THE RESPONSIVENESS OF U.S. CORN AND SOYBEAN ACREAGES TO CONDITIONAL PRICE EXPECTATIONS: AN APPLICATION TO THE 1985 FARM BILL

Kamil H. Shideed, Fred C. White, and Stephen J. Brannen

Abstract

Naive and adaptive schemes have been used as proxies for price expectations in previous studies of supply response. Those studies contain mixed formulas of futures, support, and lagged prices as alternative formulations for price expectations. This study uses a conditional expected price which combines both market and support prices into one price expectations measure. It defines the total effect of available information on supply response. The results indicate the potential usefulness of formulating expected prices as conditional price expectations in supply response analysis, with support prices being the conditional set. Under the provisions of the 1985 Farm Bill, significant reductions in corn and soybean acreages are in prospect for 1987-90.

Key words: corn, soybeans, acreage, price expectations, forecasts.

The adverse economic conditions faced by farmers in the United States throughout the 1980s have forced many farmers to idle cropland rather than continue to produce at a loss. Decisions to idle cropland have important implications for farmers, agribusinesses, and policy makers. Hence, there is a need to identify the likely response of farmers to the current economic situation and current farm programs.

Analyzing supply response within such an environment is complicated by the myriad of government programs that have been used to support prices and control production. For example, although the data series for market and support prices may contain different information, they are still highly correlated, and including both variables in a regression equation may result in multicollinearity problems. Since many of the factors which might conceivably be included in supply response models are closely related, it is important to develop variables that contain relevant information and at the same time avoid multicollinearity problems. Particular attention must be focused on how price expectations, important determinants of farmers' production decisions, are formed in an environment of government programs.

The objective of this study is to investigate the role of conditional price expectations in acreage responses of corn and soybeans. This study analyzes the effects of farm programs on farmers' price expectations under the assumption that the price expectations of rational producers are formed conditional on free market forces and various policy programs. This study treats price as an explanatory variable in a single-equation regression. Treating price as exogenously determined is consistent with the theory of a competitive firm which assumes that producers are price takers. Empirical results from this approach will be compared with empirical estimates from other studies; then, the impact of the Food Security Act of 1985 will be analyzed by forecasting corn and soybean acreage through 1990.

RELATED LITERATURE

Naive and adaptive schemes have been used as proxies for price expectations in previous studies of supply response (Nerlove, 1958; Houck and Gallagher; Garst and Miller; Shumway and Chang). Naive approaches are based on the assumption that current expectations are equal to last year's observed values. Adaptive approaches form expectations by an autoregressive moving average process.

Both naive and adaptive methods use lagged variables as substitutes for expectations (i.e., expectations are extrapolations of past values of the variables concerned). Regarding such expectations, Muth (1981) argues that "although this assumption helps make the

Kamil H. Shideed is a Postdoctoral Research Associate, Fred C. White is a Professor, and Stephen J. Brannen is a Professor and former Chairman, Division of Agricultural Economics, University of Georgia, Athens, Georgia.

equations identifiable and the parameter estimates easy to compute, there is little evidence that it is economically meaningful" (p. 321). In addition to the lack of theoretical justification for the lag structure, these models are subject to estimation difficulties (Griliches).

Nerlove's pioneering work of the 1950s regarding the partial adjustment process has been the basis for research concerning the dynamics of supply response. However, Nerlove (1979) questions whether this approach adequately models dynamic optimization in response to changing prices or the true nature of dynamic supply response in the context of a developing economy.

As an alternative approach in measuring price expectations, Gardner argues that the price of a futures contract for next year's crop reflects the price expectations of that crop. His empirical supply response estimates using futures price are comparable to those obtained using lagged price, indicating that futures prices and lagged prices are good substitutes. Further support for using futures prices as proxies for expected prices is provided by Chavas et al. and Morzuch et al. However, futures prices are not good proxies for price expectations in the presence of government programs (Chavas et al.).

Government intervention through various commodity programs has played an important role in forming producers' price expectations. Pope argues that a "rumor" of higher levels of support price is expected to increase supply even though the new expected support price is lower than price expectations. This occurs because some individuals with low expected prices raise their expectations. Since the early 1970s, numerous researchers have analyzed the effects of agricultural commodity programs on supply responses of major field crops. Quantitative techniques have been developed to combine price support and acreage restriction programs into one measure, an "effective" or "weighted" support price, which represents these government policies from a price perspective. Weighted support prices are taken as price expectations in analyzing U.S. supply responses of corn and/or soybeans (Houck and Ryan; Houck et al.; and Ryan and Abel). No lagged or other prices are included in these studies, as policy variables are assumed to capture the effects of market prices. Multicollinearity between weighted support price and lagged prices results in coefficient estimates which are statistically insignificant.

