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EVALUATION OF FORECASTS FROM THE ANNUAL AAEA OUTLOOK SURVEY[1]

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Since 1978, the AAEA has sponsored a survey of its membership concerning their judgment about the outlook for key economic variables for the coming year. The surveys were mailed out in late June or early July with deadlines set for about the third week in July. The forecasts have applied to the balance of the current and subsequent calendar years on livestock and the current and up-coming seasons on crops. Farm income and macro-economic variables have also been forecast for the current and subsequent calendar years.

We now have a record of forecasts on livestock, farm income, and macro-economic variables covering eight years on nearly all of the items. Forecasts for seven years can be evaluated in terms of comparison with actual levels. Forecasts for the eighth crop year (1985-86) can also be evaluated on a preliminary basis in comparison with current estimates. This would appear to be enough information to draw some conclusions about the accuracy of the forecasts, although not enough years are yet available to thoroughly test this technique.

The respondents to the survey have numbered around 50-65 each year and have included representatives of industry, government, and universities. Most respondents have major or moderate outlook responsibilities.

This evaluation focused on the forecasts for the coming crop or calendar year and did not include forecasts for the balance of the calendar year of the survey. Tables 1-3

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present the year-by-year mean forecasts and the actual values. Livestock production forecasts are in terms of percent changes from the previous year. This has also been the case for the selected economic variables in Table 3, although since 1982, the forecasts of cash receipts and farm income have been the absolute values themselves. The forecasts for 1982 to date were converted to percent changes in Table 3. The percent change was derived from the mean forecast for the coming year relative to the mean forecast for the current year.

Using the data in Tables 1-3, calculations were made of the mean absolute error, mean error, root mean squared error, and root mean squared percentage error as presented in Table 4. Since livestock production and the selected economic variables were in terms of percents of the previous year, the root mean squared percentage error was not calculated on those items.

The mean absolute error is simply the mean of the difference between the forecast and the actual value without regard to sign. The mean error is the average with regard to sign, indicating any bias in the forecasts. The root mean squared error (RMSE) is commonly used to evaluate predictive accuracy. Calculating RMSE as a percent of the average value of the variable being predicted provides a base for comparison of predictions from one item to another.

The root mean squared percentage error (RMSPE) has been the lowest on wheat variables. This is understandable since the crop size and harvest prices are well known at the time the survey is taken. The RMSPE on livestock prices ranged from about 7 to 14 percent and averaged nearly 15 percent on corn, cotton, and soybean prices. The RMSPE was relatively low at 5 percent on wheat with the highest error at 22.8 percent on soybean oil.

The RMSPE was relatively high on ending stocks, partially because of the fact that stock levels were low in some of the forecast years. A given percent error in predicting the size of the crop translates into a much larger percentage error in ending stocks.

Some bias is noted in the forecasts, particularly in overestimating cattle prices, livestock marketings, real GNP and food prices. There was some tendency to underestimate net farm income.

A large RMSE is noted on net farm income. This can partly be explained by major revisions recently in the computation that generated much larger year-to-year changes than had been published by the USDA prior to 1985.

Root Mean Square Percentage Errors

To provide a more comprehensive evaluation of the forecasts, RMSPE comparisons were made with other sources--the USDA, futures markets, and a naive model which assumes no change from the year before. Forecasts are presented in Table 5. Footnote "b" in Table 5 explains how forecasts of cash prices were derived from futures prices.

In Tables 1, 3 and 4, forecasts of livestock production and selected economic variables were in terms of the percent changes from the year before. In Table 5, the absolute values of the variables were derived from the percent changes by the following procedure. The USDA estimates and partial forecasts of these variables for the current year, available in July (when the survey was taken) were used as a base. These estimates were multiplied by the forecasts of the absolute values for the coming year. The reason for this processing of the forecasts from the survey was to make them comparable to forecasts from other sources.

