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# Impacts of the 1985 Farm Bill and its Alternatives on Rural Economies: The Case of Terry County, Texas

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# Impacts of the 1985 Farm Bill and Its Alternatives on Rural Economies: The Case of Terry County, Texas

**James M. Bowker**
Assistant Professor
Nova Scotia Agricultural College

**James W. Richardson**
Professor
Texas Agricultural Experiment Station
Department of Agricultural Economics
Agricultural and Food Policy Center
Texas A&M University

**Lonnie L. Jones**
Professor
Texas Agricultural Experiment Station
Department of Agricultural Economics
Agricultural and Food Policy Center
Texas A&M University

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## Introduction

The 1985 farm bill went on record as the most debated farm bill ever passed. Despite extensive analyses and debates related to this legislation, virtually no analyses were completed as to its likely impacts on agriculturally dependent rural communities. Now, less than 2 years after enactment of the 1985 farm bill, considerable controversy surrounds its impacts on agriculture and rural America. This controversy has developed because of the following situations:

- Economic conditions in agriculture have not materially improved. Financial stress is not only apparent in agriculture, but rural communities are also suffering (USDA, 1987b).
- With the exception of the cotton and rice industries which have a marketing loan in place, commodity stocks remain high and continue to put downward pressure on farm prices.
- Surplus conditions are not unique to the United States; commodities are being dumped by other countries on the world market at prices often below the cost of production.
- U.S. farm programs have become extremely costly to the federal government--more than $20 billion annually in 1985 and 1986.

Because of persistent problems in the farm sector, several alternative farm programs have been proposed. Extensive analyses of these alternative policies have been completed at the macro and firm level (FAPRI; Knutson, et al. 1987b; Kletke and Ray). No studies, however, have evaluated the proposed farm policy impacts on the economic activity of rural communities. This omission has occurred in spite of the fact that in 1985, approximately 29 percent of the jobs in nonmetropolitan counties were agriculturally related. Furthermore, roughly 700 of the 2,443 rural counties in the U.S. depend on farming for at least 20 percent of their income and employment (Green and Carlin).

As policy-makers at the state and national level seek solutions to income and employment problems in rural America, the importance of understanding more about the direct and indirect effects of farm policy adjustments on rural communities is increased. The objectives of this publication are to briefly describe a model for evaluating the impacts of alternative farm policies on rural economies and to demonstrate use of the model by evaluating the impacts of alternative farm policies on a rural region of Texas.

## Review of Literature

Few studies, empirical or otherwise, have examined the impacts of farm program changes on rural communities. There are two bodies of literature, however, which are relevant to this topic. The first addresses the relationship between farm size and rural community welfare. The second relates farm policy to farm size and structure.

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Many of the studies on agriculture and rural communities have focused on the relationship between the farm structure in a selected area and the welfare and quality of life in the associated community. Research of this nature has been inspired by the classic study by Goldschmidt of the California farming communities Arvin and Dinuba, which indicated an inverse relationship between farm size and community well-being.

Hayes and Olmstead; Harris and Gilbert; Swanson and Skees; and U.S. Congress, Office of Technology Assessment have all examined the Goldschmidt hypothesis in other regions. These studies generally conclude that the relationship between farm size and community well-being is not as direct as Goldschmidt originally indicated. Shaffer, et al. and Bealieau and Mulkey have focused their attention on the ways rural communities may influence farm structure, and they provide a conceptual framework for explaining the linkage. Heady and Sonka, using linear programming and input-output methods, indicated that a farm structure in 1974 consisting of small farms would lead to greater income generation in rural communities; however, the incomes of families operating the small farms would be at poverty levels. Michaels and Marousek used input-output methods to estimate the impacts of different farm structures on a rural economy in Idaho. They indicated that replacing small farms with large farms increased regional income while a farm structure of small farms led to greater regional employment. They further concluded that regional agricultural output remained constant as farm structure varied.

Henry, et al. used national data and input-output methods to estimate the change in nonfarm output necessary to support a new size distribution of farms in the United States. The study indicated, for a given level of crop agricultural output, total nonfarm output would be greater under a scenario of medium-sized farms than large farms.

Nuckton, et al. have reviewed both the rural sociology and agricultural economics literature and, in general, concluded that small-scale farming could nurture thriving, vital, rural communities. Sumner (1985b, p. 7) disagreed with this opinion, claiming farm size changes have little to do with rural poverty or problems in rural communities because rural populations are largely nonfarm populations in most regions of the United States.

The relationship between farm policy and the structure of agriculture is the second body of literature which is relevant to this publication. In a review of the literature, Knutson, et al. (1987a) indicated that agricultural economists disagree about the effects of farm policy on the structure of agriculture. Sumner (1985a) reported that despite an abundance of rhetoric, very little research in either applied economic theory or empirical analysis has established any consistent link between farm programs and the structural characteristics of American agriculture.

Numerous firm-level analyses are available which show the linkage between farm policy and the survival and success of different sized crop farms in specific regions (Richardson and Smith 1985a and 1985b; Smith; Smith, et al.; and U.S. Congress, Office of Technology Assessment). These studies show that as farm program benefits are reduced, mid-sized farms are more likely to exit farming than either larger or smaller farms. This research, however, is at the firm level and does not provide a formal link between farm policy and the nonfarm economy and rural communities.

In summary, a minimal amount of empirical research explores the effects of agricultural and macroeconomic policy on the economic activity of rural areas. Empirical research to quantify this relationship would be particularly important to policy-makers when agricultural and macroeconomic policies are being formulated, implemented, and modified. The following section of this publication outlines a model which provides a formal link between farm policy and economic activity in a rural community.

## Model Description

The Rural Agricultural Policy Simulation Model (RAPSIM) is a multi-year model combining linear programming (LP) and input-output (IO) methods for analyzing the impacts of alternative farm policies on the economic activity and employment of an agriculturally dependent rural economy. The model's objective is to maximize annual returns above variable costs in the crop sector subject to structural, policy, and IO balance equation constraints. Output from the model is used to identify employment differences resulting from farm policy changes.

### *Study Area*

An agriculturally dependent county in the Texas Southern High Plains was selected for evaluation with RAPSIM (Figure 1). Terry County is located about 30 miles east of the Texas-New Mexico border; and Brownfield, its county seat, is located 40 miles southwest of Lubbock, Texas. The county spans approximately 574,720 acres and had a population of 15,100 in 1982.

The growth and development of Terry County have been based primarily on agriculture and mining (oil and natural gas). Total employment in 1982 was 7,398, while personal income was $142 million (U.S. Department of Commerce 1984a). Agricultural production figures for 1984 indicate that farmers in Terry County produced 151,800 bales of cotton, 1,256,600 bushels of sorghum, and 487,000 bushels of wheat on 355,000 harvested acres (*Texas Field Crop Statistics*). Total agricultural income in 1984 was $50.885 million (*Texas County Statistics*).

In 1982, the total number of farms in Terry County was 532 (U.S. Department of Commerce 1984b). Of these, 41 percent had less than $40,000 in gross sales, 34 percent had between $40,000 and $99,999, 20 percent had between $100,000 and $249,999, and 5 percent had sales exceeding $250,000. In terms of acres, 36 percent of the farms farmed fewer than 500 acres, 28 percent farmed between 500 and 999 acres, 26 percent farmed between 1,000 and 1,999 acres, and 10 percent farmed more than 2,000 acres. However, only 7 percent of the land was in farms of less than 500 acres, with 22 percent in 500- to 999-acre farms, 37 percent in 1,000- to 1,999-acre farms, and 34 percent in farms with more than 2,000 acres.

The importance of agriculture to the county economy is indicated by the fact that 27 percent of the employed population was directly involved in agriculture, 20 percent was either on-farm proprietors or laborers, and the remaining 7 percent was employed in agricultural services. This compares to a state-wide average of less than 5 percent employed in agriculture (U.S. Department of Commerce 1984a).

### *LP-IO Model*

Input-output models are general equilibrium models based on an accounting of the backward and forward linkages among the sectors in an economy. A given sector uses inputs provided by backward linkages to produce output which may be forwardly linked to final demand or serve as an input for another sector's productive process. In agricultural economics research, these models are often used to examine the economic interdependencies among the agricultural sectors and the nonagricultural sectors of an economy at regional as well as national levels (Heady and Sonka; Henry, et al.; Johnson and Kulshreshtha; Michaels and Marousek; and Stoeker, et al.).

