Impact of Alternative Farm Programs on Different Size Cotton Farms in the Texas Southern High Plains: A Simulation Approach

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Eight Texas High Plains cotton farms, ranging in size from 189 acres to 5,570 acres, were simulated under six alternative farm program provisions to determine the likely structural impacts of these programs. The results indicate mid-size farms benefit more from farm programs than either small or large farms since the programs allow them to remain in business. Denying mid-size commercial farms access to the farm program would likely accelerate the trend towards a bimodal distribution of farm sizes on the High Plains.

Virtually all major U.S. farm legislation has been enacted with an explicit objective of preserving family farm agriculture [Talmadge].[1] Economists appear to be in general agreement that large-scale farmers benefit more in absolute terms from farm programs than their smaller-scale counterparts [Knutson *et al.*, pp. 252–54]. Gardner (p. 837), however, argues that the real question regarding benefits from farm programs should be, **Who is helped the most?** His answer is that it's more plausible that the farmers who benefit most are those who otherwise would be forced out of business. Building on Gardner's argument, Knutson suggests that larger-scale farmers are less dependent on commodity programs because they are better able to reduce risk through the use of available marketing and management tools. Small farms, on the other hand, are less dependent on farm programs for their economic survival due to the high proportion of off-farm income to total income [Office of Technology Assessment, p. 21]. Therefore it is hypothesized that mid-size commercial farms are "helped the most" by farm programs.

The objective of this paper is to test the hypothesis that farm programs benefit mid-size farms more than either large- or small-scale farms. In keeping with Gardner's definition, the present study emphasizes the effects of farm programs on: probability of survival and success, net worth, and ending farm size.

Methodology

To achieve the objective two separate research efforts were undertaken. The first was a survey of cotton producers in the Texas Southern High Plains to quantify the current structure and to obtain information as to production costs, marketing

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Technical Article TA-19421 of the Texas Agricultural Experiment Station.

[1] A family farm is defined as a farm where the family owns at least some portion of the land, supplies a majority of the labor, and controls the production and marketing decisions.

Western Journal of Agricultural Economics, 10(2): 365–374

practices, organization, and participation in farm programs by farm size. The second research effort involved simulating the typical farms developed by the survey under alternative farm policy scenarios to determine the impacts of participation in various farm program provisions on the survival, success, and growth of different size farms in the Texas Southern High Plains.

Survey

Eight typical farms were developed from the survey of 98 Southern High Plains producers.[2] These producers were selected from a stratified random sample of producers in three randomly selected Southern High Plains counties. The typical farms represent the average characteristics of the farms surveyed including: volume produced, production practices, machinery complements, financial position, input purchases, and marketing experience. Table 1 provides a summary of selected demographic and financial characteristics for the eight typical farms used in the simulation model.

In contrast to previous studies of this type, the typical farms include recognition of both the size and pecuniary economies experienced by different size farm operations. That is, the typical farm specifications recognize not only the impact of size on cost, but also differences in input costs associated with size, the cost advantages associated with typical levels of vertical integration (including cooperative and corporate), and the marketing price advantages associated with each size category. These specifications, based on primary data, indicate that when both the cost and pecuniary economies are considered, reduction in costs are experienced throughout the full range of farm sizes, from 189 acres to 5,570 acres (Table 1). Typical farms of 2,019, 3,383, and 5,570 acres were also able to obtain a 4.4 percent higher average price for cotton. The survey revealed little variation in yield across farm size; therefore the same average yield was used for all farm sizes. Survey data indicate different debt positions for farms in the eight size categories. Mid-size farms in the 641 to 2,560 acre size categories had higher overall debt-asset ratios than smaller or larger farms.

Simulation Model

A whole-farm simulation model capable of simulating the 1981 farm bill provisions over a multiperiod planning horizon was used. The model, FLIPSIM V [Richardson and Nixon], simulated each farm recursively over a ten-year planning horizon beginning in 1981. The ten-year planning horizon was repeated 50 times (iterations) using a different set of random crop prices and yields for each year. A schematic of the model is included in Figure 1.

