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GOVERNMENT POLICY INFLUENCE ON PEANUT PRODUCERS' ATTITUDES TOWARDS A FUTURES MARKET

by

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ABSTRACT

This study evaluated peanut producers' attitudes towards a potential futures market under alternative policies. The profiles of different producer groups were identified. The group with attitudes particularly influenced by government policies was investigated. The analysis indicated that such groups are mainly from Texas-Oklahoma, progressive in information search and less educated.

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U.S. farmers' stock peanuts have been marketed via a two-price plan since 1977. With the government program, quota peanuts have been supported often at prices above market-clearance levels. The support price for "additional" has been set below the world market price level which allows room for the operation of a free market mechanism for "additional" peanuts. However, additionals are now being tied to contracts for quota peanuts (Miller). Further, since most transactions are negotiated under an one-on-one informal basis, there is no central market for peanuts, and thus no organized central source of timely market information. Therefore, price discovery for both quota and "additional" peanuts has been somewhat restricted. As a result, the information content for peanut prices may be questionable. Miller et al. observed that peanut farmers and other marketers were exposed to price risk resulting from the rigidity in pricing.

Pricing mechanisms, such as a futures market and electronic or computerized market exchange providing a centralized information system, might be regarded as alternatives to the current peanut marketing system. These central markets are expected to improve price efficiency and substantially reduce market risk (Buccola; Burns; Sporleder). Helmreich and Epperson examined the possibility of establishing a computerized exchange for reporting cash peanut prices. Other research by Miller et al. evaluated world opinion on the establishment of a futures contract in shelled peanuts. However, there has been little research on examining the potential acceptance of central markets for marketing farmers stock peanuts.

This study evaluates producers' attitudes of using a futures market to market farmers stock peanuts in response to potential government policies. Producers' profiles for favoring a futures market, given the scenarios of the current government program and a free market system, are identified. The profile of producers who altered their attitudes towards a futures market in response to the associated changing policies is particularly investigated.

Survey

A survey eliciting producers' attitudes towards a proposed farmers stock peanut futures contract under different policy scenarios was conducted in 1984. Participants in the survey were randomly selected from a list of quota holders from the seven major peanut producing states (Georgia, Alabama, Florida, Virginia, North Carolina, Texas, and Oklahoma). The survey resulted in 461 complete and usable questionnaires.

The first part of the questionnaire deals with information on farm production, management, and price discovery. Questions to elicit attitudinal response towards a futures market were asked in the second part. Information pertaining to financial management and socio-economic factors were in the last part of the questionnaire.

Rational Response

The responses concerning a futures market were elicited under two policy scenarios. That is, producers were requested their opinions (Yes or No) to the following two questions: (1) "With the current government program, is a futures market for peanuts needed?" and (2) "Would a futures market for peanuts be needed if there were no government program for peanuts?." The current government program

provides a safety net for marketing peanuts. In contrast, without the government support program, the marketing of peanuts would become more risky. However, the market risks can be reduced or transferred to speculators by means of a futures market.

The responses to the questions are shown in the following diagram.

(2) No Government program (NG)

(1) Government Program (Gov't.)		Yes	No	Total
	Yes	256 (57.4)	*	256 (57.4)
	No	83 (18.6)	107 (24.0)	190 (42.6)
	Total	339 (76.0)	107 (24.0)	446 (100%)

Those who responded Yes to Gov't. first and then answered No to NG are recognized as producers having inconsistent attitudes towards a futures market. The reasoning is that those producers who need a futures market under a relatively stable marketing system are regarded as risk-averters, while those responding no under a more risky marketing (i.e., NG) are risk-takers. Therefore, the producers who say Yes to gov't. (risk-averters) and No to NG (risk-takers) have a conflicting and inconsistent risk behavior. Those producers considered irrational in their answers were eliminated from the study.

According to the preceding diagram, about 57% of the producers expressed a favorable attitude toward a futures market to market peanuts under the current government program, whereas 76.0% of producers say Yes to NG indicating a greater need for a futures market if the government program were eliminated. Approximate 19% of

the producers altered their attitudes from No to Gov't to Yes to NG should the policy change. This group of producers are influenced by government policies, whereas other producers who answer Yes (or No) to both scenarios are not influenced significantly by government policies on their preferences towards a futures market.

