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## THE RELATIONSHIP OF FARMER GOALS AND OTHER FACTORS TO CREDIT USE

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Due primarily to inflation, the desire to own assets for appreciation and new technology, capital needs in agriculture continue to increase rapidly. Accompanying this increase in the need for capital is an increase in the use of credit. A better understanding of what motivates farmers to make decisions as they do would enhance economic analysis in general and in particular cases involving credit decisions. The purpose of this analysis was to provide additional insight into economic goals of farmers and how goals, farm characteristics, and other factors affect the amounts of credit used for annual production items and intermediate and long-term assets.<sup>1</sup>

Several studies of farm goals have been made. Patrick and Eisgruber (p. 494) concluded that farm family goals could be grouped into four major areas: living standard; farm ownership; leisure/children; and credit-using, risk-taking behavior. Harman et al. used eight goals developed from previous research and consultations with agricultural workers and farmers. Smith and Capstick added two more goals to those studied by Harman but concluded that a low number of goals enhances the quality of response from the individuals interviewed.

Harman et al. found that a number of factors affect goals. However, studies have shown that the family life cycle is a major factor in explaining changes in goals (Fitzsimmons and Holmes; Heady, Back, and Peterson; Ernest; Voss). Harman et al. selected goals so that they were relatively independent of each other. However, they concluded that to some degree a problem of interrelationships between goals did exist and that it may be impossible to select goals that are completely independent.

### PROCEDURE

After reviewing these studies and pretesting the questionnaire with a small number of farmers, we selected goals for study consisting of those analyzed by Harman et al., except for minor modifications. Data for this study were obtained from 104 randomly selected farmers in six southwestern Georgia counties. Farmers in the sample were typically full-time farmers. The typical farm organization included small grain,

soybeans, peanuts, and some beef animals and swine. The average farmer was nearly 49 years old and operated approximately 460 acres of cropland. Total investment averaged over \$582,000 and total debt over \$79,000 per farm.

The paired-comparison method was used to rank basic farmer goals. The technique is based on each respondent indicating the preferred goals for all possible combinations of pairs of goals. This method provides an ordinal scale as well as each item's numerical position on a ranking scale. It estimates the closeness or disparity of goals in the framework of scales by assigning a relative value of 1.00 to the most preferred goals and a value of 0.00 to the least preferred. In this study, each individual's preferences were ranked, individuals whose choices were inconsistent were eliminated, and these results were then used to form common scalar values by age group. Descriptions of the method can be found in Brannen, Harman et al., and Smith and Capstick.

### Specification of Credit Models

It was hypothesized that the amount of credit used per farm was a function of a number of endogenous as well as exogenous factors. Endogenous factors include capital investment, land investment, labor used, types of enterprises produced, alternative methods of acquiring control of resources, equity position, personal goals, and other personal characteristics of the operator. Exogenous factors include the cost of extending credit, the interest rate, the lender's perception of the risk involved, the characteristics of the credit institution, and so forth. Multiple linear regression was used to determine the relationship between the amount of credit per farm and specified selected variables.<sup>2</sup>

The specific statistical models are as follows:

$$\begin{aligned} \text{STC} = & a + b_1 G_1 + \dots + b_8 G_8 + b_9 \text{LABOR} + \\ & b_{10} \text{PPNUT} + b_{11} \text{CROPL} + \\ & b_{12} \text{NFEMP} + b_{13} \text{AGE} + b_{14} \text{PTOB} + \\ & b_{15} \text{PCA} + b_{16} \text{BANK} + b_{17} \text{FC} + \\ & b_{18} \text{AUNIT} + b_{19} \text{I} \end{aligned}$$

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<sup>1</sup> Intermediate-term assets were defined as those assets, such as tractors and brood animals, having a life of 1-10 years. Long-term assets were those having a life of 10 or more years and consisting primarily of land and buildings.