Note in Table 5 that when the livestock forecasts were put into absolute values, the RMSPE figures were near the root mean squared errors of the percentage changes as given in Table 4. The RMSPE errors ranged from a low of 2.4 on egg production to a high of 6.3 on pork production.

While those forecasting egg production seemed to be doing the most effective job among the livestock analysts, their task was somewhat less challenging as measured by the RMSPE on the naive forecasts. The RMSPEs of the livestock production forecasts from the survey were below the RMSPEs from the naive model except on eggs.

The naive error term provides a standard for measuring how difficult a task the forecaster faces. If the variable being forecast fluctuates widely from year-to-year, the RMSPE of the naive model will be relatively high; if the volatility is low, the RMSPE of the naive model will be low.

The outlook survey respondents performed better than the naive model on egg and hog prices, but not on cattle and broilers. On cattle and hogs as well, a simple application of futures prices in the first half of July adjusted for the average "basis" for the previous year would have generated more accurate forecasts.

Outlook survey respondents generated much more accurate forecasts on crop production than the naive model--not surprising considering that information is available on crop conditions at the time of the survey. Overall, the forecast accuracy on crop production, exports and ending stocks was closely aligned with that of the USDA.

The RMSPE values of the AAEA survey forecasts were lowest on corn prices compared to the USDA, futures and the naive model and second to the USDA on wheat prices. On soybeans, the survey forecast error was above that of the USDA and futures and clearly below the naive model. The survey, USDA and futures all had RMSPE errors over 20 percent on soybean oil as did the naive model. On meal prices, futures market and USDA errors were the lowest, followed by the survey and the naive model.

Among the other economic variables, the error on net farm income seemed abnormally high. This may be due, in part, to revisions made to the estimates by the USDA.

The use of the combination of futures prices adjusted for lagged basis values in forecasting cash prices performed more effectively than might have been expected. The RMSPE from futures was lower than on the survey forecasts in five of the eight commodities analyzed. Just and Rausser also found that forecasts from futures

compared favorably with those from major econometric models.[2] Their analysis applied to quarterly forecasts over the relatively short period of 1976-78.

To examine further the relative performance of the AAEA survey performance with that of futures and the USDA, rankings were made for each year on how close each of the sources were to actual prices (Table 6). On livestock, comparisons were possible only between the survey and futures markets. On cattle, the survey was closer to mark than futures in only 2 years out of 8 on Choice steer prices at Omaha and in none of the years on feeder steers at Kansas City. The performance was a toss-up on barrow and gilt prices as the survey was more accurate in 4 of the 8 years.

The comparison between the survey and futures was close on crops. The survey was marginally superior on corn, soybean oil and soybean meal and slightly below futures on wheat and soybeans. The survey was somewhat weaker in comparison with the USDA, marginally above on corn and soybean oil prices, but below on wheat and soybeans. The count was even on soybean meal prices.

An additional comparison was made between the USDA and futures markets in Table 6. The conclusion is that the USDA's performance was equal to or somewhat better than futures on the 5 crop items.

When adding up the total performance, the USDA scored the highest on crops with the outlook survey and futures in a virtual tie for second place. When livestock was added the futures market scored above the outlook survey.

Turning Point Errors

An important criterion for evaluating forecasts is the frequency of turning point errors. The key question for many decisions is the prospective direction of change rather than how much the change will be. Since the naive model forecasts no change, it is

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[2]Just, Richard, E. and Gordon Rausser, "Commodity Price Forecasting with Large-Scale Econometric Models and the Futures Market," AJAE, May 1981.

useless as a model for indicating direction except when change from the previous year is used as the forecast for the coming year. On land values, real GNP, CPI and CPI on Food, the evaluation of the naive model was based on next year's change being the same as last year's change. On variables such as these, with strong underlying trends, the naive model does well in indicating direction.

