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ECONOMIC IMPACTS OF THE 1981 AGRICULTURAL ACT AND THE 1981 TAX ACT ON TEXAS HIGH PLAINS FARMERS

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During 1981 two major pieces of legislation were passed that will greatly influence the economic welfare of farmers in the United States. First to be passed was the Economic Recovery Tax Act, and second was the Agriculture and Food Act. These two laws will likely have significant impacts on commercial farmers throughout the next decade.

This paper compares the economic effects of the two acts on a commercial cotton-sorghum farm located on the Texas High Plains. The hypothesis to be tested is that the Economic Recovery Tax Act will be more beneficial to the economic welfare of commercial farms than will the Agriculture and Food Act. The two acts are compared by simulating their effects on the typical farm, using the Farm Level Income Tax and Farm Policy Simulation Model (FLIPSIM II).

ECONOMIC RECOVERY TAX ACT OF 1981

October 1, 1981, signaled the beginning of individual income tax rate reductions. The rate reduction affects 1981 taxable income by applying a credit of 1.25 percent to the tax computed on 1981 income. Additional tax rate reductions are applicable for the years 1982 through 1984. The cumulative effect of the rate reductions will be 10 percent in 1982, 19 percent in 1983, and 23 percent in 1984. For tax years beginning in 1985, the individual income tax brackets, zero bracket amount, and personal exemptions will be adjusted for inflation, based on changes in the Consumer Price Index.

For those farm operators in the 50-percent-plus tax bracket, the effect of the new tax law is an immediate reduction in the maximum rate from 70 to 50 percent on both earned and unearned income. In addition, the ceiling imposed on alternative minimum taxable income in excess of \$100,000 was lowered from 25 to 20 percent.

For capital intensive sectors such as agriculture, the 1981 Act made significant changes in the rate at which the cost of most newly acquired

depreciable assets (post-1980) may be recovered (depreciated).¹ The accelerated cost recovery system (ACRS) will be used for most depreciable assets, replacing other depreciation methods, including the class life ADR system, component depreciation, and facts and circumstances. Depreciable assets are identified into four class lives: 3-, 5-, 10-, and 15-year categories. For the farm operator who may not currently need larger depreciation (cost recovery) allowances, longer recovery periods for each class of assets are available.

Another important change in the tax law is that additional first-year (bonus) depreciation has been replaced by an election to expense immediately a portion of new or used personal property. The amount of eligible expensing is limited to \$5,000 in 1982 and 1983, \$7,500 in 1984 and 1985, and \$10,000 thereafter. Although the special expensing provision applies to property that is eligible for investment tax credit, its use eliminates the expensed portion from such credit. In addition, the amount expensed reduces the assets' basis for cost recovery (ACRS), and it is treated as depreciation if recapture rules are involved.

Changes in the investment tax credit rules will likely have a profound effect on the agricultural sector, because the majority of the depreciable assets that are acquired by farm operators qualify for the credit, thus enabling them to reduce their tax liabilities on a dollar-for-dollar basis. Under the new law, there are only two holding periods for qualifying assets: (a) property in the 3-year class receives a 6-percent credit on the purchase price or other basis of the asset, and (b) property in the 5-year class receives a 10-percent credit. In essence, the holding periods were reduced by two years in each case. However, there have been no changes in those assets that qualify for the credit. Finally, electing a 5-year recovery period for 3-year-class property does not increase the available investment tax credit from 6 percent to 10 percent on that property.

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¹ Depreciable assets acquired prior to 1981 will continue to be depreciated under the old law. There is also some property that, even though it is placed in service after 1980, will not be subject to ACRS. For example, certain property acquired from parents does not become ACRS property. In addition, property that the taxpayer elects to depreciate under a method not expressed in terms of years will not fall under the ACRS, e.g., machinery depreciated under the unit-of production method.

