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MARKETING LOAN OPTIONS FOR THE U.S. SOYBEAN INDUSTRY: ECONOMIC EVALUATION THROUGH 1990/91

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I. Introduction

A new policy instrument of the Food Security Act of 1985 is the marketing loan which allows participants to repay crop loans at the market price when it is lower than the loan. This provision is currently mandated for cotton and rice and is available at the Secretary's discretion for other crops including soybeans.

Considerable interest currently prevails by many individuals associated with farm and commodity organizations to move the entire farm program more immediately into the marketing loan arena. This research report examines the implications of moving the U.S. soybean industry into this arena in the 1986 through 1990/91 crop years.

-Policy option 1 - $4.56 marketing loan on soybeans
-Policy option 2 - $5.02 marketing loan on soybeans
-Policy option 3 - $6.00 marketing loan on soybeans

Implications of these program changes will be given for production, stocks, export prices, total CCC outlays, and net farm income. These impacts are based on a comparison with the continuation of a nonrecourse loan program as specified in the Food Security Act of 1985.

Also, the project includes qualitative comments about the affects of choosing intermediate marketing loan rates of $4.77 or $5.50. The effect of using a $0.77 PIK and a $4.25 cash loan program in lieu of the marketing loan and a potential need for and size of acreage reduction programs for soybeans.

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II. Evaluation Procedure

The program options were evaluated using the FAPRI annual econometric model of the U.S. livestock and crop sectors. The evaluation is for the period 1986/87 through 1990/91. A sequential procedure is applied, incorporating projections for the U.S. and foreign economies from Wharton Econometrics Forecasting Associates, Inc. The FAPRI model is solved annually incorporating provisions of the farm program options, external economic projections, and internal conditions given by the solution from the models. The specific evaluation process includes:

-Establishing conditions external to U.S. agriculture.
  *Macroeconomic factors influencing domestic and foreign commodity markets.
  *Normal weather for U.S. and foreign countries.
  *U.S. farm program provisions and associated policy assumptions for major importers and exporters of agricultural products.

-Estimation of farm program participation using market price expectations and farm program parameters.

-Computing a preliminary solution for an equilibrium in the crop and livestock sectors, reflecting CCC and Farmer-Owned Reserve changes in the new policy program features and export enhancement programs, including PL480.

-Assessment of the preliminary solution for:
  *Market price relative to loan rates and target prices.
  *Government stock positions.
  *Finalizing the annual equilibrium solution for crops and livestock to comply with provisions of the program options.
  *Establishing program parameters for succeeding years, based on market outcome and provisions for the current and previous years.

-Rolling the modeling system forward for one year and repeating the evaluation process, assuring year-to-year consistency.

This initial Farm Bill evaluation encompasses the entire U.S. agricultural economy, including crops, livestock, plus foreign trade and is conditioned on projections made by Wharton Econometrics on the general economy. This set of projections serve as a base scenario for examining the three marketing loan program options for soybeans. To ensure consistency across these options, each scenario and evaluation period resulted in a complete evaluation of the corn and soybean industries, interfaced with the U.S. livestock industry and foreign trade.

III. Policy Options

As previously indicated, three different marketing loan scenarios are being evaluated for the U.S. soybean industry. These specific options are termed: (1) marketing loan at $4.56; (2) marketing loan at $5.02; and (3) marketing loan at $6.00. Brief descriptions of these options in terms of policy parameters and factors external to agriculture are provided below. They are summarized in Table 1.

-The baseline. A continuation of the current 1985 Farm Bill under moderate to positive conditions for U.S. and world economies with marketing loans for cotton and rice, nonrecourse loans for other commodities.

-Marketing loans at $4.56. A continuation of the current 1985 Farm Bill for all commodities except soybeans. The soybean program includes a marketing loan at $4.56.

-Marketing loans at $5.02. A continuation of the current 1985 Farm Bill under moderate to positive conditions for U.S. and world economies. The soybean program includes a $5.02 marketing loan for soybeans.

-Marketing loans at $6.00. A continuation of current farm policies under moderate to positive conditions for U.S. and world economies. The soybean program includes a $6.00 marketing loan.

TABLE 1
POLICY VARIABLES FOR PROGRAM OPTIONS

	(B) Baseline 1985 Farm Bill							
Crop/ Year	Loan Rate $/bu	Target Price $/bu	Reserve Entry $/bu	Reserve Release $/bu	Set Aside %	Paid Diversion %	Payment Rate $/bu	Conservation Reserve Acres millions
CORN								
84/85	2.55	3.03	2.55	3.25	10	---	---	---
85/86	2.55	3.03	2.55	3.25	10	---	---	---
86/87	1.92	3.03	1.92	3.25	17.5	2.5	---	1.0
87/88	1.82	3.03	1.82	3.25	20	10.0	2.00	2.2
88/89	1.73	2.97	1.73	3.25	20	---	---	3.3
89/90	1.65	2.88	1.65	3.25	20	---	---	5.2
90/91	1.56	2.74	1.53	3.25	20	---	---	7.0
SOYBEANS								
	(B)[1]		ML(4.56)[2]	ML(5.02)[3]		ML(6.00)[4]		
84/85	5.02	---	5.02	5.02	---	5.02	---	---
85/86	5.02	---	5.02	5.02	---	5.02	---	---
86/87	4.77	---	4.56	5.02	---	6.00	---	1.2
87/88	4.77	---	4.56	5.02	---	6.00	---	2.5
88/89	4.77	---	4.56	5.02	---	6.00	---	3.7
89/90	4.50	---	4.56	5.02	---	6.00	---	5.9
90/91	4.50	---	4.56	5.02	---	6.00	---	8.14

[1](B) 1985 Farm Bill.

