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# Exploring Options for a New Farm Bill

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ABSTRACT

Three farm programs to increase support by $6 billion per year are analyzed. Higher marketing loan (ML), higher AMTA payments, and Modified Supplemental Income (SIP) program are evaluated at the sector and farm levels. At the sector level impacts on supply, demand, and price are modest with acreage shifts of less than two million acres. At the farm level SIP was preferred by cotton farms and higher ML was preferred by farms producing soybeans. Higher AMTA payments were preferred by 3 of 11 farms. Overall, SIP was ranked first or second by 10 of 11 representative farms.

Members of the House Agriculture Committee have indicated an interest in rewriting the farm bill in 2001 (*The Food and Fiber Letter*). Pressure to rewrite the farm bill a year before it expires comes in part from the perception that the current farm bill does not provide adequate downside protection for farm income. A symptom of this problem is the fact that Congress has passed substantial assistance packages to supplement farmers' incomes in each of the past three years.

In 1998, Congress provided $5.3 billion in market loss assistance (MLA) payments and disaster assistance to producers aversely affected by low prices and weather-induced yield losses (USDA News Release 0450.98 and 0090.99). The additional payments were distributed based on the allocations of the original contract payments under the FAIR Act. In 1999, the market loss assistance payments were made to program crop farmers by doubling the 1999 AMTA payment rates. Direct payments were also extended to oilseed producers and to dairy producers. For 2000, the Congress extended the market loss assistance payments to program crop and oilseed producers at the payment rates received in 1999. The additional market loss payments received by crop producers in 1999 and 2000 averaged approximately $6 billion per year (USDA Release 0348.00).

Barring widespread weather problems the outlook for the next five years is for continued low prices of grains, oilseeds, cotton, and rice (FAPRI 2000 U.S. Agricultural Outlook). Demand growth will not likely exceed growth in supplies over this period as export demand is expected to recover slowly. Given this lackluster outlook for prices, Congress will likely see continued pressure for supplemental assistance payments in one form or another in 2001 and 2002.

Before Congress debates another assistance package or the next farm bill we should be evaluating alternative policy options. During the past year FAPRI and AFPC were asked by Representative Charles Stenholm, ranking minority member of the House Agriculture Committee, to analyze the merits of alternative farm programs that would transfer $1, $2, or $3 billion per year (over and above the 1996 farm bill) to program crop producers (FAPRI-UMC Report 07–00). The farm program tools of interest were a supplemental income protection program, higher marketing loan rates, and additional AMTA payments. The analysis of these options showed that even with $3 billion per year of payments it would not be suf-

ficient to reduce the cash-flow problem facing farmers (Smith and Richardson).

The purpose of this paper is to quantify the impacts of alternative farm program tools that could be used to transfer $6 billion per year of additional payments to program crop and oilseed producers. The program tools used for the analysis are a supplemental income protection (SIP) program, increased marketing loan rates (ML), and increased AMTA payments (AMTA). It is assumed that Congress would set the payments and loan rates so that additional spending above the baseline would average $6 billion per year over the planning horizon, 2001–2005. The new money comes in addition to the AMTA payments already in place for 2001 and 2002, and the 2002 AMTA payment rate is assumed to be extended through 2005.

The remainder of the paper is organized in three parts. The first part summarizes the four policy scenarios and presents the sector level analysis of the baseline and the three alternative options. The second part presents the farm level impacts and the rankings of the policy options for farmers in the South. The final section discusses the prospects for agriculture and the agricultural policy debate in 2001.

## Summary of Policy Assumptions

As previously mentioned, this paper analyzes the impacts of three alternative policy options that are designed to spend $30 billion (an average of $6 billion per crop year) above baseline levels for the 2001–05 crop years. The baseline (or BASE option) refers to the FAPRI January 2000 Agricultural Outlook, which assumes an indefinite extension of the provisions of the 1996 FAIR Act. For 2003 and beyond, policies are held at 2002 levels.