Transactions within an economy during a fixed period of time serve as the basis for IO models. The economy is partitioned into endogenous and exogenous sectors. In a closed model (with respect to households), the endogenous sector comprises the processing or production sectors (e.g., manufacturing, agriculture, services, wages, and households). The payments

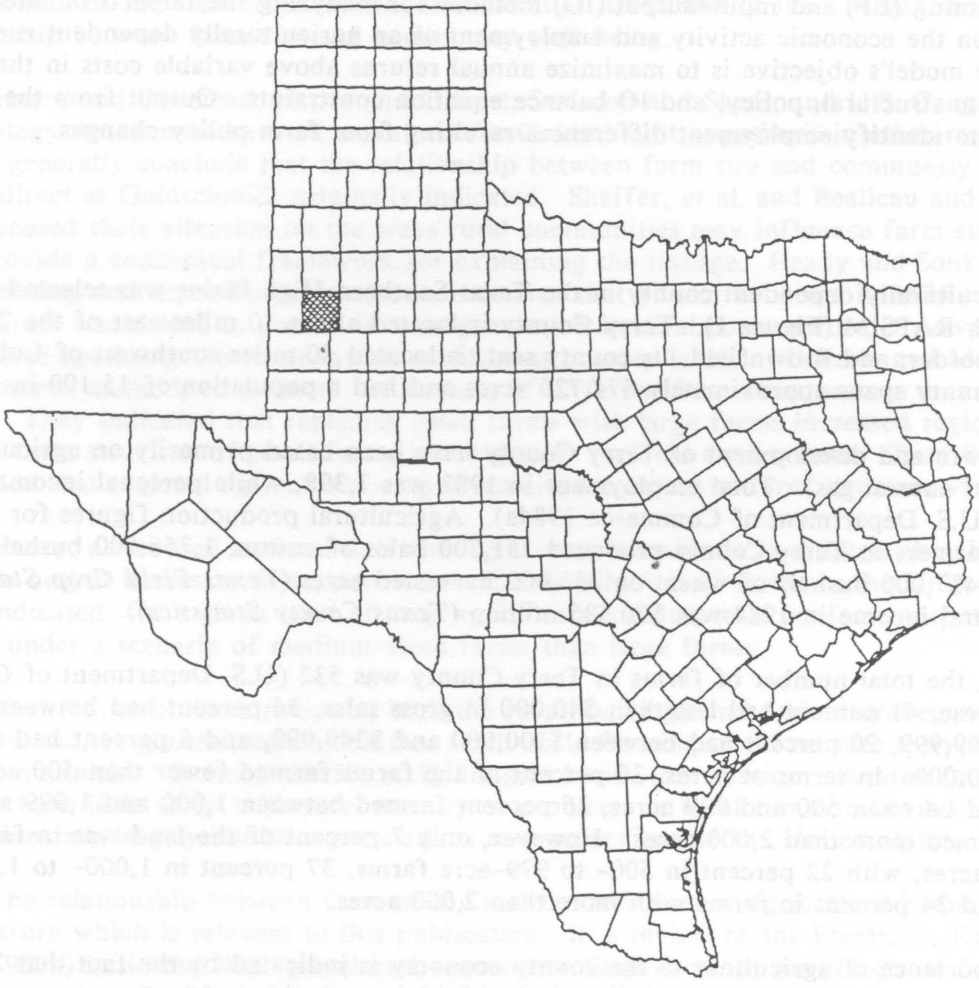

**Figure 1. Terry County, Texas.**

sector and the final demand sector make up the exogenous sectors of the economy. The payments sector includes value added items, such as payment to government services (taxes), capital (interest), land (rental payments), imports, and profits. The final demand sector consists of purchases for private investments, government purchases, and exports. As the model is in equilibrium, total outlays and total output are equal for each endogenous sector (Miller and Blair, pp. 7-9). Because wages and household final demand are endogenized, RAPSIM is a closed model with respect to households and thus a change in the amount of labor needed for production will lead to a change in expenditures by households for consumption.

Input-output models may be incorporated into a linear programming framework (Everett and McCarl; Foster, p. 16; Fulton, p. 45; Richardson, pp. 195-211). LP can be used to find an optimum set of activities consistent with the weights in the objective function. LP allocates activities among sectors to achieve the desired objective while meeting relevant constraints to production in various sectors. The interindustry linkages in the economy typified by the IO technical coefficients matrix and the region's external trade pattern represented by final demand can be incorporated into the LP model by including the basic balance equations from the IO model as constraints (Henry and Bowen).

***Terry County Model Estimation***

To account for the interindustry relationships in Terry County, a closed input-output model of the county was developed. Input-output models for regions as small as counties can be developed using survey methods or nonsurvey techniques. Survey-based IO models are generally considered to be more accurate than nonsurvey models (Schafer and Chu). However, survey-based models are extremely costly and time consuming (Miller and Blair, p. 266; Richardson, p. 85). Nonsurvey or partial survey methods, on the other hand, facilitate creation of regional IO models from existing IO models, supplemented with wage or employment data. Accepting possible compromises in accuracy, a nonsurvey procedure was used for RAPSIM. The method of simple location quotients (SLQ) was applied to an existing survey-based model of the Texas High Plains Region (Stoeker, et al.) to derive the RAPSIM model for Terry County.

Estimation of RAPSIM involved a number of steps. First the 94-sector High Plains IO was consolidated to 22 endogenous sectors (Table 1) based on available employment data for Terry County. Next, 1985 employment figures for Terry County were used in conjunction with 1977 output employment ratios for the region (Stoeker, et al., pp. 44, 56) to approximate nonagricultural sector output for the county in 1977 dollars. Agricultural sector outputs or control totals (including livestock) were estimated using production data for 1985 (*Texas County Statistics; Texas Field Crop Statistics; Texas Small Grains Statistics*) and 1977 price data (U.S. Department of Agriculture 1986). Prices for 1977 were used with 1985 employment and production levels to reflect the most recent levels of physical output at price levels consistent with the Stoeker, et al. model. The resulting basic technical coefficients matrix for Terry County and the details of model estimation are provided by Bowker.

The agricultural crop sectors in the model (irrigated and dryland cotton, irrigated and dryland wheat, and irrigated and dryland sorghum) were each disaggregated into four farm sizes. The disaggregation categories included small farms (0-499 acres), mid-sized farms (500-999 acres), large farms (1,000-1,999 acres), and very large farms (2,000+ acres) for each of the crops. Disaggregation for the IO component of RAPSIM was done by scaling the elements in each agricultural column of the technical coefficients matrix using Texas Agricultural Extension Service enterprise budgets and cost of production differences identified by Smith for different sized farms in the region. The household row for small farms was not scaled because it was

**Table 1. Sectors in RAPSIM for Terry County, Texas.**

| Sector |
|---|
| 1. Irrigated cotton |
| 2. Irrigated wheat |
| 3. Irrigated sorghum |
| 4. Dryland cotton |
| 5. Dryland wheat |
| 6. Dryland sorghum |
| 7. Livestock |
| 8. Agricultural services |
| 9. Mining |
| 10. Construction |
| 11. Manufactured nondurables |
| 12. Manufactured durables |
| 13. Transportation |
| 14. Communications |
| 15. Utilities |
| 16. Wholesale trade |
| 17. Farm machinery and building supplies |
| 18. Retail trade |
| 19. Banking and credit |
| 20. Insurance and real estate |
| 21. Services |
| 22. Households |

assumed labor on this size farm was operator supplied.[1]

The disaggregated 1977 technical coefficients matrix was updated to 1985 conditions by adjusting for relative price changes in the endogenous sectors between 1977 and 1985, using a procedure outlined by Henry. Because of the significant differences in agricultural prices for the policy alternatives throughout the simulation period, the technical coefficients matrix was updated each year of the planning horizon for changes in relative prices. Indices of agricultural relative prices under each scenario (1986 to 1990) were created based on the expected market price or the target price for each crop. All nonagricultural relative prices were increased annually by the projected GNP deflator associated with the macroeconomic environment.

