The Effect of Social and Economic Variables on Farm Performance

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I. Introduction

In a developing country (LDC) where the policy maker is faced with the necessity of selecting the appropriate policy strategy for economic development, the need for understanding the influence of social and economic variables on farm production and economy is of main importance. The experience of most LDC's indicates that an interventionist policy which does not take into account the heterogenity of physical and attitudinal differences of farm environment and of farmers themselves is unlikely to succeed. This is especially true where resources are limited and government intervention is relied upon to maintain sectoral earnings and employment.

In this paper we make the argument that socio-economic variables exert an important influence on farm earnings, yield and cost. Several hypotheses are formulated and tested using 1974 survey of four regions in Mexico. In the first section of the paper the relationship of production theory and socio-economic variables are briefly discussed. Also in this section the hypothesis to be tested are spelled out. In the next section data, methodology and findings are discussed.

II. Production and Earnings of Farms in LDC's

Modern production theory suggests that a technical relationship exists between the level of input and output. It assumes that behavioral motivation governed by the principle of economic

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optimality, given the production function will determine the level of input and the producer's earnings for any given period. However, empirical studies and observations about input and output levels as well as earnings of farms in LDC's suggest that social and economic variables exert a significant impact on technical relationship and behavioral motivation.

Earnings and production performance of farms have been shown to be strongly influenced by motivations and outside constraints. In a number of studies the influence of many exogenous variables such as tenancy status, credit accessibility, size of farms, education and age, on farm performance have been tested.[1] Economic theory suggest that those variables can influence the production and motivational systems of farmers in the following ways:

a) The tenancy status could affect the choice of technique, risk perception and within a particular institutional setting, the prices famers pay for their products;

b) Credit accessibility and attitudes toward indebtedness, affect the choice of techniques and the actual level of inputs used in production;

c) The size of farm affects a variety of economic, technical and behavioral conditons. For example, if indivisibility exists, then economy of scale would benefit larger farms. Also, institutional influences by larger farmers may in turn influence commercial conditions for input and output including prices.

d) Education may influence farmers' attitudes toward risk. The farmer with more education might be better able to exploit the technical opportunities open to him as well as utilize more effectively his farms' resources:

e) Age may have an effect on production and earning through better management associated with longer experience. However, age may influence farmer's attitudes towards uncertainty about production choices, decrease labor input and change the economic behavior of farmers.

But regardless of how these variables affect motivation one should expect such variables to be correlated with the level of production, costs and earnings.

Other variables could also exert an effect on the technical relationships and behavioral motivations. Management skills might be

much more significant than age or education in determining the final outcome of a farmer's efforts.

Hypothesis Tested

In order to test the influence of socio-economic variables on farm yields, earnings and farm costs the following hypothesis are advanced:

Hypothesis 1
Tenancy status of non-owner of land has a negative impact on yields, earnings and costs of the farm.

Hypothesis 2
Credit use is associated with higher level of earnings, higher yields and lower costs on farms.

Hypothesis 3
The size of a farm in a region of "traditional technology" is associated negatively with earnings, costs and yields. In an area of modern agriculture the association between the size and cost, earnings and yields is expected to be positive.

Hypothesis 4
The age of a farmer is positively associated with earnings and yields and negatively with costs.

Hypothesis 5
The education in the area of traditional technology is neutral with respect to cost, earnings and yields but positive in modern agriculture regions.

III. Data, Methodology and Findings

The empirical investigation carried out in this paper is based on a 1974 survey of four regions in Mexico. The sampled area was stratified by area photography and then farms in each zone were randomly selected. The sample size ranges from 157 to 288 farms. A detailed profile and description of the sample zones can be found in "Social and Economic Profiles of Farms in Oaxaca, Serdan, Durango and Nayarit in Mexico.[2]

The basic methodology used is statistical inference about the parameters of population based on information from sample population. Due to the size of the samples, the probability of erroneous inference from test results using parametric test statistics is low. With large numbers of observations almost all relevant distributions can be approximated by normal distribution. This allows us to use parametric test statistics derived on the assumption that observed values are normally distributed.

The effects of socio-economic variables on farm performance in the four Mexican regions may be ascertained from findings reported in tables 1 through 5. From the tables the following statements can be made:

1. Hypothesis 1 on the tenancy status is to be rejected. Even though in the more advanced region of Nayarit, private farmers are showing slightly better results than is the case in the remaining regions the association found between private land ownership and costs, earnings and yields did not support the hypothesis.