The SIP option differs from the BASE option only through the introduction of the SIP program. All baseline policies remain in place. The first step in determining payments under SIP is to calculate the value of production for each crop. The value of production is determined by simply multiplying national production by the higher of the loan rate or the season-average farm price. Second, the value of production is then calculated on a per-acre basis by dividing by U.S. harvested acres. Third, the trigger level, or target value, that serves as a basis for determining payments is calculated as a percentage of the average per-acre value of production for the 1995–99 period. **In this analysis the trigger value necessary to achieve the desired increase in spending is 103.35 percent of the 1995–99 average.** The final step calculates the SIP payment as the difference between the current-year value of production and the trigger level, assuming that this value is greater than zero. It is important to note that the program is based on national production and prices. If a payment is made in a given year, each producer of a particular crop will get the same per-acre payment. For example, a corn producer in Alabama will receive the same per-acre payment as a corn producer in Iowa. Also, a producer in Alabama could lose a crop, but should the U.S. Value of Production not fall low enough the Alabama producer would not receive a payment under this program.

The ML option increases marketing loan rates above Baseline levels for the 2001–05 crops. The Baseline plays a key role in evaluating the impacts of this alternative. In the FAPRI Baseline, loan rates for each crop are held constant at 2000 levels through 2001, but thereafter are allowed to adjust based on formulas in the FAIR Act. This results in lower rates for the 2002 crop when compared to 2001, thus allowing for larger percentage increases in scenario loan rates than would have been the case had Baseline loan rates been held fixed at 2001 levels. In addition, the relationship between projected prices and loan rates has a significant impact on the importance of a loan rate increase. Given the Baseline, soybeans and cotton will on average realize a much larger benefit from higher loan rates than corn and wheat. **A critical assumption of the ML option is that loan rates for all crops are increased by the same percentage above Baseline levels. In this analysis, an increase of 17.5 percent above Baseline levels is required to reach the spending target.**

The third and final option, AMTA, effec-

**Table 1.** Impacts on U.S. Crop Area and Prices, 2001–05 Average

| | Policy Option | | | |
|---|---|---|---|---|
| | BASE | SIP | ML | AMTA |
| | (Million Acres) | | | |
| **Corn Area** | | | | |
| Mean | 79.3 | 79.6 | 79.0 | 79.3 |
| Standard Deviation | 2.6 | 1.9 | 2.3 | 2.6 |
| **Soybean Area** | | | | |
| Mean | 72.3 | 72.5 | 73.8 | 72.3 |
| Standard Deviation | 1.9 | 1.4 | 1.6 | 1.9 |
| **Wheat Area** | | | | |
| Mean | 64.9 | 65.1 | 63.7 | 64.9 |
| Standard Deviation | 2.6 | 1.6 | 2.1 | 2.6 |
| **Upland Cotton Area** | | | | |
| Mean | 14.0 | 15.0 | 14.8 | 14.0 |
| Standard Deviation | 0.7 | 0.7 | 0.6 | 0.7 |
| **Rice Area** | | | | |
| Mean | 3.4 | 3.6 | 3.5 | 3.4 |
| Standard Deviation | 0.2 | 0.2 | 0.2 | 0.2 |
| **Total Grain & Oilseed Area** | | | | |
| Mean | 257.8 | 259.4 | 258.5 | 257.8 |
| Standard Deviation | 1.5 | 1.1 | 1.5 | 1.5 |
| | (Dollars per Unit) | | | |
| **Corn Farm Price** | | | | |
| Mean | 2.23 | 2.22 | 2.25 | 2.23 |
| Standard Deviation | 0.45 | 0.47 | 0.46 | 0.45 |
| **Soybean Farm Price** | | | | |
| Mean | 4.91 | 4.89 | 4.77 | 4.91 |
| Standard Deviation | 0.95 | 0.94 | 0.96 | 0.95 |
| **Wheat Farm Price** | | | | |
| Mean | 3.21 | 3.19 | 3.26 | 3.21 |
| Standard Deviation | 0.52 | 0.53 | 0.52 | 0.52 |
| **Upland Cotton Farm Price** | | | | |
| Mean | 0.52 | 0.48 | 0.49 | 0.52 |
| Standard Deviation | 0.07 | 0.08 | 0.07 | 0.07 |
| **Rice Farm Price** | | | | |
| Mean | 7.23 | 6.63 | 6.99 | 7.23 |
| Standard Deviation | 1.09 | 1.18 | 1.11 | 1.09 |

tively represents a continuation of what has been done in each of the past three years through the various supplemental assistance packages. In the analysis, annual payments of $6 billion are distributed in the same fashion as the funds included in the supplemental packages. As in the past, funds are also included for oilseeds. Feed grains receive approximately 50 percent of additional funds while wheat collects 24 percent of the additional spending. Payments to oilseeds account for 8 percent of the total.