The number of turning point errors from the eight years of forecasts from the AAEA survey is shown in Table 7. If a forecast of no change is evaluated as a .5 turning point error, the survey forecasts must have less than 4 turning point errors out of 8 to out-score the naive model (except on land values, real GNP, CPI and CPI on food).

The survey performance in predicting the direction of change on livestock production was acceptable except on eggs. Only 1 turning point error out of eight years was observed for broiler production. Curiously enough, the survey correctly predicted the direction of egg prices in every year except one even though there were 6 turning point errors on egg production. This can be explained by the fact that most of the forecasts on egg production called for only slight changes. The problem in forecasting beef demand is evident in cattle prices. Increases were predicted in every year except one for Choice steer prices, yet prices fell in 4 of the 8 years.

On crops, the major challenge seemed to be forecasting the direction of change in corn and soybean exports. The performance was very good in predicting the direction of change in crop production except on corn where 3 turning point errors were made. Except on cotton, few errors were made in calling the direction of change in ending stocks.

On crop prices, the survey scored higher than the naive model on all the items. Soybean and soybean oil prices appear to be something of a challenge in forecasting direction of change.

The survey was at the 50 percent mark on cash receipts from crops and just under on livestock and net farm income. Both the survey and the naive model correctly

predicted the direction of change in the CPI and the CPI on food, not a major accomplishment in that these indices increased each year. On land values, the survey had 2 TPEs versus 1 TPE for the naive model. On real GNP, the survey registered 2 TPEs versus the naive model's 4 TPEs.

The total turning point errors for the survey are presented in Table 7. Out of 34 items predicted over the eight year period, 29 involved less than 4 turning point errors. Including the 4 items for which the naive model forecast direction of change were excluded, the survey out-scored the naive model on 28 items out of 34--a 4.7 to 1 edge.

Summary, Conclusions and Implications

Based on 8 years of observations from the AAEA outlook survey and selected comparisons with the futures market and the U.S. Department of Agriculture, a tentative evaluation can now be made of the accuracy of agricultural outlook. The survey results indicate that analysts have a major challenge in reducing the forecast error for the year ahead, as measured by root mean squared percentage error, to 5 percent and even 10 percent or below. On livestock prices, the errors ranged from 7-14 percent and on crop prices, from 5 to 23 percent. Excluding wheat for which harvest prices were well known by respondents, the range was from 14 to 23 percent.

Forecasting livestock production was less of a challenge than on prices with the RMSPE ranging from 2 to 6 percent. Wheat production prospects were well known at survey time and the RMSPE was only about 4 percent. However, even with good indications available on acreage planted to corn, cotton and soybeans, forecast errors on production were still above 10 percent (RMSPE).

Forecast errors on exports were higher than on production, ranging from 13 percent on wheat to 32 percent on cotton. Forecast errors on ending stocks were generally higher yet, ranging from 13 percent on wheat to 52 percent on corn.

Forecast errors were relatively high on livestock marketings at about 12 percent and particularly net farm income at 40 percent, the latter partly explained by revisions

in the computation by the USDA. Forecasts on the price of farm land was also relatively high at 7.3 percent.

Forecasting real GNP, CPI and CPI on food represents less of a challenge than on agricultural variables because of more consistency in the year to year changes in these items. The errors were only about 3 percent but the naive model generated similar errors.

The outlook survey's performance in discerning the direction of change was generally good. Clearly the survey out-performed the naive model.

The overall performance of the survey was not clearly superior to the futures market and the USDA on those items for which comparisons were possible. If anything, the survey was less accurate than these other two sources of outlook information, but not significantly. The important point is that, with all the resources going into generating outlook information, the entire system--universities, firms and agencies represented in the AAEA survey, futures markets and the U.S. Department of Agriculture--is not generating forecasts for the year ahead that meets normally accepted criteria for accuracy.