The simulation model begins each year of the planning horizon by determining the farm's crop-mix using a linear programming (LP) routine. The LP selected the crop-mix which maximized expected net returns per acre, subject to constraints on farm size, irrigated acreage, monthly labor requirements, and flexibility constraints on the individual crops (irrigated and dryland cotton and irrigated and dryland sorghum). Expected per acre net returns are calculated using a three-year weighted average of previously generated random yields and prices. Expected per

[2] The following eight size categories were identified for the study area: 0–320, 321–640, 641–960, 961–1,280, 1,281–1,600, 1,601–2,560, 2,561–4,400, and 4,401 acres and larger. Approximately 14 farms in the first six size categories, eight farms in the seventh, and five farms in the largest category were included in the survey. The number of farms surveyed in the two largest size categories were limited due to population. For example, only nine farm operations having more than 4,480 acres were identified by the Texas Crop Reporting Service. The average acreage defined by the survey is used in referring to the different farm size categories.

TABLE 1. Demographic and Financial Characteristics of Typical Farms by Size in the Texas Southern High Plains, 1980.

	Farm Size (Acres)							
	189	511	793	1,088	1,457	2,019	3,383	5,570
Age of Operator	44	51	44	41	42	45	45	51
Tax Exemptions	4	4	4	4	4	4	4	4
Acres Owned	110	261	357	381	539	646	1,048	3,453
Acres Leased	79	250	436	707	918	1,373	2,335	2,117
Value of Owned Land ($1,000)	70.6	163.6	225.3	229.8	326.2	386.8	611.7	2,015.4
Value of Equipment ($1,000)	41.2	77.8	116.6	169.4	220.8	305.9	553.2	875.0
Long-Term Debt ($1,000)	13.4	36.9	68.7	63.1	51.6	111.2	120.9	488.7
Intermediate-Term Debt ($1,000)	12.0	37.6	73.4	116.8	208.7	251.0	267.7	582.7
Net Worth ($1,000)	86.4	166.9	199.8	219.3	286.7	330.5	776.3	1,819.0
Total Debt to Total Assets	0.23	0.31	0.42	0.45	0.48	0.52	0.33	0.37
Long Term-Debt/Assets	0.19	0.23	0.31	0.27	0.16	0.29	0.20	0.24
Int. Term-Debt/Assets	0.29	0.48	0.63	0.69	0.95	0.82	0.48	0.67
Total Cost of Production for Cotton ($/lb.)	88.1	66.1	65.9	62.6	58.7	59.3	53.3	53.2
Off Farm Income ($1,000)[a]	24.0	21.0	16.0	16.0	16.0	16.0	0.0	0.0
Minimum Family Living Expenses ($1,000)	12.6	15.2	15.2	15.2	18.5	18.5	29.1	38.0

[a] Off-farm income includes only income from services or salary, to the exclusion of income from off-farm investments.

acre net returns are adjusted for expected farm program benefits in the year being simulated, i.e., price supports, deficiency payments, insurance indemnities, diversion payments, and required set-aside. The LP routine selected a combination of irrigated and dryland cotton over 95 percent of the time reflecting the relatively favorable farm program provisions and cost economies for cotton production. This result is not contrary to observed practices in the region where, depending on the county, over 85 percent of the cultivated cropland is devoted to cotton production.

After determining the crop-mix each year the model generated random crop prices and yields. Random prices and yields were drawn each year from a multivariate normal probability distribution of cotton and sorghum prices and dryland and irrigated cotton and sorghum yields. The distribution parameters were estimated using actual values for producers in the survey area. Next the model simulated variable production costs by multiplying the per acre input cost by planted acreages for the respective crops. Labor costs are calculated as the sum of full-time labor charges plus the cost of part-time labor. Part-time labor needs are based on the difference between hours of monthly labor available and the monthly labor needs for all crops. Harvesting costs are the product of the per unit harvest cost, random yield, and harvested acreage. The base production and harvesting costs obtained from the producer surveys for 1980 were inflated at 9.3 percent annually over the ten-year planning horizon [Texas Federal Intermediate Credit Bank]. Average yields were inflated one percent per year based on an assumption of continued adoption of technology. Average annual crop prices were inflated at 75 percent of the annual percentage change in input costs based on Tweeten's analysis of the relationship between inputs cost and prices received.