2. Hypothesis 2 on the use of credit was not supported. In all regions the direction of association between use of credit and earnings was negative, while that between credit and costs was positive.

3. Hypothesis 3 regarding the size of farms is supported. Earnings and yields had a tendency to be higher for larger farms in the region of Nayarit with modern agriculture. They were lower as the size of farms increased in the area of traditional agriculture.

4. Hypothesis 4 on the influence of the age of farmers on costs, earnings and yields is not supported.

5. Hypothesis 5 concerning the influence of education in traditional agriculture is to be rejected. The alternative hypothesis of positive influence of education can be accepted except for the Durango region. For advanced methods of agriculture, in Nayarit, the hypothesis is accepted for earnings and rejected for corn yields.

A further step in the analysis was to test for the influence of the eight socio-economic variables on residual variance of corn yields after taking into account input levels. The resultes are presented in Table 6. In the Table F values of the ratio between the appropriate sum of squares and the error of sum of squares are given. This ratio is spelled out in equation (1). The nominator is the difference between the sum of squares of unrestricted regression and restricted formulation multiplied by appropriate degrees of freedom. The denominator is the estimator of the sum of squares due to error

Table 1

AVERAGE COST, EARNINGS, NET EARNINGS AND YIELDS PER HECTARE FOR TENANCY CATEGORIES IN 1974 (IN CURRENT PESOS, YIELDS IN KG. PER HECTARE)

Region	Nayarit		Durango		Oaxaca		Cd. Serdan	
Category	Ejido	Priv. Owner	Ejido	Priv. Owner	Ejido	Priv. Owner	Ejido	Priv. Owner
Cost/Ha	3200[1]	2130	1470[1]	940	6000[1]	4700	2600[1]	800
Earnings/Ha	5200	4700	2700[1]	1430	6250[1]	5100	4300[1]	2200
Net Earnings/ Ha	2000	2570	1230[1]	590	250[1]	400	1700	1400
Corn	2100	2560	660[1]	485	600	730	840[1]	600
Yields Beans	850	1100	450	330	280	250		

1. T-test about the zero difference between means significant on at least $\alpha = 10\%$

Table 2

AVERAGE COST, EARNINGS, NET EARNINGS AND YIELDS PER HECTARE FOR CREDIT CATEGORIES IN 1974 (IN CURRENT PESOS, YIELDS IN KG. PER HECTARE)

Region	Nayarit		Durango		Oaxaca		Cd. Serdan	
Category	Use Credit	No Credit	Use Credit	No Credit	Use Credit	No Credit	Use Credit	No Credit
Cost/Ha	2670	3400	1060	1180	6000	5300	2450	2100
Earnings/Ha	4500[1]	7080	1800	1800	4300	4500	3120	3200
Net Earnings/ Ha	1830[1]	3680	740	620	1650	700	670[1]	1150
Corn	2000	2350	560	760	700	650	800	790
Yields Beans	1000	900	420	420				

1. T-test about the zero differences between means significant on at least $\alpha = 10\%$

Table 3

AVERAGE COST, EARNINGS, NET EARNINGS AND YIELDS PER HECTARE FOR SIZE CATEGORIES IN 1974 (IN CURRENT PESOS, YIELD IN KG. PER HECTARE)

Region	Nayarit				Durango				Oaxaca				Cd. Serdan			
Category (Ha)	< 10	10-20	20-30	> 30	< 10	10-20	20-30	> 30	< 10	10-20	20-30	> 30	< 10	10-20	20-30	> 30
Cost/Ha	2830	2880	2810	2280	1980	1680	1520	920[1]	5900	1270			2900	2300	1790	1560[1]
Earnings/Ha	5000	4260	6530	5000[1]	2900	2700	2050	1670	6000	2650			4280	3160	2220	750[1]
Net Earnings/ Ha	2200	1380	3720	2760[1]	920	720	530	750	100	1380			1380	860	230	-810[1]
Corn	2080	2200	3100	2250	780	590	380	630	680	500			800	700	370	300[1]
Yields Bean	1000	500	1000	1500	420	480	370	420								

1. F-Test about the mutual equality of groups means is negative on at least $\alpha = 5\%$

Table 4

AVERAGE COST, EARNINGS, NET EARNINGS AND YIELD PER HECTARE FOR FARMER'S AGE CATEGORIES IN 1974 (IN CURRENT PESOS, YIELD IN KG. PER HECTARE)