Of course, no particular standard has been set. Subjectively, root mean standard percentage errors greater than those of the naive model are unacceptable. Perhaps a reasonable goal might be to generate forecasts with RMSPE at a level three-fourth or less of those generated by the naive model. In 1978-79 to 1985-86, this objective was achieved on only a third of the items tabulated from the survey.

The value of the outlook program cannot be measured strictly on the basis of accuracy of forecasts. The forecasts themselves may modify decisions of farmers and others whose response can invalidate the forecasts. Outlook programs also provide a means for disseminating economic education. But accuracy is one important criterion that must be considered. The performance of the past 8 years is not up to the standards acceptable to user and analyst.

Another implication is that analysts need to provide more information on the error term implicit in their forecasts. Users may not be fully aware of the magnitude of the variance nor the form of the distribution of the error term. Recognizing that improving the accuracy of forecasts will likely be a slow process even if possible, more monitoring and evaluation of forecasts is imperative. Presentation of forecast distribution would enable users to be more effective as risk managers.

Table 1. Comparison Between AAEA Outlook Survey Forecasts (F) on Livestock and Actual Values (A)

		Unit	Year							
			1979	1980	1981	1982	1983	1984	1985	1986
Livestock Production			Percent Change From Previous Year							
Beef	F	%	- 4.1	- 3.0	+ 1.2	+ 2.3	+ 1.8	+ .6	- 1.4	- 2.9
	A	%	-11.5	+ .9	+ 3.4	+ .7	+ 3.1	+ 1.5	+ .6	
Pork	F	%	+ 5.8	+ 2.7	- 8.1	- 3.2	+ .5	+ 4.0	- .3	+ .02
	A	%	+15.4	+ 7.5	- 4.6	-10.4	+ 6.8	- 2.5	- .1	
Broilers	F	%	+ 6.4	+ 4.2	- .2	+ 3.1	+ 2.5	+ 2.0	+ 3.1	+ 2.5
	A	%	+10.5	+ 1.5	+ 5.6	+ 1.5	+ 1.8	+ 4.9	+ 4.4	
Eggs	F	%	- .1	+ .3	- 2.0	+ .1	+ .2	- .7	+ 2.1	- .9
	A	%	+ 3.0	+ .5	+ .2	- .2	- 2.2	+ .1	+ .3	
Livestock Prices										
Steers, Cho., Omaha	F	$/cwt	59.02	72.98	73.32	70.93	67.50	65.79	69.64	64.36
	A	$/cwt	67.75	66.96	63.84	64.22	62.37	65.34	58.37	
Feeder Steers, Choice, KC	F	$/cwt	-	83.69	83.82	73.89	69.15	68.30	70.92	69.96
	A	$/cwt	-	75.23	66.24	64.82	63.70	65.28	64.56	
Barrows and gilts, 7 markets	F	$/cwt	44.65	42.01	44.64	52.21	52.36	44.87	53.03	48.26
	A	$/cwt	42.48	40.04	44.45	55.44	47.71	48.86	44.77	
Broilers, 12 city ave.[a]	F	¢/lb	44.6	44.5	46.7	52.4	48.0	46.4	54.1	50.25
	A	¢/lb	44.4	46.8	46.3	44.0	49.4	55.6	50.8	
Eggs, NY Grade A Large	F	¢/doz	62.4	66.4	66.9	73.2	75.5	73.5	73.1	67.62
	A	¢/doz	68.8	66.9	73.2	70.1	75.2	80.9	66.5	

[a] 9 city average prior to 1984.