<sup>2</sup> In order to minimize intercorrelations of variables, correlation coefficients were examined and no variable was included in the final models with a correlation coefficient greater than 0.72. Moreover, most of the variables had correlation coefficients of between -0.15 and 0.15.

$$ITC = a + b_1G_1 + \dots + b_8G_8 + b_9 \text{ LABOR} + b_{10} \text{ NFEMP} + b_{11} \text{ AGE} + b_{12} \text{ PCA} + b_{13} \text{ BANK} + b_{14} \text{ AUNIT} + b_{15} \text{ EQUIP}$$

$$LTC = a + b_1G_1 + \dots + b_8G_8 + b_9 \text{ LABOR} + b_{10} \text{ NFEMP} + b_{11} \text{ AGE} + b_{12} \text{ FC} + b_{13} \text{ AUNIT} + b_{14} \text{ I} + b_{15} \text{ PINHERIT} + b_{16} \text{ LAND}$$

where:

- STC = short-term credit,  
 ITC = intermediate-term credit,  
 LTC = long-term credit,  
 G<sub>1</sub> = control more acreage by renting or buying,  
 G<sub>2</sub> = avoid being forced out of business,  
 G<sub>3</sub> = maintain or improve family's standard of living,  
 G<sub>4</sub> = avoid years of low profits or losses,  
 G<sub>5</sub> = increase net worth (from farm or off-farm investments),  
 G<sub>6</sub> = reduce borrowing needs,  
 G<sub>7</sub> = make the most profit each year,  
 G<sub>8</sub> = increase time off from farming so as to devote more time for family, recreation, church, and community activities,  
 LABOR = the amount of full-time family and hired labor,  
 PPNUT = peanuts as a percentage of total cropland,  
 CROPL = total number of acres of cropland farmed,  
 NFEMP = income from nonfarm sources (1 = yes, 0 = no),  
 AGE = age of farm operator,  
 PTOB = percentage tobacco is of cropland,  
 PCA = loan from a production credit association (PGA) (1 = yes, 0 = no),

BANK = loan from a bank (1 = yes, 0 = no),

FC = whether operator expressed a fear of credit (1 = yes, 0 = no),

AUNIT = number of animal units, including poultry,

I = whether an irrigation system was being used (1 = yes, 0 = no),

EQUIP = value of machinery and equipment,

PINHERIT = percentage of the total number of acres owned that were inherited, and

LAND = value of land and buildings.

Some of variables, for example, PPNUT, PTOB, and AUNIT, were included because the kinds of enterprises help to explain the amount of credit needed plus the fact that lenders in many cases either prefer to lend on certain enterprises, or the enterprises may actually play a major role in determining the amount loaned. The rate of interest does not appear in the statistical models because there was not enough variation in the interest rates observed to be of any statistical consequence. Lenders other than banks and PCA were not included for the same reason. Variables such as growth rates of credit extended and loan/deposit ratios of the lenders were not included because of the lack of data.

## RESULTS OF ANALYSIS

### Basic Goals

The results of the survey show multiple goals as well as considerable variation in the way individuals rank their goals (Table 1). The goal "stay in business" was ranked first by the total group of respondents, yet only about 18.4 percent of the respondents ranked this goal above all others and about 18.1 percent ranked "improve family's standard of living" above all others. The tendency over all the age groups was to rank "stay in business" first and "improve family's living" sec-

**Table 1.** Rank Order, Percentage of Preference of a Given Goal to All Others, and Common Scale Values, by Age Group, Sample of Georgia Farmers, 1977