Region	Nayarit			Durango			Oaxaca			Cd. Serdan		
Category (years)	35	35-50	50	35	35-50	50	35	35-50	50	35	35-50	50
Cost/Ha	2400	3500	2500	1560	1000	1250	4600	4700	5300	2350	2570	2180
Earnings/Ha	4830	6100	4500	2500	1700	2200	6850	5300	5200	4300	3000	3000
Net Earnings/ Ha	2430	2600	2000	940	700	950	2200	600	-100	1950	430	820
Corn	1800	2100	2200	620	600	600	550	680	700	900	660	780
Yield Beans		850	890	400	460	400						

Table 5

AVERAGE COST, EARNINGS, NET EARNINGS AND YIELD PER HECTARE FOR FARMER'S EDUCATION CATEGORIES IN 1974 (IN CURRENT PESOS, YIELD IN KG. PER HECTARE)

Region	Nayarit		Durango		Oaxaca		Cd. Serdan	
Category	literate	illiterate	literate	illiterate	literate	illiterate	literate	illiterate
Cost/Ha	2700	2700	1140	1000	5000	6000	2400	2500
Earnings/Ha	5200	3850[1]	1180	2160	6200	3800[1]	3200	280
Net Earnings/ Ha	2500	1150[1]	660	1160[1]	1200	-2200[1]	800	300
Corn	2000	2500	560[1]	740[1]	720	570	780	680
Yield Beans	1000	700	400	500	300	90		

1. T-test about the equality of group's means is significant on at least $\alpha = 10\%$

Table 6

F-VALUES OF TEST ABOUT THE INFLUENCE OF CATEGORIES ON CORN-YIELDS. IN UPPER LEFT CORNER ARE DEGREES OF FREEDOM. IN LOWER RIGHT CORNER THE F-VALUE

Categories	Nayarit		Durango		Oaxaca		Cd. Serdan	
	y_1, y_2	F_{y_1, y_2} α=.05	y_1, y_2	F_{y_1, y_2} α=.05	y_1, y_2	F_{y_1, y_2} α=.05	y_1, y_2	F_{y_1, y_2} α=.05
Tenancy	3;29	.56	2;109	1.26	3;264	.1	3;41	.4
Credit Use	3;100	3.2	3;108	.36	3;264	1.33	1;43	1.6
Size of Farm	3;29	1.9	3;108	3.6	2;265	.75	2;42	.76
Age of Farmer	2;30	2.43	3;108	.23	3;264	1.33	2;42	1.4
Education	3;29	1.3	3;108	.29	3;264	1.7	2;42	1.25
Specialization			4;107	1.1	4;263	3.5		
Land Quality	1;31	7.1			1;266	.3		
Intensity of Cropping	2;30	2	1;110	.63	2;265	5.4		

multiplied by the appropriate degree of freedom.

$$F_{m,n-k-1} = \frac{n-k-1}{m} = \frac{\sum_{j=i}^{n} \left(\sum_{i=1}^{k} \hat{\alpha}_i X_{ij} - \bar{Y} \right)^2 - \sum_{j=1}^{n} \left(\sum_{i=1}^{e} \tilde{\alpha}_i X_{ij} - \bar{Y} \right)^2}{\sum_{j=1}^{m} \left(Y_j - \sum_{j=1}^{k} \hat{\alpha}_i X_{ij} \right)^2}$$

$e < k$

The unrestricted sum of squares due to regression is the sum of the squares of differences between fitted values of corn yields and average yields where fitted values are obtained by regressing the observed yields on observed inputs and dummy variables representing the eight variables. The restricted sum of squares due to regression is the sum of square differences between fitted values of corn yields and average corn yields where the fitted value was obtained by regressing observed corn yields on observed inputs only. The denominator is the sum of square differences between observed corn yields and estimated corn yields from the unrestricted model. This is an estimate of the true error sum of squares in the true model. The model of relationship between corn yields and inputs was formulated as a Cobb Douglas production function. An alternative formulation, a transcendental production function, was also tested, but the results were not significantly different from those obtained with the Cobb Douglas form.

When the F values were evaluated on the 5% level of significance for the given degree of freedom, the influence of the tenancy variable was found to be insignificant in all regions. The use of credit variable explained the additional variance in yields of corn in Nayarit, but was not a significant explanatory variable in the other regions of Mexico. Farm size explained additional variance in yields only in the State of Durango. Age and education were found not to be significant in explaining additional variance in corn yields.