AGRICULTURE AND FOOD ACT OF 1981

The Farm Bill was signed into law on December 22, 1981. The 1981 Agriculture Act is essentially a continuation of the amended 1977 Act with regard to the provisions affecting grain sorghum and cotton. The price support, target price and deficiency payment, farmer-held reserve, and acreage restriction provisions of the amended 1977 Act are continued under the 1981 Agriculture Act (Johnson et al.). Minimum target prices for 1982-85 are specified in the new law for corn (and thus grain sorghum) and cotton, along with a provision that they be increased in the future for the cost of production. The target price for cotton must be at least 120 percent of cotton's loan rate.

Minimum loan rates for corn (\$2.55/bu.) and cotton (\$.55/lb.) are established for the 1982-85 crop years. These minimum values are slightly higher than their 1981 counterparts of \$2.40 and \$0.52. Similarly, the minimum 1982 target prices for corn and cotton (\$2.70/bu. and \$0.71/lb., respectively) are slightly higher than their 1981 levels of \$2.40/bu. and \$0.708/lb. The formula for determining the cotton loan rate under the 1977 Act will remain in effect under the new act.

The Secretary of Agriculture again may require acreage reductions, as a condition for participation in the price and income support provisions of the program. Payments for acreage reductions may be used if the Secretary believes that they are necessary to obtain the desired reduction in total acreage. On January 29, 1982, Secretary Block announced a 15-percent acreage reduction for cotton and a 10-percent acreage reduction for feed grains. Although set-asides were authorized under the 1977 Act, they had not been used for the previous two crop years on feed grains. While the 1977 Act was applicable, no set-aside was announced for cotton.

Disaster payments for low yields and prevented planting will be in effect only in counties where federal all-risk crop insurance is not available. However, since the change was to be implemented prior to the 1981 Act, this paper assumes that the disaster program has been replaced by all-risk insurance.

INCOME TAX AND FARM POLICY SIMULATOR

FLIPSIM II was used to simulate the economic impacts of the 1981 Tax Act and the 1981

Agriculture Act on a commercial cotton-sorghum farm located on the Texas High Plains. The model is a computer program that simulates the effects of alternative farm programs and income tax laws on typical farms (Richardson and Nixon). FLIMSIM II is a recursive, farm-level, stochastic simulation model that simulates the annual production, farm policy, marketing, financial management, growth, and income tax aspects of a farm over a multiple-year planning horizon.

The model is stochastic in that for each iteration a different set of annual crop prices and yields is selected at random from a multivariate normal probability distribution. The model is recursive because the financial position at the end of one year is the beginning financial position for the following year. A complete run consists of 50 iterations of the 10-year planning horizon, 1981-90.

At the start of each year, the crop mix is determined. The crop mix is fixed in year 1, using the typical cropping pattern for the area. For years 2-10, the crop mix that maximizes expected net returns over variable cost is used. This crop mix is determined by using a linear program incorporated in the model. Stochastic prices and yields are drawn at random from multivariate normal probability distributions that are developed from producer's yield records and county average prices. Total variable production costs and cash receipts are calculated on the basis of crop acreages and stochastic prices and yields. Farm policy options (loan program, farmer-owned reserve, set-aside, deficiency payments, and crop insurance) are simulated by using appropriate values provided by the user and the necessary adjustments made to cash receipts and expenses.

The model calculates the standard financial activities of a farm, such as paying fixed and variable costs, making loan payments, withdrawing family living expenses,² depreciating machinery, and paying income taxes. The market value of farmland is updated annually, based on the initial value of land and the endogenous capital gains rate for land.³ This allows the value of cropland to change over time, responding to changes in the profitability of typical farms in the region.

When the operator experiences a year-end cash flow deficit (i.e., there is not sufficient ending cash to repay fully the operating loan), a sec-

² Family size is assumed to be four members. Annual family living expenses are calculated using the following consumption function:

$$\text{Consumption Expense } \$ = 3.2315 \text{ FFS}^{0.3765} \text{ ATI}^{0.6283} \text{ CPI}^{0.3716}$$

where FFS is family size, ATI is disposable income, and CPI is the Consumer Price Index for all commodities and services (1967=100). This consumption function for farmers on the Southern Plains was estimated by using the SRS-USDA Farm Operator Family Living Expenditures Survey for 1973.