**Table 2.** Impacts on U.S. Crop Net Returns, 2001–05 Average

| | Policy Option | | | |
|---|---|---|---|---|
| | BASE | SIP | ML | AMTA |
| | (Dollars per Acre) | | | |
| **Corn** | | | | |
| Mean | 154.82 | 176.29 | 176.69 | 190.14 |
| Standard Deviation | 34.55 | 23.33 | 31.56 | 34.22 |
| **Soybeans** | | | | |
| Mean | 129.22 | 148.45 | 158.70 | 135.70 |
| Standard Deviation | 16.21 | 8.24 | 18.14 | 16.24 |
| **Wheat** | | | | |
| Mean | 68.22 | 81.22 | 76.72 | 93.67 |
| Standard Deviation | 17.29 | 11.15 | 14.53 | 17.48 |
| **Upland Cotton** | | | | |
| Mean | 150.43 | 214.30 | 202.11 | 198.18 |
| Standard Deviation | 41.31 | 31.84 | 49.55 | 41.62 |
| **Rice** | | | | |
| Mean | 212.13 | 282.96 | 261.32 | 350.17 |
| Standard Deviation | 50.16 | 51.76 | 51.78 | 54.70 |

## Sector Level Impacts of Policy Options

Tables 1–3 present the sector level results of each of the policy options. In each case the mean and standard deviation are based on 500 stochastic iterations through the FAPRI modeling system. The simulations incorporate var-

**Table 3.** Impacts on Aggregate Measures, 2001–05 Average

| | Policy Option | | | |
|---|---|---|---|---|
| | BASE | SIP | ML | AMTA |
| | (Billion Dollars) | | | |
| **Net CCC Outlays, Fiscal Yr** | | | | |
| Mean | 11.82 | 16.82 | 16.82 | 16.82 |
| Standard Deviation | 3.45 | 5.23 | 5.26 | 3.45 |
| **Net Farm Income, Calendar Yr** | | | | |
| Mean | 40.59 | 44.15 | 44.42 | 45.03 |
| Standard Deviation | 6.10 | 5.88 | 6.87 | 6.41 |

iability for major exogenous factors such as weather and macroeconomic variables. A detailed discussion of the stochastic methodology can be found in FAPRI-UMC Report #07–00.

Impacts at the sector level begin with adjustments in planted acreage in response to the different signals of the alternative policy options. Under the SIP and ML options the benefits of each program are crop-specific and vary directly with the number of acres or bushels produced. As a result the two options will have a direct impact on total area as well as the crop mix. Under the AMTA option payments are theoretically decoupled from the production decision. Any contract holder currently receiving payments under the FAIR Act need not plant a crop to receive those payments or any additional AMTA payments. It is commonly accepted that the payments definitely have an impact on land values and cash rents. However, it is less clear what the actual impacts are on aggregate acreage and crop mix. For this analysis we have not included any acreage impacts under the AMTA option. We do not conclude that the additional AMTA payments would have no effect on acreage decisions, but we are not able to estimate specific impacts with confidence.

Under the SIP and ML options the shifts in acreage are rather modest, with most changes being less than one million acres. For the 2001–05 period, acreage under SIP increases above BASE levels for each of the five major crops as producers respond to the additional support provided by the program. The most significant increase occurs in cotton with planted area averaging one million acres above the BASE option. For each of the other crops acreage increases by approximately 200 thousand acres. The acreage shifts under the loan option are mixed due to the differences in relative benefits associated with an increase in loan rates. For commodities that are "deep in the money" with Baseline loan rates, such as soybeans and cotton, increased loan rates generate a substantial benefit relative to corn and wheat. Not surprisingly, soybean acreage increases by 1.5 million acres above the Baseline, while cotton gains 840 thousand acres. Many of those acres come from feed grains and wheat, with corn and wheat losing 300 thousand and 1.2 million acres, respectively. The additional support of the SIP and ML options reduces the standard deviation of planted area relative to the BASE option.

