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RISK PREFERENCES OF AGRICULTURAL PRODUCERS:
THEIR MEASUREMENT AND USE - DISCUSSION

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Young, et al. reflects an outstanding effort on the part of the Subcommittee. The assignment of the Subcommittee was not only large but, more importantly, also subsumed a number of divisive issues that have not been raised during previous W-149 Committee Meetings. Particularly impressive is that the members gave sufficient consideration to the issue so that a consensus was reached on recommendations for the full Committee. While the authors indicate that complete agreement was not reached (p. 2), the continued differences were not sufficient to warrant any minority reports. Considering the diverse educational and research background of the members, their deliberations and consensus recommendations therefore have considerable credibility.

Their conclusions and recommendations are largely acceptable to this Committee member. While I would place different emphasis on the various recommendations, I could have endorsed the Report if I had been a Subcommittee member. Later in this discussion, I will present more specifics on my viewpoint of their conclusions. As background, I will first examine the measurement issue from a broader viewpoint than is considered in the Report. This viewpoint concerns issues raised in the economics methodology literature along with related material from other areas of economics familiar to agricultural economists. The implications of this review for the measurement of risk preferences are then considered along with some evidence from psychological research. The conclusions of the Report are then reconsidered and some additional research approaches suggested.

Review of Different Economic Methodologies

The framework to conceptualize alternative economic methodologies is adapted from the views of Machlup. Machlup characterized the extreme views of economic methodology as radical apriorism and ultraempiricism. The former methods are representative of economic methodology before the application of statistics to economic research. Reasonable assumptions concerning the economic system were derived with introspection, personal observation, or both. Deductive logic was then used to derive theoretical conclusions. In contrast, ultraempiricism is the position represented by institutionalist economists. Inductive research methods and the gathering of facts comprise the appropriate methodology.

Machlup viewed these two positions as extremes which he implicitly considered formed the basis for a continuum as indicated in Figure 1. The general current consensus of appropriate methodology is approximately in the middle of the continuum, which I have labeled logical positivism. While the label is suggestive of Friedman's views, the description in Figure 1 is meant to encompass a broader view among economists and agricultural economists. For example, Judge's framework which combines deductive and inductive methods is consistent with this central position. While this central position is representative of the methodology of agricultural economists, issues at the

| | Radical Apriorism | Logical Positivism | Ultra-Empiricism |
|------------------------|-----------------------------|---|--|
| Logical Approach | Deduction | Both | Induction |
| Empirical Verification | Impossible | Not Possible for Fundamental Assumptions | Necessary for All Theoretical Assumptions |
| Research Approach | Refine Logical Models | Test Theoretical Predictions | Collect and Synthesize Facts |

Figure 1. A Continuum of Economic Methodology.

ends of the continuum do exist: the continual interest in current cost of production is approaching ultraempiricism while dissention over publishing theoretical articles in the agricultural economics journals has some aspects of radical apriorism.

One aspect of the continuum which is probably the most controversial concerns empirical verification of the theory. Radical apriorism has the position that verification is not an empirical question but rather a metaphysical and logical question. In contrast, ultra-empiricists argue that every assumption must be empirically tested. The central position has been characterized by Friedman's viewpoint that only theoretical, positive predictions are testable. While this position may not represent a methodological consensus, it does represent an immediate position between the extremes.

The most controversial part of Friedman's position is his position on assumptions. Since this position is a crucial part of the argument of this paper, Friedman's statement of his position is worth reviewing:

Truly important and significant hypotheses will be found to have "assumptions" that are wildly inaccurate descriptive representations of reality, and, in general, the more significant the theory, the more unrealistic the assumptions (in this sense). The reason is very simple. A hypothesis is important if it "explains" much by little, that is, if it abstracts the common and crucial elements from the mass of complex and detailed circumstances surrounding the phenomena to be explained and permits valid predictions on the basis of them alone. To be important, therefore, a hypothesis must be descriptively false in its assumptions; it takes account of, and accounts for, none of the many other attendant circumstances, since its very success shows them to be irrelevant for the phenomena to be explained (pp. 14-15).

To understand this position, consider the theory of consumer equilibrium. This theoretical area includes some of the most widely accepted propositions, including one which is honored with the status of a law - the law of demand. At the same time, the logical micro-foundations of the theory are a perfect example of theory that economists accept as logically correct but probably not descriptively valid or useful as a normative individual decision process for consumer behavior. The example of the theory of consumer equilibrium suggests two propositions concerning use of microeconomic theory: 1) the predictions are relevant for group behavior rather than individual behavior and 2) the optimization procedure is a logical system to derive predictions, not a normative decision process. While these propositions are not explicit in Friedman's, they are consistent with his position at least for the theory of consumer equilibrium.

This argument does not have as wide an acceptance in other areas of economics and agricultural economics as in consumer behavior. In the theory of the firm and the applied related area of farm management, firm behavior is a respectable area of research - contradicting both the above propositions. In part, this difference may reflect comparative ease of empirical application of the theory of the firm. Even with the recognition of conceptual and empirical problems, profits, production functions, and cost functions appear more measurable than consumer preferences.

The ultra-empirical roots of farm management also probably contribute to continued emphasis of both positive and normative farm research. Despite the widespread acceptance of the neoclassical theory of the firm, adherents of the behavioral theory of the firm present arguments similar to the logical positivism methodology as a justification for their theory (Simon, Cyert and

March). Briefly, their position is that many circumstances are important in individual firm behavior from which neoclassical theory abstracts in order to analyze groups of firms. Some of these important factors include multiple goals with ill-defined functional relationships, a wide range of relevant alternative actions with uncertain outcomes, and managers with limited decision-making time. Partial acceptance of the propositions of the behavioral theory of the firm provides at least implicit support for the relevance of logical positivism for the theory of the firm. The relationship of simulation studies of farm firms such as Harmon, *et al.*, and Patrick and Eisgruber to the propositions of the behavioral theory of the firm therefore indicates such indirect endorsement.