Other studies contain mixed formulas for price expectations. Gallagher incorporates both lagged and support prices into the formation of price expectations by assuming weak and strong market conditions. For this specification, the expected price is determined mainly by the support price when market conditions are weak and by market prices when market conditions are strong. This method of incorporating price expectations into the supply model results in nonlinear relationships between observable variables, thus creating estimation difficulties. In another study, Lidman and Bawden build an expectations model in which farmers revise their expectations in proportion to lagged expected price, the announced loan rate, and the prediction error of last year's price forecasts. After combining the supply and price expectations equations, both current and lagged values of independent variables appear in the final supply response equation, thereby introducing potential statistical problems.

Although in most of the above studies the assumption was made that the structure of supply response has not changed over time, Lee and Helmberger argue that supply response under farm programs is different from that under a competitive market. Accordingly, they used the concept of effective acreage control programs to divide the 1948–80 period into two subperiods, "free market" and "farm program" regimes. This distinction allows for changes in structural parameters. However, in both regimes, expected prices are approximated only by lagged market prices. This formation of expected prices stands in contrast to Shonkwiler and Maddala who specify that producers use the knowledge of farm programs to form their price expectations. Moreover, the disaggregated analysis used by Lee and Helmberger reduces the number of observations available for estimating supply equations for different policy regimes, thus creating a serious problem for empirical analysis of supply response.

Shonkwiler and Maddala treat price as an endogenous variable via a simultaneous equation model and formulate expected price based on the rational expectations hypothesis. Since their formulation of expected price depends on whether the support price is effective, their model is subject to an "endogenous switching mechanism." Thus, their formulation requires a nonlinear systems procedure for estimation. Although the use of a systems method results in asymptotically efficient estimates and guarantees that expectations are formed rationally, it is sensitive to specification bias. The imposition of cross-equation parameter constraints by full systems estimation ensures that a single misspecification in any equation leads to inconsistent estimates of all parameters in the model (Cumby et al.).

In summary, previous work on the supply response of field crops suggests the following points. First, support prices have a major role in field crop production decisions. Thus, their exclusion from the variables used to capture expectations may lead to biased estimates. On this issue, Fisher argues that it is naive to build supply response models containing price expectations generated by past prices alone without allowing for changes in government policy: "This [decision of government policy changes] is extra information that can be used to make more informed price forecasts" (p. 261).

Second, market prices play a significant role in resource allocation, and their exclusion from price expectations is inappropriate if the influence of market prices continues to strengthen. This is especially true given the free market emphasis of the 1985 Farm Bill. Third, futures prices provide estimates very close to those obtained by using lagged market prices, suggesting that both may reflect similar information; however, futures prices are not good proxies for expected price in the presence of changing government programs. Fourth, the presence of price supports, which are highly correlated with market prices, makes it difficult to isolate the net effect of either one on the supply response of a particular crop. Therefore, both variables need to be combined into one price expectations measure which defines their total effect on supply response. Finally, single-equation estimates are not expected to fully maintain or test all restrictions of the theory of the firm (Shumway). While the satisfaction of all the theoretical properties requires a full systems approach with nonlinear constraints, much can be learned from simpler models.

CONCEPTUAL FRAMEWORK

The basic supply response model used in this study is similar to the general model of Morzuch et al. The planted acreage of each crop is assumed to be related functionally to expected prices, a trend variable, and other exogenous variables. In its simplest form, the supply response model is:

$$(1)\ PA_t = B_0 + B_1P^*_{it} + B_2P^*_{jt} + B_3T + U_t ,$$

where PA is planted acreage of crop i, P^*_i represents price of crop i, P^*_j is the price of competing crop j, * denotes expectations, T stands for time trend, and U_t is a stochastic term.

To complete the stochastic specification of the model, the following autoregressive moving average (ARMA) model for P_t (both for P^*_{it} and P^*_{jt}) is assumed:

$$(2)\ \alpha (L)P_t = \Upsilon(L)\epsilon_t ,$$

where ϵ_t is a white noise process independent of U_t and $\alpha(L)$ and $\Upsilon(L)$ are polynomials in the lag operator L of degrees p and q, respectively.

