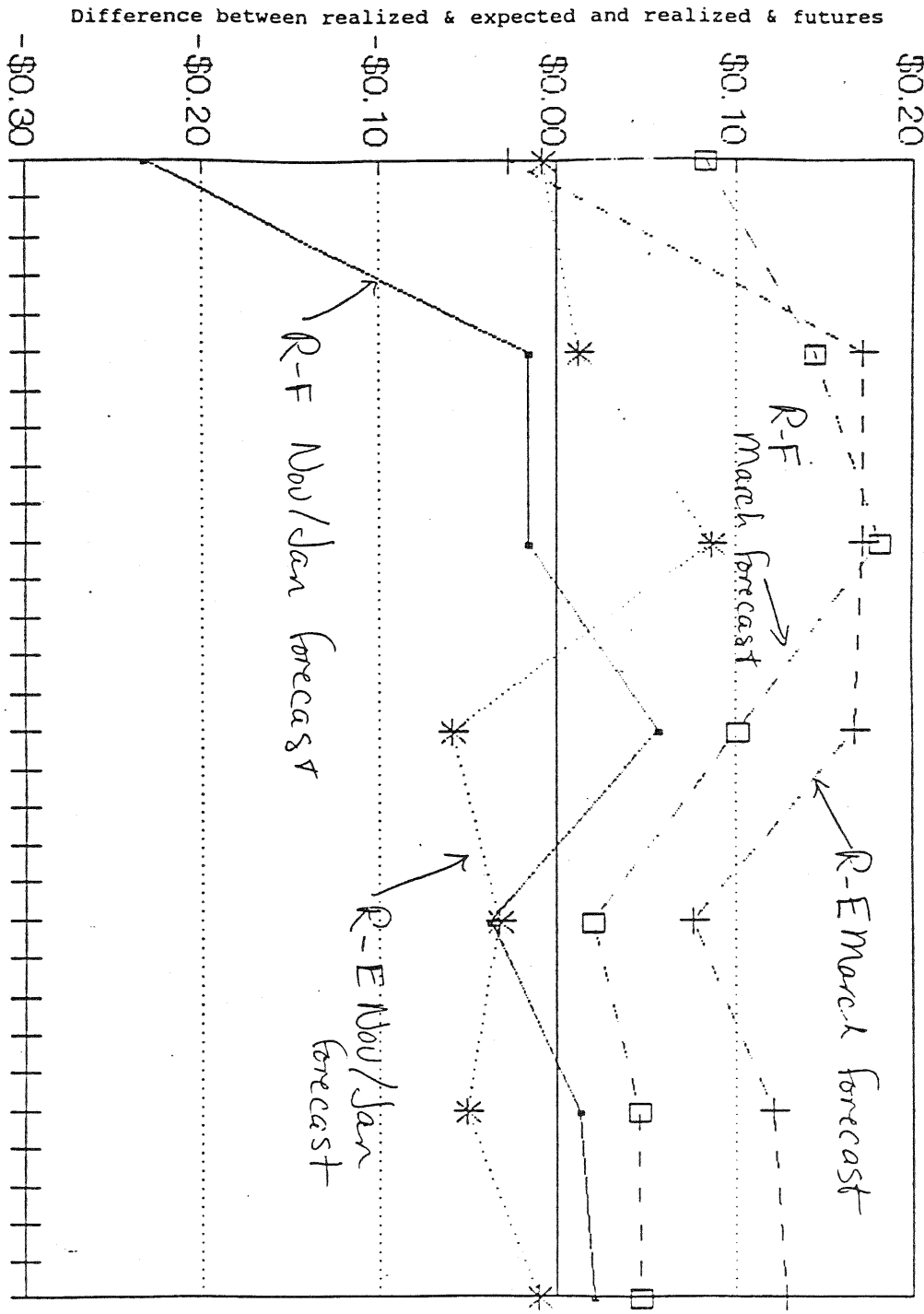


Figure 2

Forecast Performance of Survey Respondents as Compared to Futures Prices for CORN



performance of futures markets. Because the carrying charge is more directly related to the allocative performance of futures, further analysis might more appropriately focus on differences in carrying charges rather than on the forecast performance of futures price levels as compared to the expectations of survey respondents.

