



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

PROCEEDINGS

45th Annual Meeting

WESTERN AGRICULTURAL ECONOMICS ASSOCIATION

Logan, Utah
July 23, 24, 25, 1972

Samuel H. Logan, Editor

STRUCTURE AND ORGANIZATION OF AGRICULTURE IN THE WEST

Chairman: William E. Martin, University of Arizona

AN ANALYSIS OF BANKRUPTCIES AND DEBTOR ARRANGEMENTS AMONG SAN JOAQUIN VALLEY COTTON GROWERS */

Sylvia Lane and Charles V. Moore
University of California, Davis, and Farm Production Economics Division,
Economic Research Service, U.S. Department of Agriculture, Davis

Introduction

The number of bankruptcies and debtor arrangements among farmers in the eastern San Joaquin Valley increased markedly in 1968, 1969, and 1970. There were 67 percent more bankruptcies in 1968 than in 1967. In the six-county study area (Kern, Tulare, Kings, Fresno, Madera, and Merced) the number of debtor arrangements in 1968 was double the number in 1967. With the continued increase in the numbers of bankruptcies and debtor arrangements in 1969 and 1970 an explanation for their occurrence seemed warranted.

The study was limited to cotton growers. Cotton is a major crop in the study area [1]. The specific objectives of this preliminary study were to develop hypotheses (1) for differentiating characteristics of bankrupts from those of debtors and both from those of other cotton growers, (2) to help identify causes for the bankruptcies and debtor arrangements and their increase, and (3) to aid in estimating their effects and to test methods of analysis for this particular application.

Debtor arrangements are plans, supervised by the referee in bankruptcy, under which insolvent firms who have petitioned voluntarily under the provisions of Chapter XI of the Bankruptcy Act, are granted extensions of time for the repayment of debt. Unlike a bankrupt, a "debtor" does not lose control of assets and is permitted to continue in operation.

Procedures

The court records of the 61 cases studied, all the applicable cases available filing petitions in 1968, 1969, or 1970, were drawn from the files of the Bankruptcy Court in Fresno, Calif. Twenty-eight had filed bankruptcy. Thirty-three had filed under the provisions of Chapter XI. Eight bankrupts and 17 debtors, i.e., 25 or 41 percent of the 61 cases were located and interviewed in depth. One major creditor in each of the cases was also interviewed.

The data for the random sample of "normal" cotton growers, i.e., cotton growers who were not bankrupts or debtors, used for comparison was compiled from 25 questionnaires returned by respondents to a mail survey. The 61 bankrupts and debtors were 1 percent of the 6,139 cotton farms in the six-county study area in 1964 [7, p. 454].

Sample attributes used in the comparisons and as variables in the analyses included:

1. size of farm,
2. form of business organization,
3. tenure and land ownership,
4. age of farm owner,
5. number of persons in household,
6. education,
7. experience,
8. size and composition of work force,
9. type of accounting system used,
10. past credit record and whether involved in former bankruptcy,
11. crop pattern,
12. income,
13. asset pattern, and
14. debt pattern [3, 6, 8].

Stated causes for the bankruptcies were examined, ranked, and evaluated, and some estimates were made of the effects of the bankruptcies and debtor arrangements.

Sample Characteristics

A very small percentage of cotton growers are forced into seeking relief from the Bankruptcy Court. In evidence, a fraction of 1 percent a year of cotton growers in the study area are filing for business bankruptcy or petitioning for relief under Chapter XI of the Bankruptcy Act. Sixty-one out of approximately 6,300 cotton growers in the study area filed in the three-year study period [8]. However, if small cotton growers are filing for personal bankruptcy rather than as business bankrupts, they would not appear in our study.

Bankrupts' and solvent growers' farms tend to be smaller than debtors'. The highest percentage group of bankrupts in the interviewed sample, 50 percent, had farms between 450 and 999 acres. The highest percentage group of the debtors, 35 percent, had farms over 2,000 acres (Table 1).

Bankrupts and debtors, like "normal" growers, are primarily sole proprietors, but the percentage of corporations among bankrupts and debtors is higher than among solvent growers. Tenants are more likely to be bankrupts than debtors, and tenants and part-owners of the land farmed are more likely to become bankrupts or debtors than growers who own more of the land they farm (Table 1).

Bankrupts' losses are less than debtors'. The means of the income distribution of the interviewed bankrupts and debtors were both negative, with the mean for the debtors being the larger absolutely. The mean for the sample of solvent cotton growers was positive as was the expected (Table 1).

All of the bankrupts and debtors are between 35 and 65 years of age (Table 1).