[2]ML(4.56) Soybean Marketing loan at $4.56.

[3]ML(5.02) Soybean Marketing loan at $5.02.

[4]ML(6.00) Soybean Marketing loan at $6.00.

IV. The 1985 Farm Bill - Baseline

A major theme of the 1985 Farm Bill is to move U.S. agriculture to a more competitive position in world markets. Loan rates which have been de facto floor prices in many commodity markets are reduced from 5 to 25 percent beginning in 1986/87. To stabilize farm income, target prices for all commodities are frozen at 1985/86 levels for 1986/87 and 1987/88, then decline by 10 percent over the remaining three years. The conservation reserve, market loan, export enhancement, and dairy buyout provisions are all directed at the present excess capacity situation, fragile lands in crop production and the U.S. agricultural trade position. Under the 40-45 million acre conservation reserve, fragile land will be idled for 10 years at rental payment levels determined by competitive bidding at the county level. Payments for establishing permanent cover are also included.

The specific values of the parameters for the corn and soybean sectors used in the FAPRI analysis of the 1985 Farm Bill are summarized in Table 1. The maximum allowable reductions in loan rates and maximum acreage reductions have been announced for 1986/87. Paid diversions are mandatory for wheat and corn in 1986/87, and payment rates have been chosen by the Secretary. It is assumed that the Secretary will not offer paid diversions in succeeding years. The 1985 Farm Bill authorizes the Secretary to reduce the loan rates below those mandated. This options was assumed not to be exercised after 1986/87. Possible impacts of the Gramm-Rudman-Hollings legislation are not reflected in the program parameters or analyses. With the announced implementation plan, this legislation would reduce direct payment levels to program participants.

The marketing loan was introduced for rice and cotton and is available to the Secretary for other program crops. This feature of the 1985 Farm Bill eliminates the possibility that U.S. loan rates will provide a floor for world commodity prices. The market loan permits prices to fall to equilibrium levels on international markets and authorizes what is in effect an added payment to farmers.

The conservation reserve was implemented for the farm program crops at 5.4 million acres in 1986/87, 14.4 million in 1987/88, 22.9 in 1988/89, moving to 45 million acres by 1990/91. The export bonus program lowers effective commodity prices to qualified importers by using PIK, cash, or credit. A total of $1.0-$1.5 billion was mandated by the Food Security Improvements Act of 1986 for the export enhancement program which targeted the assistance to counter unfair trade practices at $325 million annually.

An important assumption incorporated in the 1985 Farm Bill is that the Secretary of Agriculture will manage farm programs in such a way that market prices move at or near the loan rate except for rice and cotton. This will be accomplished by paying the 5 percent diversion payment for feedgrains, maximum allowed, in PIK payments. This implies, for example that under the conditions of a 8 billion bushel corn crop, that approximately 300-400 million bushels of corn could enter the market under the deficiency payment program. Under the marketing loan program, rice and cotton prices are permitted to fall below the loan rate as needed to clear the market without government stock acquisition.

V. Marketing Loan Program Options

Marketing Loan, $4.56. This program design maintains all parameters of the 1985 Farm Bill as discussed above, except that the soybean loan rate has been converted from a $4.77 per bushel nonrecourse loan to a $4.56 per bushel marketing loan. This strategy assumes that government CCC stocks are released when market prices reach 105 percent of the announced marketing loan repayment rate. Program participants are provided the option of marketing grain at prices below the loan rate. The market price can be used as repayment for the corresponding CCC loan. Since CCC stocks have been accumulated in the 1985/86 marketing year, this necessarily implies that soybean prices would initially be lower under this scheme than under the nonrecourse loan. Therefore, the initial year of analysis reflects the dumping of CCC stocks at these lower release prices.

Marketing Loan, $5.02. This option considers the economic ramifications of moving the soybean loan rate to $5.02. However, a marketing loan is imposed. Under this scenario, all program variables associated with the 1985 Farm Bill are maintained for other crops. Models are reevaluated for the crops and livestock sectors and international trade but modified to reflect the $5.02 marketing loan for soybeans over the period under consideration.

Marketing Loan, $6.00. This scenario reflects implications for U.S. soybeans of instituting a $6.00 per bushel marketing loan, all other commodities held and evaluated at the parameter levels associated with the 1985 Farm Bill. A significant feature of this program option is that the ratio of the $6.00 loan rate to the corn target price is approximately equal to the ratio of the soybean and corn loan rates in the 1981 Farm Bill.