Table 2 . Comparison Between AAEA Outlook Survey Forecasts (F) on Crops and Actual Values (A)

		Unit	Crop Year 1978 -79	1979 -80	1980 -81	1981 -82	1982 -83	1983 -84	1984 -85	1985 -86
Wheat										
Production	F	mil bu	1808	2009	2249	2671	2704	2352	2503	2416
	A	mil bu	1776	2134	2381	2785	2765	2420	2595	2425
Exports	F	mil bu	1096	1262	1289	1545	1707	1446	1398	1245
	A	mil bu	1194	1375	1514	1771	1509	1429	1424	910
Stocks	F	mil bu	1082	838	1051	1180	1256	1509	1439	1526
	A	mil bu	924	902	989	1159	1515	1399	1425	1869
Corn										
Production	F	mil bu	6114	6648	7288	7368	7645	6170	7811	7986
	A	mil bu	7268	7928	6395	8119	8235	4175	7656	8865
Exports[a]	F	mil bu	1655	2197	2419	2411	2276	2029	1994	1747
	A	mil bu	2133	2423	2355	1967	1870	1865	1838	1330[p]
Stocks[a]	F	mil bu	1108	1024	1497	901	2123	2119	1185	2139
	A	mil bu	1304	1617	1034	2171	3120	723	1381	3668[p]
Cotton										
Production	F	mil bls	11.83	13.28	13.83	13.83	11.24	8.80	11.70	12.18
	A	mil bls	10.86	14.63	11.12	15.65	11.96	7.78	12.96	13.40
Exports	F	mil bls	4.61	6.03	7.53	6.96	7.15	5.60	5.70	5.08
	A	mil bls	6.18	9.23	5.93	6.57	5.21	6.79	6.20	2.00[p]
Stocks	F	mil bls	6.40	5.32	3.45	3.26	5.20	5.40	3.20	6.25
	A	mil bls	3.96	3.00	2.67	6.63	7.94	2.78	4.10	9.40
Soybeans										
Production	F	mil bu	1786	1995	2038	2020	2129	2026	2057	1895
	A	mil bu	1869	2261	1798	1989	2190	1636	1861	2099
Exports	F	mil bu	691	827	857	821	919	928	831	690
	A	mil bu	739	875	724	929	905	743	598	780[p]
Stocks	F	mil bu	204	194	350	306	330	312	214	374
	A	mil bu	176	358	313	266	345	176	316	495[p]
Wheat Price[b]	F	$/bu	2.93	3.88	4.16	4.19	4.03	3.60	3.46	3.27
	A	$/bu	2.97	4.25	4.45	4.27	3.94	3.53	3.38	3.16
Corn Price[b]	F	$/bu	2.24	2.74	2.83	3.41	2.82	2.85	2.77	2.55
	A	$/bu	2.25	2.81	3.36	2.62	2.98	3.25	2.62	2.35[p]
Cotton Price[c]	F	$/lb	53.6	56.6	71.6	76.3	75.8	67.6	68.2	58.1
	A	$/lb	58.1	71.5	83.0	60.5	63.1	73.1	60.5	59.7[p]

			Crop Year							
		Unit	1978 -79	1979 -80	1980 -81	1981 -82	1982 -83	1983 -84	1984 -85	1985- 86
Soybean Price[b]	F	$/bu	5.90	7.19	6.71	7.53	6.41	6.28	6.66	5.64[p]
	A	$/bu	6.66	6.46	7.59	6.24	6.11	7.81	5.85	5.10[p]
Soybean Oil Price, Decatur Illinois	F	¢/lb	24.3	26.8	24.5	24.5	20.8	20.2	25.7	26.8[p]
	A	¢/lb	27.4	24.3	22.8	19.0	20.6	30.6	29.5	18.5[p]
Soybean Meal Price, Decatur Illinois	F	$/T	171	197	184	219	188	193	181	129[p]
	A	$/T	190	182	218	183	187	188	117	150[p]

p = preliminary

[a]Export and stock values for 1985-86 were estimated using the traditional October to September crop year rather than the new September to August crop year.

[b]Predictions for 1978-79 and for 1983-84 on were for the average price received by farmers. In the crop years from 1979-80 to 1982-83, the prices forecast were No. 1 hard red winter wheat at KC, No. 2 yellow corn at Chicago and No. 1 yellow soybeans at Chicago.