Absent structural information regarding the generation of the exogenous variable, P_t, optimal one-step forecasts are given by the following (see Wallis, pp. 52–53):

$$(3)\ P_t = -\alpha_1P_{t-1} - \dots -\alpha_pP_{t-p} + \Upsilon_1\epsilon_{t-1} + \dots + \Upsilon_q\epsilon_{t-q}.$$

This time series model can be estimated by an appropriate procedure to generate the one-step forecasts. The constructed forecasts can be treated as an exogenous variable in equation (1), which, in turn, can be estimated by ordinary least squares.

As mentioned earlier, distributed lag models are subject to theoretical and statistical limitations. Moreover, an optimal use of past information on prices requires a systems procedure for estimation.[1] To overcome these difficulties, conditional price expectations are used here. Since these forecasts are observable, they can be treated as explanatory variables and substituted for P^*_t in equation (1).

The formation of conditional price expectations draws upon Anderson et al. (pp. 34–41). The assumption of normality or approximate normality for distributions of market and support prices suggests estimation of a joint distribution of expected price as though it were multivariate normal. This implies that if

[1]An alternative estimation procedure would be to substitute equation (3) for P^*_t in equation (1), which may then be estimated jointly with the ARMA model, equation (2).

market price, MP, and support price, SP, are jointly normally distributed with means E(MP) and E(SP), standard deviations σ_1 and σ_2, and correlation r_{12}, then the mean of the conditional distribution of MP given SP = SP* is defined as

$$(4)\quad E(MP \mid SP = SP^*) = E(MP) + r_{12}\left(\frac{\sigma_1}{\sigma_2}\right)(SP^* - E(SP)),$$

where SP* is the annual announced or weighted support price. This formulation requires that the correlation matrix is positive definite.

This formation of conditional price expectations states that price forecasts are based on all observations of market and support prices up to the time of the forecast. Such conditional price expectations are consistent with Muth's (1961) rational expectation hypothesis under the assumption that both market and support prices are exogenously determined. These expectations can be termed "quasi-rational expectations" (Nerlove, 1979) if market and support prices are simultaneously determined. But, under the assumption that farmers are aware of the underlying structure, quasi-rational expectations are a less arbitrary approach to price expectations than the adaptive expectations used in the basic supply response model (Nerlove, 1979).

Another advantage is that this conditional price expectation allows for supply adjustment in response to the variability of historic prices as measured by σ_1 and σ_2. On this issue, Pope shows that aggregate supply may respond to the variability of historic prices, regardless of risk attitudes, if increased variability of price implies greater dispersion of expected price across individuals. This is the case because some producers will change their expected prices as the environment becomes more risky.

DATA AND VARIABLE MEASUREMENTS

Corn and soybean acreage supply response models were analyzed for the 1951-86 period. Planted acreage data were obtained from *Agricultural Statistics* and *Crop Production*. Farm price data were obtained from *Agricultural Prices*, and the data on support price and acreage diversion programs were taken from *Situation and Outlook Reports* and *ASCS Commodity Fact Sheet* for feed grains and soybeans. Conditional price expectations were calculated following the specification of equation (4), given the effective and announced support price levels for corn and soybeans, respectively. The effective support price data for corn were obtained following the development of Houck and Ryan, Ryan and Abel, Houck et al., and Gallagher. Historical observations for the 1951-86 period were used to construct σ_1, σ_2, and r_{12} to empirically implement the conditional expectations for corn and soybean prices. For corn, σ_1 is the standard deviation of average seasonal corn prices received by farmers; σ_2 is the standard deviation of effective corn loan rates; and r_{12} is the correlation coefficient between farm price and effective loan rates of corn. Soybeans are treated in the same manner as corn.

U.S. Department of Agriculture estimates of variable production costs for corn and soybeans are considered the best available estimates for production costs. Since the available variable cost data do not cover the whole study period, the index of prices paid by farmers for production items, interest, taxes, and wage rates was used to generate the cost values in years of missing observations on variable costs.