VI. Evaluation of the Farm Program Options

Details on commodity markets evaluated are contained in commodity balance sheets in Appendix A. Commodity market results, highlighted in this summary, for the baseline and program options, are for corn and soybeans only, with additional information provided on the consequences of world competitive production and trade. Detailed consequences of the 1985 Farm Bill provided for other commodities including wheat, cotton, and rice for crops and beef, pork, and poultry for livestock can be obtained in FAPRI Staff Report #2-86, June 1986. The sequence of the presentation and the conditioning variables and the analysis is as described in the previous section (VI).

VII. The 1985 Farm Bill Baseline Option

The analysis of the 1985 Farm Bill is based on policy projections and parameters as described in Table 1. A more detailed analysis of the 1985 Farm Bill is given in FAPRI #2-86, June 1986.

Crops

Soybeans (Table 2)

*Soybean planted area averages about 63 million acres through 1988/89, then increases to 67.1 million in 1990/91. Lower acreage in initial years reflects the absence of the target price and

deficiency payments available to other program crops. A long-term conservation reserve containing 1.2 million acres of soybean land in 1986/87, 2.5 million in 1987/88, moving 8.14 million in 1990/91 also curtails the expansion of production. Some of the later expansion in acreage is attributed to land not adequately covered under other programs. Expected market prices imply a shift towards bean area, sheltered by the $4.77 nonrecourse loan.

*Domestic utilization increases approximately 7 percent over the evaluation period, reflecting moderate growth in the livestock industry.

*Exports increase approximately 24 percent over the projection period in response to low prices, devaluation of the U.S. dollar, moderate demand expansion in foreign markets, and slow to no expansion in major competitors production area.

*The loan rate drops from $5.02 per bushel in 1985/86 to $4.77 in 1986/87, remaining at this level through 1988/89, then declining to $4.50 for the latter two years.

*Market prices drop from $5.28 in 1985/86 to a low $4.85 in 1987/88, increasing moderately by the end of the decade to $5.44. Key factors associated with this particular price path are reduced loan rates for feedgrains, plus the release of PIK grain as a part of the deficiency payments.

*Government cost is projected to decline from $768 million in 1985/86, a CCC stock accumulation year to a low of $10 million by 1987/88, increases $673 million by the end of the decade reflecting payments for land in the long-term conservation reserve.

*Returns over variable costs fall from $105 per acres in 1985/86 to a low of $78 in 1988/89, then increasing to slightly above $90 by the end of the study period. These returns reflect a substantial decline relative to the 1981 Farm Bill, ranging between $100-$120 per acre. Without target prices and deficiency payments, per acre income to soybean producers decline initially more than income to producers of other program commodities.

*Stocks decline steadily over the evaluation period from 522 million bushels in 1985/86 to around 300 million bushels by 1990/91.

TABLE 2
FAPRI PROGRAM PROJECTIONS, SOYBEANS: THE 1985 FARM PROGRAM (BASE) SOYBEAN MARKETING LOAN AT $4.56 ML(4.53), SOYBEAN MARKETING LOAN AT $5.02 ML(5.02), AND SOYBEAN MARKETING LOAN AT $6.00 ML(6.00)

Variable/ Year	Program Option	Actual 83/84	Actual 84/85	FAPRI 85/86	FAPRI 86/87	FAPRI 87/88	FAPRI 88/89	FAPRI 89/90	FAPRI 90/91
Planted Acres (millions)	Base	63.1	67.8	63.1	63.0	63.0	65.0	66.0	67.1
	ML(4.56)	-----	-----	63.1	63.0	60.3	65.4	66.1	66.9
	ML(5.02)	-----	-----	63.1	63.0	63.2	66.1	66.6	67.5
	ML(6.00)	-----	-----	63.1	63.0	69.7	71.7	72.6	73.0
Domestic Use (mil. bu.)	Base	1,062	1,123	1,145	1,209	1,243	1,263	1,276	1,266
	ML(4.56)	-----	-----	1,145	1,217	1,246	1,261	1,265	1,259
	ML(5.02)	-----	-----	1,145	1,238	1,250	1,269	1,269	1,264
	ML(6.00)	-----	-----	1,145	1,244	1,301	1,311	1,333	1,345
Total Exports (mil. bu.)	Base	743	598	750	750	825	849	889	903
	ML(4.56)	-----	-----	750	759	820	838	882	901
	ML(5.02)	-----	-----	750	786	850	860	892	913
	ML(6.00)	-----	-----	750	791	901	960	1,024	1,015
Total Carryover (mil. bu.)	Base	176	316	522	504	401	343	291	297
	ML(4.56)	-----	-----	521	485	299	268	237	245
	ML(5.02)	-----	-----	521	437	309	270	241	252
	ML(6.00)	-----	-----	521	427	403	401	371	380
Farm Price	Base	7.81	5.78	5.28	4.96	4.85	4.84	4.96	5.30
	ML(4.56)	-----	-----	5.28	4.52	4.89	4.93	4.98	5.32
	ML(5.02)	-----	-----	5.28	4.39	4.83	4.90	4.95	5.27
	ML(6.00)	-----	-----	5.28	4.31	4.09	4.08	4.17	4.39
Returns Over Variable Cost(total)	Base	8,299	5,829	6,614	5,365	5,319	5,610	6,038	6,915
	ML(4.56)	-----	-----	6,614	4,512	5,185	5,825	6,096	6,952
	ML(5.02)	-----	-----	6,614	5,478	5,683	6,077	6,215	6,889
	ML(6.00)	-----	-----	6,614	7,410	8,401	8,802	9,014	9,104
Returns Over Variable Cost($/acre)	Base	131.52	85.97	104.82	83.06	79.47	78.00	79.12	86.06
	ML(4.56)	-----	-----	105.16	69.52	80.81	80.81	79.88	86.88
	ML(5.02)	-----	-----	105.16	84.86	84.98	83.77	81.07	85.17
	ML(6.00	-----	-----	105.16	115.53	116.05	115.23	112.92	109.09
PIK Commodities (mil. bu.)	Base	0	0	0	8	15	23	30	0
	ML(4.56)	-----	-----	0	8	15	0	0	0
	ML(5.02)	-----	-----	0	175	0	0	0	0
	ML(6.00)	-----	-----	0	175	0	0	0	0
Planted Area Plus LTCR (mil. acres)	Base	63.1	67.8	63.1	64.2	65.5	68.7	71.9	75.14
	ML(4.56)	-----	-----	63.1	64.2	62.7	69.0	70.9	72.9
	ML(5.02)	-----	-----	63.1	64.2	65.6	69.7	71.4	73.5
	ML(6.00)	-----	-----	63.1	64.2	72.1	75.3	77.4	79.0
					Fiscal Year (Oct. 1 to Sept. 30)				
Government Cost (million $)	Base	-----	-----		768	75	10	377	673
	ML(4.56)	-----	-----		768	(86)	44	540	816
	ML(5.02)	-----	-----		768	736	884	1,000	1,178
	ML(6.00)	-----	-----		768	2,613	4,690	5,123	5,307