[c]Predictions were for farm prices in 1978-79 and U.S., SLM, $1\frac{1}{16}$ inch, in designated U.S. markets for the years since.

Table 3. Comparison Between AAEA Outlook Survey Forecasts (F) on Selected Economic Variables and the Actual Values (A)

		Unit	Year 1979	1980	1981	1982	1983	1984	1985	1986
Cash Receipts From Marketings			Percent Change from Previous Year							
Crops	F	%	+ 4.6	+ 6.3	+ 7.3	+ 6.2	+ 3.3	+ 4.6	+ 2.2	+ .1
	A	%	+17.5	+15.2	+ 1.5	- .3	- 8.1	+ 3.4	+ 7.1	
Livestock	F	%	+ 8.9	+ 6.9	+ 9.8	+ 8.3	+ 2.9	+ 2.3	+ 1.8	+ 2.8
	A	%	+16.9	- 1.7	+ 1.8	+ 1.6	- 1.3	+ 4.8	- 5.1	
Net Farm Income, Realized	F	%	+ 3.3	+ 1.7	+13.3	+13.5	+14.4	+ 3.9	-13.3	+ 3.2
	A	%	+15.7	-36.3	+47.5	-17.4	-39.0	+130.0	-11.6	
Land Values, Apr. 1	F	%	+ 8.3	+11.7	+ 7.9	+ 8.1	- .9	+ 3.2	- .9	- 9.0
	A	%	+18.3	+17.4	+11.1	+ .5	- 4.2	- .8	-13.2	-12.0
Real GNP, 1972 $	F	%	+ 2.9	+ 1.4	+ 1.9	+ 3.4	+ 3.4	+ 3.9	+ 3.6	+ 2.6
	A	%	+ 2.5	- .2	+ 1.9	- 2.6	+ 3.5	+ 6.5	+ 2.2	
CPI, All Items	F	%	+ 7.1	+ 8.2	+10.0	+ 8.7	+ 6.4	+ 5.3	+ 6.0	+ 4.3
	A	%	+11.3	+13.5	+10.4	+ 6.1	+ 3.2	+ 4.3	+ 3.6	
CPI, Food	F	%	+ 7.7	+ 7.8	+10.5	+ 9.0	+ 6.6	+ 4.9	+ 4.9	+ 3.7
	A	%	+10.8	+ 8.6	+ 7.9	+ 4.0	+ 2.1	+ 3.8	+ 2.3	

Table 4. Statistical Evaluation of the AAEA Outlook Survey Forecasts, 7 Calendar Years of 1979-85 on Livestock and 8 Crop Years of 1978-79 to 1985-86 on Crops