The price changes in the analysis reflect the production changes brought about by the acreage shifts. As we have seen, the changes are relatively modest with mean corn, soybean, and wheat prices moving by less than 2 percent. Changes are a bit more substantial for cotton and rice with declines under SIP of approximately 8 percent from Baseline levels.

After incorporating the payments under the three policy options, per-acre returns (Table 2) show some noticeable differences when compared across crops. Of the three options corn, wheat, and rice returns show the largest gains under the AMTA option. On a per-acre basis rice sees the largest increase, with the AMTA option providing $138 in additional income. For soybeans higher loan rates under the ML option generate average additional income of $29 per acre, easily surpassing the other options. At the mean the SIP program increases cotton returns by $64 per acre while the other two options increase returns by about $50. Of the three alternative policy options SIP has the greatest impact on the variability of net returns. With the exception of rice the standard deviation of returns declines dramatically under SIP. For example, soybeans returns have a standard deviation of $8 per acre under SIP, compared to $16 under the BASE. In general the reduction in variability can be attributed to the additional downside protection offered by the SIP option.

Table 3 presents the impacts of the policy options on net CCC outlays and U.S. net farm income. By design, each policy option increases net CCC outlays by an annual average of $6 billion above Baseline levels for the 2001–05 crops. Because of the timing of crop and fiscal years, the total additional costs of $30 billion are spread over fiscal years 2001–06. U.S. net farm income increases above the BASE option, but by less than the amount of additional spending. In all cases a portion of the additional government payments is cap-

tured by higher land values and cash rents. The AMTA option results in a total increase of $26.7 billion over 2001–2006, the largest impact of the three alternatives. The SIP and ML options increase farm income by $21.4 billion and $23.0 billion, respectively. The differences between these options and the AMTA option can be attributed to the impacts on overall acreage and production. Since payments under the SIP and ML alternatives directly depend on either the number of acres harvested or the number of bushels produced, it is reasonable to expect that those programs will have an impact on overall acreage levels. With an inelastic demand for the major crops an increase in overall production levels causes a proportionately larger decline in price. As a result overall market net income to the crops sector falls. Although a portion of this decline is captured in lower feed costs to the livestock sector, the total impact is negative on net farm income. The sum effect is that $1 spent under each of these programs gives slightly less of a bump to net farm income than $1 spent in direct decoupled payments.

## Farm Level Impacts of Policy Options

The probability distributions of prices, marketing loan rates, AMTA payment rates, and SIP payments from the sector analysis were used directly as input in FLIPSIM to quantify the impacts of the four policy options on the cash flows for a dozen representative crop farms in the South.[1] Four feed grain/oilseed farms, four cotton farms and three rice farms from the AFPC representative farm database were used for the analysis. Most of these representative farms were developed in 1989–1990 and have been updated every three years since. The farms are classified as large commercial family farms and generally are larger than the typical full-time family farms in their region. With the help of a local extension specialist in each area, panels of producers were interviewed to obtain production, cost, and balance-sheet data to describe the farms. To validate the model, the farm panels were asked to review the simulated results for their farm data and revisions were made until the results matched their recent experiences.

Characteristics of the farms in 2000 are summarized in Appendix Table A. The four grain farms are in Texas, Missouri, Tennessee, and South Carolina (TXNP, MOCG, TNG, and SCG, respectively) and a majority of the receipts for these farms comes from feed grains. The four cotton farms are in Texas and Tennessee (TXSP, TXBC, TXCB, and TNC) and receive a majority of their revenue from cotton. The rice farms are located in Texas, Arkansas, and Louisiana (TXR, ARR, LAR, respectively). The representative farms annual receipts range from $230,000 to $1,500,000. The farms were simulated over the 1996–2005 period. Over the 1996–1999 period, actual farm programs, prices, and yields were assumed. At the outset of 1996, the farms were assumed to have 20-percent debt on land, machinery, and livestock. Over the 2001–2005 period, the policies consistent with the Baseline and the three alternatives were assumed. The 500 iterations of annual stochastic prices for each of the policy scenarios were used as input into FLIPSIM. Additionally, the stochastic national crop yields associated with the sector analysis were used in FLIPSIM to correlate local yields to national crop yields.[2] Local yields were correlated to national yields to appropriately simulate SIP payments that are triggered by decreases in national revenues.