The model calculates fixed costs (e.g., property taxes and insurance) based on the

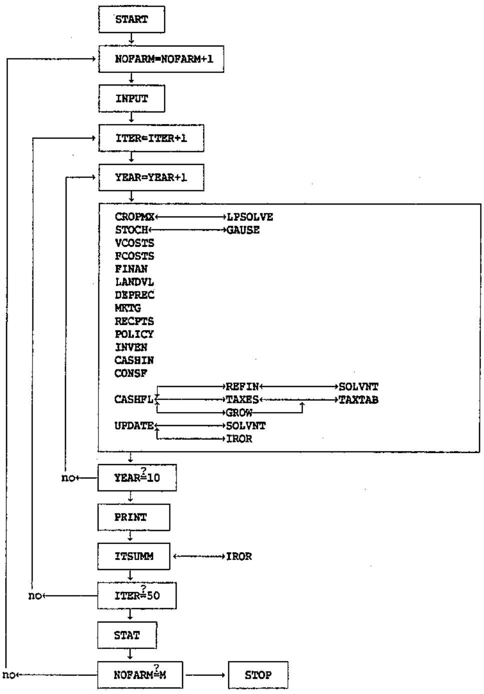

Figure 1. Schematic of the Overall FLIPSIM V Model.

initial values obtained from the producer survey and the assumed annual inflation rate for input costs. Next the model amortizes all outstanding loans assuming they are simple interest mortgages. (Annual interest rates in the study area for land, machinery and operating loans were, respectively, 8.5, 13, and 15 percent.) The market value of farm machinery and cropland is then updated, assuming the value of land increases nine percent per year and the nominal value of used equipment increases one percent per year.

The model next depreciates each piece of equipment for the farm. Equipment purchased prior to 1981 was depreciated assuming a five- to seven-year life and the double declining balance method. Equipment purchased after 1980 was cost recovered assuming a five-year life and the ACRS rules in the Economic Recovery Tax Act of 1981. Equipment that has passed its economic life (seven to ten years) was replaced by trading the existing piece for a replacement. The cost of replacement equipment was assumed to increase 9.3 percent per year from its 1980 base price. First year expensing and investment tax credit were calculated for new purchases of equipment.

The fraction of each crop marketed in the current tax year was estimated internally based on the operator's desired taxable income ($7,400), estimated cash receipts, and income tax deductions.[3] The product of random yield, harvested acres, fraction of crop marketed and random price, less the landlord's share of each crop, is cash receipts for each crop. If the market price is less than the effective loan rate (as specified in the 1981 farm bill) for a crop, it is placed in the CCC loan (cotton) or the direct FOR (sorghum) rather than being sold. Stocks are released from the loan (or FOR) if the market price in the following year exceeds the net loan rate (or trigger price). Deficiency payments are paid if the season average price is less than the target price.[4] The deficiency payment

[3] Income tax consequences frequently determine the fraction of crops sold during the income tax year they are harvested. The first step in calculating this fraction is to determine the operator's expected income tax deductions and cash receipts. Estimated deductions include: fixed costs, interest payments, variable production and harvesting costs, labor costs, cash rent for land, depreciation, crop insurance premiums, and personal income deductions ($1,000 per dependent plus excess itemized deductions). Estimated cash receipts include: value of all crops if sold in the current tax year, value of crops held over from the previous year and sold in the current year, all off-farm income, and other farm income. If estimated cash receipts are less than estimated tax deductions plus the targeted taxable income ($7,400), all crop production is sold in the current tax year. When cash receipts exceed deductions plus $7,400, the proportion of crops sold in the next tax year equals the percentage of the crop that must be carried over for current cash receipts to equal deductions plus $7,400.

[4] The 1981 Farm Bill indicates deficiency payments for cotton shall be based on annual average prices received by farmers. Since weighted average annual prices received by farmers in the Lubbock

is a function of the payment rate, the farm program yield, the harvested acreage and a national allocation factor of 0.90 (1.0 when an acreage reduction program is in effect). When an acreage set-aside program is simulated the model reduces planted acreage a given percentage without paying the operator a diversion payment.