Interindustry constraints for the model were developed from the disaggregated and relative price adjusted technical coefficients matrices for Terry County. Technical coefficients for each of the agricultural sectors were further adjusted to change agricultural purchases from a per dollar of output basis to a per acre basis. RAPSIM contains 29 resource constraints that are used to establish a realistic starting point for the model regarding: (a) total farmland and base acreages (Lippke, et al.), (b) acres by farm size (U.S. Department of Commerce 1984b), (c) irrigated land (*Texas County Statistics*; U.S. Department of Commerce 1984b), and (d) conservation reserve acreage (U.S. Department of Agriculture 1987a). Maximum and minimum constraints for acreages, based on historical variability, were included as appropriate to allow flexibility in the model. Land constraints (except for maximum irrigated acreage and aggregate farm program base acreages) were relaxed by 1 percent annually during the 5-year simulation period to permit farm growth and gradual changes in farm structure.

In summary, the RAPSIM model developed for Terry County contains 28 crop activities. Represented, on an acre basis, are each of the six major crops and four farm sizes for each. Also included in the crop sector are Conservation Reserve Program (CRP) activities for each of the farm sizes. The noncrop sector includes, on a dollar output basis, 16 processing sectors. In addition, slack activities are included in the model to capture agricultural output on a per dollar basis. Slack activities are not necessary for the crop sectors because the model is designed so these sectors produce only enough to support intermediate demand stimulated by agricultural production.

Objective function values in RAPSIM are zero for all but the crop activities. The portion of the objective function corresponding to the crop sectors contains estimated net returns per acre for each of the 28 crop activities in the model.

Employment levels in regional IO studies are often calculated using established output-employment (OE) ratios and estimates of sectorial output (Casey, p. 88; Kao, p. 27). This procedure is used for the RAPSIM model. For the noncrop sector, OE ratios were estimated using output and employment tables derived from the High Plains IO model (Stoeker, et al., pp. 44-56). Crop sector OE ratios were developed by modifying crop sector output and employment figures from Stoeker, et al. to more closely represent Terry County employment (U.S. Department of Commerce, 1984a). Further discussion of the procedure used to modify the employment figures is provided by Bowker.

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[1] Column totals for each new agricultural sector were compared to the original and adjusted in the household row to reflect efficiency differences. For example, the column total of technical coefficients for the large irrigated cotton farm sector is less than the original irrigated cotton farm sector by a factor of 0.87. Hence, the technical coefficient for the household row in the large irrigated cotton farm sector is increased by the difference to reflect an increase in profit. Implicit in this process is the assumption that external payments are constant across farm sizes.

## Policies Analyzed

Six farm policies were analyzed throughout the 1987-90 planning horizon with RAPSIM. The specific farm policy scenarios to be analyzed include:

- Baseline: continuation of the 1985 farm bill and the current macroeconomic policy;
- Alternative 1: continuation of the 1985 farm bill with a reduced federal budget deficit and rate of growth in the money supply;
- Alternative 2: continuation of the 1985 farm bill and current macroeconomic policy but with an altered agricultural structure;
- Alternative 3: continuation of the 1985 farm bill under a maximum 25 percent participation rate for the county in the CRP from 1987-90;
- Alternative 4: continuation of the 1985 farm bill with target prices reduced by 25 percent in years 1988-90; and
- Alternative 5: continuation of the 1985 farm bill through 1987 followed by the implementation of the Harkin bill in 1988.

Baseline policy is a continuation of the 1985 farm bill which is characterized by declining target prices and loan rates through 1990, and maximum acreage set-aside requirements (Table 2). This current farm program is analyzed under two macroeconomic policies (high deficit--Baseline, and low deficit--Alternative 1). A major structural change in the size of farms in the county was examined under the current farm program (Alternative 3). Alternative 3 is a continuation of the current farm program but with producers in the county enrolling 25 percent instead of 10 percent of their crop acreage in the CRP. The fourth alternative policy is a 25 percent reduction in the target prices of wheat, cotton, corn, and sorghum for 1988-90 (Table 2). All other farm policy variables in the 1985 farm bill are held constant at their base values. The final alternative policy is implementation of the Harkin bill for 1988-90. The bill will support domestic wheat, cotton, feedgrain, and soybean prices at 70 percent of parity in 1988 and at progressively higher prices through 1990 (Table 2). The Baseline, along with Alternatives 1, 3, 4, and 5 were believed to be the most probable policy scenarios at the time the study was initiated. Alternative 2 was included to contribute to the debate concerning farm structure.

Impacts of the base policy, lower target prices, and the Harkin bill on the production, prices, and consumption of cotton, wheat, and sorghum were estimated at the national level by Knutson, et al. (1987b). Their estimates of annual farm policy variables and crop prices are used in a RAPSIM support model to estimate the 1986-90 returns above variable costs for each crop, by farm size, for the objective function in RAPSIM. Acreage constraints in RAPSIM are adjusted each year to reflect the acreage set-aside requirements for the particular farm policy being simulated.

All but one of the policies outlined above were simulated assuming a continuation of the current macroeconomic environment. This macro policy (Alternative 1) is characterized by high federal budget deficits ($200 billion per year) and rapid growth in the money supply (8 percent per year). Knutson, et al. (1987b) project that under this macroeconomic policy, the annual inflation rate gradually climbs to 7 percent by 1990, real interest rates climb to 8 percent, and farm asset values and real net farm income continue to decline through 1990.

**Table 2. Policy Variables for Continuation of the 1985 Farm Bill, a 25 Percent Reduction in Target Prices, and the Harkin Bill.**

| | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|
| Continuation of 1985 Farm Bill | | | | | |
| Loan Rates | | | | | |
| Cotton ($/lb) | 0.55 | 0.525 | 0.50 | 0.50 | 0.50 |
| Wheat ($/bu) | 2.40 | 2.28 | 2.17 | 2.06 | 1.95 |
| Sorghum ($/bu) | 1.82 | 1.74 | 1.65 | 1.56 | 1.48 |
| Target Prices | | | | | |
| Cotton ($/lb) | 0.81 | 0.794 | 0.77 | 0.745 | 0.729 |
| Wheat ($/bu) | 4.38 | 4.38 | 4.29 | 4.16 | 4.00 |
| Sorghum (S/bu) | 2.88 | 2.88 | 2.82 | 2.74 | 2.16 |
| Set-Aside Levels | | | | | |
| Cotton (fraction) | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Wheat (fraction) | 0.27 | 0.275 | 0.30 | 0.30 | 0.30 |
| Sorghum (fraction) | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Lower Target Prices[1] | | | | | |
| Target Prices | | | | | |
| Cotton ($/lb) | 0.81 | 0.794 | 0.578 | 0.559 | 0.547 |
| Wheat ($/bu) | 4.38 | 4.38 | 3.22 | 3.12 | 3.00 |
| Sorghum ($/bu) | 2.88 | 2.88 | 2.12 | 2.05 | 1.96 |
| Harkin Bill[2] | | | | | |
| Loan Rates | | | | | |
| Cotton ($/lb) | 0.55 | 0.525 | 0.907 | 0.971 | 1.053 |
| Wheat ($/bu) | 2.40 | 2.28 | 4.95 | 5.30 | 5.74 |
| Sorghum ($/bu) | 1.82 | 1.74 | 3.43 | 3.67 | 3.98 |
| Set-Aside Levels | | | | | |
| Cotton (fraction) | 0.25 | 0.25 | 0.282 | 0.318 | 0.284 |
| Wheat (fraction) | 0.27 | 0.275 | 0.33 | 0.33 | 0.33 |
| Sorghum (fraction) | 0.20 | 0.20 | 0.33 | 0.33 | 0.33 |

[1]Loan rates and set-aside value for continuation of the 1985 farm bill were used for the reduced target price scenario.

[2]The Harkin bill does not provide for target prices.

The base farm policy was also analyzed under an alternative macroeconomic policy of lower federal budget deficits (Alternative 1). This alternative macroeconomic scenario includes a reduction in the rate of increase in federal spending to no more than the rate of inflation (2 percent per year) and a slow down in the rate of growth in the money supply (3.75 percent per year). The impacts of this macroeconomic policy at the aggregate level were estimated by Knutson, et al. (1987b).