³ The initial value of land in the study area was \$605 per acre. The capital gains rate for land in the Southern Plains is a function of past rates to production assets and time:

$$\text{capital gains rate}_t = -0.2705 + 2.4157(\text{LRET}) + 0.0036(\text{TREND}) \\ (-3.90) \quad (3.57) \quad (3.16)$$

LRET is a weighted average of the rate of return to production assets for t-1 weighted 0.75 and t-2 weighted 0.25, and TREND is the last two digits of the calendar year. The F-ratio for the equation is 12.85 and the R-squared value is 0.52.

ond mortgage on farmland and/or intermediate assets is obtained. If refinancing is not feasible because of excessive debts, the farm operator may sell a portion of the farmland to cover the deficit. The minimum equity-to-asset ratio that the farm is permitted to carry is 30 percent on long-term assets and 30 percent on intermediate-term assets.

If adequate resources are available at year end, the farm may grow by the lease or purchase of 160, 320, 480, or 640 acres of cropland each year. To grow, the farm must have sufficient cash reserves and/or equity in land to cover a 40-percent downpayment for cropland and a 30-percent downpayment for any additional machinery required.⁴ Additional farm machinery is purchased in discrete units when the farm grows to the point where its present complement is inadequate. Budgets for the individual crop enterprises are adjusted as the farm expands, thus internalizing economies or diseconomies to size.

Each item of machinery purchased before 1981 is depreciated, using the double-declining balance method and assuming a 7-year depreciation life. Machinery placed into use after 1980 is recovered, using the 5-year accelerated cost recovery system. Machinery is replaced after 7 years by trading an old item in on its replacement. The cost of replacement machinery is calculated by inflating the item's 1982 replacement cost by 8.5 percent for each year from 1982 to the year replaced. The market value of used machinery is updated annually by inflating the initial market value of each item by 1 percent.

TYPICAL FARM

The cotton-sorghum farm involved here consists of 1,457 acres in the Texas Southern High Plains. Data to describe the farm and possible future additional sizes were obtained from a stratified random sample of producers in the Southern High Plains (Smith et al.). Farmer surveys provided information for estimating production costs and labor requirements in 1980 for the individual crops. Costs of production for 1981-90 were estimated in the model by inflating the base 1980 costs by 9.3 percent annually. Initial per acre crop yields (410 lbs./acre irrigated cotton, 182 lbs./acre dryland cotton, 35 cwt./acre irrigated sorghum, and 13 cwt./acre dryland sorghum) were inflated at 1 percent per year to account for improved managerial ability and technological advances over time. Prices of cotton lint, sorghum, and cotton-seed were inflated at 7 percent per year from their assumed 1981 mean

values under the 1977 Agricultural Act.⁵ Prices for the 1981 Act are discussed in the following section.

Items in the machinery complement for a typical farm were identified from the survey. Each item was assigned an age equal to the model age that was observed for that particular type of machine or implement. The machinery complement for the 1,457-acre farm is considered to be adequate for farms up to 1,750 acres (Beach). When a farm grows beyond this threshold, the operator must buy an additional complement of 8-row equipment.

The farm's beginning debt-to-asset ratio is 48 percent, the average observed in the farm survey. Interest ratio for existing long-term and intermediate-term debts are assumed to be approximately 8.5 and 13 percent, respectively. Also, it is assumed that the interest rates for operating capital and cash reserves are 15 percent and that interest rates for new land and machinery loans are 11 and 15 percent, respectively. Interest rates charged on second mortgages are assumed to be one-half of a percentage point higher than those charged for comparable new loans. In addition, a 1-percent loan origination fee is charged for refinancing cash flow deficits.

A minimum family living expense is set at \$16,000 in 1981 and inflated annually at 9.3 percent. The inflated minimum is used if it exceeds the value that is calculated by the family consumption function in the model. Off-farm income is assumed to be \$16,000 in 1981 and is increased annually for changes in the Consumer Price Index (CPI) (9.3 percent).