Corn (Table 3)

*The 17.5 percent acreage reduction program (ARP) and the 2.5 percent paid diversion in 1986/87 is followed by ARPs of 20 percent in 1987/88 through 1990/91. Program participation peaks at 82 percent with planted area declining from 75.5 million acres in 1986/87 to 71 million acres by 1990/91. The long-term conservation reserve at 1 million acres in 1986/87, increasing to 7 million by 1990/91, contributes to the decline in planted area.

*Domestic use increases moderately from 5.2 billion to around 6.0 billion in 1990/91. Slow growth rates of the livestock herd and of the corn sweetener demand, are offset by increases in ethanol production demand in the latter crop years.

*Exports increase about 23 percent over the period 1985/86 through 1990/91. Corn production increases abroad but at a substantially reduced rate. The growth in feedgrain exports reflect a slight increase in the U.S. market share in a slowly growing total market.

*Ending stocks are projected to remain about 3 billion bushels through 1989/90 (note these are on an October/September year), declining to 2.6 billion the end of the forecast period. A considerable amount of this grain is projected to be under control of the federal government either through CCC or Farmer-Held Reserve categories. Potential for PIK payments associated with this level of carryover, will contribute to overall price pressure for the entire crop sector. If corn yields exceed expectation or if exports fail to increase, it may be necessary to resort to other more restrictive production control strategies.

*With loan rates down from $2.55 per bushel in 1985/86 to below $1.56 by 1990/91, and with continuing surpluses, market prices are expected to fall from the $2.37 per bushel price in 1985/86 to a low of $1.82 in 1988/89. It is difficult to move market prices much above the loan given projected stock and export levels, plus the downward market pressure from PIK payments.

*Returns over variable costs are more than twice as high for program participants as for nonparticipants in the 1989/90 year. The margin is reduced as market price moves closer to the target prices.

*Government costs are projected to average above $7 billion for the entire forecast period ranging from a high of $8.7 billion in 1985/86 to a low of $5.1 billion in 1986/87. Most of this cost is associated with deficiency payments to participating farmers.

TABLE 3
FAPRI PROGRAM PROJECTIONS, CORN: THE 1985 FARM PROGRAM (BASE) SOYBEAN MARKETING LOAN AT $4.56 ML(4.53), SOYBEAN MARKETING LOAN AT $5.02 ML(5.02), AND SOYBEAN MARKETING LOAN AT $6.00 ML(6.00)