	Unit	Mean Absolute Error	Mean Error[a]	Root Mean Squared Error	Root Mean Squared Percentage Error
Livestock Production					
Beef	% Prev. Yr.	2.8	.2	3.5	-
Pork	% Prev. Yr.	5.5	-1.8	6.1	-
Broilers	% Prev. Yr.	2.7	1.3	3.2	-
Eggs	% Prev. Yr.	1.6	.3	1.9	-
Livestock Prices					
Steers, Choice Omaha	$/cwt.	6.83	-4.33	7.57	11.8
Feeder Steers, KC	$/cwt.	8.32	-8.32	9.51	14.3
Barrows and Gilts, 7 Markets	$/cwt.	3.49	-1.43	4.22	9.1
Broilers	¢/lb.	3.6	.9	5.0	10.3
Eggs	¢/doz.	4.4	1.5	5.2	7.2
Crop Supply and Exports					
Wheat					
Production	mil. bu.	79	71	89	3.7
Exports	mil. bu.	155	17	186	13.4
Ending Stocks	mil. bu.	129	38	170	13.3
Corn					
Production	mil. bu.	962	201	1087	14.8
Exports	mil. bu.	294	-118	330	14.9
Ending Stocks	mil. bu.	830	366	971	51.7
Cotton					
Production	mil. bls.	1.38	.21	1.50	12.2
Exports	mil. bls.	1.68	-.07	1.95	32.4
Ending Stocks	mil. bls.	2.29	.25	2.46	48.6
Soybeans					
Production	mil. bu.	184	-30	216	11.0
Exports	mil. bu.	107	-34	128	16.3
Ending Stocks	mil. bu.	80	20	96	31.6
Crop Prices					
Wheat	$/bu.	.14	.05	.18	4.8
Corn	$/bu.	.29	*	.38	13.7
Cotton	¢/lb.	9.3	.2	10.5	15.8
Soybeans	$/bu.	.86	-.06	.93	14.4
Soybean oil, Decatur	¢/lb.	4.4	-.11	5.5	22.8
Soybean meal, Decatur	$/T	24.4	-5.9	30.8	17.4
Other Economic Variables					
Cash Receipts from Marketings					
Crops	% Prev. Yr.	7.4	.3	8.3	-
Livestock	% Prev. Yr.	6.3	-3.3	6.6	-
Net Farm Income	% Prev. Yr.	42.4	7.4	56.7	-
Price of Farm Land	% Prev. Yr.	6.6	-1.2	7.3	-
Real GNP (1972 $)	% Prev. Yr.	1.8	-.9	2.6	-
Consumer Price Index	% Prev. Yr.	2.7	*	3.2	-
Consumer Price Index on Food	% Prev. Yr.	2.9	-1.6	3.2	-

[a]Actual value minus predicted value.

* = negligible.

Table 5. Comparison Between the AAEA Outlook Survey Forecasts and Selected Other Sources of Agricultural Forecasts, 1978-85, as Measured by Root Mean Squared Percentage Errors (RMSPE)

	Unit	AAEA Outlook Survey N	AAEA Outlook Survey RMSPE	USDA[a] N	USDA[a] RMSPE	Futures[b] N	Futures[b] RMSPE	Naive[c] Model N	Naive[c] Model RMSPE
Livestock Production									
Beef	mil. lbs.	7	4.0					7	5.0
Pork	mil. lbs.	7	6.3					7	7.8
Broilers	mil. lbs.	7	4.2					7	4.7
Eggs	mil. lbs.	7	2.4					7	1.4
Livestock Prices									
Steers, Choice Omaha	$/cwt.	7	11.8			7	10.1	7	10.4
Feeder Steers, KC	$/cwt.	6	14.3			6	8.5	6	7.5
Barrows and Gilts, 7 Markets	$/cwt.	7	9.1			7	8.1	7	13.2
Broilers	¢/lb.	7	10.3					7	7.9
Eggs	¢/doz.	7	7.2					7	10.0
Crop Supply and Exports									
Wheat									
Production	mil. bu.	8	3.7	8	1.8			8	11.4
Exports	mil. bu.	8	13.4	8	10.9			8	17.3
Ending Stocks	mil. bu.	8	13.3	8	14.6			8	18.4
Corn									
Production	mil. bu.	8	14.8	8	15.0			8	29.1
Exports	mil. bu.	8	14.9	8	17.1			8	13.2
Ending Stocks	mil. bu.	8	51.7	8	53.9			8	70.7
Cotton									
Production	mil. bls.	8	12.2	8	12.9			8	31.2
Exports	mil. bls.	8	32.4	8	30.3			8	38.7
Ending Stocks	mil. bls.	8	48.6	8	46.8			8	61.2
Soybeans									
Production	mil. bu.	8	11.0	8	9.4			8	16.3
Exports	mil. bu.	8	16.3	8	16.2			8	18.3
Ending Stocks	mil. bu.	8	31.6	8	25.0			8	40.7
Crop Prices									
Wheat	$/bu.	8	4.8	8	3.6	8	4.9	8	11.2
Corn	$/bu.	8	13.7	8	14.3	8	15.9	8	17.2
Cotton	¢/lb.	8	15.8	-		-	-	8	17.5
Soybeans	$/bu.	8	14.4	8	13.9	8	14.0	8	20.6
Soybean oil, Decatur	¢/lb.	8	22.8	8	25.0	8	23.0	8	23.6
Soybean meal, Decatur	$/T	8	17.4	8	16.6	8	16.5	8	19.4
Other Economic Variables									
Cash Receipts from Marketings									
Crops	bil. $	7	4.8					7	8.4
Livestock	bil. $	7	11.6					7	6.2
Net Farm Income	bil. $	7	40.2					7	39.5
Price of Farm Land	% change	7	7.3					7	7.4
Real GNP (1972 $)	% change	7	2.6					7	3.8
Consumer Price Index	% change	7	3.2					7	2.8
Consumer Price Index on Food	% change	7	3.2					7	2.1