There are a larger number of dependents in bankrupt and debtor households than in farm households generally. The average number of persons in the interviewed bankrupts' households was 3.6; the average for the interviewed debtors was 4 (Table 1) [7]. Larger than average families were also associated with unsuccessful farm loans in a recent South Dakota study [8].

Bankrupts and debtors are better educated than California farmers as a whole. Judging by the median, debtors had a higher level of education than bankrupts or normal sample members (Table 1).

Long-term farm experience does not prevent becoming a bankrupt or a debtor. However, debtor and normal growers had more experience, on the average, than bankrupts (see Table 1).

Bankrupts' farms are predominantly family farms; debtors' are not. For the interviewed sample family members or partners provided 25 percent or more of the labor on 7 of the 8 or 88 percent of the bankrupts' farms, but this was the case on only 35 percent of the debtors' farms. Half the bankrupts had 2 or fewer persons in their entire work force. None had over 9 including family members (Table 1).

Judging by the accounting systems they used, debtors are better business managers than bankrupts. Granted an accounting system may not be a necessary or sufficient discriminator between good and poor managers, and its use may have been imposed by creditors, nonetheless, 88 percent of the bankrupts used a simple cash accounting system. By contrast 63 percent of the debtors used a more sophisticated system, i.e., cost accounting under an accrual system (Table 1). However, the percentage of normal sample growers and bankrupts relying on relatively simple systems were quite similar.

Bankrupts and debtors become delinquent in their payments two to four years before filing. First delinquencies among the interviewed sample dated from 1960. The largest number first became delinquent in 1966 (Table 1).

Only about half the cotton growers filing bankruptcy or petitions under Chapter XI have poor credit records. Forty-three percent of the bankrupts and 54 percent of the debtors in the interviewed sample had had satisfactory credit records prior to filing. None had been involved in a prior bankruptcy (Table 1).

Acres
Med
Mea
Sta
Busin
Pro
Par
Con
Tenur
Fu
Par
Ter
Net F
Med
Mea
Sta
Age o
Med
Mea
Sta
Numbe
Med
Mea
Sta
Educa
Med
Mea
Sta
Exper
Med
Mea
Sta
Perc
Own
Me
Me
Sta
Work
Me
Me
Sta
Work
Me
Me
Sta
Acco
Ta
Im
Past
Del
Me
Me
Sta
Cred
Sa
Po
Liqu
L
a
b
c
To
St
To
a/
b/
c/
d/
e/
f/
g/

Table 1. Personal and Farm Characteristics of 25 Bankrupts and Debtors and 25 Solvent Cotton Growers, Eastern San Joaquin Valley, California a/

Item	Sample bankrupts	Sample debtors	Interviewed sample total	Normal sample	Six-county region	State
Acres Farmed						
Median	274.5	1499.5	1499.5	280	49.8	
Mean	1082.7 ^{c/}	2000.9 ^{d/g/}	1707.1 ^{e/}	697.2	261.4	
Standard error	(1254.7)	(1592.0)	(1592.7)	(967.3)	(15.6)	
Business Form						
Proprietorship (percent)	50.0	50.0 ^{d/}	50.0	60.9		
Partnership (percent)	37.5	37.5	37.5	34.8		
Corporation (percent)	12.5	12.5	12.5	4.3		
Tenure						
Full owners (percent)	12.5	11.8 ^{b/d/g/}	12.0	28.0	64.0	
Part owners (percent)	37.5	82.2	68.0	60.0	25.0	
Tenants (percent)	50.0	5.9	20.0	12.0	11.0	
Net Farm Income						
Median	0	-10000.00	-7580.00	8349.20		
Mean	-3910.67 ^{c/f/}	-30736.73 ^{d/g/}	-26265.72 ^{e/}	16426.29		16003.00
Standard error	(6773.47)	(74510.37)	(68434.59)	(28125.85)		
Age of Farm Operators						
Median	44.5	49.5	49.5	52.0	49.5	
Mean	48.8	50.2	49.7	52.0	50.3	
Standard error	(10.4)	(8.6)	(9.0)	(11.9)		
Number of Persons Living in Farm Household						
Median	3.5	4.0	4.0	3.5		
Mean	3.6	3.9	3.8	4.1		3.33
Standard error	(1.6)	(1.4)	(1.9)	(1.9)		
Educational Level						
Median	12.0	14.0	14.0	12.0		11.0
Mean	12.3	12.9 ^{d/g/}	12.7 ^{e/}	11.7		12.0
Standard error	(3.4)	(2.4)	(2.7)	(3.5)		(3.5)
Experience: Years Operating Own Farm						
Median	12.0	25+	22	24.0		
Mean	15.5 ^{c/}	24.0 ^{b/}	21.1	23.16		
Standard error	(7.6)	(10.4)	(9.5)	(10.14)		
Percent of Labor Force Provided by Owners or Partners						
Median (percent)	22.0	56.0	37.0			
Mean (percent)	48.6	34.3 ^{b/}	34.1			
Standard error	(11.57)	(25.26)	(15.60)			
Work Force with Family						
Median	3.0	6.0	5.0	7.0		
Mean	4.0	10.8 ^{b/}	8.6	6.7		
Standard error	(2.8)	(11.2)	(9.8)	(5.5)		
Work Force without Family						
Median	2.0	6.0	4.0			
Mean	2.75	11.3 ^{b/}	7.68			
Standard error	(2.66)	(10.0)	(9.9)			
Accounting System						
Tax purpose only (percent)	87.6	37.5 ^{b/d/}	54.3	85.0		
Improved system (percent)	12.5	62.5	45.7	15.0		
Past Credit Record - Year of First Delinquent Loan						
Median year	1966	1966	1966			
Mean year	1965.4	1965.8	1965.8			
Standard error	(2.6)	(1.4)	(1.6)			
Credit Record						
Satisfactory (percent)	42.9	53.8	53.8			
Poor (percent)	57.1	46.2	46.2			
Liquidity and Debt Ratios						
Liquidity						
a) cash/current liability	0.0273	0.0231		2510.94		
b) net current assets/total assets	0.2170	0.0951		0.2770		
c) net current assets/net current debt	0.4104	0.8575		4934.37		
Total debt/total assets	5.2662	0.9812		0.2928		
Short term unsecured debt/income	49901.90	2120.92		0.5409		
Total debt/income	143410.22	15910.07		3.8525		