An analysis of the profiles for these producer groups would provide useful information for promotional programs. However, this will not be possible until those influential factors that determine producers' attitudes towards a futures market are identified. For this later purpose, the probit analytical framework is employed.

The Model

The model assumes that the t^{th} producer's preference for a futures market can be summarized by his expected utility index which is a linear combination of several explanatory variables including attributes of the market and characteristics of the individual. (One will note that the only variables identified by the survey are producer characteristics). That is

(1) $U_t = X_t\beta + e_t$

where U_t denotes the unobserved expected utility index for the t^{th} individual; X_t is a vector of producer characteristics for the t^{th} individual; β is a vector of parameters; and e_t is the random error. The observed decision variable Y_t is determined by U_t and its corresponding threshold value U_t^*. The t^{th} producer will prefer a futures market if U_t exceeds U_t^*, i.e.,

(2) $Y_t = 1$ (positive attitude) for $U_t > U_t^*$

$= 0$ (negative attitude) for $U_t \leq U_t^*$

Using a probit transformation, the probability of a favorable attitude by the t^{th} producer towards a futures market is

(3) $P_t = \text{PROB}\ (Y_t = 1) = N(X_t\beta)$

where N is the standard normal distribution function. The maximum likelihood method is then used to estimate the probit model (Maddala). The likelihood function is

(4) $L(\beta) = \prod_{t=1}^{T} [N(X_t\beta)]^{Yt}\ [1-N(X_t\beta)]^{1-Yt}.$

The parameter estimates obtained by the probit model are consistent.

Hypothesized Explanatory Variables

The hypothesized explanatory variables are the producer characteristics. These characteristics are categorized into three groups: information/perception, farm management, and demographic factors. Descriptive statistics are presented in Table 1.

Producers who regard PNUTOG and BUYER as important sources of market information are hypothesized to be active in information seeking. These people, with a broader information base than other growers, are expected to have a higher interest in a futures market. Producers who are satisfied with the current market (SMKT) tend to dislike futures market under the scenario of current government program, yet they may change their attitude under the free market scenario.

A futures market is expected to be of interest to those growers with large farms or with better managerial skills. That is, growers with higher TOTAC or NETW are likely to accept a futures market. Diversification is one way to reduce market risk. Thus, a grower with a higher ENTRP may not need a futures market to further reduce risks. Part time farmers (OFF-FARM) with a small farming operation may have

Table 1. Variables Hypothesized to Influence Producers Attitudes Towards a Futures Market

Variable	Description	Mean	Standard Deviation	Measurement
Information/perception factors:				
PNUTOG	Regard peanut organization as important source of marketing information	0.910	0.286	0=Not important 1=Important
BUYER	Regard peanut buyers as important source of marketing information	0.868	0.339	0=Not important 1=Important
SMKT	Satisfaction with current marketing system	0.798	0.402	0=No 1=Yes
Farm management factors:				
TOTAC	Total acreage planted for peanuts in 1984	148.200	160.240	Amount reported (acres)
ENTRP	Number of farm enterprises in 1984	4.471	1.454	Amount reported
NETW	% of net worth to assets	55.647	32.446	Mid-point range 100 100 87 75-99 62 50-74 37 25-49 12 0-24
OFFFARM	Off-farm employed for male member in the farm	0.182	0.386	0=No 1=Yes
R_QUOTA	Ratio of quota peanuts to total peanuts planted in 1984	0.852	0.214	Amount reported
Demographic factors:				
AGE	Age of the farm operator	47.428	12.474	Amount reported (years)
COLLEGE	At least college education	0.352	0.478	0=No 1=Yes
SE	Georgia, Alabama and Florida (runner peanuts)	0.484	0.500	0=No 1=Yes
NCVA	North Carolina & Virginia (Virginia peanuts)	0.213	0.410	0=No 1=Yes
SWOK	Texas & Oklahoma (runner and Virginia)	0.303	0.460	0=No 1=Yes

less interest to use a new market under the current government program. However, these people equipped with skills beside farming may have positive attitudes to try a new and risk-reducing marketing system such as a futures market. Producers with high R__QUOTA, indicating higher dependency on government support, are expected to prefer a futures market to reduce market risks in a free market system.