N = number of observations. RMSPE = root mean squared percentage errors.

[a]USDA forecasts as published in the August Agricutural Outlook. Forecasts represent information available from the July Crop Production Report.

[b]Closing futures prices on the Chicago Board of Trade and the Chicago Mercantile Exchange were averaged for the first 3 Wednesdays in July. On crops, all the new crop months were included. On livestock, all the contracts available for the following calendar year were averaged. The average "basis" (futures less cash) in the contract months for the previous year was used as a proxy for expected basis. This basis was subtracted from futures prices to derive a forecast of cash prices.

[c]Values for the succeeding year were assumed to be the same as the current year.

[d]Farm prices.

[e]Root mean squared error.

Table 6. Comparison of the Ranking on Accuracy in Forecasting Prices by the Outlook Survey, Futures Markets and the U.S. Department of Agriculture, 1978-79/1985-86[a]

Product	Accuracy Ranking Number of Years out of Eight		
	Outlook Survey over Futures	Outlook Survey over USDA	USDA over Futures
Steers, Choice, Omaha	2	-	-
Feeder Steers, KC	0	-	-
Barrows and Gilts, 7 markets	4	-	-
Wheat	3	3	5.5[b]
Corn	5	4.5[b]	5
Soybeans	3	2	4
Soybean oil, Decatur	5.5[b]	5	5
Soybean meal, Decatur	4.5[b]	4	4
Total of times source was more accurate	27.0	18.5	23.5
Total observations	64	40	40
Percent of total observations	42.2	46.2	58.8

[a] A preliminary evaluation of livestock forecasts was made for 1986, based on actual prices for the first half of the year and forecasts for the balance of the year.

[b] .5 relates to a tie.

Table 7. Number of Turning Point Errors (TPE) in Eight Years of Forecasts From the Annual AAEA Outlook Survey [a]

LIVESTOCK		CROPS		SELECTED ECONOMIC VARIABLES	
Livestock Production	TPE	Wheat	TPE	Cash Receipts	TPE
Beef	2	Prod.	0	Crops	4
Pork	2.5	Exports	2	Livestock	3
Broilers	1	Stocks	0	Net Farm Income	3
Eggs	6	Corn			
Livestock Prices		Prod.	3	Land values	2
Steers, Ch.	3	Exports	4	Real GNP	2
Feeder steers	6	Stocks	1	CPI, all	0
Barrows and gilts	2	Cotton		CPI, food	0
Broilers	2	Prod.	1		
Eggs	1	Exports	3		
		Stocks	3	TOTALS	
		Soybeans		TPE	Number
		Prod.	0		
		Exports	4		
		Stocks	1		
		Prices		0	5
		Wheat	1.5[b]	1-1.5	8
		Corn	1	2-2.5	8
		Cotton	2	3-3.5	8
		Soybeans	3	4	3
		Soybean		5	0
		Oil	3.5[b]	6	2
		Soybean		7	0
		Meal	1	Total	34

[a] Calendar year values for 1986 are partly forecast.

[b] No change forecast=TPE of .5.