Preferred Goal	All Ages Combined			Age 39 or Less			Age 40 to 49			Age 50 to 59			Age 60 or Over		
	Order	%	Common Scale	Order	%	Common Scale	Order	%	Common Scale	Order	%	Common Scale	Order	%	Common Scale
Control More Acreage by Renting or Buying	8	5.62	.000	7	6.91	.322	8	4.50	.000	8	5.95	.000	8	5.36	.000
Increase Time Off	7	6.81	.122	8	2.45	.000	7	8.38	.274	7	6.31	.038	7	9.52	.352
Increase Net Worth	6	11.70	.494	3	14.96	.724	6	10.56	.404	6	11.07	.398	5	11.31	.482
Reduce Borrowing	5	11.82	.499	6	11.39	.552	4	12.42	.497	4	11.90	.467	6	11.31	.475
Avoid Low Profits	4	12.40	.550	2	16.07	.775	5	11.34	.442	5	11.31	.444	4	12.30	.566
Make the Most Profit	3	15.19	.766	4	14.29	.708	3	14.75	.657	3	16.07	.808	3	15.10	.759
Improve Family's Living	2	18.07	.966	5	13.61	.659	1	20.96	1.000	1	18.93	1.000	2	16.86	.884
Stay in Business	1	18.39	1.000	1	20.32	1.000	2	17.09	.751	2	18.45	.963	1	18.25	1.000

ond. The goals "increase time off" and "control more acreage" were the least preferred.

The results show that farmers' goals vary by age group. The younger group, age 39 years or less, tended to place more importance on goals related to staying in business, increasing net worth, and farm profits. The groups 40 years of age or older tended to place more importance on improving the family's standard of living, staying in business, and profits and less importance on increasing net worth. Groups 40 years of age or older placed more importance on having increased time off from the farm business to devote to family recreation, church, and community activities, although generally this goal was ranked low. Of particular note is the fact that the younger group placed less importance on reducing borrowing than did the 40-59 age group. This suggests that the younger farmers are willing to borrow funds in order to achieve their goals. An unexpected result was the sixth ranking for reduced borrowing by the 60-or-over age group. Perhaps this is partially explained by the fact that this group had already achieved this goal, and other goals took on more importance. (The average debt for this group was lower than for the other age groups for all three categories of debt.)

The goal of making the most profit, which is typically used as the basic criterion for economic analysis, was important to all age groups. However, as previously noted, other goals were important, and the younger group ranked it fourth and the 40-and-over groups ranked it third. Such results show the need for incorporating multiple goals into economic analyses of farm firm organization and behavior.

### Effects of Goals and Other Factors on the Amount of Credit

Least squares regression analysis was used to quantify the effect of goals and other variables on the amount of credit used for annual production items and intermediate and long-term assets. Each respondent's scalar value for each goal was used as the measure for the goal variables.

*Short-Term or Annual Production Credit.* Only the total amount of cropland farmed and the percentage of total cropland in peanuts were statistically significant at the 90 percent level of probability or better (Table 2). These two variables were expected to be highly significant because row crops are the major source of income in the sample area and peanuts are a high-value crop. The fact that none of the goals or other variables were statistically significant of course means that they had a negligible influence on the amount of production credit used.

*Intermediate Term Credit.* The goal "control more acreage" was significant in this model, although in the overall ranking of goals it was in last place (Table 3). The positive relationship is logical and means that a strong preference for controlling more acreage was associated with more credit for equipment and other in-