a/ t values examined at the 95 percent level of significance.

b/ Significant difference between means for debtors and bankrupts.

c/ Significant difference between means for bankrupts and normal sample.

d/ Significant difference between means for debtors and normal sample.

e/ Significant difference between means for total sample and study area or State.

f/ Significant difference between means for bankrupts and study area or State.

g/ Significant difference between means for debtors and study area or State.

Assets

Assets reflect the fact that bankrupts farm fewer acres than debtors and own less of the land they farm. Parenthetically, debtors, again probably reflecting their scale of operation, were owed more. Normal cotton growers were more heavily insured (Table 2).

Debts

Cotton oil companies taking crop mortgages as security are the most important source of borrowed funds for California cotton growers filing bankruptcy (Table 3). Banks are the most important source of secured loans for debtors and solvent cotton growers. Cotton oil companies and insurance companies are the second and third leading sources of secured loans for debtors. Both bankrupts and debtors owe relatively high amounts on loans secured by irrigation equipment.

Debtors have more secured debt than bankrupts or normal cotton growers again probably reflecting their larger scale of operation. Normal cotton growers have more secured debt than either the bankrupts or debtors (they owed the highest amount, on the average, to ginners) probably reflecting their higher credit-worthiness.

Liquidity and Debt

Liquidity and debt ratios all reflect the fact that the normal growers are solvent (as was to be expected). The total debt to total assets ratio is higher for the bankrupts than the debtors and higher for the debtors than the normal sample growers. Three of the ratios -- cash to current liabilities, net current assets to total assets, and total debt to income -- were somewhat more favorable for the bankrupts than the debtors in the interviewed sample. (The latter could be accounted for by the fact that both total debt (Table 1) and losses for the debtors were larger.)

Cropping Pattern and Risk Propensity

Judging only by the variance of expected income from the crops, cropping patterns of bankrupts and debtors have more risk than those of solvent growers. Six of 24 farms in the interviewed sample were in the highest-risk group insofar as income variability due to cropping pattern was concerned (Figure 1). Cropping patterns of normal growers compared to those of the bankrupts and debtors led to less expected income variance for any given level of income per acre, or less risk due to this factor.

Causes of Bankruptcies and Debtor Arrangements

About half the bankruptcies and debtor arrangements are due to disastrous occurrences over which neither farm operators nor policy makers have any control. Fifty-six percent of the interviewed growers blamed their predicament primarily on a disastrous occurrence. This included 4 or 50 percent of the bankrupts and 10 of 17 or 58 percent of the debtors. Disregarding the individual's rankings of the causes, among all causes cited (as many as five in each case) disasters (weather, insects, partner defecting, etc.) were cited most often by bankrupts and debtors. The cost-price squeeze received the second highest frequency of citation by the bankrupts; liquidity problems were second highest for the debtors. Creditors thought management error and the cost-price squeeze were the most frequent causes of bankruptcies, and the cost-price squeeze was the most frequent cause for the debtor arrangements. The person interviewing the bankrupts, debtors, and creditors -- who was probably the least subjective evaluator -- cited disasters and the cost-price squeeze as the most frequent causes of the bankruptcies and disasters as the most frequent cause for the debtor arrangements (Table 4).