In addition to effective support price, two other policy variables were considered for corn. They are effective (weighted) diversion payment and the payment-in-kind (PIK) programs. The effective diversion payment was developed following the procedures of Houck and Ryan, Ryan and Abel, Houck et al., and Gallagher. The PIK program was applicable for the 1983 and 1986 corn crop years. Under this program, farmers had the option of reducing their planted acreages by 10 to 30 percent in addition to the previously announced programs in The Agriculture and Food Act of 1981 (Hargrove). The PIK program was accounted for by the use of a dummy variable with a value of one for 1983 and 1986 and zero otherwise.

Market risk is represented by price risk. The risk variables were calculated as deviations of corn and soybean prices from three-year moving averages. This follows the procedure used by Gallagher.

ESTIMATION AND RESULTS

At least six factors can influence field crop acreage responses: factors of physical production of the crop concerned, expected price of the crop being produced, expected prices of competing crops, changes in relative input prices, risk variables, and government commodity programs.

Lagged planted acreage is included in the set of explanatory variables to permit a dynamic analysis. It allows a period of more than one year to complete the acreage adjustment process in response to exogenous shocks. Although both market and production risks are important factors affecting producers' planting decisions, only market risk is considered in this study. The effects of production risk are not measured explicitly in the model but are assumed to be accounted for either in the intercept term (if yield variability remained unchanged over the planning period) or in the trend coefficient (if yield variability changed steadily over time). The effects of excluding production risk require further research.

Empirical analysis suggested that all variables specified above were important in explaining the acreage supply response of corn and soybeans, except the risk variable for soybeans. The signs and significance levels of some variables were affected by the risk variable, indicating potential multicollinearity problems arising from including this variable in the equation; thus, it was excluded from the soybean acreage response equation.[2]

The estimated coefficients of the specified response equations of corn and soybean acreages are presented in Table 1. These estimates are consistent in sign with economic theory and are generally significant. The values of the coefficient of determination, R^2, indicate that 92 percent of the variation in the planted acreage of corn in the U.S. during the period 1951-86 is explained by the corn model. Similarly, 98 percent of the variation in the planted acreage of soybeans during the same period is explained by the soybean model. These explained percentages of variation are significant at the one percent level. The estimated h-statistics suggest the acceptance of the hypothesis that there is no serial correlation of the first order.

TABLE 1. ACREAGE RESPONSE MODELS FOR CORN AND SOYBEANS, U.S., 1951-86

Variables	Planted Acreage Equation: Corn	Planted Acreage Equation: Soybeans
Constant	21004.32 (2.44)*	−15142.23 (−1.18)
Lagged dependent variable (1,000 acres)	.2518 (3.12)**	.6376 (4.27)**
Weighted diversion payment of corn ($/bu.)	−37719.07 (−5.23)**	
Conditional expected price of corn ($/bu.)/production variable cost of corn ($/bu.)	4796.12 (3.42)**	−2548.23 (−2.77)**
Conditional expected price of soybeans ($/bu.)/production variable cost of soybeans ($/bu.)	−2096.62 (−1.90)*	4255.02 (4.22)**
Trend (1951=51, 1952=52, . . ., 1986=86)	523.16 (4.97)**	363.45 (1.38)
Price risk of corn ($/bu.)[a]	−1865.95 (−.76)	
PIK variable (PIK = 1 for 1983 and 1986, 0 otherwise)	−16624.33 (−6.15)**	
Expected deficiency payments of corn ($/bu.)[b]	3161.03 (1.75)+	−1353.70 (−.97)
R^2	.92	.98
F-Statistic	36.89**	307.86**
Durbin h-Statistic	−.15	−1.33

Numbers in parentheses are t-statistics.
\+ = significant at ten percent level.
* = significant at five percent level.
** = significant at one percent level.
[a]Price risk of corn is estimated as follows:

$$CRISK_t = \frac{(CFP_{t-1} - CMA_t)^2}{CMA_t},$$

where CFP_t = seasonal average price of corn received by farmers ($/bu.), and $CMA_t = .333(CFP_{t-2} + CFP_{t-3} + CFP_{t-4})$.
[b]Expected deficiency payments of corn = target price of corn − conditional expected price of corn.

[2]A major challenge in supply analysis is to determine prior to econometric estimation which market and policy variables are potentially relevant to producers' decisions. However, *a priori* determination is difficult to achieve on a theoretical basis. In addition, previous studies differ as to geographic areas, periods of study, and estimation techniques. Therefore, experimentation is exercised in model specification and estimation (e.g., see Shonkwiler and Maddala, Houck and Ryan, and Bailey and Womack). In these studies different variable specifications were considered but some of them were excluded because of a lack of significant contributions to specified models.