Endnotes

1. We did not elicit distributions of the expected cash or futures price in Chicago because we intend to focus further research on the expected cash and basis distributions. We also wanted to reduce the likelihood that respondents would simply quote that day's futures quotation.

2. The common-way of estimating variances for pricing options is by using daily log price differences. The variance of these differences gives a variance rate per day. In a sense, it represents the variance expected for tomorrow's price distribution. The time diffusion process underlying the estimate implies that if this rate stays the same for one year then the distribution expected one year from now is the daily variance times 365. The variance is thus assumed proportional to time. The variances obtained from survey respondents are for distributions 'x' days away. To annualize their variance, it is multiplied by 365/x. For example, if the variance of the survey respondents' log prices for a 60 day forecast is .01, then the annualized variance is (365/60).01 = .061. The square root of this is .246, and the volatilitiy is expressed as 24.6.

3. Calls slightly out of the money were used because (a) calls are usually traded more than puts, and (b) studies tend to indicate that options deep in or out of the money are "mispriced" (wrong implied volatility) more often than those near the money. (See Hauser and Neff for a brief review of some of these studies.)

4. The F-tests were performed by converting annualized percentage standard deviations to variances. The degrees of freedom were the number of respondents for the survey variances and the average daily volume of option trading by commodity in each survey period for the variances implied by option premia.

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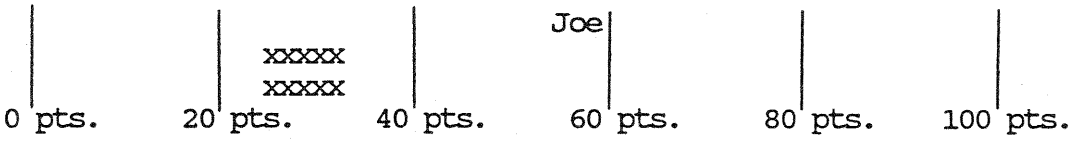
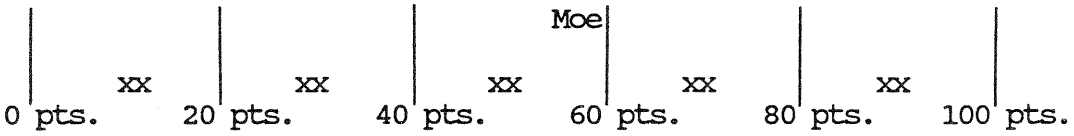
Appendix. Survey Instrument

Example:

The charts below are ranges of total football points that the Chicago Bears may score in their first game of the season. Joe and Moe are given 10 X's each to place in the ranges in any combination to indicate the confidence in their belief that the Bears' points will lie in a given range. Joe is 100% certain the Bears will score between 20 and 40 points, so he places the 10 X's in that range. Moe believes that each range of scores is equally possible, so he places 2 X's in each range.

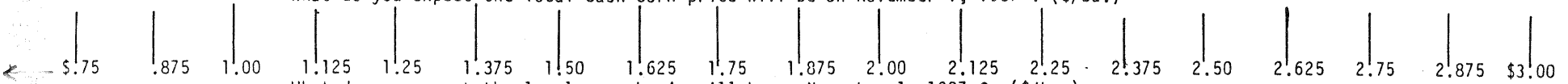




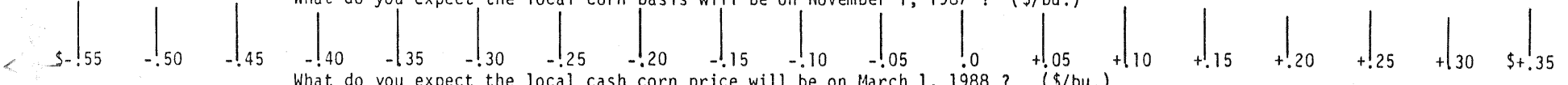
1. Given the ranges of your local cash prices and basis for corn and soybeans on the following page and given 10 X's (XXXXXXXXXX) for each question; place X's (in any combination) in the ranges to indicate how strongly you believe the price or basis will be in that range on the given dates. The greater the number of X's placed in one range, the greater the confidence that local cash price or basis will be in that range. Please use all of the X's.

Basis is defined as the local cash price minus the nearby futures contract (cash-futures). Therefore if the local cash price is greater than the nearby futures contract the basis is positive (+) or the basis is negative (-) when the nearby futures contract is greater than the local price.