The results of simulating the representative crop farms for the four policy options are summarized in Table 4. The probability distributions of average net cash farm income over the 2001–2005 period are summarized in terms of

[1] FLIPSIM is a Monte Carlo, whole-farm-simulation model capable of simulating farms under alternative farm programs. The model is described in detail by Richardson and Nixon.

[2] Crop yields are simulated multivariate empirical in FLIPSIM using the procedure described by Richardson, Klose and Gray. The procedure was expanded to correlate local crop yields to national crop yields so that the relationship observed over the past 10 years would be repeated over the five-year planning horizon.

**Table 4.** Impacts of Alternative Farm Policy Options on the Income and Cash Flows of Representative Crop Farms

| | Baseline | | Loan | | AMTA | | SIP | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std Dev | Mean | Std Dev | Mean | Std Dev | Mean | Std Dev |
| | **Average Annual Net Cash Farm Income 2001–2005 ($1000)** | | | | | | | |
| TXNP[1] | 219.5 | 171.9 | 355.4 | 163.3 | 361.3 | 168.5 | 311.4 | 143.5 |
| MOCG | 219.4 | 76.1 | 296.7 | 79.8 | 273.2 | 74.5 | 271.2 | 68.9 |
| TNG | 52.8 | 76.7 | 126.6 | 78.1 | 102.0 | 75.8 | 113.6 | 67.2 |
| SCG | 272.9 | 128.9 | 356.0 | 132.9 | 363.1 | 127.2 | 379.2 | 119.1 |
| TXSP | 181.8 | 81.6 | 264.4 | 89.0 | 249.3 | 79.9 | 339.7 | 78.7 |
| TXBC | 47.4 | 16.0 | 66.5 | 16.0 | 71.7 | 15.9 | 82.0 | 12.1 |
| TXCB | 83.7 | 61.6 | 121.3 | 66.3 | 119.9 | 59.8 | 133.2 | 56.7 |
| TNC | 29.7 | 157.2 | 185.7 | 170.7 | 119.9 | 156.0 | 221.1 | 148.1 |
| TXR | −65.2 | 63.1 | 64.0 | 65.6 | 188.4 | 57.5 | 92.3 | 59.7 |
| ARR | 256.4 | 47.4 | 355.5 | 51.7 | 388.1 | 46.6 | 354.0 | 43.2 |
| LAR | −62.7 | 23.6 | −25.9 | 25.9 | −16.6 | 23.6 | −8.8 | 23.5 |
| | **Probability of a Cash Flow Deficit in 2005 (%)** | | | | | | | |
| TXNP | 66.8 | | 41.8 | | 43.6 | | 54.6 | |
| MOCG | 59.4 | | 35.4 | | 44.6 | | 47.2 | |
| TNG | 90.8 | | 69.2 | | 79.2 | | 79.8 | |
| SCG | 58.2 | | 47.4 | | 42.8 | | 43.8 | |
| TXSP | 63.2 | | 36.2 | | 36.8 | | 19.2 | |
| TXBC | 86.0 | | 68.2 | | 58.0 | | 53.6 | |
| TXCB | 55.4 | | 45.6 | | 43.6 | | 41.0 | |
| TNC | 96.4 | | 84.4 | | 90.6 | | 79.4 | |
| TXR | 98.6 | | 86.2 | | 37.0 | | 85.4 | |
| ARR | 54.6 | | 27.6 | | 15.2 | | 31.8 | |
| LAR | 99.0 | | 99.0 | | 99.0 | | 99.0 | |

[1] The abbreviated names for the farms are explained in Appendix A.

their means and standard deviations.[3] Additionally, the simulated probability of the farm having a cash flow deficit in 2005 is reported in Table 4.[4]

Under the BASE policy option all of the representative farms are projected to have greater than a 50-percent chance of a cash flow deficit in 2005. This result indicates the potential for a cash flow crisis in agriculture if there is no change in the farm program. The probability of a cash flow deficit in 2005 declines significantly for 10 of the 11 farms when government payments are increased. The Texas Southern Plains Cotton (TXSP) farm would see its probability of a deficit fall from 63 to 36 percent under the higher ML and AMTA options and to 19 percent under the SIP option. The Arkansas rice (ARR) farm could see its probability of a cash-flow deficit in 2005 fall from about 55 percent under the BASE to 15 percent under the higher AMTA option. The decreases in the chance of a deficit are smaller for the feed grain/oilseed farms. For example, the Central Missouri grain (MOCG) farm could expect the chance of a deficit to fall from 59 percent under the BASE to 35 percent with a higher marketing loan rate.