## Results

Results of analyzing the alternative farm policies using the RAPSIM model for Terry County, Texas are presented in terms of the nominal net returns and output for each of the crop sectors. In addition, the noncrop sector's output, which is an estimate of the secondary output determined by the level of crop sector activity, is reported. County employment levels under the current farm bill and changes in employment for the alternative policies are compared. Results for only 1988-90 are reported for the non-Baseline scenarios because this time frame is usually when these policies are effective. Results for 1986 and 1987 are available elsewhere for these alternative scenarios (Bowker).

### *1985 Farm Bill and Current Macroeconomic Policy*

The results in nominal dollars for the Baseline continuation of the 1985 farm bill and high federal budget deficits are summarized in Table 3. Net returns to the crop sector in Terry County diminish steadily from $25.3 million (in 1986) to $14.3 million (in 1990) during the course of the 1985 farm bill. This is due to a gradual reduction of government price and income supports, particularly the target price which decreases 10 percent from 1986 to 1990. In addition, input prices are projected to rise annually at a rate assumed equal to the GNP deflator. The estimated drop in net returns from 1986 to 1990 is about 43 percent in nominal dollars and 54 percent in constant 1986 dollars. Estimated gross output by the crop sector drops about 7 percent in nominal terms, from $73.7 million in 1986 to $68.4 million in 1990 (Table 3). These output figures include all government payments to producers (e.g., deficiency, marketing loan, Findley, and CRP).[2]

Output for the noncrop sector measures the secondary effects of agricultural production. Total nominal output from the nonagricultural sector in support of agricultural production averages $70.6 million during the 5-year period (Table 3). The general trend for total noncrop sector output follows that of the crop sector. This trend occurs despite the fact that prices in the noncrop sector are assumed to directly follow the upward trend of the GNP deflator. The drop in noncrop output is primarily due to decreased output from the household sector, and to a lesser extent, land entering the CRP.

The largest noncrop sector influenced by changes in crop production and income is the household sector. In RAPSIM, the household sector is endogenous and captures wages and profits resulting from all sectors and consequent secondary effects. Throughout the course of the 1985

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[2] Estimated output levels appear reasonable given that 1981-85 agricultural output for the country ranged from $51 million to $89 million. In 1986, less than 0.5 percent of the county acreage was enrolled in the CRP; however, in 1987, approximately 10 percent of the acreage was enrolled in the CRP (U.S. Department of Agriculture 1987a). From 1987 to 1990, gross output resulting from CRP participation declines from $2.7 million to $1.9 million due to the cover crop establishment subsidies received in 1987 and 1988.

**Table 3. Terry County Texas Crop Sector and Supporting Noncrop Sector Output Under the 1985 Farm Bill and a High Federal Budget Deficit (Nominal Dollars), 1986-1990.**

| | 1986 | 1987 | 1988 | 1989 | 1990 | Average 1986-90 | Average 1988-90 |
|---|---|---|---|---|---|---|---|
| Crop Sector ($1,000) | | | | | | | |
| Irrigated cotton | 37,954 | 37,256 | 37,628 | 34,594 | 34,116 | 36,309 | 35,446 |
| Irrigated wheat | 895 | 867 | 852 | 834 | 813 | 852 | 833 |
| Irrigated sorghum | 773 | 794 | 845 | 865 | 831 | 822 | 847 |
| Dryland cotton | 28,763 | 28,152 | 28,587 | 28,672 | 28,356 | 28,506 | 28,538 |
| Dryland wheat | 1,087 | 1,079 | 1,142 | 1,160 | 1,146 | 1,123 | 1,149 |
| Dryland sorghum | 4,272 | 1,788 | 1,891 | 1,917 | 1,201 | 2,214 | 1,669 |
| Conservation Reserve | 0 | 2,750 | 2,232 | 1,934 | 1,934 | 1,770 | 2,034 |
| Total return | 73,746 | 72,690 | 73,180 | 69,979 | 68,400 | 71,599 | 70,520 |
| Net return | 25,343 | 24,530 | 23,506 | 18,831 | 14,330 | 21,308 | 18,889 |
| Noncrop Sector ($1,000) | | | | | | | |
| Livestock | 143 | 141 | 148 | 146 | 147 | 145 | 147 |
| Agricultural services | 7,506 | 7,685 | 8,319 | 8,639 | 9,231 | 8,276 | 8,730 |
| Mining | 1,453 | 1,441 | 1,511 | 1,504 | 1,527 | 1,487 | 1,514 |
| Construction | 21 | 21 | 32 | 36 | 38 | 30 | 35 |
| Manufactured nondurables | 3,261 | 3,221 | 3,383 | 3,384 | 3,435 | 3,337 | 3,401 |
| Manufactured durables | 200 | 198 | 203 | 203 | 208 | 203 | 205 |
| Transportation | 453 | 448 | 460 | 448 | 444 | 451 | 451 |
| Communications | 1,308 | 1,307 | 1,352 | 1,330 | 1,364 | 1,332 | 1,349 |
| Utilities | 801 | 804 | 838 | 823 | 837 | 821 | 833 |
| Wholesale trade | 1,460 | 1,421 | 1,461 | 1,439 | 1,439 | 1,444 | 1,446 |
| Farm machinery and building supplies | 424 | 428 | 446 | 443 | 463 | 441 | 450 |
| Retail trade | 3,978 | 3,911 | 3,961 | 3,788 | 3,682 | 3,864 | 3,810 |
| Banking and credit | 2,285 | 2,243 | 2,411 | 2,488 | 2,577 | 2,401 | 2,492 |
| Insurance and real estate | 626 | 632 | 667 | 667 | 683 | 655 | 672 |
| Services | 2,157 | 2,118 | 2,165 | 2,102 | 2,083 | 2,125 | 2,116 |
| Households | 45,484 | 44,633 | 44,930 | 42,433 | 40,620 | 43,620 | 42,661 |
| Total | 71,568 | 70,658 | 72,293 | 69,880 | 68,786 | 70,637 | 70,319 |

farm bill, household sector output falls 10.7 percent from $45.5 million to $40.6 million under the 1985 farm bill (Table 3). This $5 million decline is primarily due to decreased net returns in the crop sector and thus lower retained earnings for farm families. The retail sector depends heavily on the household sector, which explains the 7 percent decrease in retail sales.

Agricultural services experience a 23 percent increase in nominal output from 1986 to 1990; however, in terms of 1986 dollars, the sector shows no growth. The manufactured nondurables sector also shows a nominal increase in output during the course of the 1985 farm bill; however, this increase depends on the nominal price increases assumed in the study. A similar situation occurs in the banking and credit sector.

In summary, continuation of the current farm bill and high federal budget deficits through 1990 leads to nominal decreases in economic activity for most sectors in Terry County. Total crop sector output declines about 7 percent and total noncrop output declines about 4 percent. Households experience a 10.7 percent decline in income due primarily to the 43 percent decrease in agricultural net returns.

### *1985 Farm Bill and Reduced Deficits*

Results for continuing the 1985 farm bill, assuming a macroeconomic environment with a lower rate of growth in the money supply and a tighter fiscal policy, are summarized in Table 4. Essential farm program parameters are identical to the Baseline. However, market prices are slightly higher and the GNP deflator is somewhat lower than for the Baseline (Knutson, et al., 1987b). Terry County output under the reduced budget deficit scenario is nearly identical to the Baseline (Table 4). Total crop sector output averages about 1 percent more annually than under Baseline for the last 3 years of the planning horizon. This is due primarily to the slight increase projected in market prices for agricultural commodities.

The largest difference between the reduced budget deficit scenario and the Baseline is in crop sector net returns. During the final 3 years of the period simulated, the average annual difference is 9.4 percent (Table 4). The primary reason for the increase in net returns is the slower rate of increase in production costs (inflation). Nevertheless, net returns fall 34 percent nominally over the 1986 to 1990 period in this scenario.

In the noncrop sector, the assumed slower rate of increase in the price of noncrop sector goods translates to slightly lower nominal output for sectors supplying primary inputs to the crop sector. However, with higher net returns to the crop sector, household output is greater (1.48 percent), and consequently, sectors dependent on household spending, such as retail and services, exhibit slightly increased output--1.0 and 0.5 percent, respectively (Table 4).

Overall, total output in response to crop production by the noncrop sector annually averages about 0.5 percent higher than the Baseline from 1986 to 1990. The low deficit macroeconomic environment appears to benefit the crop sector more than most noncrop sectors, at least in this partial equilibrium framework.