The then current 1981 and 1982 provisions of the Federal Crop Insurance program for the study area were used in the model. It was assumed the farm operators elected the 65 percent yield coverage level and the high price guarantee. Provisions to increase or decrease the annual insurance premium based on loss records were incorporated into the model.

After simulating the farm policies selected by the user, the model determined the farm operator's year-end financial position, calculated family cash withdrawals,[5] and calculated income taxes payable in the following year. Year-end cash flow deficits are handled in the following order: (a) grant a lien on crops in storage, (b) refinance long-term equity, (c) refinance intermediate-term equity, and/or (d) sell cropland. If the operator is unable to cover the deficit in one of these ways, the farm is declared insolvent and the model begins the next iteration.

Personal income taxes and social security taxes were calculated assuming the operator was married, filing a joint income tax return, and itemizing personal deductions.[6] The regular income tax liability was computed using two methods: (a) income averaging (if qualified), and (b) the standard tax tables. The model selected the tax strategy which resulted in the lower income tax liability.[7]

The farm was permitted to grow at the end of each year by purchasing cropland if the operator had cash available (after meeting all expenses) to cover the 30 percent downpayment for land and the additional machinery necessary for the proposed larger farm. The operator was permitted to borrow against his equity in land to meet up to 50 percent of the downpayment. The farm operation could also grow by leasing land if the operator had cash available to cover the downpayment requirements for purchasing additional machinery needed by the proposed larger size farm. If machinery was purchased due to growth, the machinery was depreciated, investment tax credit was calculated, and the operator's income taxes were recomputed.

area are not available for cotton and sorghum, the model calculated deficiency payments for both cotton and sorghum using season average prices. Target prices and loan rates for cotton were scaled down 8.3 cents per pound to account for locational and quality differentials between Lubbock prices and national average cotton prices used to calculate deficiency payment rates. This adjustment forced the maximum deficiency payment rate to be equal to the value one would have used for a national policy simualtion model. A similar adjustment was made for sorghum.

[5] A family consumption function estimated for farmers in the Southern Plains was used. The function was estimated using the 1973 Statistical Reporting Service survey of U.S. farm families in Oklahoma and Texas (U.S.D.A.). Based on this function, the average propensity to consume from after-tax disposable income is 0.89 and the marginal propensity to consume is 0.56 for farm families in the Southern Plains.

[6] Depreciation recapture, capital gains and losses, investment tax credit, and depreciation allowances are explicitly accounted for in calculating the sole proprietor's accrued income tax liability. If there is a net operating loss from prior years, taxable income in the current year is appropriately reduced. If there is a net operating loss in the current year it is automatically carried forward. Net operating loss carryback is not permitted in the model.

[7] All investment tax credit allowances were deducted from the regular tax liability and the result was compared to the income tax liability under the alternative minimum tax. The operator paid the excess of the alternative minimum tax over the sum of the regular income tax liability and the regular minimum tax. Income tax rate schedules for 1981, 1982, 1983, and 1984 were included in the model, as well as a procedure to develop tax rate schedules for 1985–90 based on changes in the Consumer Price Index.

All assumptions regarding annual inflation rates and interest rates, production costs, annual mean crop yields and prices, values for farm program provisions, family consumption, off-farm income, beginning assets and liabilities, machinery depreciation and replacement methods, growth strategies, and income tax calculations were held constant for all farm program provisions analyzed.[8] By holding these assumptions constant, the cumulative impacts of selected farm program provisions can be isolated for each farm size.

Actual beginning financial positions of typical farms in each of the eight size categories (Table 1) were used rather than a common financial position for all eight farms. Using a common initial financial position would have distorted the structural impacts of farm programs on producers in the study area. The emphasis of the present study was to determine how different size farms benefit from farm programs. The observed differential financial positions, therefore, were critical to the analysis. It is from this base position that the differential impacts of alternative levels of farm program participation are identified.