Improvements in the cash flow situation for the representative farms are largely due to $6 billion of increased program payments to the sector changing the probability distributions for net cash farm income. Increased govern-

[3] *Net cash farm income* is defined as total farm receipts less total cash costs including interest. Net cash farm income does not include principal payments or depreciation as expenses.

[4] A cash-flow deficit occurs when family living, principal payments, taxes, and machinery replacement costs exceed net cash farm income.

**Table 5.** Policy Option Rankings Based on Alternative Performance Variables

| | Average Net Income | Relative Risk of Net Income | Prob. of a Deficit 2005 | Average Cash Balance 2005 | Average Change RNW[1] |
|---|---|---|---|---|---|
| Feed grain | | | | | |
| TXNP[2] | AMTA | ML | ML | AMTA | AMTA |
| MOCG | ML | ML | ML | ML | ML |
| TNG | ML | ML | ML | ML | ML |
| SCG | SIP | SIP | AMTA | SIP | SIP |
| Cotton | | | | | |
| TXSP | SIP | SIP | SIP | SIP | SIP |
| TXBC | SIP | SIP | SIP | SIP | SIP |
| TXCB | SIP | SIP | SIP | SIP | SIP |
| TNC | SIP | SIP | SIP | SIP | SIP |
| Rice | | | | | |
| TXR | AMTA | AMTA | AMTA | AMTA | AMTA |
| ARR | AMTA | AMTA | AMTA | AMTA | AMTA |
| LAR | SIP | SIP | SIP | SIP | SIP |

[1] RNW is real net worth over the 2001–2005 planning horizon.
[2] The abbreviated names for the farms are explained in Appendix A.

ment payments raise the mean for net cash farm income and in most cases reduce the relative risk for net income.

Rankings of the policy options for the representative crop farms, based on the mean and relative risk for net cash farm income, are summarized in Table 5. Increasing the marketing loan rate is preferred by two farms (MOCG and TNG) because of the high portion of receipts coming from soybeans. Higher AMTA payment rates are ranked first for three of the farms (TXNP, TXR and ARR) due largely to the low yield risk on these irrigated farms. The SIP program received six first-place rankings because of two factors: (a) it provides support to farms with risky yields and (b) it tends to pay more frequently to highly diversified farms, such as the SCG farm. Ranking the policy options based on reduction in relative risk for net cash farm income results in the SIP option maintaining its first-place ranking on six of the 11 farms (Table 5).

The rankings of the four farm program options changes only slightly if they are ranked based on the probability of a cash-flow deficit in 2005. The only change is for the SCG farm to rank higher AMTA payments over the SIP program (Table 5). However, the change in rankings is not robust given it is based on a one percentage point change in the probabilities (Table 4).

The program options are also ranked based on the average ending cash reserves in 2005 and the average change in real net worth 2001–2005 (Table 5). The rankings, however, are the same as when the program options are ranked based on average net income.

Generalized stochastic dominance with respect to a function was used to rank the farm program options as a further test of likely program preferences. The simulated net present value (NPV) distributions for the farms were compared across farm program options, assuming the decision maker was risk averse. The stochastic dominance rankings for the policy options show that cotton farmers (TXSP, TXBC, TXCB, and TNC) would prefer SIP to the other options.[5] Additionally, the SCG farm that has 840 acres of cotton ranks SIP first. The Louisiana rice farm (LAR) would likely rank SIP highest in its preference

[5] A generalized stochastic dominance function in Simetar© was used assuming a common risk-aversion coefficient of 0.001 across all 11 representative farms. See Richardson, Schumann and Feldman for a description of Simetar©.