### *1985 Farm Bill and Structural Change*

Alternative 2 demonstrates the impacts on the county's economy of a farm structure dominated by mid-sized farms. This alternative proceeds under the same farm policy and macroeconomic assumptions as the Baseline. The primary exception is that land in farms of greater than 2,000 acres is assumed to be displaced by farms of 500 to 1,000 acres in the

**Table 4. Comparison of the Economic Impacts on Terry County, Texas, of a Continuation of the 1985 Farm Bill with a High Federal Budget Deficit vs. a Continuation of the 1985 Farm Bill with Lower Federal Budget Deficits, 1988-90.**

| | 1985 Farm Bill with High Federal Budget Deficits | 1985 Farm Bill with Lower Federal Budget Deficits | |
|---|---|---|---|
| | | 3-Year Average | Change From Base |
| | ($1,000) | ($1,000) | (%) |
| Crop Sector | | | |
| Irrigated cotton | 35,446 | 35,643 | 0.556 |
| Irrigated wheat | 833 | 832 | -0.164 |
| Irrigated sorghum | 847 | 852 | 0.609 |
| Dryland cotton | 28,538 | 28,959 | 1.474 |
| Dryland wheat | 1,149 | 1,148 | -0.103 |
| Dryland sorghum | 1,669 | 1,684 | 0.902 |
| Conservation Reserve | 2,034 | 2,033 | -0.014 |
| Total | 70,520 | 71,155 | 0.901 |
| Net Return | 18,889 | 20,668 | 9.415 |
| Noncrop Sector | | | |
| Livestock | 147 | 147 | 0.125 |
| Agricultural services | 8,730 | 8,637 | -1.060 |
| Mining | 1,514 | 1,513 | 0.078 |
| Construction | 35 | 35 | -1.263 |
| Manufactured nondurables | 3,401 | 3,397 | -0.103 |
| Manufactured durables | 205 | 204 | -0.370 |
| Transportation | 451 | 453 | 0.605 |
| Communications | 1,349 | 1,343 | -0.441 |
| Utilities | 833 | 833 | -0.022 |
| Wholesale trade | 1,446 | 1,449 | 0.224 |
| Farm machinery and building supplies | 450 | 446 | -0.880 |
| Retail trade | 3,810 | 3,851 | 1.087 |
| Banking and credit | 2,492 | 2,475 | -0.700 |
| Insurance and real estate | 672 | 671 | -0.121 |
| Services | 2,116 | 2,128 | 0.532 |
| Households | 42,661 | 43,292 | 1.478 |
| Total | 70,319 | 70,882 | 0.800 |

county. As a result, acreage in mid-sized farms is increased by about 170,000 acres to a total of approximately 280,000 acres (or 56 percent) of the county's farmland.

Total output in the crop sector under Alternative 2 is not very different from the Baseline (Table 5). Output from 1988 to 1990 averages about 2.3 percent less under Alternative 2 than the Baseline. Most of the difference comes from decreases in irrigated cotton and dryland sorghum output. During the period from 1988 to 1990, output from the irrigated cotton sector averages 5 percent less than for the Baseline, and dryland sorghum output averages 14.3 percent less.

The most important result in the crop sector pertains to net returns. Throughout the 1988 to 1990 period, net returns are 58.1 percent lower than the Baseline (Table 5). This result is not surprising given the differences in efficiency for different sized farms in the study area. Smith documented large efficiency differences in the Southern High Plains region for the various farm sizes used in the Baseline.

In the noncrop economy, results indicate a general increase in economic activity for most sectors. This is particularly true for agricultural services (16.3 percent), manufactured nondurables (4.6 percent), and banking and credit (10.8 percent). However, when the effects of the household sector are considered, the implications are different. The decrease in profits in the crop sector due to the inefficiencies of production on mid-sized farms versus very large farms leads to a sharp decline in household sector output (-6.5 percent). The decline in household output translates to a decline in retail trade (-3.4 percent). Overall, the decline in the household and retail sector outputs is enough to offset increases in output experienced by other noncrop sectors. The total noncrop output generated to support crop production throughout the 1988 to 1990 period averages 1.16 percent less than in the Baseline (Table 5).

*1985 Farm Bill and Maximum CRP*

Continuing the 1985 farm bill and current macroeconomic policy with CRP participation set at its maximum (25 percent) provides an estimate of the maximum effect the CRP can have on the county. Under the Baseline and other scenarios, CRP participation is held constant at the 1987 enrollment levels of 10 percent.

The differences between the maximum CRP scenario and the Baseline are summarized in Table 6. Annual total returns to the crop sector under the maximum CRP scenario average 3.3 percent less than the Baseline from 1988 to 1990 (Table 6). This reduction occurs because an additional 15 percent of the county's acreage is enrolled in the CRP. When set-aside acres are considered, however, this scenario represents only about 12 percent less acreage in crop production than the Baseline.

Dryland wheat and sorghum are the primary crops affected by the increase in the CRP (Table 6). These crops have low gross and net returns per acre which are more than offset by CRP payments of $39 per acre. As a result, while 12 percent more acres are no longer in production, gross output in the crop sector is only reduced by about 3 percent.

Net returns in the crop sector are improved by 9.9 percent relative to the Baseline (Table 6). The difference between CRP maintenance costs and returns are greater than net returns in dryland wheat and sorghum. Moreover, the model indicated additional acreage entered into the CRP comes entirely from the small and mid-sized farms which are less efficient than the larger size farms.

Annual output for the entire noncrop sector averages about 1.4 percent annually less than

**Table 5. Comparison of the Economic Impacts on Terry County, Texas, of a Continuation of the 1985 Farm Bill vs. an Alternative Agricultural Structure, 1988-90.**

| | 1985 Farm Bill Average for 1988-90 | 1985 Farm Bill with an Alternative Agricultural Structure | |
|---|---|---|---|
| | | 3-Year Average | Change From Base |
| | ($1,000) | ($1,000) | (%) |
| Crop Sector | | | |
| Irrigated cotton | 35,446 | 33,969 | -5.014 |
| Irrigated wheat | 833 | 833 | -0.020 |
| Irrigated sorghum | 847 | 850 | 0.368 |
| Dryland cotton | 28,538 | 28,918 | 1.332 |
| Dryland wheat | 1,149 | 1,148 | -0.083 |
| Dryland sorghum | 1,669 | 1,430 | -14.341 |
| Conservation Reserve | 2,034 | 2,034 | 0.000 |
| Total | 70,520 | 68,885 | -2.318 |
| Net return | 18,889 | 7,912 | -58.113 |
| Noncrop Sector | | | |
| Livestock | 147 | 152 | 2.991 |
| Agricultural services | 8,730 | 10,156 | 16.336 |
| Mining | 1,514 | 1,573 | 3.908 |
| Construction | 35 | 38 | 8.548 |
| Manufactured nondurables | 3,401 | 3,557 | 4.591 |
| Manufactured durables | 205 | 220 | 7.342 |
| Transportation | 451 | 451 | 0.123 |
| Communications | 1,349 | 1,387 | 2.789 |
| Utilities | 833 | 849 | 1.972 |
| Wholesale trade | 1,446 | 1,482 | 2.501 |
| Farm machinery and building supplies | 450 | 476 | 5.774 |
| Retail trade | 3,810 | 3,680 | -3.408 |
| Banking and credit | 2,492 | 2,762 | 10.841 |
| Insurance and real estate | 672 | 712 | 5.881 |
| Services | 2,116 | 2,110 | -0.301 |
| Households | 42,661 | 39,891 | -6.494 |
| Total | 70,319 | 69,504 | -1.160 |