Older producers (AGE) tend to behave more as risk-averters. They are expected to like a futures market under both scenarios. Higher educated producers (COLLEGE) are expected to have more knowledge and be able to handle relatively complicated futures contract, and thus prefer a futures market. Regional variables represent differences attributable to peanut variety and end-use differences.

Empirical Results

The probit coefficient estimates and asymptotic T values for the scenarios of with and without government program are shown in Table 2. The estimated model was statistically significant as indicated by the likelihood ratio test.

Under the government program scenario, BUYER and NETW had significant positive effects as expected, whereas SMKT had the expected negative effect towards futures market. Thus, producers who are progressive in information seeking (BUYER), who have better management skill (NETW), and who are not satisfied with the current marketing (SMKT) system favor futures market under the current government program scenario. Regional factors show that growers in NCVA region favor futures market, whereas growers in TXOK region do not.

Table 2. Probit Coefficient Estimates and Asymptotic T values ( ) by Scenarios

Variable[c]	With government programs	Without government programs
Intercept	-0.7047 (-1.357)	-0.8456 (-1.501)
PNUTOG	0.2777 (1.216)	0.4144 (1.725)
BUYER	0.6456 (3.411)[a]	0.8780 (4.463)[a]
SMKT	-0.2980 (-1.836)[a]	-0.1512 (-0.859)
TOTAC	-0.0004 (-0.883)	-0.0003 (-0.773)
ENTRP	-0.0630 (-1.401)	-0.0597 (-1.211)
NETW	0.0039 (1.912)[a]	0.0024 (1.032)
OFFFARM	0.1190 (0.698)	0.3345 (1.675)[a]
R_QUOTA	0.4086 (1.282)	0.6294 (1.836)[a]
AGE	0.0034 (0.611)	0.0074 (1.160)
COLLEGE	-0.2219 (-1.564)	-0.3412 (-2.210)[a]
NCVA	0.6595 (3.602)[a]	0.6223 (2.750)[a]
TXOK	-0.4366 (-2.621)[a]	-0.4275 (-2.382)[a]
Goodness of fit: Likelihood ratio[b]	62.109	66.653
Correct prediction (%)	65.47	77.13

a. Significance at $\alpha = 0.10$.
b. Critical value for chi-square (12) at $\alpha = 0.050$ is 21.026.
c. Variable definitions are reported in table 1.

Under the second scenario of no government program, PNUTOG, BUYER, OFFFARM and R_QUOTA have the expected positive effect, whereas COLLEGE has an unexpected negative effect. Growers who are progressive in information search (PNUTOG and BUYER), who are part time farmers (OFFFARM), and who grow more quota peanuts (R_QUOTA) favor a futures market under a free market system. However, producers with a higher education (COLLEGE) tend to dislike futures market. Regional factors are again significant as under the previous scenario.

One will note that variables such as PNUTOG, OFFFARM, R_QUOTA and COLLEGE became significant, whereas SMKT and NETW became insignificant when the policy changed. Such changes in explanatory producer characteristics on futures market indicates a need for a profile analysis.

Profile Analyses

Profile analysis identifies characteristics of peanut producers who are (or are not) favorably inclined towards a futures market. Profile analysis is important because it allows key individuals to be identified and targeted for participation in the implementation of a futures market. Profile variables are those influential producer characteristics identified by the previous probit analysis. Producer profiles for four different policy combinations are presented in Table 3.