Variable/ Year	Program Option	Actual 83/84	Actual 84/85	FAPRI 85/86	FAPRI 86/87	FAPRI 87/88	FAPRI 88/89	FAPRI 89/90	FAPRI 90/91
Planted Acres (millions)	Base	60.2	80.4	83.3	75.7	74.5	73.5	72.3	71.0
	ML(4.56)	-----	-----	83.3	75.5	74.5	73.4	72.2	70.8
	ML(5.02)	-----	-----	83.3	75.5	74.5	73.4	72.2	70.8
	ML(6.00)	-----	-----	83.3	75.5	74.3	72.2	72.0	70.8
Domestic Use (mil. bu.)	Base	4,709	5,215	5,220	5,674	5,782	5,875	5,931	6,009
	ML(4.56)	-----	-----	5,220	5,669	5,779	5,884	6,005	5,960
	ML(5.02)	-----	-----	5,220	5,669	7,760	5,873	5,987	5,959
	ML(6.00)	-----	-----	5,220	5,651	5,738	5,884	5,947	5,960
Total Exports (mil. bu.)	Base	1,865	1,925	1,625	1,732	1,794	1,869	1,967	8,005
	ML(4.56)	-----	-----	1,625	1,688	1,796	1,868	1,954	2,005
	ML(5.02)	-----	-----	1,625	1,688	1,778	1,860	1,944	2,004
	ML(6.00)	-----	-----	1,625	1,688	1,738	1,810	1,892	1,948
Total Carryover (mil. bu.)	Base	723	1,242	3,402	3,570	3,536	3,298	3,048	2,626
	ML(4.56)	-----	-----	3,403	3,616	3,582	3,323	3,002	2,608
	ML(5.02)	-----	-----	3,403	3,616	3,619	3,379	3,086	2,694
	ML(6.00)	-----	-----	3,403	3,634	3,678	3,356	3,133	2,796
Farm Price	Base	3.25	2.65	2.37	1.98	1.87	1.82	1.89	2.05
	ML(4.56)	-----	-----	2.37	1.95	1.85	1.81	1.86	2.06
	ML(5.02)	-----	-----	2.37	2.00	1.86	1.81	1.86	2.05
	ML(6.00)	-----	-----	2.37	2.00	1.85	1.79	1.85	1.95
Returns Over Variable Cost(total)	Base	8,299	5,829	12,863	12,781	11,195	10,376	10,465	10,147
	ML(4.56)	-----	-----	12,863	11,695	11,472	10,263	10,354	10,221
	ML(5.02)	-----	-----	12,863	11,662	10,748	10,028	10,113	10,109
	ML(6.00)	-----	-----	12,863	11,543	9,559	9,018	9,198	8,552
Returns Over Variable Cost($/acre)	Base	-----	-----	125.99	153.0	147.0	139.0	137.0	113.0
	ML(4.56)	-----	-----	125.76	153.0	147.0	139.0	137.0	113.0
	ML(5.02)	-----	-----	125.76	153.0	147.0	139.0	137.0	113.0
	ML(6.00	-----	-----	125.76	153.0	147.0	139.0	137.0	113.0
PIK Commodities (mil. bu.)	Base	0	0	0	425	279	327	481	348
	ML(4.56)	-----	-----	0	425	293	327	487	348
	ML(5.02)	-----	-----	0	425	271	319	486	348
	ML(6.00)	-----	-----	0	425	243	300	460	333
Planted Area Plus LTCR (mil. acres)	Base	-----	-----	89.2	87.6	89.5	89.6	89.1	88.5
	ML(4.56)	-----	-----	89.2	87.4	90.3	89.2	89.0	88.3
	ML(5.02)	-----	-----	89.2	87.4	86.0	85.6	86.2	85.7
	ML(6.00)	-----	-----	89.2	87.4	88.7	88.7	89.0	88.3
				Fiscal Year (Oct. 1 to Sept. 30)					
Government Cost (million $)	Base	-----	-----	8,746	5,115	7,139	7,561	7,482	
	ML(4.56)	-----	-----	8,746	5,520	6,932	7,814	7,733	
	ML(5.02)	-----	-----	8,746	5,538	6,614	7,413	7,722	
	ML(6.00)	-----	-----	8,746	5,198	6,607	6,113	7,101	

VIII. Soybean Marketing Loan Options ($4.56)

General Economic and Foreign Sectors Assumptions. This analysis uses the same general economic assumptions as for the baseline. Foreign economic growth is also assumed identical to that in the baseline. Production of grains and oilseeds by competitors and importers were allowed to adjust to U.S. price movements. Policy variables are identical to the baseline analysis except for the shift in the soybean industry to a $4.56 marketing loan.

Crops

Soybeans (Table 2)

*Soybean planted area is projected to average slightly below the baseline with the most significant departure in 1987/88, following the lower price year of 1986/87. In subsequent years, the supply inducing price signals are very similar for both the base and $4.56 scenario.

*Domestic utilization reflects the modest expansion in the U.S. livestock industry primarily in pork and poultry, moving at levels very similar to the base forecast.

*The market price path is near the baseline level with a low of $4.52 in 1986, but moves back into a range similar to the baseline. The soybean industry in conjunction with the feedgrain industry tends to float towards the upper $4.89-$5.32 range with returns to farmers at or near the $80 per acre level.

*Returns over variables costs increase from a low of $69.52 per acre in 1986/87, to a high of $86.88 per acre by 1990/91.

*Ending stocks average slightly below the baseline, declining from a high of 521 million bushels in 1985/86, to a low of 237 million by 1989/90, and holding at that level through the end of the decade.

*Total exports increased from 750 million bushels per acre in 1985/86, to 901 million bushels by 1990/91. A very similar path to that under the baseline option.

*Government costs fluctuate showing positive returns in 1986/87 as CCC stocks are sold back on the market, but increased costs to $816 million in 1990/91, reflecting area in the long-term conservation reserve. Costs are slightly above that of the baseline.

Corn (Table 3)

*Corn area remains very stable relative to the baseline with little or no modifications associated with the shift to a $4.53 marketing loan. Area shifts from the corn sector are very unlikely given the high differential of support between the corn and soybean sectors.