**Table 6.** Rankings and Certainty Equivalents of Farm Program Options for Risk-Averse Decision Makers on Representative Crop Farms

| | Baseline | Higher Loan | Higher AMTA | SIP |
|---|---|---|---|---|
| Feed grain/Oilseeds | | | | |
| TXNP[1] | 4(360)[2] | 3(102) | 1 | 2(116) |
| MOCG | 4(166) | 1 | 2(49) | 3(50) |
| TNG | 4(228) | 1 | 3(77) | 2(35) |
| SCG | 4(250) | 3(83) | 2(45) | 1 |
| Cotton | | | | |
| TXSP | 4(357) | 2(173) | 3(199) | 1 |
| TXBC | 4(86) | 3(39) | 2(26) | 1 |
| TXCB | 4(133) | 3(39) | 2(38) | 1 |
| TNC | 4(596) | 2(178) | 3(318) | 1 |
| Rice | | | | |
| TXR | 4(722) | 3(330) | 1 | 2(240) |
| ARR | 4(271) | 3(67) | 1 | 2(63) |
| LAR | 4(169) | 3(56) | 2(27) | 1 |

[1] The abbreviated names for the farms are explained in Appendix A.

[2] The first value is the preference ranking for a policy option assuming the decision maker is risk averse. The value in parenthesis is the certainty equivalents in thousands of dollars that the decision maker would be willing to pay in order to gain access to the preferred policy option.

schedule. The SIP program is ranked second by two feed grain farms (TXNP and TNG) and by two rice farms (TXR and ARR). The program option with the most second place preference rankings is the higher AMTA payment program.

Certainty equivalents (CE) between the first-place program option and the remaining options can be used to quantify the net benefits producers would have to forego if they did not get the first-place option. The CEs for the policy options are summarized in Table 6.[6] The TXNP grain farm prefers a higher AMTA program and if forced to accept a SIP program instead would suffer an $116,000 decrease in NPV over the five-year planning horizon (Table 6). The CE also shows that a higher AMTA would increase NPV for the TXNP farm by $360,000 over the current farm program in the BASE.

[6] Certainty equivalents were calculated assuming a risk-aversion coefficient of 0.001 using Simetar©.

Among the feed grain farms the CE values for the second place policy options are quite small, ranging from 3 to 7 percent of annual cash receipts (Table 6 and Appendix Table A). This result suggests that their preference for the first-place policy option may not be very strong. In contrast the CE values for the four cotton farms are 11 to 17 percent of their annual cash receipts so they may have strong preferences for a SIP program. The three rice farms are divided in their preferences with the TXR farm having a strong preference against the SIP program ($240,000 or 10 percent of receipts) and the ARR farm having a weak preference ($63,000 or 7 percent of receipts) against a SIP.

The CE values associated with the Baseline are relatively large, as a percent of cash receipts, for all 11 farms (Table 6). The CE for the Baseline ranges from 17 to 60 percent of annual cash receipts suggesting that large commercial farms have much to be gained from a change in policy. Even if a farm does not get its first choice, the benefits can be substantial for even its second or third choice. For instance, the CE between the ARR farms fourth (Baseline) and third choice (ML) is about $204,000 over the 2001–2005 period.

## Summary

At the sector level the impacts on overall supply, demand and price are relatively modest. Acreage shifts due to the policy options are generally less than two million acres, and subsequently, price changes are relatively modest. The most noticeable impacts occur in the SIP option for cotton and rice.

For individual commodities the question as to which policy ranks 'best' is related to the commodity's expected price levels compared to the loan rate, the proportion of historical AMTA payments the commodity has received, or the base period used to calculate the SIP support level. Cotton returns, on a per-acre basis, rise most under the SIP option, due mainly to the size of the payments in the first three years of the program. Of the three, the ML option gives soybean producers the greatest increase in returns. Given the market price

projections for soybeans throughout the analysis period, the increase in loan rates positions the soybean sector so that it would receive loan deficiency payments in nearly all years of the analysis. Conversely, under the AMTA-option, payments go to soybean producers based on the historical proportion of payments received under the earlier supplemental packages. Thus while the feed grains sector receives 50 percent of the payments, oilseed producers receive only 8 percent. Corn, wheat and rice see the largest gains in average per-acre returns under the AMTA option. Rice currently receives 8 percent of the AMTA funds, but accounts for only 1 percent of the area planted to the 15 major crops.