Cotton and vegetables were the two crop categories most often associated with financial difficulties of the bankrupts and debtors. Obviously, the inclusion of cotton in this instance is expected since the sample was composed of cotton growers.

Factors Contributing to Increase

The combined effect of the market price, yield, increasing costs of operation, and the direct payment and diversion programs contributed to the increase in bankruptcies and debtor arrangements among cotton growers in the study area in 1969 and 1970. A hypothetical grower with 100 acres in the study area would have had a positive net income in 1966, 1967,

Table 2. Assets of Cotton Growers Filing in Federal Bankruptcy Court Eastern San Joaquin Valley, California, 1968, 1969, or 1970 Solvent Cotton Growers, 1969

Category	Interviewed and un interviewed sample							
	Bankrupts				All insolvent farms			
	No. re- porting	Mean asset	No. re- porting	Mean asset	No. re- porting	Mean asset	No. re- porting	Mean asset
		Level ^{a/}		Level ^{a/}		Level ^{a/}		Level ^{a/}
Cash on hand	10	2,406	12	2,868	22	2,658	23	978
Insurance policies	10	1,727	7	2,569	17	2,074	16	22,844
Accounts receivable and unliquidated claims	13	29,397	21	63,351	34	50,369	8	28,963
Crops	12	31,150	10	76,720	22	51,863	7	34,364
Miscellaneous	30	3,874	23	12,680	53	7,559	17	39,749
Stocks and bonds	5	5,720	14	37,144	19	28,874	15	10,226
Vehicles	24	2,579	16	29,256	40	13,250	18	6,191
Farm machinery	24	31,304	26	180,292	50	108,778	21	37,360
Real estate Farm	18	286,779	28	641,348	46	498,103	17	169,611
Residence	14	29,761	15	183,630	29	109,348	14	31,400
Household goods	14	12,533	15	32,851	29	23,043	--	--
Mean ^{b/}		39,748		114,791		81,447		38,169
Standard deviation		82,936		186,009		143,444		48,128

a/ Non-zero samples used.

b/ Mean of total assets reported.

Table 3. Debts of Cotton Growers Filing in Federal Bankruptcy Court Eastern San Joaquin Valley, California, 1968, 1969, or 1970 Solvent Cotton Growers, 1969

Category	Interviewed and uninterviewed sample						Normals	
	Bankrupts		Chapter XI		All insolvent farms			
	No. re- porting	Mean debt	No. re- porting	Mean debt	No. re- porting	Mean debt	No. re- porting	Mean debt
		Level a/		Level a/		Level a/		Level a/
Unsecured debt								
1. Banks	13	2,490	8	4,216	21	3,147	--	--
2. Rent	19	14,988	12	13,082	31	14,214	6	17,905
3. Wages	--	--	1	5,793	1	5,793	3	7,535
4. Irrigation equipment companies	20	2,342	24	6,397	44	4,554	--	--
5. Farm equipment companies	26	3,111	23	8,353	49	5,572	--	--
6. Utilities	22	1,356	23	4,367	45	2,895	6	289
7. Chem., fert., and seed companies	29	14,788	27	46,648	56	30,149	4	817
8. Petroleum companies	24	1,723	24	3,566	48	2,650	7	5,973
9. Ginners	12	9,331	5	12,976	17	10,403	1	44,646
10. Repair and supply companies	28	2,208	26	9,591	54	5,762	6	1,274
11. Professionals	11	782	19	3,069	30	2,230	8	488
12. Insurance companies	17	1,265	12	1,944	29	1,546	5	35,041
13. Contractors	9	2,539	17	4,611	26	3,894	1	300
14. Individuals	19	10,828	21	5,369	40	7,876	2	58,500
15. Retailers	19	918	16	554	35	752	3	1,664
16. Medical creditors	12	611	7	2,252	19	1,216	6	400
17. Miscellaneous	11	6,936	19	4,793	30	5,579	--	--
18. Mean		4,764		8,093		6,367		13,452
Standard deviation		4,991		10,546		7,034		19,813
Secured debt								
1. Internal Revenue Service	9	475	11	3,343	20	2,052	11	4,660
2. State-county taxes	15	5,358	15	4,926	30	5,142	15	2,086
3. FICA	1	924	9	3,426	10	3,176	10	685
4. Federal Land Bank	6	35,242	3	52,282	9	40,922	--	--
5. Commercial banks	25	30,854	28	359,593	53	204,527	14	69,628
6. Savings and loan associations	10	5,110	1	55,817	11	9,720	--	--
7. FHA and PCA b/	--	--	3	77,667	3	77,667	--	--
8. Irrigation districts	1	276	7	1,664	8	1,491	8	1,877
9. Irrigation equipment companies	8	10,688	6	54,686	14	29,544	--	--
10. Equipment companies	15	9,322	16	51,535	31	31,109	5	4,956
11. Equipment credit companies	4	3,337	4	15,590	8	9,463	--	--
12. Insurance companies	6	188,303	15	211,680	21	205,001	--	--
13. Chemical and fert. companies	8	22,868	6	17,001	14	20,354	--	--
14. Cotton oil companies	20	111,952	17	145,252	37	127,252	--	--
15. Automobile finance companies	4	1,290	6	3,518	10	2,626	--	--
16. Miscellaneous credit	12	25,793	11	24,342	23	25,099	--	--
17. Private	15	37,191	21	85,999	36	65,662	--	--
18. Mean		30,561		68,725		50,636		13,982
Standard deviation		50,387		93,885		66,751		27,312
Mean total ^{c/}	450	17,663	463	38,409	913	28,502	121	13,717