**Table 2.** Short-Term Credit-Current Amount, Regression Analysis for the Six County Sample, Southwest Georgia, 1977

Variable	Units	Partial Regression Coefficient	t-value
Intercept		-58,929.66	-0.75
Control More Acreage by Renting or Buying ( $G_1$ )	scalar value <sup>a/</sup>	12,315.98	0.37
Stay in Business ( $G_2$ )	scalar value	44,122.89	1.35
Improve Family's Living ( $G_3$ )	scalar value	-8,866.97	-0.27
Avoid Low Profits ( $G_4$ )	scalar value	-2,008.09	-0.06
Increase Net Worth ( $G_5$ )	scalar value	-6,061.66	-0.19
Reduce Borrowing ( $G_6$ )	scalar value	-23,326.29	-0.75
Make the Most Profit ( $G_7$ )	scalar value	24,000.63	0.62
Increase Time Off ( $G_8$ )	scalar value	17,874.92	0.72
Full Time Family and Hired Labor (LABOR)	no. workers	2,305.95	1.31
Percentage Peanuts of Total Cropland (PPNUT)	percentage	1,013.72	1.76*
Total Amount of Cropland (CROPL)	acres	94.17	3.44***
Income from Non-farm Sources (NFEMP)	yes-no	-13,705.80	-0.99
Age of Farm Operator (AGE)	years	62.24	0.08
Percentage Tobacco of Total Cropland (PTOB)	percentage	-1,980.27	-0.15
Borrow from Production Credit Association (PCA)	yes-no	23,432.26	0.67
Borrow from Bank (BANK)	yes-no	-40,740.65	-1.16
Operator Expressed Fear of Credit (FC)	yes-no	15,171.74	0.80
Animal Units (AUNIT)	no.	-64.76	-0.81
Irrigation Used (I)	yes-no	17,619.43	1.05

<sup>a</sup> Refers to individual scalar values.  
 \* Significant at the 0.10 level.  
 \*\* Significant at the 0.01 level.  
 R<sup>2</sup> = 0.6225.

**Table 3.** Intermediate Term Credit-Current Amount, Regression Analysis for the Six-County Sample, Southwest Georgia, 1977

Variable	Units	Partial Regression Coefficient	t-value
Intercept		-212,507.28	-2.33**
Control More Acreage by Renting or Buying ( $G_1$ )	scalar value <sup>a/</sup>	-24,727.84	-0.73
Stay in Business ( $G_2$ )	scalar value	10,905.12	0.31
Improve Family's Living ( $G_3$ )	scalar value	83,146.61	2.59**
Avoid Low Profits ( $G_4$ )	scalar value	41,608.07	1.12
Increase Net Worth ( $G_5$ )	scalar value	27,080.43	0.78
Reduce Borrowing ( $G_6$ )	scalar value	27,453.72	0.79
Make the Most Profit ( $G_7$ )	scalar value	111,076.23	2.41**
Increase Time Off ( $G_8$ )	scalar value	40,863.76	1.46
Full Time Family and Hired Labor (LABOR)	no. workers	7,508.70	4.14***
Income from Non-farm Sources (NFEMP)	yes-no	-21,573.81	-1.30
Age of Farm Operator (AGE)	years	308.75	0.36
Operator Expressed Fear of Credit (FC)	yes-no	-28,767.47	-1.46
Animal Units (AUNIT)	no.	-157.09	-2.26**
Irrigation Used (I)	yes-no	45,611.40	2.40**
Percentage Inherited Land of Total Land Owned (PINHERIT)	percentage	-408.03	-1.90*
Value of Land and Buildings (LAND)	dollars	0.05	3.56***

<sup>a</sup> Refers to individual scalar values.  
 \* Significant at the 0.10 level.  
 \*\* Significant at the 0.05 level.  
 \*\*\* Significant at the 0.01 level.  
 R<sup>2</sup> = 0.4097.

intermediate term assets. The other statistically significant goal was "avoid low profits," which had a negative relationship to credit use. Farmers were apparently trying to avoid fixed principal and interest payments to improve the residual returns to their equity and own labor. In addition, or alternatively, they could have been adding flexibility by leasing equipment and/or getting work done on a custom basis.

Three nongoal variables were significant. The value of machinery and equipment was the most highly significant variable and was positively related to the amount of credit. This variable was highly correlated with the acres of cropland farmed; thus it reflects the fact that much of the intermediate-term credit was for the purpose of buying equipment and that this in turn is related to the size of the farm. Whether the loan was from the Production Credit Association (PCA) was significant and positively related to the amount of credit. This result suggests that larger loans are associated with borrowing from the PCA. The number of animal units was a significant negative variable and is explained again by the fact that row crops are the major source of income and that credit for the purpose of poultry and swine housing was on a long-term basis.