*Domestic utilization reflects a similar path as the baseline with prices of soybean meal and corn relatively unchanged across the scenario.

*Exports increase from 1,625 million bushels to a high 2,005 bushels by 1990/91 - 23 percent increase over the forecast period very similar to the baseline projection.

*Ending stocks peak at a high of 3.6 billion bushels in 1986/87 and decline moderately to 2.6 billion bushels by the end of the decade - a path very similar to the baseline solution.

*Market prices are very similar to the baseline, resulting in a slightly lower price path than under the baseline solution.

*Returns over variable costs are more than twice as high for program participants than for nonparticipants, ranging from $173 per acre in 1985/86, to a low $113 per acre by 1990/91. This path is substantially in excess of returns per acre for the soybean industry especially in the initial part of the estimation period. Returns tends to converge to baseline levels by the end of the decade.

*Government costs are projected to average above $7 billion for the entire period ranging from a high of $8.7 billion in 1985/86 to a low of $5.5 in 1986/87. Program costs are high reflecting the wide gap between the target price and low market price.

Summary

Long-term consequences of moving the U.S. soybean industry to a marketing loan of $4.56, suggests very modest differences compared with the baseline solution. Close examination of the market price path and corresponding ending stocks does, however, indicate some degree of vulnerability relative to the accumulation and management of government stocks. Release of CCC reserves can occur at 105 percent of the market price. Given a fairly high accumulation of CCC stocks, market prices will initially decline to the new minimum price level as stock are released back to the market. However, the analysis tends to indicate considerable resistance in the soybean sector to prices below the $4.52 level. In fact, the equilibrium solution between the soybean and feedgrain sectors with moderate growth projected both in the domestic and foreign demand sectors imply prices slightly below the $5 range with returns per acre at about $80 over variable costs and total area at or near 65 million acres. Therefore if this analysis is on target, the U.S. soybean industry stands to gain very little in a environment of significantly lower marketing loan options relative to the management and operation of the current farm program for other commodities.

IX. The Soybean Marketing Loan Option ($5.02)

General Economic and Foreign Sector Assumptions. This analysis utilizes the same general economic assumptions as for the baseline. Foreign economic growth is also assumed identical to that in the baseline. Production of grains and oilseeds by competitors and importers were allowed to adjust to

U.S. price movements. All program assumptions are the same as under the baseline solution, except for the soybean loan which has moved to a marketing loan of $5.02.

Crops

Soybeans (Table 2)

*Soybean area ranges from 63 million acres in 1986/87, to a high of 67.5 by 1990. The area averages about one-half million acres higher than the base for the period 1988/89 through 1990/91.

*Domestic utilization ranges from a low of 1,145 million bushels in 1985/86, to high of 1,264 million by 1990/91. In fact, this scenario produces results very similar to the base and to the $4.56 marketing loan.

*Market price declines to a low of $4.39 in 1986/87, increasing to a high of $5.27 by the end of the decade, a price pattern 3¢ to 13¢ below the base and the $4.56 option.

*Returns over variable costs reflect the higher marketing loan with returns averaging at or near $85 per acre over the forecast period, this contrasts with approximately $80 per acre for the base and $4.56 scenario.

*Ending stocks reflect similar paths as the base and $4.56 option, moving from 521 million bushels in 1985/86, to a low of 241 million bushels in 1989/90.

*Total exports increase from 750 million bushels in 1985/86, to a high of 913 million by the end of the decade - a path of 10 to 30 million bushels above the base and marketing loan $4.56 option.

*Government costs at the $5.02 loan rate approximately doubles compared with the baseline, reflecting some marketing loan payments at projected market prices below the loan rate. The range of cost is $0.7 to $1.2 billion.

Corn (Table 3)

*Given similar program parameters and long-term conservation reserves with the same set-aside requirements, area is projected to follow the same path as the base.

*Domestic use follows a similar path as the baseline options, reflecting the moderate growth in the livestock industry and the similar price paths for corn and soybean meal prices.

*Total exports increased from 1,625 million to 2,004 million bushels, reflecting a similar path as the baseline and $4.56 option.

*Total carryover declines from a high of 3.6 billion in 1986/87, to a low of 2.7 billion bushels by 1990/91. Path is very similar to the baseline option, suggesting continued pressure for stronger acreage control throughout the remainder of the decade.

*Market prices are estimated to decline from a high of $2.37 in 1985/86 to a low $1.81 by 1988/89, increasing moderately to the 2.05 level by 1990/91. Paths are very similar to projections under the base and marketing loan options.

*Returns over variable costs are estimated to be the same under all options, since farmers are protected by the $3.03 target price through 1988/89. However, declining target prices in the latter part of the decade reflect less support to the corn industry.

*Government costs at or near baseline averaging above $7 billion per year.

Summary

Sensitivity to moderate changes in price support are reflected in this particular scenario. Moving the U.S. soybean industry from a $4.77 nonrecourse loan to a $5.02 marketing loan generates approximately $5 per acre net return over variable costs relative to the base solution. However, market signals are at or near those generated under the $4.77 and $4.56 options. Domestic and foreign utilization follow a very similar path with the soybean industry moving towards a longer-term equilibrium with market prices slightly below the $5 level until the end of the decade.