Farm Programs Analyzed

The analysis consisted of six different farm program scenarios simulated over a ten-year planning horizon.[9]

- BASIC reflects a continuation of the provisions of the 1981 Farm Bill including the target price, loan rate, farmer owned grain reserve, all-risk crop insurance, and the $50,000 payment limit.[10]
- NOLIM assumes an effective $50,000 payment limit did not exist. Since the effectiveness of the $50,000 payment limit has come under considerable question [Knutson *et al.*, page 253], this alternative may more closely reflect the impact of the 1981 Farm Bill than BASIC.
- NOGOV assumes the farm operator chooses not to participate in the farm program. When compared to BASIC, NOGOV quantifies the economic impact of a farm operator not participating in any farm program provisions.[11]
- NOSUP assumes farmers do not participate in the target price and loan provisions of the 1981 Farm Bill. It, however, assumes participation in the all-risk crop insurance program.
- SASDE assumes a 15 percent set-

[8] Using higher (lower) interest rates would have produced slightly different results to the extent that higher (lower) interest rates increase (decrease) the cash expenses of farms with debt. Farms in the 640 to 2,560 acre range have the greatest leverage ratios (Table 1) so higher (lower) interest rates would have further reduced (increased) their chances of survival. Using higher inflation rates for production costs would have similarly impacted the survival of the smaller-scale, high production cost farms (0 to 320 acres) more adversely than the larger-scale commercial farms.

[9] Although an individual farm bill generally lasts only four years, the current farm policy concept has been applied since 1973. In addition, the impacts of a four-year farm bill last much longer. For these reasons a ten-year planning horizon was used to demonstrate the longer-term impacts of selected farm program provisions.

[10] Target prices were as specified in the 1981 farm program and the 1981 Farm Bill for the years 1982–85 [Johnson *et al.*]. After 1985, target prices were increased at the same rates specified for the period 1982–85. The loan rate in 1982 adjusted for the quality of cotton typically produced on the High Plains (42–31) was 46.7 cents per pound. After 1982 it was assumed to maintain the same relation to the target price as existed in 1982. The farmer owned grain reserve was included in the model because the typical farms had the option of raising grain sorghum. Participation in crop insurance was assumed at the 65 percent yield and highest price level (60 cents in 1982).

[11] NOGOV is not a representation of what would happen without any farm programs, since without farm programs the probability distribution of farm prices would be different.

aside in addition to the other 1981 Farm Bill provisions outlined in BASIC. Consistent with recent experience, the set-aside was assumed to be only 20 percent effective in reducing production for cotton and grain sorghum.

- NOINS assumes the farmer chooses not to participate in the all-risk crop insurance program under the premium structure that existed for 1982. All other provisions of the 1981 Farm Bill outlined in BASIC are in effect.

Evaluation Criterion

The following statistics were chosen to evaluate the structural impacts of the various programs:

- **Probability of survival** is defined as the probability that a farm will remain solvent through 1990, i.e., the number of solvent iterations divided by 50. This statistic indicates the staying power of different size farms under each policy scenario.
- **Probability of success** measures the likelihood of the farm earning a positive after-tax net present value, i.e., the number of iterations that net present value exceeded zero divided by 50. Using the then prevailing certificate of deposit interest rate of 13 percent, a 9.75 percent after-tax return on initial equity was required.
- **The present value of ending net worth** measures the financial growth of the firm over the ten-year period. It is the discounted (9.75 percent discount rate) net worth of the farm in the last year of solvency or at the end of the simulation period. When compared to the beginning net worth, it indicates the relative magnitude of financial growth.
- **Cropland acres farmed** is the sum of the acres owned and leased at the end of the simulation period.

Results

The 1981 Farm Bill provisions with a rigidly enforced $50,000 payment limit and no set-aside (BASIC) provided nearly complete assurance that typical producers in each farm size would survive (88 to 100 percent probability of survival) (Table 2). Smaller size farms, however, frequently realized less than a 9.75 percent return on initial equity. The 189 acre farm has only a two percent chance of receiving a 9.75 percent return on initial equity and a 100 percent chance of survival. The high survival rate for small farms was, therefore, largely a function of off-farm income. Under BASIC nearly all farm sizes grew in terms of increases in real net worth and acres operated. However, the largest farms grew the most in both absolute and percentage terms. The largest three farms experienced an average acreage increase of 27.1 percent, while the smallest farm increased its acreage by only 3.2 percent over ten years. Similarly the largest three farms experienced over a 20 percent increase in average present value of ending net worth while the 189 acre farm had a 16 percent decline in real net worth on the average.