**Table 6. Comparison of the Economic Impacts on Terry County, Texas, of a Continuation of the 1985 Farm Bill vs. Maximum Participation in the Conservation Reserve Program, 1988-90**

| | 1985 Farm Bill Average for 1988-90 | 1985 Farm Bill with Maximum Participation in the Conservation Reserve Program | |
|---|---|---|---|
| | | 3-Year Average | Change From Base |
| | ($1,000) | ($1,000) | (%) |
| Crop Sector | | | |
| Irrigated cotton | 35,446 | 34,778 | -1.884 |
| Irrigated wheat | 833 | 833 | 0.017 |
| Irrigated sorghum | 847 | 848 | 0.114 |
| Dryland cotton | 28,538 | 26,640 | -6.653 |
| Dryland wheat | 1,149 | 0 | -100.000 |
| Dryland sorghum | 1,669 | 0 | -100.000 |
| Conservation Reserve | 2,034 | 5,087 | 150.121 |
| Total | 70,520 | 68,188 | -3.307 |
| Net return | 18,889 | 20,754 | 9.875 |
| Noncrop Sector | | | |
| Livestock | 147 | 143 | -2.908 |
| Agricultural services | 8,730 | 8,217 | -5.876 |
| Mining | 1,514 | 1,467 | -3.097 |
| Construction | 35 | 46 | 28.618 |
| Manufactured nondurables | 3,401 | 3,283 | -3.469 |
| Manufactured durables | 205 | 187 | -8.556 |
| Transportation | 451 | 441 | -2.063 |
| Communications | 1,349 | 1,277 | -5.358 |
| Utilities | 833 | 816 | -2.023 |
| Wholesale trade | 1,446 | 1,364 | -5.708 |
| Farm machinery and building supplies | 450 | 419 | -6.892 |
| Retail trade | 3,810 | 3,763 | -1.242 |
| Banking and credit | 2,492 | 2,351 | -5.657 |
| Insurance and real estate | 672 | 661 | -1.669 |
| Services | 2,116 | 2,044 | -3.444 |
| Households | 42,661 | 42,841 | 0.421 |
| Total | 70,319 | 69,325 | -1.414 |

the Baseline (Table 6). Sectors supplying primary inputs to the crop sector are affected most by the increase in CRP acreage. Maintenance for the CRP requires very few inputs. Agricultural services, manufactured durables, communications, wholesale, farm machinery and building supplies, and banking and credit experience at least 5 percent less annual output in response to crop production than in the Baseline (Table 6).

Two sectors affected positively by maximum CRP participation, relative to the Baseline, are households and construction. Profits resulting from increased net returns to the crop sector cause annual household returns to increase by 0.4 percent more than the Baseline. However, due to the lower returns in the CRP establishment years of 1987 and 1988, household output for the entire 5-year period is about 0.5 percent less than the Baseline.

Construction output in the maximum CRP scenario shows a sharp increase (28.6 percent) from the Baseline. This increase occurs because general repair and maintenance falls into this aggregation category and is a prominent CRP input. In spite of this large percentage increase in construction output, the dollar increase only amounts to about $9,000 annually.

In summary, the results indicate that increasing CRP acreage to 25 percent of cropland in the county would have positive effects on the crop sector from a net returns perspective, although total output would decrease slightly. For the noncrop sector, most nonhousehold sectors experience 2 to 8 percent less output than in the Baseline. Households appear to be slightly benefited. These results suggest that while output is affected negatively by moving an additional 15 percent of the crop acreage into the CRP, the decrease in output is considerably less than 15 percent for most sectors of the economy.

### *Lower Target Prices*

Reducing target prices 25 percent in 1988-90 for cotton, wheat, and sorghum results in a drastic decrease in crop sector output and net returns relative to the Baseline (Table 7). The physical volume of crop sector output is approximately the same as the Baseline; however, the value of output declined due to lower target prices (deficiency payments). During the 1988-90 period, average crop sector net returns fall 100.5 percent from the Baseline as total output falls 33.2 percent. Irrigated cotton output declines the most (56.6 percent), while dryland cotton experiences an 8.8 percent decrease in output as more producers shift from irrigated to dryland cotton.

Under the reduced target price policy, output from the noncrop sector declined relative to the 1985 farm bill. Households are the most adversely affected, with a 36.4 percent decline. The retail sector follows the household sector and experiences a 33.3 percent decline in output for 1988-90. Some important noncrop sectors (agricultural services, manufactured nondurables, and banking and credit) show smaller decreases in output compared to the Baseline (12.4 to 21.6) (Table 7). This result occurs because these sectors are less affected by decreased net returns than other sectors in the short run. In the long run, as production declines, the output from these sectors may be expected to decline more than in the short run.

### *Harkin Bill*

The final farm program alternative analyzed is the Harkin bill, which increases support prices to 70 percent of parity beginning in 1988 (Table 2). Implementation of the Harkin bill would provide an economic boost, at least in the 4 years analyzed, to the economy in Terry County (Table 8). Both the crop and noncrop sectors would experience large output increases compared to the Baseline.

**Table 7. Comparison of the Economic Impacts on Terry County, Texas, of a Continuation of the 1985 Farm Bill vs. a 25 Percent Reduction in Target Prices, 1988-90.**

| | 1985 Farm Bill Average for 1988-90 | 25 Percent Reduction in Target Prices | |
|---|---|---|---|
| | | 3-Year Average | Change From Base |
| | ($1,000) | ($1,000) | (%) |
| Crop Sector | | | |
| Irrigated cotton | 35,446 | 15,352 | -56.6 |
| Irrigated wheat | 833 | 1,116 | 33.9 |
| Irrigated sorghum | 847 | 664 | -21.6 |
| Dryland cotton | 28,538 | 26,006 | -8.8 |
| Dryland wheat | 1,149 | 693 | -39.6 |
| Dryland sorghum | 1,669 | 1,180 | -29.3 |
| Conservation Reserve | 2,034 | 2,034 | 0.0 |
| Total | 70,520 | 47,047 | -33.2 |
| Net return | 18,889 | -106 | -100.5 |
| Noncrop Sector | | | |
| Livestock | 147 | 112 | -23.8 |
| Agricultural services | 8,730 | 7,362 | -15.6 |
| Mining | 1,514 | 1,150 | -23.9 |
| Construction | 35 | 33 | -5.7 |
| Manufactured nondurables | 3,401 | 2,663 | -21.6 |
| Manufactured durables | 205 | 160 | -22.0 |
| Transportation | 451 | 319 | -29.1 |
| Communications | 1,349 | 909 | -32.5 |
| Utilities | 833 | 577 | -30.6 |
| Wholesale trade | 1,446 | 1,069 | -26.0 |
| Farm machinery and building supplies | 450 | 309 | -31.4 |
| Retail trade | 3,810 | 2,540 | -33.3 |
| Banking and credit | 2,492 | 2,181 | -12.4 |
| Insurance and real estate | 672 | 517 | -23.0 |
| Services | 2,116 | 1,465 | -30.7 |
| Households | 42,661 | 27,127 | -36.4 |
| Total | 70,319 | 48,502 | -31.0 |

**Table 8. Comparison of the Economic Impacts on Terry County, Texas, of a Continuation of the 1985 Farm Bill vs. the Harkin Bill, 1988-90.**

| | 1985 Farm Bill Average for 1988-90 | Harkin Bill | |
|---|---|---|---|
| | | 3-Year Average | Change from Base |
| | ($1,000) | ($1,000) | (%) |
| Crop Sector | | | |
| Irrigated cotton | 35,446 | 46,641 | 31.5 |
| Irrigated wheat | 833 | 2,118 | 154.1 |
| Irrigated sorghum | 847 | 1,623 | 91.5 |
| Dryland cotton | 28,538 | 30,851 | 8.1 |
| Dryland wheat | 1,149 | 1,037 | -9.7 |
| Dryland sorghum | 1,669 | 2,071 | 24.0 |
| Conservation Reserve | 2,034 | 2,034 | 0.0 |
| Total | 70,520 | 86,377 | 22.4 |
| Net return | 18,889 | 35,020 | 85.3 |
| Noncrop Sector | | | |
| Livestock | 147 | 167 | 13.7 |
| Agricultural services | 8,730 | 8,209 | -5.9 |
| Mining | 1,514 | 1,698 | 12.1 |
| Construction | 35 | 35 | -2.2 |
| Manufactured nondurables | 3,401 | 3,781 | 11.1 |
| Manufactured durables | 205 | 215 | 5.0 |
| Transportation | 451 | 513 | |
| Communications | 1,349 | 1,487 | 10.2 |
| Utilities | 833 | 958 | 14.9 |
| Wholesale trade | 1,446 | 1,640 | 13.3 |
| Farm machinery and building supplies | 450 | 472 | 4.7 |
| Retail trade | 3,810 | 4,692 | 23.1 |
| Banking and credit | 2,492 | 2,506 | 0.5 |
| Insurance and real estate | 672 | 738 | 9.7 |
| Services | 2,116 | 2,487 | 17.5 |
| Households | 42,661 | 54,663 | 28.1 |
| Total | 70,319 | 84,284 | 19.8 |

Total output for the crop sector averages 22.4 percent more than the Baseline (Table 8). This output increase occurs primarily because of the large increases in prices of agricultural commodities. The increase in set-aside acreage offsets some of the price increases and resulting yield response. The irrigated sectors show output increases between 31.5 and 154.1 percent. The dryland sectors show smaller output increases, and wheat actually shows a decrease in output versus the Baseline. These results indicate a trend toward increased irrigated acreage relative to dryland acreage as crop prices increase. This result agrees with Lee's finding for the larger High Plains region.