It is worth noting at this point that because of the limitation of partial analysis one should not conclude that variables such as the age or education of the farmer do not effect farm performance. Where we have tried to account for variance in yields and earnings we have forced the production relationship first and then tested the residual variance for additional determinants represented by age and education. It is reasonable to hypothesize that the age and education variables in some combinations could be taken as

proxies for a set of attitudes and motivations affecting the decision variables. Therefore, we test the following hypothesis:
"Yields and earnings are affected indirectly by age and education or a combination thereof through the influence on input levles and various other production characteristics farm operation and/or consumption pattern.

In order to test the hypothesis a canonical correlation analysis between age and education on the one hand and selected production and consumption variables on the other hand was carried out.[5] The variables are: yields of corn, sowing time, plant's density, nutritional needs -- domestic consumption of corn, input composition variables -- labor per hectare, capital per hectare, capital-labor ratio, domestic composition of labor; fixed capital constraint (stock of land) and gross income. As can be seen from Tables 7 and 8 the first canonical variate of the first group represents age and the second canonical variate of the first group represents level of education. The first canonical variate of the second group represents labor intensity, capital intensity and stock of land. The second canonical variate of the second group represents the sowing time, domestic consumption of corn and gross income. First variate of both groups and second variates of both groups exhibit a reasonably strong correlation as can be seen from Table 8. The age variable was found to be strongly associated with production decisions and therefore indirectly with corn yields. The education variable was not associated with yields but was found to be associated with the level of gross income and sowing time.

Management Skill and Entrepreneurship

We have stated earlier that the relationships between socio-economic variables, representing various motivational and attitudinal forces, and farm performance may be weak or contradictory. The analysis however suggests that this weak association should not be used as gounds for rejecting their importance. One should be aware of the fact that these variables are proxies that represent a mixture of several attitudes. For example, although it may be true that as the age of a farmer increases, his farming experience increases, it may also be true that age makes a farmer more cautious and would thus increase risk aversion which could lead the farmer to select a certain production target with lower expected yields and earnings. Furthermore with increased age, the farmer's capacity for work decreases and this may be reflected not on his labor input but also on his ability to manage others. For

Table 7

CORRELATION COEFFICIENT BETWEEN EACH CANONICAL VARIABLE OF GROUP 1 AND THE VARIABLES OF GROUP 1

Cannonical	Age	Education
Var. 1	1.00	.354
Var. 2	0.00	-0.935

these reasons an attempt was made to find some stable variable which would be a good "discriminator" to distinguish between a group of farmers expected to perform above average and farmers expected to perform below the average.

A discriminant Factor, which seems to be intuitinal apalling, is the farmer's affinity for management and entrepreneurship. Given the same resources, the farmer manager would be expected to perform better than his collegues. the problem is that such a factor cannot be measured directly. Since management ability and entrepreneurship could be expected to be fairly stable throughout the farmer's production life, it might be hypothesized that managerial and entrepreneurial ability is reflected in some consistent decisions about production and marketing processes.

Since the sample has a large number of characteristics a consistent search for a variable indicates skill level associated with groups of farmers achieving at different levels of success was made. For this purpose two criteria were used: (a) the net income of farm operation, and (b) the average estimated income from agricultural activities given the level of inputs. By the first criteria the group of successful farmers had a net income larger than zero. The remaining group's net income was less than zero. By the second criteria, successful farms were earning more than the average estimated income while the unsuccessful farms were earning less than the average estimated income. The characteristics of both groups of farmers divided along the first criteria is summarized in Table 9. The second criteria was used to divide the sample population into farms whose average income is above the estimated regression plane and those whose estimated income is below it. The production function estimated is of the Cobb Douglas form.

Table 8

CORRELATION COEFFICIENTS BETWEEN EACH CANONICAL VARIABLE OF GROUP 2 AND VARIABLE OF GROUP 2

Canonical	Yield of Corn	Sowing Time	Plant Density	Hired Labor Share in Total Labor Input	Labor Per Hectare
Var. 1	0.18	0.0	-0.01	0.16	0.21
Var. 2	0.01	0.45	-.25	0.02	0.05
	Labor Share of Cost	Labor/ Capital	Capital Per Hectare	Portion of Corn Consumed	
Var. 1	0.47	0.22	-0.39	0.17	
Var. 2	0.0	-0.22	-0.03	-0.49	
	Total Cultivated Area			Gross Earnings	
Var. 1	0.37			0.02	
Var. 2	0.30			0.54	