Under BASIC the payment limit reduced deficiency payments for farms in the 2,019 acre and larger size categories. Removing the payment limit (NOLIM) exaggerated the growth of the larger farms observed for BASIC. Farms having over 2,019 acres generated an average net worth two to eight percent greater than under BASIC and enjoyed a higher probability of success.

A comparison of BASIC and NOLIM with NOGOV indicates cotton farmers who do not participate in the farm program are adversely affected across all farm sizes. More important, the results indicate that program participation was considerably more critical to the survival of the mid-size farms than to either the small-scale farms (189–511 acres) or the large-

TABLE 2. Comparison of the Impact of 1981 Farm Bill Program Provisions on Evaluation Criteria for Different Size Farms on the Southern Texas High Plains.

Evaluation Criterion and Farm Program Provision	Initial Farm Size							
	Acres							
	189	511	793	1,088	1,457	2,019	3,383	5,570
Probability of Survival								
BASIC	100	100	94	100	98	88	100	100
NOLIM	100	100	94	100	98	92	100	100
NOGOV	98	82	58	42	42	36	70	98
NOSUP	100	100	88	90	82	60	100	100
SASDE	100	100	100	100	98	92	100	100
NOINS	100	94	86	76	74	48	96	98
Probablity of Success								
BASIC	2	66	66	82	92	88	98	88
NOLIM	2	66	66	82	92	92	98	92
NOGOV	2	22	28	28	32	32	62	50
NOSUP	2	36	46	52	70	60	96	82
SASDE	2	80	80	88	98	92	98	94
NOINS	2	40	46	52	64	44	88	66
Initial Net Worth ($1,000)[a]	86	167	200	219	287	331	776	1,819
Present Value of Ending Net Worth ($1,000)								
BASIC	73	175	198	243	344	456	965	2,188
NOLIM	73	175	198	244	345	466	998	2,359
NOGOV	65	128	122	147	174	225	641	1,573
NOSUP	68	151	174	204	278	325	900	2,061
SASDE	80	193	236	266	375	527	1,078	2,457
NOINS	69	154	170	198	267	286	836	1,838
Initial Acres Operated	189	511	793	1,088	1,457	2,019	3,383	5,570
Acres of Cropland Operated After 10 Years								
BASIC	195	655	927	1,210	1,678	2,413	4,433	7,298
NOLIM	195	655	927	1,210	1,678	2,471	4,503	7,471
NOGOV	195	562	731	1,103	1,390	1,938	3,812	5,991
NOSUP	195	607	858	1,150	1,542	2,207	4,196	7,202
SASDE	192	671	963	1,232	1,745	2,512	4,593	7,420
NOINS	195	604	806	1,163	1,493	2,165	4,055	6,731

[a] Initial net worth present value of ending net worth are expressed in 1980 dollars.

scale farms (3,383–5,570 acres). For farms in the 793 to 2,019 size categories, the probability of survival was cut from 38 to 59 percent by failing to participate in the farm program. The net worth likewise fell by a greater percentage for these mid-size farms than for the larger and the smaller farms.

Nonparticipation in the target price and loan provisions of the 1981 Farm Bill (NOSUP) has the primary impact of reducing the probability of survival and success for the middle size farmers (793 to 2,019 acres). The very large and very small farmers are better able to survive despite an absence of price and income support—although for different reasons. While the large-scale farmers continue to grow at a rapid rate (25 to 29 percent increase in cropland over ten years), mid-size farmers barely show an increase. Small-scale farmers survive due to their low initial debt and high level of off-farm income, but they experience a decline in real net worth and no appreciable change in average acres farmed.

The addition of a set-aside option to BASIC (SASDE) simply enhances the growth advantage held by the large farms. Large farms grew even more relative to small or mid-size farm under the BASIC scenario.