Pretesting would reduce variances in least squares estimators at the risk of bias (Wallace). Hence standard errors and other measures of model reliability as reported in a final regression estimation may be affected by pretesting.

The coefficients of lagged acreages are highly significant, positive, and less than unity, suggesting that a period of more than one year is required for U.S. farmers fully to adjust their planting decisions in response to exogenous shocks. The partial adjustment coefficients are .75 for corn and .37 for soybeans. These coefficients indicate that the economic adjustment in corn acreage is faster than in soybean acreage.

The coefficients of diversion payment, risk, and PIK variables indicate that these variables have significantly reduced the planted acreage of corn over time. Each dollar increase in diversion payments reduced corn acreage by more than 37 million acres. Similarly, the PIK program reduced corn planting by more than 16 million acres.

Each additional dollar per bushel of expected deficiency payments of corn increased its planted acreage by more than 3 million acres. This, in turn, would reduce the planted acreage of soybeans by 1.4 million acres.

ELASTICITIES

Short-run elasticities of corn and soybean acreages with respect to conditional expected prices relative to variable production costs were calculated using mean values for the 1951–1986 period. To account for the long-run adjustments, long-run elasticities were estimated following the partial adjustment hypothesis of Nerlove (1958). These estimates are presented in Table 2.

The estimated elasticities indicate the following points. First, the negative signs of cross elasticities for corn and soybean prices suggest decision interdependence between corn and soybean production. The values of the cross elasticities provide evidence of the percentage change in corn (soybean) acreage in response to a given change in expected price of soybeans (corn) relative to variable production costs. Second, own price elasticities of soybean acreage are greater than those of corn acreage. This may be due to the fact that corn has been subject to various supply control programs, thus reducing the responsiveness of corn producers to changes in its expected price. Third, as usual, all the estimated long-run elasticities are greater than those of the short run. Such results provide evidence that asset fixities will become less restrictive in influencing the planted acreages of corn and soybeans in the long run. The divergence between the short- and long-run elasticities depends on the value of the corresponding coefficient of adjustment. The smaller the coefficient of adjustment (the larger the coefficient of lagged acreage), the more elastic the long-run response is relative to that for the short run, and vice versa.

Although this study differs from previous studies of supply response in terms of underlying data, study period, and the formation of price expectations, it is possible to make general comparisons. To do so, elasticity estimates of corn and soybean acreages from selected studies are summarized in Table 3. All elasticity estimates are consistent in sign. However, elasticity estimates from these previous studies vary over a wide range, indicating that estimated elasticities of corn and soybean acreages are sensitive to the formulation of price expectations. To place general confidence in any particular formulation of price expectations, and thus in its corresponding elasticities, requires further research. This study provides reasonably successful results, suggesting that the manner employed in formulating price expectations provides useful elasticity estimates.

ACREAGE FORECASTS, 1986-90

The effect of the 1985 Farm Bill on corn and soybean acreage was analyzed by forecasting the planted acreage of these crops for the 1986-90 period. These forecasts were based on the assumption that the current economic situation would prevail through 1990. More specifically, the nonprogram exogenous variables were held constant at the 1986

TABLE 2. ESTIMATES OF SHORT-RUN AND LONG-RUN ACREAGE SUPPLY RESPONSE ELASTICITIES FOR CORN AND SOYBEANS[a]

	Planted Acreage Equation	
	Corn	Soybeans
Elasticity with respect to corn price/variable production cost		
Short-run	.137	−.130
Long-run	.183	−.351
Elasticity with respect to soybean price/variable production cost		
Short-run	−.076	.274
Long-run	−.101	.741

[a]The elasticities were calculated at the mean values of the corresponding variables. The mean values were 42.32 million acres and 75.45 million acres for soybean and corn acreages, respectively; 2.73 and 2.16 for soybean and corn prices, respectively.