COMPARISON OF THE 1981 TAX AND AGRICULTURAL ACTS

The provisions of the 1981 Tax Act were programmed into the FLIPSIM II model. Since the Internal Revenue Service has not prescribed tables indicating how the income tax rates will be adjusted for inflation after 1984, the 1984 tax schedule was adjusted annually for changes in the CPI to develop schedules for 1985-90. The indexing adjustment procedure involves inflating the 1984 values for personal exemptions, zero bracket amounts, and tax brackets to correspond to the annual changes in the CPI. Under the old tax law, it was assumed that all machinery would be depreciated, using the double-declining method with a 7-year life and a 10-percent salvage value. To analyze the new tax law, machinery that was purchased after 1980 was recovered, using the 5-year accelerated recovery

⁴ Downpayment requirements of 40 and 30 percent for farmland and machinery, respectively, are typical for Federal Land Bank and Production Credit institutions in the High Plains.

⁵ Prices paid are inflated at 9.3 percent per year, and prices received are inflated at 7 percent per year, implying an inflation passthrough coefficient of 0.752. Tweeten (p. 102) has estimated the inflation passthrough coefficient (percentage increases in prices received by farmers in relation to the percentage increase in prices paid by farmers) at 0.725 for the 1963-77 time period. The slightly higher coefficient used here is implied by the average percentage change in the indices of prices paid and received by farmers during the past decade.

method. It was assumed that the farm operator elected to take first-year expensing under the new tax law and additional first-year (bonus) depreciation under the old tax law.

To simulate the two agricultural acts, two sets of annual prices, loan rates, and target prices were developed based on values in the acts (Table 1).⁶ Since the index of crop prices has increased an average of 7 percent per year during the past decade, the average annual prices of cotton and sorghum for 1981 are inflated 7 percent per year for 1982–90 under the 1977 Act. This series of annual prices serves as a baseline for comparison because it has no acreage restrictions. The loan rates and target prices under the 1977 Act for 1981 were increased annually to maintain their relationship to the average crop price in 1981. This results in the same relative price and income protection throughout the planning horizon. The national allocation factor for computing deficiency payments was assumed to be 0.90 for both crops in all years.

The announced acreage reductions of 15 percent for cotton and 10 percent for sorghum were assumed to prevail for 1982–90 under the 1981 Act. As a result of the set-aside, one would expect slightly higher average prices. Given the level of acreage reduction, likely participation, slippage rates, and the appropriate supply and

demand elasticities, prices probably will be 3 to 5 percent greater under the new law than under the 1977 Act. The 1982–90 average annual prices for cotton and sorghum under the 1981 Agricultural Act were therefore assumed to be 4 percent greater than for the 1977 Act (Table 1). The minimum target prices in the 1981 Act for 1982–85 were used for those years. After 1985, target prices were increased to maintain the 1985 relationship between average crop prices and target prices. The minimum loan rates in the 1981 Act were used for 1982. Loan rates were increased annually for 1983–90 to maintain their 1982 relationship to target prices. The national allocation factor was assumed to equal 1.0 when acreage reductions were in effect and 0.90 otherwise. The farmer-owned reserve bonus presently in effect for sorghum, 45¢/cwt., was assumed for 1982–85. Acreage reductions were assumed to be only 60 percent effective in reducing production on the typical farm.

The results of simulating the typical farm under the two acts are summarized in Table 2. The 1981 Agricultural Act coupled with the 1981 Tax Act results in the highest average, after-tax net present value.⁷ This combination of policies also results in the most farm growth on the average and the largest average present value of ending net worth. These results should be expected because this particular combination of programs includes higher crop prices, loan rates, and target prices, coupled with lower marginal income tax rates and more rapid depreciation (cost recovery) of farm machinery. In terms of average after-tax net present value, the worst combination of policies is the old tax law coupled with the 1981 farm program. This result appears reasonable because the new farm program results in higher taxable incomes—the result of higher crop prices, loan rates, and target prices—and the 1980 income tax provisions use higher income tax rates and permit smaller deductions for machinery depreciation, resulting in less after-tax net income.