The farm-level analysis suggests that any of the three policy options considered here would greatly benefit crop producers in the South. Higher marketing loan rates, higher AMTA payment rates, or a SIP program would significantly increase net cash farm incomes for large commercial farms. Additionally, these program options would substantially reduce risk associated with net farm income, relative to continuation of the 1996 farm program.

Rankings of the Baseline and the three program alternatives do not show a clear winner across feed grain, cotton, and rice farms in the South. One consensus appears to be that cotton farmers would prefer the SIP program as defined and analyzed in this paper. Two of the three rice farms also ranked the SIP program over the other programs. Feed grain farms that receive a large portion of their receipts from oilseeds tend to prefer higher marketing loan rates because of the LDP benefits to soybeans. Only three of the 11 representative crop farms preferred the higher AMTA payment rate option. For these three farms the SIP program was ranked second. Overall, the SIP program was ranked first or second by 10 of the 11 representative crop farms.

In conclusion, we should note that the results of the analysis are not "universal." They are conditioned on the construction of the particular alternatives as well as the projections in the FAPRI Baseline. In addition, the analysis does not serve as an endorsement for any particular policy option, but rather an objective assessment of the impacts of the alternatives. The options analyzed in this study reflect only a small sample of the alternatives that have emerged in the early stages of the farm bill debate. It is expected that as the debate intensifies, new alternatives will surface and the demand for objective analysis will increase. FAPRI and AFPC will continue to refine the stochastic methodology in this report and apply it in future policy analysis.

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## Appendix

**Table A.** Characteristics of Representative Crop Farms

| | TXNP[1] | MOCG | TNG | SCG | TXSP | TXBC | TXCB | TNC | TXR | ARR | LAR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cropland (acres) | 6,700 | 3,300 | 2,400 | 3,500 | 3,697 | 1,400 | 1,720 | 3,800 | 3,750 | 3,400 | 1,100 |
| Acres Owned | 1,100 | 1,600 | 482 | 1,400 | 1,627 | 150 | 360 | 1,520 | 1,688 | 1,020 | 50 |
| Acres Leased | 5,600 | 1,700 | 1,918 | 2,100 | 2,070 | 1,250 | 1,360 | 2,280 | 2,062 | 2,380 | 1,050 |
| Assets in 2000 ($1,000) | | | | | | | | | | | |
| Total | 2,760 | 4,307 | 1,079 | 3,846 | 1,776 | 548 | 891 | 8,485 | 2,508 | 3,779 | 428 |
| Real Estate | 896 | 3,198 | 138 | 2,551 | 969 | 279 | 460 | 6,929 | 1,327 | 2,042 | 87 |
| Machinery | 1,389 | 638 | 704 | 931 | 759 | 195 | 280 | 1,340 | 650 | 992 | 342 |
| Other & Livestock | 475 | 470 | 237 | 365 | 49 | 75 | 151 | 216 | 530 | 746 | |
| Total Gross Receipts in 2000 ($1,000) | 1,585 | 667 | 663 | 1,445 | 982 | 230 | 311 | 1,264 | 1,181 | 833 | 270 |
| Planted Acres in 2000 | | | | | | | | | | | |
| Total | 6,030 | 3,300 | 3,000 | 4,400 | 3,164 | 1,400 | 1,720 | 4,100 | 1,700 | 3,500 | 902 |
| Feed Grains | 3,685 | 1,319 | 1,200 | 1,400 | | 950 | 1,020 | 532 | | | |
| Soybeans | 670 | 1,881 | 1,200 | 1,260 | | | | 760 | | 1,700 | 362 |
| Cotton | | | | 840 | 2,665 | 350 | 700 | 2,508 | | | |
| Rice | | | | | | | | | 1,500 | 1,300 | 540 |
| Wheat | 1,675 | 100 | 600 | 900 | | 100 | | 300 | | 500 | |
| Other and CRP | | | | | 499 | | | | 200 | | |

[1] Farm names are abbreviated as follows: TXNP is Texas Northern Plains grain, MOCG is Central Missouri grain, TNG is Tennessee grain, SCG is South Carolina grain, TXSP is Texas Southern Plains cotton, TXBC is Texas Blacklands cotton, TXCB is Texas Coastal Bend cotton, TNC is Tennessee cotton, TXR is Texas rice, ARR is Arkansas rice, and LAR is Louisiana rice.