This solution reflects the strong influence of the U.S. feedgrain industry managed under the current farm program design, where strong economic incentives for program participation in the corn sector, lock in a high level of program participation and corresponding area. Practically all variables on the supply and demand side are similar to those estimated under the baseline option, except for this slightly higher support price which generates a moderate increase in returns to the farmers with slightly higher exposure to the government treasury for differential payments to all producers.

X. The Soybean Marketing Loan Option ($6.00)

General Economic and Foreign Sectors Assumptions. This analysis utilizes the same general economic assumptions as the baseline. Foreign economic growth is also assumed identical to that in the baseline, where production of grains and oilseeds by competitors and importers were allowed to adjust the U.S. price movements. All policy variables are the same as under the baseline, except for the soybean loan which has been moved from $4.77 nonrecourse to the $6.00 marketing loan option.

Crops

Soybeans (Table 2)

*Planted area is projected to increase from 63.1 million acres to 79.0 million by 1990/91, shifting approximately 6 million additional acres of land into the soybean industry over the forecast period.

*Domestic utilization is projected to increase from 1,145 million bushels to a high of 1,345 million bushels by 1990/91. Approximately 80-90 million bushels higher than similar estimates for the baseline in 1990/91.

*Market prices are projected to decline from a high of $5.28 in 1985/86 to a low of $4.08 by 1988/89, recovering moderately to $4.39 by 1990/91. This price equilibrium reflects the stronger supply inducing signal from the $6.00 support price with market prices equilibrating approximately 80¢ below the other program after the first year.

*Returns over variable costs are estimated to increase to the $110 to $116 per acre range over the projection period. Returns at this level are very similar to estimated returns associated with price supports under the 1981 Farm Bill.

*Ending stocks are projected to decline from 520 million bushels to a low of 380 million bushels by 1990/91. This particular scenario suggests stronger supplies with lower prices and correspondingly larger stock levels then under the baseline option.

*Total exports are projected to increase from 750 million bushels to a high 1,015 million by the end of the decade, or roughly 100 million bushels above the baseline and other options.

*Government costs necessary to achieve this higher level of income support will average about $3.5 billion per year, increasing to around $5.3 billion in the latter part of the decade. This sharp increase is associated with planted area increases and the consequent decline in market price.

Corn (Table 3)

*Planted area follows a similar path as under the baseline, declining from 83.3 million acres in 1985/86, to a low of 70.8 million acres by 1990/91.

*Domestic utilization follows a similar path as the baseline, moving from 5,220 million bushels to 5,960 million bushels by 1990/91.

*Total exports are in a similar path as the baseline, moving from 1,625 million bushels to 1,948 million bushels by the end of the decade. Ending exports are slightly below levels considered under the baseline, reflecting the cumulative effect of lower soybeans and soybean meal prices by the end of the forecast period.

*Total carryover peak at 3.7 billion bushels in 1987/88, declining to 2.8 by 1990/91 - slightly higher than level projected under the baseline solution.

*Market prices are projected slightly below the baseline, declining to a low of $1.79 in 1988/89, ending the decade at about $1.95 or approximately 10¢ below the baseline for that same period.

*Returns over variable costs are the same as under the baseline option, declining to a low of $113 by the end of the decade, as target prices begin to slide downward.

*Government costs are slightly below the baseline, averaging about $6.5 billion per year. This decline is associated with lower participation rates with modest shifts in land area towards soybeans.

Summary

The $6.00 marketing loan option for the soybean industry reflects an umbrella of income protection similar to that in the feedgrain industry. As the U.S. agricultural industry moves in the direction of a market oriented agriculture, support at the $6.00 level encourages a significant increase in planted area, implying that acreage program constraints may be necessary to maintain supply-demand balance at these higher supported prices. Returns to producers are at or near levels generated by the 1981 Farm Bill, but with a significant departure from previous government involvement with government cost averaging around $3.5 billion per year.

XI. General Conclusions

The 1985 Farm Bill is a change in the direction for U.S. agriculture, providing a transition towards a more market-oriented agriculture. To ensure movement in this direction, the 1985 Farm Bill drastically lowered support prices for major commodities across the board; however, target prices are maintained at current levels through 1986 and 1987 for wheat and feedgrains only. Commodities with target price protection are provided a shelter with projected returns at or near levels associated with support under the 1981 Farm Bill.

However, the soybean industry becomes extremely vulnerable to this transition period for two reasons. First, no target price protection is provided as market prices moves toward the lower overall floor and second, a management strategy that ensures low feedgrain prices and wheat prices, via the use of generic PIK certificate payments complicates this situation adding and ensuring that market prices of soybeans run at or near the lower loan rates.

In this environment, the soybean industry loses as the loan rate declines and does not necessarily reap the benefits in the near-term of market expansion relative to increased domestic and foreign demand. In other words, a greater volume flows through the market but at a reduced price. This particular combination and shelter associated with the feedgrain industry implies high participation rates in the feedgrain and wheat commodity programs with very little movement of area between the soybean and corn complex.