a/ Non-zero samples used.

b/ Farmers Home Administration and Producers Credit Association.

c/ Mean of unsecured and secured debts reported.

Table 5. Standard Regression Coefficients^{a/} Eastern San Joaquin Valley,
California Interviewed Sample Bankrupts and Debtors, 1967, 1968,
or 1969 Solvent Cotton Growers, 1969

Variables	Bankrupts & debtors		Normal cotton growers	
	Coefficient	T-values	Coefficient	T-values
Type of business organization ^{b/}	0.6969* (1.2116)†	4.3837	0.3629 (0.0956)	2.0689
Number in household ^{c/}	0.5763* (0.5605)	3.8021	-0.1022 (0.0282)	-0.6095
Yield ratio ^{d/}	-0.4635* (2.9126)	-2.9953	0.6447* (0.1428)	3.6871
Percent barley ^{e/}	-0.4476 (0.0709)	-2.0556	-0.2813 (0.0035)	-1.1753
Accounting system ^{f/}	-0.4088* (1.7821)	-2.3999	0.0471 (0.2366)	0.2851
Coefficient of variation ^{g/}	0.3480 (0.9381)	1.4951	-0.2652 (0.1089)	-1.1131
Percent hay ^{e/}	-0.2746 (0.0713)	-1.3892	-0.4619 (0.0035)	-1.7844
Acres owned ^{h/}	-0.2568 (0.0005)	-1.4018	-1.1356* (0.0003)	-3.9059
Age group ^{i/}	0.2516 (0.5070)	1.7034	-0.1628 (0.0310)	-0.9608
Percent other ^{e/}	-0.2014 (0.0643)	-0.5977	-0.0499 (0.0042)	-0.1440
Percent cotton ^{e/}	0.1281 (0.0525)	0.7385	0.0254 (0.0062)	0.1159
Acres rented ^{h/}	0.1118 (0.0003)	0.6606	1.1499* (0.0008)	5.1966
R ²	0.7876		0.9177	
Durbin-Watson statistic	1.2245		1.6634	

* Significant at the 95 percent level.

† Standard errors in parenthesis.

a/ The function used in the regression analysis was debt-assets ratio = f (age group, number in household, rented acres, owned acres, type of business organization, accounting system, cropping pattern, coefficient of variation, and $\sum_{i=1}^k \frac{(\text{actual yield})}{(\text{normal yield})} / k$ where k = 3.).

b/ Farms were typed according to their form of business organization as being sold proprietorships, partnerships, or corporations with ten stockholders or less and corporations with ten or more stockholders.

c/ Number in household included all persons living in sample households.

d/ The yield ratio was computed for 1969 in the case of the normals or the petition year for the bankrupts and debtors. Actual yields were yields per acre for the three crops with the largest total acreage on each of the sample farms. Normal yields were average yields for the appropriate county for 1969 as reported in United States Department of Agriculture, Agricultural Statistics, 1970.

e/ Cropping pattern included as separate variables acres of cotton, barley, hay, and other (including acres fallow) as percentages of total acres for 1969 or petition year.

f/ Accounting systems were classified as being for tax purposes only (cash); or more sophisticated (accrual).