A crop insurance program is important to High Plains Texas cotton farmers due to the high variability of yields. In addition, initial premiums under the all-risk crop insurance program were favorable to this area (not actuarially sound) [Lemieux *et al.*]. The result was that a farmer who did not take out crop insurance reduced his probability of survival, success, and growth. Crop insurance was particularly critical to the survival and success of mid-size farms. Large farms are better able to withstand the vagaries of yield risk and thus their probability of survival was not significantly reduced. Without crop insurance, however, their probability of success and growth potential was substantially reduced.

Summary

The objective of this study was to empirically test the link between farm program participation and farm survival, success and growth by analyzing the impacts of the 1981 farm bill on different size cotton farms located on the Texas Southern High Plains. Data necessary to describe different sized typical cotton farms were developed from a stratified random survey of producers in the study area. Eight typical farms, ranging in size from 189 acres to 5,570 acres, were simulated under six alternative farm policy scenarios to determine the 1981 Farm Bill's impacts on farm survival, success, growth, and accumulation of wealth.

The simulation results indicate farms of all sizes benefit from the price and income stabilizing components of the 1981 Farm Bill. However, the mid-size farms (511 to 2,019 acres) receive the greatest relative benefits since the farm program provisions increase their chances of survival from an average of 45 percent to an average of 95 percent. For farms smaller than 511 acres and greater than 2,019 acres, the 1981 Farm Bill provisions increase the chances of survival about three percentage points. Small farms (less than 320 acres) rely heavily on off-farm income and initial wealth to survive while larger farms (3,383 to 5,570 acres) rely heavily on cost and pecuniary economies in addition to initial wealth to survive.

Comparing the rate of growth for farms under the 1981 Farm Bill provisions to a scenario where the operator fails to participate in any government programs indicates the structural impacts of price and income support programs as well as crop insurance programs. For the smallest farm there was no change in the average ending farm size between the two scenarios. However, for the mid-size farms the program change reduced the average increase in farm size. On average, these farms experienced a decrease in size of approximately 3.6 percent from their initial level. The increase in cropland farmed was similarly slowed for the two largest farms from an average increase of 31 percent to only 10.1 percent. Thus eliminating farm programs benefits for large farms would not halt their growth but would reduce it substantially.

Similar structural impacts are observed if the price and income support provisions of the 1981 Farm Bill are removed. Mid-size farms grow an average of seven percent less in this case than when they are allowed to benefit from price and income support programs. The average ending farm size for the largest farm is reduced by only one percent if these programs are not directly available.

The trend toward larger farms on the Southern High Plains is accelerated by adding a set-aside to the basic 1981 Farm

Bill provisions of price and income supports and federal crop insurance. The reason is that mean prices of cotton and sorghum are increased more than enough to compensate for the lost production. The two largest farms are again able to grow more on the average than mid-size farms and the smallest farm shows no increase in average farm size over the basic 1981 Farm Bill.

Removing the payment limitation on deficiency payments had no effect on farms smaller than 2,019 acres. Removing the limitations, however, increased average real net worth approximately three percent for the 2,019 and 3,383 acre farms and over seven percent for the 5,570 acre farm. Thus, the biggest beneficiary from removing the payment limitation ceiling would be the 5,570+ acre farm which could achieve an increase in average real net worth of $171,000 over a ten year period.

In conclusion, large farmers receive more absolute benefits from the 1981 Farm Bill provisions than small farms; however, they are less dependent on farm program provisions for survival. Mid-size farmers who do not participate in government programs run a substantially greater risk of not surviving than large farms who do not participate. Small-scale farms have the same chances of survival, success, and growth whether they participate in farm programs or not.

Although a discontinuance of all farm programs would alter the yield, price level, and price variability simulated in this study, the results suggest an accelerated trend toward a bimodal distribution of farm sizes on the Southern High Plains of Texas should such occur. It is hypothesized that any program change that increases price variability would only accentuate the results derived here. Further study is, however, needed to confirm this hypothesis. In addition, further research into the extent to which the results of this study hold in other regions is warranted.

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