Table 3. Estimates of Short-run and Long-run Acreage Supply Response Elasticities for Corn and Soybeans, Selected Studies

Source and Period of Study	Definition of Expected Price	Elasticity of	With Respect to Corn Price: Short-run	Corn Price: Long-run	Soybean Price: Short-run	Soybean Price: Long-run
Houck et al. (1949-70)	effective support price	corn	.125			
(1950-74)	effective support price for 1950-71 and one-year lagged price for 1972-74	corn	.130			
(1950-72)	one-year lagged price	soybeans			.39	
Gardner (1950-74)	futures price	soybeans			.61	1.36
	one-year lagged	soybeans			.56	1.04
Gallagher (1954-77)	function of current year support price and lagged price[a]	corn	.159		−.080	
			.178	.184	−.065	−.067
Chavas et al. (1957-77)	weighted average of futures, cash, and support prices[b]	corn	.441	.459	−.206	−.214
			.421	.443	−.169	−.178
			.439	.472	−.200	−.215
		soybeans	−.584	−5.122	.590	5.175
			−.611	−6.266	.557	5.713
			−.566	−9.982	.606	10.687

[a]The expected price is a function of current year support price (PS_t) and previous crop year market price (PM_{t-1}):

$$PE_t = PS_t + \gamma[(D_t + 1)\ln(D_t + 1) - D_t], \text{ where } D_t = PM_{t-1} - PS_t.$$

[b]Expected price is defined as a weighted average of deflated futures (FP), cash (CP), and support prices (SP):

$$EP_t = b_1FP_t + b_2CP_{t-1} + b_3SP_t, \text{ where } b_1 + b_2 + b_3 = 1, 0 \le b_i \le 1.$$

levels. However, government program provisions were allowed to adjust as prescribed under the 1985 Farm Bill (Glaser).

The forecasts in Table 4 show that the model underestimated the 1986 planted acreage of corn by less than 4 million acres, which is equivalent to a forecasting error of 5.1 percent. The actual 1986 plantings of corn are 76.6 million acres, 8 percent lower than the 1985 acreage. Under current production and market conditions, corn acreage in the United States is expected to be 14.2 percent less in 1987, down 11.8 million acres from the 1985 plantings of 83.3 million acres. Planted acreage of corn is projected to level off in 1989 and then increase slightly in 1990.

For soybeans, predicted 1986 acreage planted is very close to the actual planting of 61.8 million acres, yet it is slightly overestimated. The model overestimates actual 1986 acreage by only 281,050 acres, which is an error of less than 1 percent. For the 1987-90 crop years, planted acreage of soybeans is projected to increase slightly.

The confidence intervals around these forecasts were narrow initially, because the values of the exogenous variables were known for 1986. However, the confidence intervals widen through time because of the variance associated with forecasts of the exogenous variables.

Table 4. Forecasts of U.S. Corn and Soybean Acreages, 1986-1990[a]

Year	Lower Confidence Limit	Forecasted Acreage	Upper Confidence Limit
	(Million Acres)		
Corn			
1986	70.2	72.7	75.2
1987	57.1	71.5	85.9
1988	55.9	70.6	85.3
1989	55.8	70.6	85.4
1990	55.8	70.7	85.6
Soybeans			
1986	59.4	62.1	64.8
1987	46.8	62.6	78.4
1988	47.5	63.6	79.6
1989	48.5	64.7	80.9
1990	49.4	65.9	82.4

[a]Lower and upper confidence limits are calculated at the 5 percent level by using a method provided by Johnston.

CONCLUDING REMARKS

This study provides reasonably successful results, suggesting that the procedure used to formulate price expectations provides a useful tool for future research on supply analysis. Expected prices are formulated as conditional price expectations, with support prices being the conditional set. The correlation coefficients between the conditional expected prices and their respective farm prices are .88 and .89 for corn and soybeans, respectively. The estimated coefficients of these conditional expected prices are consistent in sign and provide statistically significant elasticity estimates.

The estimated supply response functions for corn and soybean acreages support the following conclusions. First, conditional expected prices effectively combine available information into one measure of price expectations. These price expectations define the total effect of market and support prices on planted acreages of corn and soybeans without creating estimation and/or statistical difficulties.

Second, government intervention through various commodity programs plays a major role in corn and soybean production decisions. Support prices indirectly affect corn and soybean planting through the formation of their conditional expected prices. Diversion payment rates and the PIK program played significant roles in restricting corn acreages during the 1951-86 period.

Third, as suggested by previous studies, corn and soybeans are close substitutes in production and their relative conditional expected prices have a strong impact on the acreage allocated between them.

Fourth, acreage forecasts for 1987-90 are based on the assumption that production and market conditions will be similar to those of 1986. Therefore, these estimates are subject to change as new information becomes available.

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