(Table 5 continued on next page.)

g/ The coefficient of variation was computed as follows:

(1) Variance of income was computed from the equation

$$\sigma_t^2 = \sum_{i=j}^n \sigma^2 + \sum_{\substack{ij \\ i>j}} \text{cov}_{ij}$$

where σ^2 and cov_{ij} were from Bill Lin, "Adjusted Variance-Covariance Matrix for the Net Incomes of Crop Activities: Sanders Farm," unpublished manuscript, Department of Agricultural Economics, University of California, Davis, 1971;

(2) the coefficient of variation was then computed using the formula

$$\sqrt{\sigma_t^2 / \Sigma(Y)}.$$

h/ Rented acres plus owned acres equaled size of farm.

i/ Age groups were designated as under 35; 35-39; 40-44; 45-49; 50-54; 55-59 and over 60.

Table 6. Discriminant Analysis Classification Matrix, Eastern San Joaquin Valley, California, Interviewed Sample Bankrupts and Debtors and Solvent Cotton Growers

Group	Classified as bankrupts		Classified as debtors		Classified as normals		Totals
	number	percent	number	percent	number	percent	number
Bankrupts	6	86	0	0	1	14	7
Debtors	0	0	13	93	1	7	14
Normals	1	6	3	18	13	76	17

Table 7. Variables Tested in Discriminant Analysis and Coefficients, Eastern San Joaquin Valley, California, Interviewed Sample Bankrupts and Debtors, 1970 Solvent Cotton Growers, 1971

Variables tested	Bankrupts		Debtors		Normals	
	Rank	$W^a/$	Rank	$W^a/$	Rank	$W^a/$
Ratio of total debt to total assets	1	44.05956	2	62.54266	1	58.26609
Ratio of net worth to total assets	2	40.22573	1	62.59503	2	56.70342
Yield ratio (1969 or petition year)	3	10.92112	3	8.54241	3	10.00412
Ratio of non-real estate debt to total debt	4	9.99129	4	6.04237	4	6.46994
Number of persons in household	5	5.15857	5	5.26059	5	6.18260
Years of formal education	6	4.63580	6	4.03651	6	4.61626
Age of cotton grower	7	1.95275	7	1.61431	7	1.97356
Percentage of land leased	8	0.26208	10	0.22246	8	0.23441
Number of employees	9	0.10577	9	0.15627	9	0.18273
Production record, 1968	10	0.02211	11	0.02215	10	0.02771
Production record, 1969	11	-0.02786	12	-0.02268	11	-0.02601
Years of farming experience	12	-0.78382	13	-0.46312	12	-0.82313
Ratio of total debt to net worth	13	-1.19061	15	-1.36620	13	-1.24884
Cash accounting dummy	14	-4.05351	8	1.42111	14	-1.89231
Ratio of non-real estate debt to non-real estate assets	15	-4.55685	14	-0.83674	15	-2.68407

$$a/ W = 1 - \frac{D^2(p-1)}{D_p^2} \quad \text{where } p = \text{number of variables in the discriminant function.}$$

$$\text{Mahalanobis } D^2 = \frac{(\bar{Z}_A - \bar{Z}_B)^2}{S_Z^2} = 94.40225.$$

Table 4. Analysis of Causes by Frequency of Citation Eastern San Joaquin Valley,
California Interviewed Sample Bankrupts and Debtors, 1970

Causal category	Bankrupts' statements			Debtors' statements			Creditor's statement			Interviewer's statement		
	Times cited	Pct.	Times cited	Pct.	Bankrupts		Pct.	Debtors		Pct.	Bankrupts	
					No.	Pct.		No.	Pct.		No.	Pct.
Disaster	8	33.3	20	38.4	7		6.2	5	15.6	10	27.0	33.4
Major judgement error	3	12.5	8	15.4	2		12.5	3	9.4	4	10.8	13.0
Management error	1	4.2	1	2.0	5		31.2	6	18.8	4	10.8	8.7
Liquidity	3	12.5	11	21.1	2		12.5	5	15.6	5	13.6	23.2
Cost-price squeeze	6	25.0	9	17.3	5		31.3	8	25.0	10	27.0	13.0
Other	3	12.5	3	5.8	1		6.3	5	15.6	4	10.8	8.7
Total Citation	24 ^a / ₁₀₀		52 ^a / ₁₀₀		16 ^a / ₁₀₀		100	32 ^a / ₁₀₀		100	32 ^a / ₁₀₀	69 ^a / ₁₀₀

^a/ Total includes all responses. Respondents cited one or more causes in each case.

and 1968 and substantial losses in 1969 and 1970. Over the five years the gains would have only slightly offset the losses. If a grower was in difficulty, the cost-price squeeze did not improve the likelihood of his returning to solvency.

Utilizing regression analysis the significant variables associated with increases in debt-asset ratios of the interviewed bankrupts and debtors as one set, were (1) type of business organization, (2) number in household, (3) the yield ratio (which had a negative sign denoting the higher the ratio between the actual yield and the normal yield the lower the debt-asset ratio) (Table 5), and (4) the accounting system used (which has a negative sign denoting the use of a more sophisticated accounting system was associated with a lower debt-asset ratio).