*Long-Term Credit.* The goal "improve family's living" (ranked second overall) was significant and positively related to the amount of long-term credit (Table 4). "Make the most profit" (ranked third overall) was also significant and had a positive relationship to the amount of credit. Adequate long-term credit for land

and buildings and other permanent improvements can enable the farmer to meet his goals of improving his income and thus improving his family's standard of living.

Three nongoal variables were statistically significant and positively related to long-term credit: the number of full-time workers, the use of irrigation, and the value of land and buildings. The number of full-time workers is associated with the amount of crops and livestock and is thus a measure of the overall size of the farm. Irrigation systems involve long-term investments in wells and equipment, so this suggests that farmers are financing these items with long-term credit. The value of real estate is associated with a number of factors such as size, productivity of the soil, permanent improvements, location, and so forth. Furthermore, long-term loans are usually based on some percentage of market value, and the coefficient in this case reflects that relationship.

Significant negative coefficients were those for the number of animal units and the percentage of inherited land. These results are logical in that land for animals in this area is valued lower than cropland; thus the amount loaned per acre would be less. The results on "inheritance" are obvious since this is an alternative to borrowing.

## CONCLUSION

Evidence from this study indicates that farmers are not motivated by a single goal, but by a multiplicity of goals. An evaluation of all of the individual responses indicated that "stay in business" and "improve family's living" were ranked the highest, with "increase time off" and "control more acreage" being the least preferred. The ranking of goals varied considerably among the age groups, with the largest difference between the youngest and oldest groups. The youngest group tended to place more importance on avoiding low profits, increasing net worth, and controlling more acreage than did any of the other groups. Taken together, these last two goals reflect a desire to increase the size of the farm business. The goal most often used as the basis for economic analysis, "making the most profit," was ranked third overall, with a scalar value of 0.766. Overall, "reduce borrowing" ranked fifth, indicating that the fear of credit or the reluctance to borrow is not widespread. The youngest group placed less importance on reducing borrowing than the 40-59 age group.

Results of other studies of farmer goals (Harman et al. and Smith and Capstick) show somewhat similar results in that there was no general agreement on one primary goal. Results from Harman et al. show the least preferred goals to be the same as those in this study. Smith and Capstick's results show that "control more acreage" was ranked last, and "increasing net worth" was ranked next to last.

Results from this study differed from previous studies in a number of instances. For example, Harman et al. reported that "making the most profit" was the number one goal of 32 percent of the respondents,

**Table 4.** Long-Term Credit-Current Amount, Regression Analysis for the Six-County Sample, Southwest Georgia, 1977

Variable	Units	Partial Regression Coefficient	t-value
Intercept		-8,382.66	-0.36
Control More Acreage by Renting or Buying ( $G_1$ )	scalar value <sup>a/</sup>	19,600.62	2.08**
Stay in Business ( $G_2$ )	scalar value	13,473.72	1.37
Improve Family's Living ( $G_3$ )	scalar value	-3,565.68	-0.39
Avoid Low Profits ( $G_4$ )	scalar value	-17,005.82	-1.73*
Increase Net Worth ( $G_5$ )	scalar value	3,947.90	0.43
Reduce Borrowing ( $G_6$ )	scalar value	13,591.43	1.47
Make the Most Profit ( $G_7$ )	scalar value	-10,048.68	-0.86
Increase Time Off ( $G_8$ )	scalar value	4,620.14	0.59
Full Time Family and Hired Labor (LABOR)	no. workers	-157.09	-0.35
Income from Non-farm Sources (NFERMP)	yes-no	5,819.03	1.31
Age of Farm Operator (AGE)	years	-213.50	-0.95
Borrow from Production Credit Association (PCA)	yes-no	22,518.10	2.92**
Borrow from Bank (BANK)	yes-no	10,372.65	1.23
Animal Units (AUNIT)	no.	-37.61	-2.45**
Value of Machinery and Equipment (EQUIP)	dollars	0.102	3.47***

<sup>a/</sup> Refers to individual scalar values.