The first policy group (A) are those producers who favor futures market under the current government program (Yes: Gov't). This group is also the producers favoring futures market under both policy scenarios (Yes: Gov't and Yes: NG). The second group (B) are producers who do not favor a futures market at all. The third group

Table 3. Means, Standard Deviations () and T test for Selected Producer Profiles

Variable[b]	No government-affected group (A) yes: gov't (& yes: NG)	(B) no: gov't & no: NG	Government-affected group (base) (C) no: gov't & yes: NG	(D) yes: NG
FNUTOG	0.934 (0.249)	0.841[a] (0.367)	0.928 (0.261)	0.932 (0.252)
BUYER	0.910 (0.287)	0.738[a] (0.442)	0.904 (0.297)	0.909 (0.289)
SMKT	0.797 (0.403)	0.766 (0.425)	0.843 (0.366)	0.808 (0.394)
METW	58.473 (32.534)	51.383 (32.729)	52.428 (31.271)	56.993 (32.288)
OFFFARM	0.191 (0.394)	0.131 (0.338)	0.217 (0.415)	0.198 (0.399)
B-QUOTA	0.862 (0.212)	0.823 (0.232)	0.858 (0.191)	0.861 (0.207)
COLLEGE	0.305 (0.461)	0.467[a] (0.501)	0.349 (0.480)	0.316 (0.465)
SE	0.477 (0.506)	0.486 (0.502)	0.506 (0.503)	0.484 (0.500)
NOVA	0.297[a] (0.458)	0.075 (0.264)	0.133 (0.341)	0.257[a] (0.437)
TXOK	0.227[a] (0.419)	0.439 (0.498)	0.361 (0.483)	0.260[a] (0.439)

a. T statistic for the null hypothesis "no difference between mean of this sample and mean of the "base sample" with No: Gov't and Yes: NG" is greater than the critical T value at $\alpha = 0.10$.
b. Variable definitions are reported in table 1.

(C) are producers who do not favor a futures market with the current government program, but favor a futures market under the free market system (No: Gov't and Yes: NG). The last group (D) are those producers who favor futures market under a no government program scenario (Yes: NG). The groups (A) and (D) are those who favor futures market under different policies. Group (C) is the producer group who changed their attitudes when government policies were changed, whereas groups (A) and (B) are groups who have the same preferences regardless of policy changes. One will note that with the elimination of irrational producers, the difference between the group favoring futures market under the current government program (Group A) and the group favoring futures market under the free market system (Group D) is the group who altered their attitudes (from yes to no) between the two scenarios (Group C).

The profile for those who favor futures market under the current government program (group (A)) can be characterized as one who highly regards peanut organization and buyers as important source of market information, satisfied with current the marketing system, has about 58% of net worth to assets ratio, mostly full time farmer , plant an average of 86% of quota peanuts, less educated, and mainly from the SE. Similarly, mean values of producer characteristics in Table 3 can be used to present producer profiles for the other groups.

The policy effect on producer preference can be evaluated by comparing group (C) to the other groups. A T test of identical mean values for each producer characteristic between group (C) and the other groups is utilized to distinguish differences between group (C) (the gov't-affected group) and the other No-gov't-effect groups. The

results of the T test between group (A) and the base group (C) indicate that the gov't-affected group has more producers in TXOK and less producers in the NCVA region than those who favored futures market under both scenarios. Also, the results between group (B) and the base group (C) indicate that the gov't-affected group has a higher percentage for PNUTOGT and BUYER, and a lower percentage for college education than the group who disliked a futures market regardless of government scenarios.

Concluding Remarks

The potential acceptance of futures market by peanut producers was examined under the scenarios of current government program and free market system. Producers' response indicates about 57% favored a futures market under the current government program scenario, while an additional 19% favored a future market if the marketing system changes to a free market system.

By probit analyses, influential producer characteristics including information/perception, farm management, and demographic factors were identified by means of probit analyses. Based on these characteristics, profiles for different producer groups were established. The comparisons between the government-affected group and the no-government-affected groups indicated that those who altered their attitudes (affected by government policies) towards a futures market come from the Texas and Oklahoma region and less likely from the North Carolina and Virginia region than the group of producers who favored a futures market regardless of the change in government policies. In addition, this group of producers are more progressive in information search and less educated than the group of producers disliking the futures market no matter what government policy exists.

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