This type of area stickiness is associated with the fact that the corn program provides returns at or near $140 per acre for the next two years as opposed to approximately $80 per acre under the $4.77 nonrecourse loan option. Therefore, given this combination of program variables and corresponding market prices, achieved primarily through manipulation of the loan rates and PIK deficiency payments, establishes a market equilibrium for soybeans with a return per acre of $80 over variable production cost.

Scenarios designed to examine the consequences of the soybean industry, modified for the marketing loan options, gives very similar results as the $4.77 nonrecourse loan strategy, especially for the $5.02 marketing loan option and the $4.56 marketing loan option. In the case of the $4.56 marketing loan option, consequences are very similar to the 1985 Farm Bill. The reason is associated with supports provided by the target price shelter in the feedgrain industry. Lower potential support prices on the soybean side does not change the area planted to corn and soybeans. Therefore, the market price is projected to flow at or around the $4.85 level for most of the projection period.

Similar consequences are obtained for the $5.02 marketing loan option. Area planted to soybeans increases slightly at the end of the decade, reflecting some advantage to soybeans relative to the lower target prices, however, this shift is not sufficient enough to change the market price equilibrium floating at or near $4.85 for the forecast period. As a result, returns to farmers increase but only through the implied deficiency payments associated with the $5.02 marketing loan. In fact, government costs are projected to increase across this scenario from around $736 million in 1988/89 to $1.2 billion by 1989/90.

The $6.00 marketing loan option for soybeans, essentially provides a target price shelter similar to other major commodities. Returns per acres over variable costs are estimated to increase about $35 per acre over the baseline and attract approximately 7 million additional acres of land into the program by the end of the decade. Additional area and corresponding supplies reflect a lower market price path with the equilibrium moving down into the $4.10 range, averaging about $4.25 for the forecast period.

The government costs as a result, are expected to increase significantly from about $770 million in 1985/86 to around $5.3 billion in 1989/90. It is fairly evident from this analysis that in order to increase returns to soybean producers at or near levels that are equitable to protection provided for other commodities, modifications will be necessary. However, it is unlikely that a shift to a marketing loan at or below the current nonrecourse loan of $4.77 will alleviate this apparent differential.

Several options may be considered in attempting to rectify this situation. However, strategies associated with lower nonrecourse loans or marketing loans may not produce desired results, especially given the strong possibility that the feedgrains and wheat sectors will be managed in such a way that market prices move at or near the declining support prices in the feedgrain sector. In this case, strategies associated with management of the feedgrain industry should be monitored very closely since the spillover into the soybean industry can and does have a significant impact in this highly competitive industry with corresponding inelastic market demands.

Quantitative Statement Summary

Intermediate Marketing Loan of $4.77. This option would be very similar to the $4.56 marketing loan. Farm price in 1986/87 would be below the projected $4.96 baseline, falling to the $4.77 level. Government stocks levels would be lower initially. However, since the producer continues to receive at or near $80-$83 per acre over variable cost, it is very likely that acreage would run close to the baseline. With a similar supply path, market price should settle out in the $4.85 range.

As in the case of other marketing loan options set below the expected farm price of around $4.85, spillover from the feedgrain programs becomes a significant factor. Higher returns per acre in the corn program holds producers and acreage in these programs. This stickiness will very likely hold soybeans acreage at about 63 million and market price around $4.80-$4.90.

Intermediate Marketing Loan at $5.50. This option provides a shelter for soybean producers raising returns per acre over variable cost to about $95. Therefore, this option provides more protection with the potential for stronger acreage response relative to the baseline. However, area should not approach levels associated with the $6.00 marketing loan option. In this event, market prices should move into the $4.25 to $4.65 range. Government exposure would be higher, averaging $2 to $3 billion per year.

Cash Loan of $4.25 with a $.77 PIK. Since farmers would receive $5.02 price protection, production area should be at or near the $5.02 marketing loan option. If the $.77 PIK were given initially in soybeans, then market prices would drop to the $4.25 level. But since area should hold at or near 63 million acres, the demand side will begin to use up excess government stocks. Eventually PIK payments would have to come from other commodities. Then market prices should move back into the same range as under the $5.02 option. Downward market pressure from the PIK release of other commodities would stop at the loan levels for corn and wheat. Government cost would reflect the $.77 payment per bushel produced.

Soybean Loan Participation and Forfeiture Reduction Program. This optional program ensures all farmers a return in the $4.80 to $5.00 range for production, implying $80-$85 per acre over variable cost. If this is the case, then area planted to corn and beans should not shift much in comparison to the $5.02 marketing loan option, at least in the beginning years of the program.

The market price path would be different. As long as producers received soybean PIK payments, prices would run near $4.05, moving up through the season to reflect storage and interest payment cost. However, if PIK soybeans were not available, price would move back toward the $4.85 range. This would imply returns at or near $5.60 per bushel, $4.85 + $.75. Reaction in succeeding years would bring in more acreage pulling market prices down towards the $4.30 to $4.40 range. Could, however result in a longer run price slightly above $5.00 into the $5.15 range. This possibility would exist as long as no CCC soybean stocks were accumulated. Any accumulation would push market price back into the low $4.00 range with PIK payments. Government cost would reflect the $.75 value of the certificate.

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