Table 9

CHARACTERISTICS OF FARMS WITH NET INCOME LARGER AND SMALLER THAN ZERO IN 1974

	DURANGO			SERDAN		
N	45	112		95	93	
Group	1	2	Alpha	1	2	Alpha
SFT	42	57	.80	10	8	.11
SFR	1.91	1.74	.76			
STE	32.5	35.7	.82	9.8	7.5	.056
SHARE F	.59	.72	.04	.093	0.78	.50
SHARE M	.38	.27	.007	.80	.69	.002
SALIDAS	$49878	$40837	.50	$26288	$15857	.0001
ENTRADAS	$21638	$93323	.008	$12400	$43676	.0001
NIT-MAIZ				72	59	.15
NIT-FRIJ				93	54	.23
COMP-DOM	.89	.68	.0001	.91	.81	.004
LAB/HA	$2120	$781	.0001	$2895	$1741	.004
REND-MA	530	636	.21	566	928	.0002
REND-FR	303	477	.0001	40	50	.68
LAB/COST	.80	.60	.0001	.82	.73	.006
LAB/CAP	8.96	3.7	.0006	8.9	6.2	.03
OTR-INS	.12	.22	.02	.06	.11	.07
PAGOS	.57	.59	.86	.27	.23	.31
CUOTAS	.026	.042	.25	.10	.07	.12
FER-QUIM	0	.006	.18	.44	.51	.18
CAP/HA	$418	$483	.42	$447	$390	.35
MAIZ-CON	.18	.10	.11			
FRIJ-CON	.14	.09	.09			
SIEM	181	183	.71	91	90	.80
TPLANTM	33000	35000	.36	37000	39000	.29
SIEF	212	198	.13	123	132	.46
TPLANTF	60000	63000	.51	138000	171000	.17

Notes: Group 1 = Farmers with net income less or equal to zero
Group 2 = Farmers with net income greater than zero
Alpha = Probability of equality between means in both groups

Table 9 (Contd.)

OAXACA			NAYARIT			ALL		
157	135		34	95		331	435	
1	2	Alpha	1	2	Alpha	1	2	Alpha
3	3.2	.62	12.4	15.4	.45	11	15	.28
.61	.97	.06	3.6	3.9	.81	1.4	2.5	.009
3.16	3.31	.97	7.2	11.3	.01	9.4	14.4	.1
.024	.004	.04	.028	.068	.07	.12	.21	.0001
.90	.78	.0001	.69	.61	.26	.78	.60	.0001
$20283	$11580	.0001	$39500	$39300	.98	28000	26000	.52
$6894	29000	.0001	$244000	$88300	.0001	12000	61000	.0001
48	55	.50	74	82	.27	64	67	.53
						84	50	.09
.98	.81	.0001	.82	.63	.0003	.93	.74	.0001
$22814	$4301	.0001	$4330	$2259	.0002	$7681	$2350	.0001
635	716	.30	1800	2250	.0002	710	1080	.0001
			581	1000	.23	191	458	.0001
.94	.75	.0001	.77	.61	.0001	.87	.68	.0001
16.5	8.5	.0001	.5	2.4	.01	11.5	5.3	.0001
.091	.098	.74	.20	.18	.68	.09	.15	.0001
.45	.49	.26	.28	.30	.56	.40	.42	.5
.29	.30	.94	.012	.023	.01	.12	.06	.0001
.11	.10	.74	.32	.30	.73	.20	.20	1.0
$486	$584	.24	$900	$1277	.01	$510	$670	.003
1.45	1.37	.80	.13	.50	.03			
.59	.32	.18	.033	.020	.50			
172	172	.0	164	205	.0006	146	161	.01
74000	73000	.74	53000	56000	.47	56000	53000	.26
141	171	.64	258	261	.97	171	192	.02
125000	167000	.68	55000	15000	.21	99000	99000	1.0