The benefits of the 1981 farm program over its predecessor are mixed, depending on the income tax provisions assumed. Average net present value for the typical farm under the old situation (1977 farm program and 1980 income tax provisions) is 2.3 percent greater than under the combination of the 1981 farm program and the 1980 income tax provisions. This result indicates that the 1981 farm program provides about the same to slightly lower average returns than the 1977 farm program. In comparing the present situation (1981 farm program and 1981 income tax provisions) to the combination of the 1977 farm program and the 1981 tax provisions, one finds that the present situation results in a 5-percent

TABLE 1. Annual Average Prices, Loan Rates, and Target Prices for Cotton and Grain Sorghum Under Both the 1977 and the 1981 Agricultural Act

Year	Cotton ^{1/}			Grain Sorghum		
	Average Price (\$/lb.)	Loan Rate	Target Price	Average Price (\$/cwt.)	Loan Rate	Target Price
Continuation of 1977 Agricultural Act						
1981	0.49	0.44	0.63	4.10	4.07	4.33
1982	0.52	0.47	0.66	4.39	4.36	4.62
1983	0.56	0.51	0.70	4.70	4.67	4.93
1984	0.60	0.55	0.74	5.02	4.99	5.25
1985	0.64	0.59	0.78	5.38	5.35	5.61
1986	0.69	0.64	0.83	5.75	5.72	5.98
1987	0.74	0.69	0.88	6.15	6.12	6.38
1988	0.79	0.74	0.93	6.58	6.55	6.81
1989	0.84	0.79	0.98	7.05	7.02	7.28
1990	0.90	0.85	1.04	7.53	7.51	7.76
1981 Agricultural Act						
1981	0.49	0.44	0.63	4.10	4.07	4.33
1982	0.54	0.47	0.68	4.57	4.64	4.64
1983	0.58	0.52	0.73	4.89	4.70	4.93
1984*	0.62	0.57	0.78	5.22	5.03	5.30
1985	0.67	0.61	0.82	5.60	5.41	5.50
1986	0.72	0.66	0.87	5.98	5.79	5.88
1987	0.77	0.71	0.92	6.39	6.20	6.29
1988	0.82	0.76	0.97	6.84	6.65	6.74
1989	0.87	0.81	1.02	7.33	7.14	7.23
1990	0.94	0.88	1.09	7.83	7.64	7.73

¹ Loan rates and target prices are in terms of \$/lb. for 31/32 inch SLM cotton.

⁶ A 10-year planning horizon was used despite the fact that the 1981 Agriculture and Food Act expires after the 1985 crop year. The longer planning horizon is reasonable in light of the fact that only minor changes were made in the 1977 Food and Agricultural Act in 1981.

⁷ The model accounts for contingent capital gains taxes in calculating net worth, thus providing a more accurate picture of the farm operator's ending financial position.

TABLE 2. Comparison of the 1981 Agricultural Act to the 1981 Tax Act for a Typical Farm in the Southern High Plains, 1981-1990

Item	1980 Income Tax Provisions		1981 Tax Act	
	1977 Agri. Act	1981 Agri. Act	1977 Agri. Act	1981 Agri. Act
After-tax net present value (\$) ^a				
Mean	409,601.0	400,362.0	455,773.3	477,032.8
Standard Deviation	450,290.0	378,405.1	546,113.5	506,146.1
Cropland Owned in 1990 (acres)				
Mean	577.4	569.4	664.5	665.0
Standard Deviation	261.7	249.4	328.3	421.8
Cropland Farmed in 1990 (acres)				
Mean	1,600.6	1,581.9	1,669.3	1,793.9
Standard Deviation	472.9	399.3	441.6	508.1
Value of Cropland (\$/acres)				
Mean	1,410.7	1,388.1	1,416.1	1,404.0
Standard Deviation	718.6	665.3	799.5	1,197.6
Equity Ratio in 1990				
Mean	0.61	0.63	0.62	0.63
Standard Deviation	0.11	0.10	0.11	0.11
Leverage Ratio in 1990				
Mean	0.69	0.62	0.66	0.63
Standard Deviation	0.31	0.26	0.29	0.32

^a After-tax net present value is the present value of all family withdrawals and the after-tax change in the farm's net worth adjusted for off-farm income and investments.

higher average net present value for the typical farm. The implications are that the 1981 farm program, when coupled with a more favorable income tax law, provides greater after-tax returns than did the 1977 farm program.