\* Significant at the 0.10 level.

\*\* Significant at the 0.05 level.

\*\*\* Significant at the 0.01 level.

R<sup>2</sup> = 0.5125.

whereas in this study only 6 percent ranked it first. Respondents in Smith and Capstick's study ranked it seventh out of ten. The goal of "reduce borrowing" was ranked higher by the respondents in Smith and Capstick's study than it was by those in this study.

The different goal rankings found in the studies are partially explained by the different geographic areas and types of farms. However, the fact that farmers in this study ranked "stay in business" as most important and those in the study by Harman et al. ranked it sixth reflects the fact that farmers have become more concerned with risk over time. Risks in agriculture increased dramatically during the 1970s. Not only did price and production risks increase, but so did the risks associated with government action. More specifically, the risk associated with freer markets on one hand and the imposition of new controls, such as those on exports, on the other hand (Boehlje and Trede) increased. This was also a period of lower rates of return to farmers (Uhrig and Irwin). These conditions affect farmer goals and resulted in this study group ranking "stay in business," or survival, as most important. Similar results were obtained by Smith and Capstick and by Patrick et al. In the Patrick et al. study, farmers ranked "making mortgage and loan payments on time" and "having a farm business which produces a stable income" among the most important goals. Another risk-related goal, "avoid using borrowed funds for the farm business," was ranked as least important; however, it was reported that a number of farmers stated that they would like to avoid borrowing but that it was impossible in their situation.

The regression analysis showed that there was not a statistically significant relationship between goals and credit use for production items. The main variable related to this type of credit was the amount of cropland farmed.

The goals "avoid low profits" and "control more acreage," ranked fourth and eighth respectively, were significant variables in the intermediate-term credit model. The higher the ranking of "avoid low profits," the less credit was used for intermediate-term purposes. A higher ranking of "control more acreage" was associated with more credit. However, the most significant variable was the value of machinery and equipment, which was also associated with greater amounts of credit.

Two goals, "improve family's living" and "make the most profit," were significant and positively related to long-term credit use. Overall, these goals were ranked second and third. The amount of labor used, the value of land and buildings, and the presence of an irrigation system were all significantly related to more credit for long-term assets. The number of animal units and the percentage of land inherited were significantly related to lower amounts of credit.

Generally, the significant nongol variables that were positively associated with credit use were those related to size of business and to high-value enterprises such as peanuts. Overall, goals were not significantly related to credit use. Only two were significantly related to intermediate-term and two to long-term credit use. None were significantly related to short-term credit. Such a result suggests that other factors tend to offset the importance of goals in credit decisions. The fact that two goals were significant in the long-term model suggests some tendency for farmers to make choices consistent with longer term goals. In the short run, decisions are more influenced by conditions facing the farmer at that point in time.

None of the variables indicating negative feelings about credit use were significant in the analysis, for example, the goal of "reduce borrowing" or the fear of credit. This seems to give philosophical support to the well-documented fact that most farmers are using large quantities of credit in their operations. On the other side, some respondents did hold goals that were associated with reduced use of credit. Although not statistically significant in the regression analysis, "reduce borrowing" was ranked fifth overall and fourth by the 40-59 age group. "Avoid low profits" was a statistically significant goal that was associated with reduced use of intermediate-term credit. In addition, a number of respondents did indicate a fear of credit. For the entire sample, these goals and attitudes did not always result in reduced credit use, due to other factors offsetting them. However, their presence does suggest that those persons and institutions concerned with credit and capital use in agriculture should take these attitudes into account in designing programs and policies. More specifically, lenders and educational institutions should provide information and assistance in credit analysis and use, risk management, and alternative methods of acquiring control over resources.

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