The noncrop sector does not show quite as much increase in output, relative to the Baseline, as the crop sector. In fact, agricultural services and construction show decreases in average annual output of 5.6 and 2.2 percent, respectively (Table 8). Other sectors servicing the crop sector such as manufactured nondurables and banking and credit show small increases in output relative to other crop-related sectors. These results occur primarily because most of the increase in agricultural output is directly related to commodity price increases. Input use by the crop sector remains relatively constant and may possibly drop because of increased set-aside acreage. The household and retail sectors show the most positive effects of the Harkin bill on the noncrop sector. Because of the increased net returns in agriculture and resulting profits to the household sector, households and retail trade indicate annual percentage output increases (28.1 and 23.1 percent, respectively) greater than the overall percentage output increase in the crop sector (22.4 percent).

***Employment Effects***

Sector outputs in response to the level of crop sector output are important indicators of the relative impacts of farm policy on Terry County economy. Employment effects of farm policy on an agriculturally dependent rural economy are also of particular interest to decision-makers.

Average annual crop sector employment for the Baseline in Terry County from 1988 to 1990 is estimated to be 1,202.5 (Table 9). This figure is consistent with data showing a decline in county agricultural employment from 1,497 in 1977 to 1,349 in 1984 (U.S. Department of Commerce, 1984a). The cotton sector accounts for 88 percent of the agricultural work force.

Employment in the noncrop sector resulting from output supporting crop production under the Baseline averages 431.6 jobs per year from 1988 to 1990 (Table 9). This represents about 10 percent of the total private noncrop employment in Terry County during 1984 (U.S. Department of Commerce, 1984a). The bulk of noncrop employment supporting crop production (85 percent) is in the agricultural services, retail trade, services, and banking and credit sectors.

Employment differences between the reduced federal budget deficits scenario and the Baseline are very minor (Table 9). An increase of 10.7 jobs is projected for the crop sector and 9.1 jobs for the noncrop sector. The total increase in jobs is only about 1.2 percent.

Significantly restructuring the crop production sector in Terry County is the only alternative in this study which has a major positive impact on employment in the county. Crop sector employment increases by 131.7 jobs relative to the Baseline, while noncrop employment increases by 24.8 jobs (Table 9). About 94 percent of the overall employment increase falls in the irrigated and dryland cotton sectors and the agricultural services sector.

Increases in crop sector employment result from increased labor requirements of 42 percent per acre on mid-sized versus very large farms (Smith, et al., p. 8). The increase in agricultural services employment (24.6 jobs) corresponds to increased output by that sector in

**Table 9. Average Annual Employment Supported by Terry County Crop Production from 1988 to 1990 Under Continuation of the 1985 Farm Bill, Includes Deviations in Employment from the Baseline for a 25 Percent Reduction in Target Prices and the Harkin Bill.**

| | Continuation of 1985 Farm Bill (Base) | Reduced Federal Budget Deficit (Alternative 1) | Structural Change in Agriculture (Alternative 2) | Maximum CRP Participation (Alternative 3) | 25 Percent Lower Target Prices (Alternative 4) | Harkin Bill (Alternative 5) |
|---|---|---|---|---|---|---|
| | (no.) | (Absolute Deviation from Base) | | | | |
| Crop Sector | | | | | | |
| Irrigated cotton | 590.57 | 3.28 | 49.49 | -11.13 | -254.12 | 3.43 |
| Irrigated wheat | 17.64 | -0.03 | 2.48 | 0.00 | 13.93 | 17.21 |
| Irrigated sorghum | 27.56 | 0.17 | 4.00 | 0.03 | 1.06 | 11.37 |
| Dryland cotton | 470.34 | 6.93 | 73.46 | -31.29 | 93.41 | -81.68 |
| Dryland wheat | 23.04 | -0.02 | 3.23 | -23.04 | -4.47 | -6.89 |
| Dryland sorghum | 42.14 | 0.38 | -0.95 | -42.14 | -2.64 | -3.58 |
| Conservation Reserve | 31.24 | -0.00 | 0.00 | 46.90 | 0.00 | 0.00 |
| Total | 1,202.52 | 10.71 | 131.71 | -60.67 | -152.83 | -60.14 |
| Noncrop Sector | | | | | | |
| Livestock | 0.90 | 0.02 | 0.03 | -0.03 | -0.21 | 0.12 |
| Agricultural services | 150.44 | 0.96 | 24.58 | -8.84 | -23.56 | -8.98 |
| Mining | 3.00 | 0.06 | 0.12 | -0.09 | -0.72 | 0.37 |
| Construction | 0.46 | 0.00 | 0.04 | 0.13 | -0.03 | -0.01 |
| Manufactured nondurables | 11.64 | 0.24 | 0.53 | -0.40 | -2.52 | 1.30 |
| Manufactured durables | 2.25 | 0.05 | 0.16 | -0.19 | -0.50 | 0.11 |
| Transportation | 4.20 | 0.11 | 0.01 | -0.09 | -1.23 | 0.75 |
| Communications | 15.51 | 0.27 | 0.43 | -0.83 | -5.06 | 1.59 |
| Utilities | 3.56 | 0.08 | 0.07 | -0.07 | -1.09 | 0.53 |
| Wholesale trade | 8.37 | 0.15 | 0.21 | -0.48 | -2.18 | 1.12 |
| Farm machinery and building supplies | 7.98 | 0.09 | 0.46 | -0.55 | -2.51 | 0.38 |
| Retail trade | 133.38 | 5.05 | -4.55 | -1.66 | -44.45 | 30.86 |
| Banking and credit | 22.50 | 0.31 | 2.44 | -1.27 | -2.81 | 0.13 |
| Insurance and real estate | 8.04 | 0.16 | 0.47 | -0.13 | -1.85 | 0.79 |
| Services | 59.35 | 1.57 | -0.18 | -2.04 | -18.28 | 10.39 |
| Total | 431.59 | 9.11 | 24.83 | -16.55 | -106.98 | 39.45 |

response to a relative increase in demand for agricultural services by more mid-sized farms than in the Baseline. The employment results for the altered farm structure scenario are somewhat contrary to the Goldschmidt hypothesis. Rather than stimulating jobs uniformly throughout the economy, these results indicate very little stimulation except in the cotton and agricultural services sectors.

Forcing producers to participate in the CRP at the maximum (25 percent) results in a decrease of 60.7 jobs in the crop sector and 16.6 in the noncrop sector, relative to the Baseline. Most of the decrease in crop sector employment results from dryland crop acreage entering the CRP. In this case, the increased participation in the CRP results in about 46 more jobs for that particular sector. In the noncrop sector, agricultural services account for 53 percent of the employment decline.

Reducing target prices for cotton, wheat, and sorghum by 25 percent in 1988-90 results in major employment losses for Terry County. Total crop sector employment declines by about 153 jobs or 12.7 percent from the Baseline (Table 9). In the noncrop sector, the total employment decline from the Baseline is 106.9 jobs. The bulk of these jobs are in agricultural services, retail trade, and services.

Contrary to what might be expected by large increases in crop prices and output under the Harkin bill, employment in the crop sector is expected to decline by 60.1 jobs relative to the Baseline (Table 9). Most of this decline is attributed to decreased output in dryland cotton. The increased profits to the crop sector are enough to stimulate an increase of 39.5 jobs in the noncrop sector relative to the Baseline. The majority of the new jobs are projected in the services and retail sectors. Because of increased set-asides and only modest increases in crop yields, the agricultural services sector is expected to lose 9 jobs relative to the Baseline.

## Summary

Although much has been written about the effects of farm structure on community well-being, minimal research has been conducted to explain the relationships between farm policy and economic activity in agriculturally dependent rural economies. The objectives of this bulletin were to describe a model for evaluating the impacts of farm policy changes on rural economies and to demonstrate how the model can be used to evaluate alternative farm policies.