Comparison of the farm operator's average net present value under the two income tax provisions indicates that the 1981 Tax Act will be more beneficial than were the 1980 income tax provisions, as expected. The change in policy from a combination of the 1980 income tax provisions and 1981 farm program to the present situation (1981 tax provisions and 1981 farm program) increases the operator's average after-tax net present value by 19 percent. Similarly, going from the old situation to the 1977 farm program and the 1981 income tax provisions results in an 11-percent increase in average after-tax net present value. These results lead one to conclude that the 1981 Tax Act will likely benefit the typical cotton farmer more than did the 1981 farm program.

Both average acres of owned cropland and average acres farmed in 1990 are greatest under the present combination of farm programs. The relationship between owned cropland and leased cropland is about the same for all four policy combinations. The average price of cropland in 1990 is essentially the same under the four policy combinations. The value of land increased an average of 8.8 percent per year over the 10-year

period for each policy scenario. This result indicates that the policy changes are not significant to cause major changes in the net returns to production assets, and thus to land values.

Two measures of the farm's financial well-being (equity ratio and leverage ratio) are included in Table 2. The average ending equity ratio (or ratio of equity to assets) is approximately the same under the four farm programs. The average leverage ratio (the ratio of debt to equity) in 1990 is lowest under the 1981 Agriculture Act; however, the average leverage ratio across the four programs differs only slightly.

SUMMARY AND CONCLUSIONS

Passage of the 1981 Agriculture and Food Act and the Economic Recovery Act of 1981 has changed the environment that farmers must work in. The overall objective of this paper was to compare the economic effects of these two acts for a typical cotton-sorghum farm on the Texas High Plains. The specific hypothesis tested was that the tax act will be more beneficial to the economic welfare of commercial farmers in Texas than will the agricultural act.

A typical cotton-sorghum farm on the High Plains was simulated over the 1981-90 planning horizon using the Farm Level Income Tax and Farm Policy Simulator (FLIPSIM II). The 1980

income tax provisions and the 1981 tax law provisions were simulated with the 1977 and 1981 Agricultural Acts. It was assumed that the farm operator would participate in all farm program provisions and that the agricultural policies announced for 1982 would continue through 1990.

The results indicate that, on the average, an operator of a typical High Plains cotton-sorghum farm will be better off under the current combination of farm programs and income tax provisions than under the old farm program and tax law. The current set of policies would likely increase the operator's average after-tax net present value (for a 10-year period) by more than \$129,000 over the previous set of policies. These results are to be expected because the present farm program provides slightly higher loan rates and target prices, and the new income tax law provides for faster depreciation of farm machinery and lower income tax rates.

For a given set of tax provisions, only a slight difference (2 to 5 percent) in average after-tax net present value results from changing the farm

programs. However, going from the 1980 income tax provisions to the 1981 tax provisions increases the average after-tax net present value by 19 percent if the 1981 farm program is in effect, and by 11 percent if the 1977 farm program had continued in effect. The marked improvement under the 1981 farm program results from the higher target prices in the act, as well as from the slightly higher crop prices that will result from the acreage limitation program.

The consequences presented here are dependent on the probability distributions used for crop yields and prices and on the farm policy variables (set-aside, loan rates, and target prices). The benefits of the 1981 Agricultural Act may be greater than those of the 1981 Tax Act if the target prices and loan rates are increased above the minimum established in the act, or if the acreage set-aside raises crop prices more than 3 to 5 percent. Despite these shortcomings, the conclusions presented here illustrate the probable effects of the new acts on commercial farm operators in the Texas High Plains.

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