Table 10

CHARACTERISTICS OF FARMS WITH INCOME FROM AGRICULTURAL ACTIVITIES ABOVE AND BELOW EXPECTED INCOME IN 1974

	DURANGO			SERDAN		
N	72	85		104	84	
Group	1	2	Alpha	1	2	Alpha
SFT	49	29	.27	8.5	9.5	.48
SFR	1.86	1.78	.90	0.0	.83	+
STE	43	27	.24	8.5	9.0	.62
SHARE-F	.62	.73	.05	.10	.06	.07
SHARE-M	.31	.29	.53	.77	.70	.03
SALIDAS	$50500	$37500	.28	$20500	$21800	.62
ENTRADAS	$50000	$92000	.07	$11500	$48000	.001
NIT-MAIZ	+	+	+	74	55	.02
NIT-FRIJ	30.	40	+	93	54	.24
COMP-DOM	.81	70	.02	.90	.81	.009
LAB/HA	$1150	$1170	.90	$2380	$2230	.70
REND-MA	453	725	.001	543	086	.001
REND-FR	270	560	.001	37	54	.50
LAB/COST	.64	.67	.35	.77	.77	1.0
LAB/CAP	6.0	4.6	.27	7.3	7.7	.72
OTR—INS	.20	.19	.82	.06	.10	.11
PAGOS	.48	.67	.07	.28	.22	.134
CUOTAS	.04	.03	.53	.09	.06	.34
FER-QUIM	.003	.005	.70	.47	.47	1.0
CAP/HA	$420	$500	.31	$400	$440	.60
MAIZ-CON	.20	.07	.02	+	+	+
FRIJ-CON	.15	.07	.01	+	+	+
SIEM	184	181	.65	92	89	.45
TPLANTM	35000	34500	.88	38000	37000	.70
SIEF	203	201	.80	125	130	.67
TPLANTF	63000	62000	.80	150000	157000	.75

Table 10 (contd.)

OAXACA			NAYARIT			ALL		
163	129		72	57		391	375	
1	2	Alpha	1	2	Alpha	1	2	Alpha
3.1	3.2	.80	13	17	.32	14.7	12.7	.60
.54	1.0	.01	3.6	4.1	.62	1.3	2.5	.002
2.9	2.8	.70	10	10.	.52	13	11	.40
.01	.01	1.0	.03	.09	.04	.16	.18	.40
.90	.77	.001	.72	.52	.002	.73	.61	.001
$16000	16000	1.0	$40000	39000	.92	$27000	$26000	.86
$8300	28000	.001	$50000	$100000	.006	$22000	$60000	.001
37	62	.005	76	87	.16	64	68	.50
+	+	+	71	22	+	78	41	.20
.95	.85	.001	.76	.58	.001	.89	.76	.001
$9000	$8700	.90	$2900	$2300	.11	$5600	3600	.03
500	900	.001	.800	2600	.001	600	1250	.001
78	350	.16	430	1250	.002	200	520	.001
.86	.84	.55	.67	.62	.21	.77	.75	.16
13.5	10.5	.02	3.5	.27	.22	9.2	6.3	.001
.08	.10	.21	.15	.24	.009	.10	.15	.001
.54	.38	.001	.3	.3	1.0	.44	.38	.07
.13	.15	.62	.017	.025	.07	.09	.07	.23
.08	.13	.04	.32	.29	.50	.19	.22	.19
$450	$620	.07	$1000	$1350	.09	$516	$685	.002
2.2	.44	.001	.10	.03	.001	+	+	+
.73	.15	.001	.03	.015	.17	+	+	+
171	174	.80	195	196	.94	150	160	.1
76000	70000	.18	56000	55000	.78	56000	53000	.27
191	118	.13	202	295	.08	178	191	.13
76000	180000	.36	87000	164000	.07	99000	97000	.86

Notes: Group 1 = Farmers below regression line of $Y = cap^a\ lab^b\ land^c$
Group 2 = Farmers above regression line of $Y = cap^a\ lab^b\ land^c$
Alpha = Probability of equality between means in both groups

The test results show that by both criteria of success, the index uniformly consistent with each category was the proportion of hired labor in total labor input. Across all samples in each region, the relatively more successful farms were found to employ proportionately more hired labor in total labor input. After examining the associated characteristics i.e. size of farms and land quality which might have explained the findings, no association between these and success were found. This finding is consistent with the hypothsis that better management practices and entrepreneurship are associated with successful farms. The farmer-manager would be expected to hire extra help if the labor demand during the period is not readily satisfied from domestic sources or if the operation requires proficiency and skills not available to him from the domestic pool of labor.

IV. Conclusions

Contrary to expectations empirical evaluation of theoretically predicted relationships between farm production outcomes and selected socio-economic variables have often revealed only weak association between these variables and farm performance.

This paper examined further the influence of eight socio-economic variables on farm production in Mexico. Using a sample of farmers in four regions of Mexico the findings did not contradict earlier results. Nevertheless the weak association found between socio-economic variables and farm performance does not constitute grounds for rejecting the importance of socio-economic variables on the outcomes of farm production. Testing simultaneously the influence of a group of variables on production process, we have found substantial association to exist between these variables and farm performance.

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