Parenthetically in a discriminant analysis [2] which disclosed the three sample sets, i.e., bankrupts, debtors, and normal cotton growers to be distinguishable (Table 6), the variables that served to differentiate one set from the other the best were the debt-asset ratio, the net worth-asset ratio (which depends on the same factors) and the yield ratio (Table 7). Lower-than-expected yields appear to be one of the most important factors accounting for increasing debt-asset ratios and resulting increases in bankruptcies and debtor arrangements. For the "normal" sample the significant variables (which for this set should be interpreted as attributes), in order, were the yield ratio, acres rented, and acres owned with a negative coefficient.

Effect of Subsidy Limitation

If all other factors remain constant, limitations on subsidy payments to cotton growers should cause some increase in the number of bankruptcies and debtor arrangements. If the \$55,000 limitation had been strictly construed and enforced in terms of the definition of a farm and an operator, one of the bankrupts (bankrupts in the interviewed sample received an average of \$21,213) and five of the debtors (debtors in the interviewed sample received an average of \$41,108) would have been affected. Lower limitations will have greater effects.

Effects on Creditors

In the case of farm bankruptcies, unsecured creditors receive nothing. For the bankrupts in the entire sample total assets were 63 percent of total secured debt. Apparently, a small percentage of the debtors become bankrupts. Only one of the 61 cotton growers in the study changed his status from Chapter XI to bankruptcy subsequent to his initial filing. Creditors of the debtors would probably have a large portion of their claims repaid over an extended period of time.

Effects on Communities

Reductions in income sustained by communities may be over twice the losses sustained by creditors. According to Martin and Carter each dollar decrease in income to central California cotton farmers causes a reduction in income to other sectors of the economy of approximately \$2.28 [4].

Effects on Bankrupts and Debtors

For the most part cotton growers who file bankruptcy subsequently become agricultural wage-earners. Of 12 bankrupts in the sample who replied to a follow-up questionnaire 7 were employed as agricultural wage-earners, 2 had returned to farming, 2 were employed outside of agriculture, and 1 was unemployed. Debtors tend to remain operators of their farms. Of 16 debtors who replied to a follow-up questionnaire in 1971, 11 were still operating their farms. One was employed as an agricultural wage-earner. Two had part-time employment. One was employed outside of agriculture, and one was unemployed. Unemployment rates for study area counties were higher than for the State as a whole making re-employment for those who leave farming relatively difficult.

Summary and Conclusions

Only about 1 percent of the commercial cotton growers in the study area filed for bankruptcy or asked for relief under Chapter XI of the Bankruptcy Act in 1968, 1969, and 1970. The increase in their number in these years may be attributed to the combined effects of the cost-price squeeze, the "credit-crunch" in 1969, relatively lower yields in

these years than previous years, relatively high-risk cropping patterns in some cases, lower direct payments in some cases, and the cut-off of the diversion program. (Lower-than-expected yields, a leading determinant for the financial difficulties, were lower for the bankrupts than for the debtors and lower for the debtors than for the normal growers.) Those who suffered from an unexpected occurrence beyond their control (about half) did not have the needed margin of resources required for recovery. The bankrupts and debtors were generally not uneducated, inexperienced, the very young or old or the smaller farm operators (debtors operated larger farms than bankrupts or solvent growers), but they were generally tenants or part-owners, sole proprietors (although an inordinately high percentage compared to the State as a whole were corporations), and family farms. Furthermore, the bankrupts did not appear to be sophisticated business managers while the debtors did. The bankrupts and debtors appeared to assume higher risks than the solvent cotton growers. Cropping patterns of normal growers compared to the bankrupts and debtors led to less expected variance for any given level of income per acre, or less risk. Due to the small samples utilized, the present study should be replicated on a larger scale over a longer time period to validate the findings. One of the areas suggested for further investigation is why the Farmers' Home Administration did not appear to be used as a lender of last resort.

FOOTNOTES

*/ A debt of gratitude is owed to Gordon Rausser, Robert Firch, and Melvin D. Skold who reviewed the manuscript, but all errors and omissions remain the responsibility of the authors.

1/ An attempt was made to contact all 61 cases. Thirty-six of the bankrupts and debtors either could not be located or would not consent to an interview.