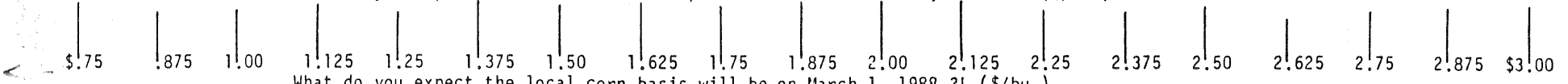
What do you expect the local cash corn price will be on November 1, 1987 ? ($/bu.)



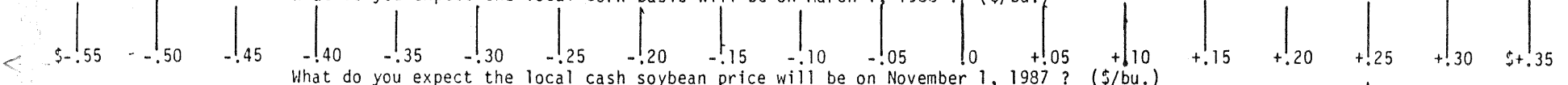
What do you expect the local corn basis will be on November 1, 1987 ? ($/bu.)



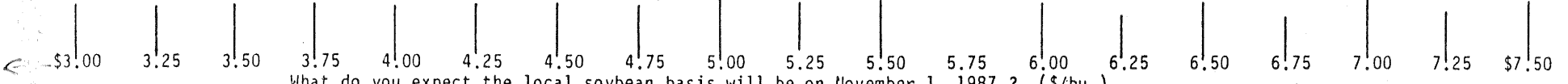
What do you expect the local cash corn price will be on March 1, 1988 ? ($/bu.)



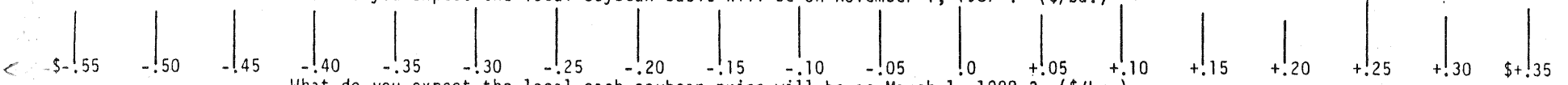
What do you expect the local corn basis will be on March 1, 1988 ? ($/bu.)



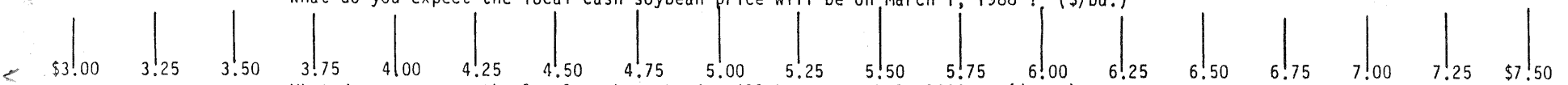
What do you expect the local cash soybean price will be on November 1, 1987 ? ($/bu.)



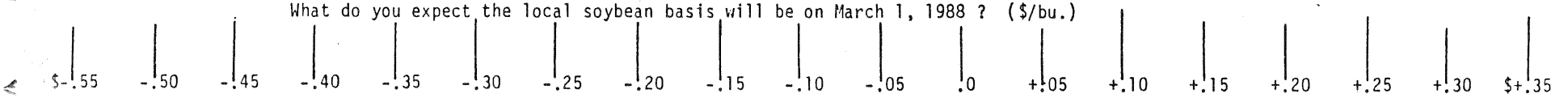
What do you expect the local soybean basis will be on November 1, 1987 ? ($/bu.)



What do you expect the local cash soybean price will be on March 1, 1988 ? ($/bu.)



What do you expect the local soybean basis will be on March 1, 1988 ? ($/bu.)



1. Where is your farm located (county)?_____

2. How many acres do you farm? total_____ corn_____ soybean_____

3. Please circle your type of operation: grain livestock mixed

4. Do you sell grain under forward contracts, basis contracts, or delayed pricing? yes no

5. Do you trade futures contracts? yes no

6. How many years have you been farming? _____

7. Please circle the highest level of education attained:
high school 2 yr. college 4 yr. college grad school

DATE: / /1987