Parameters for the Rural Agricultural Policy Simulation Model (RAPSIM) were developed for an agriculturally dependent rural county in the Texas Southern High Plains--Terry County. The model is a multi-year, linear programming-input-output model developed to quantify the impacts of alternative policies on the economic activity and employment of a rural economy. The model is driven by the objective of maximizing annual returns above variable costs in the crop sector subject to structural, policy, and IO balance equation constraints. The model estimated annual net returns and output from the crop sector, as well as the annual output from the noncrop sector necessary to support the solution level of crop sector output.

Six farm policies were analyzed during the 1986-90 planning horizon with RAPSIM. Continuation of the 1985 farm bill through 1990 was used as a base for comparison to the alternative policies. The alternative policies involved: (a) an alternative macroeconomic policy, (b) an altered farm structure, (c) maximum participation in the CRP, (d) a 25 percent reduction in target prices, and (e) implementation of the Harkin bill with high price supports.

Under the Baseline, conditions in agriculture are expected to continue to deteriorate. Gross crop sector output for Terry County, Texas, (including government payments) is expected to decline from about $74 million in 1986 to $68 million in 1990. More importantly, annual net

returns to the crop sector are expected to drop 43 percent from $25.3 million to $14.3 million.

Output in the noncrop sector (including households) in response to crop production activity tends to follow the decline in output from the crop sector. Sectors providing agricultural inputs are stable if not growing slightly in nominal terms. However, because of the linkage between the household sector and net returns in the crop sector, the household sector and the sectors heavily dependent on household purchases, such as retail and services, are projected to be negatively affected.

Employment in the crop sector is expected to continue a gradual declining trend with levels in 1990 expected to be about 10 percent less than in 1984. Employment in the noncrop sector in response to crop production activity is projected to be about 431 jobs in 1990.

Reducing the federal budget deficit and the rate of increase in the money supply has little impact on the output for the county. During the final 3 years of the planning horizon, average output differences from the Baseline are less than 1 percent for either the crop or noncrop sectors.

The major departure from the Baseline occurs with respect to net returns in the crop sector. The slower rate of increase in input prices under the reduced federal budget deficit scenario leads to an annual average of 9.4 percent greater net returns to agriculture. This acreage is rather substantial and emphasizes the importance of the rate of input price increases to the crop sector when commodity prices are stable or falling. Employment impacts from the reduced budget deficit scenario are minimal, with an increase of only 10.7 jobs in the crop sector and 9.1 jobs in the noncrop sector.

The results of a structural change in agricultural production are most notable in the crop sector. Output decreases slightly from the Baseline. However, net returns decrease by an average of 58 percent from Baseline levels. Crop sector employment increases by 11 percent due to labor efficiency differences rather than output changes.

The noncrop sector is affected in two ways. Sectors primarily responsible for supplying crop production inputs experience output increases relative to the Baseline. This increase is most evident in the agricultural services and banking and credit sectors. However, the decline in net returns in the crop sector causes a decrease in the household sector output relative to the Baseline. This decrease is accompanied by reductions in the retail trade and services sectors. Overall, the net effect on the noncrop sector is marginally negative. Employment effects in the noncrop sector are extremely minor with the exception of agricultural services, which supports 16 percent more jobs than in the Baseline. The retail sector is the most negatively affected, supporting 3 percent fewer jobs than in the Baseline.

Increasing CRP participation from 10 to 25 percent of cropland in the county has the effect of removing an additional 15 percent of the county's acreage from crop production. Output in the crop sector decreases only slightly because the producers are compensated by the government for retiring their land. Net returns in the crop sector increase by nearly 10 percent because land with low or negative net returns is retired.

Most noncrop sectors show 2 percent to 8 percent decreases in output from the Baseline. These decreases are offset by a small increase in the household sector resulting from improved net returns in the crop sector. The employment effects of the maximum CRP scenario are negative. Overall, there is a 5 percent decrease in employment versus the Baseline. Most of the decrease is from the crop sector. Labor supported by dryland crop production is reduced as these acres are placed in the CRP. The labor necessary for CRP maintenance does not completely offset this reduction.

A reduction of target prices by 25 percent in 1988-90 from Baseline levels has a significant impact on the crop sector. Total output from the crop sector decreases by an annual average of more than 33 percent from the Baseline during 1988 to 1990. More importantly, the drop in net returns to crop producers is 100 percent. Crop sector employment decreases by about 153 jobs from the Baseline.

Output in the noncrop sectors declines fairly uniformly. Average annual total noncrop output declines 31 percent from the Baseline. Households are the most affected, with a 36 percent decline, because they reflect the severe drop in net returns from the crop sector. Employment figures show agricultural services, retail trade, and services bear most of the adjustment as the county loses 107 jobs relative to the Baseline. Overall employment generated by crop production and supporting noncrop sector activity is 16 percent less than in the Baseline.

Increasing price supports through the Harkin bill increases crop sector output an average of 22 percent over the Baseline. Interestingly, 60 jobs are lost in the crop sector as physical output is reduced by increased set-asides in the Harkin bill. Net returns to the crop sector improve an average of 85 percent from 1988 to 1990.

Output from the noncrop sector increases by 20 percent above the Baseline with households and retail increasing the most (28 percent and 23 percent, respectively). Agricultural services actually decline 6 percent relative to the Baseline. Employment supported by the nonagricultural sector is increased from Baseline levels by an average of 39 jobs. Retail and services provide for most of the increase, while 9 jobs are lost in the agricultural services sector.

## Conclusions

In the noncrop sector of rural economies, two groups of industries are most affected by farm policy. The first group contributes to agricultural production directly. Included in this group are agricultural services, banking and credit, and nondurable manufacturing. As agricultural crop production and value of output decline, these sectors experience losses of greater proportion than other noncrop sectors. However, as long as crop production continues, these sectors should remain viable, albeit at a somewhat reduced level of activity.

The second group of industries affected to a major degree by farm policy are the household-related sectors, including retail trade and services. These sectors are likely to continue their decline throughout the course of the 1985 farm bill. Such a conclusion is reached because as net returns in crop production fall sharply, retained income to the household sector falls, and household spending declines.

Macroeconomic change to a lower federal budget deficit would clearly benefit agricultural producers in Terry County. Net returns will be enhanced because the rise in input prices will be slowed relative to a more inflationary environment typified by the high deficit macroeconomic scenario. Benefits that accrue to the noncrop sector will fall primarily on the household-related sectors, particularly retail trade.

A major structural change in the Terry County agricultural sector, whereby very large farms are replaced by mid-sized operations, would have mixed effects on the economy under the provisions of the 1985 farm bill. While there is no reason to expect economic conditions to induce such a structural change, the change could possibly be brought about politically. If this situation occurs, it would positively affect the number of jobs supported directly and indirectly by crop production in the county. In addition, output by most noncrop industries would rise slightly. However, the negative impacts of this kind of structural change are more

pronounced. For example, net returns in the crop sector would fall dramatically because higher cost/lower profit farm units would be producing the agricultural output. This decline would reverberate through the household, retail trade, and service sectors of the economy. On balance, output for both crop and noncrop sectors would decline.

Drastic changes in farm programs are likely to have major impacts on the Terry County economy. A sharp reduction in farm program benefits, such as a significant drop in target prices, would affect all sectors. Declining production, value of production, and net returns would be accompanied by declines in output from sectors providing inputs to the crop sector and by sectors more related to the household sector. Conversely, a sharp rise in program benefits exemplified by the Harkin bill would render concentrated benefits. The significant increase in net returns in the agricultural sector would enhance activity for households, retail trade, and services. The controls on the quantity of production in the Harkin bill, on the other hand, negatively impact production-related industries.

The results presented for Terry County, Texas, are not directly applicable to other agriculturally dependent counties in the United States. However, the directional changes in economic activity for the noncrop sectors in other counties may react to farm policy changes similar to the changes predicted for Terry County. Counties that are more dependent on commodities supported by the farm program would experience more drastic changes in noncrop sectors resulting from farm policy changes and vice versa. These results refute those who suggest that rural America has become sufficiently nonrural and agricultural policy and farm income is not significantly important. On the contrary, rural communities still appear to have a strong, legitimate interest in farm policy decisions.

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