REFERENCES

1. California Farmer, "California at a Glance, Crop Year 1970," San Francisco, July 1971.
2. Johnson, Norman L., and Fred C. Leone, Statistical and Experimental Design, Vol. 2, New York: John Wiley and Sons, Inc., 1964, pp. 281-289, and particularly p. 287.
3. Lane, Sylvia, "Sub-Marginal Credit Risks: The Comparative Profiles and Their Implications," Journal of Consumer Affairs, Spring, 1971, pp. 24-39.
4. Martin, W.E., and H.O. Carter, A California Interindustry Analysis Emphasizing Agriculture, Giannini Found. Res. Rept. No. 250, Part II, 1962.
5. Moore, C.V., and J.H. Snyder, A Statistical Profile of California Corporate Farms, Un. of Calif. Agr. Ext. Info. Series, December 1970, pp. 27 and 30.
6. Stanley, David T., and Marjorie Girth, Bankruptcy, Problem, Process, Reform, Washington, D.C.: Brookings Institution, 1971 (see chapter 6, p. 108).
7. U.S. Bureau of the Census, Census of Agriculture, 1964, Statistics for State and Counties, California, 1967.
8. U.S. Department of Agriculture, Economic Research Service, An Analysis of Successful and Unsuccessful Farm Loans in South Dakota, February 1971.

AN ANALYSIS OF BANKRUPTCIES AND DEBTOR ARRANGEMENTS
AMONG SAN JOAQUIN VALLEY COTTON GROWERS: DISCUSSION

Robert S. Firch
University of Arizona

When one sets about discussing the statistical analyses of someone else in this context, the role of "devil's advocate" is impossible to avoid if he is to properly discharge his responsibilities. He is forced into this role because he usually does not have access to the raw data, and even if he did have them available, he would usually not have the time or other resources to test alternate hypotheses or the seriousness of what he believes may be errors in approach or interpretation.

The authors have certainly given thorough study to the farm businesses that they chose to study, although it may be reasonable to question whether the problem warrants the effort expended. Filings for bankruptcy did increase substantially from 1967 to 1970, but evidence that I was able to find suggests that the failure rate of San Joaquin Valley cotton farms in 1970 may have still been below the failure rate of nonfarm businesses.

To the credit of the authors they do not make any bold claims for the general applicability of their results or prescriptions for correcting the problem, if in fact a problem exists. Facetiously, one might prescribe from their results that farmers, to avoid bankruptcy, should not operate a cotton farm if younger than 35 or older than 65, should not have any children, and should not expose themselves to a college education.

One of the reasons that broad generalization from this research is not carried forward is, of course, the very small sample size. The bankrupt category contained only eight farms and the total of the debtors was only 17 farms. The 25 filings for bankruptcy occurred during a three-year period, but the authors give no information about the distribution among the three years. On many of the characteristics studied, they had data on only 16 of the 17 debtor farms in the latter group. However, Table 8 covers 22 debtor farms for some unexplained reason.

The authors interviewed 25 "normal" farms in order to have some basis for identifying characteristics of bankrupt and debtor farms that differ statistically from other farms. Close examination of Table 3 reveals that the distributions of farm sizes in the bankrupt and debtor groups differs substantially from the distribution of sizes in the normal group. The mean of the bankrupt group is 50 percent larger than the normal group, and the debtor group is 200 percent larger than the mean of the normal group. While the normal group has 32 percent of the farms smaller than 180 acres, the bankrupt group has but one of eight and the debtor group one of 17 farms in this size range. Thirty-five percent of the debtor farms exceeded 2,000 acres, while the normal group had only 8 percent in excess of 2,000 acres. Because the size distributions are so different, one can only wonder if it would not be more appropriate to say that the authors have found, for instance, that operators of large farms have spent a significantly larger number of years in school than operators of small farms rather than to say that debtor farm operators have significantly more years of schooling than solvent farm operators as the authors imply.

This ambiguity of the meaning of the results might have been avoided if the authors had carefully developed a "normal" sample deliberately stratified by size to make it comparable to the bankrupt and debtor groups. Partial correlations with farm size included as one of the variables would probably provide some insight into determining if the group of normal farms that was used is a reasonable basis for comparison.

The authors apply discriminant analysis to their data in order to determine if the characteristics of the bankrupt, debtor, and normal farms differ in sufficiently systematic ways to allow consistent classification by these characteristics. They apply the discriminant analysis to 7 of the 8 bankrupt farms, 14 of the 17 debtor farms, and 17 of the 25 normal farms but give no indication of their criteria for excluding farms from this analysis. It could be argued that nearly all of power to discriminate emanates from the debt-asset ratio and net worth-asset ratio variables which are virtually definitions of the groups. If these two variables are ruled out on tautological grounds, the three groups are probably not distinguishable by the other characteristics used.

Since this paper that I have been discussing does not reach conclusions possessing any

great power of generalization or prediction, it might be more appropriate to preface the paper with a statement to the effect that it reports the results of a preliminary study.