Public decision making is another area of economic theory in which the applicability of normative models to individual decisions has come under attack. The theory of disjointed incrementalism uses arguments similar to those previously discussed to suggest that rational normative models are inappropriate for public decisions (Lindblom, Braybooke and Lindblom). As in firm theory, these issues are controversial but some political scientists and economists, such as Wildavsky and Schultze, respectively, have endorsed the propositions of incrementalism.

In conclusion, the methodological position of Friedman along with selected literature in several areas of economics suggest that economic theories whose foundation is individual optimization have limited micro-applicability. Rather, the theories serve as a method of deriving general positive hypotheses concerning group behavior. In the next section, evidence on the applicability of these propositions to measurement of risk preferences is considered.

Logical Positivism and Measurement of Risk Preferences

Consideration of the hypothesis that the utility maximization model is inappropriate for application to individual decision making has several dimensions. Most importantly, the evidence concerning the performance of this approach needs consideration. Another important issue concerns whether this evidence reflects research methodology of the fundamental characteristics of the theory. Specifically, the latter issue is concerned with whether the utility maximization model abstracts from circumstances which are important to individual decisions. Young, *et al.* have presented evidence on both these issues. This section supplements their work with a summary of evidence from the psychology literature.

In psychology, risk preferences are considered as attitudes toward risk. While some differences between the concepts probably exist, they are more or less synonymous. While attitudes are not exactly defined, attitudes are considered as having cognitive, affective, and behavioral components. The cognitive component concerns beliefs about a subject, the affective component concerns values about the subject, and the behavioral component concerns planned action towards the subject (Schneider, pp. 161-162). The literature on the strength of the relationships between attitudes and behavior is extensive. A textbook summary of this literature is that individual behavior does not closely correspond with predicted behavior. Only when the time lag between attitude measurement and prediction of behavior is short and the attitudes are towards a specific act do attitudes predict well (Schneider, pp. 390-396). With this perspective, the expected utility maximization model would not be expected to perform well simply because the measurement of

preferences is very general. In summarizing the extensive experiments with the expected utility model, Kogan and Wallach conclude that the expected utility models do not predict individual risky behavior. This conclusion is appropriate both for studies which utilize objective and subjective probability distributions (pp. 115-125). An interesting aside is that these studies do support the previously noted generalization that expected utility does predict behavior better than expected value of rewards (Kogan and Wallach, p. 117). Thus, this evidence supports Young, et al., that individual risk measurement is not a primary approach.

Additional Circumstances Influencing Risk Behavior

Other circumstances besides expected gains and risk can be identified which influence behavior at an individual level. The general problem with the attitude-behavior prediction problem is that "other forces" or attitudes which also influence behavior vary from situation to situation (Schneider, pp. 391-392). This general argument is very similar to the proposition reviewed earlier that multiple goals are important in individual behavior. Until faced with a specific decision context, the relationship of the relevant alternatives to these other goals cannot be controlled.

With respect to behavior towards risk, Kogan and Wallach identify some of the circumstances from which expected utility maximization abstracts. These circumstances include skill, magnitude of gains and losses, prior gains and losses, and individual versus group decision. The first three can be characterized as factors affecting subjective probabilities: skill relates to ability to manage the particular decision, prior gains and losses refer to past payoffs, and magnitude of gains and losses concerns level of possible payoff. However, estimation of subjective probabilities will not necessarily salvage the expected utility model. For example, this literature would suggest that a crop farmer would behave differently toward risky decisions concerning production and marketing if he considers himself having either more marketing or production skill, if he had different prior experiences with payoffs from production or marketing decisions, and/or if the magnitudes of payoffs vary greatly between marketing and production. Thus, risk preferences and subjective probability distribution functions would have to be estimated for each specific decision to be consistent with this literature. This conclusion strongly supports the conclusions of Young, et al., that the expected utility model does not appear promising for extensive applications and that transferring individual risk preferences to different situations for research applications is not advisable. In reference to the latter point, Harris and Nehring's use of risk preferences estimated in California at an earlier date for use in an Iowa application appears to be highly doubtful methodology.

The final circumstance demonstrated to be of importance in risky behavior was whether the decision-maker was an individual or a group. The results in this area indicate that a group will assume a riskier position than an individual. This phenomena, which has been identified as the risky shift, probably has applicability in agricultural economics research. Even though most farm firms are organized as individual proprietorships, few managerial decisions are sole decisions; family members, landlords, and lenders are examples of other individuals who influence a farmer's decision. The standard methodology of the expected utility model, however, is based on eliciting individual preferences. Thus, this methodology in general ignores the importance of the risky shift in behavior.

Conclusions

This discussion has been extremely pessimistic concerning research on risk management at the firm level. Considering the continued public support for farm management research and extension, including support of the author, the viewpoint that economists have nothing to offer for individual farm management decisions is probably too extreme. A view which is consistent with this discussion is that the positive information provided concerning important circumstances is valuable in decision-making. For W-149 research, the information on alternative risk management practices under Objectives 3 and 4 could conceptually enrich decision-makers information on magnitude of gains and losses, and previous gains and losses along with increasing management skills. This view is consistent with the psychological research considered in this discussion. In addition this view suggests that positive information rather than normative model results are the most appropriate focus for firm research.

In general, this discussion suggests that research on aggregate risk behavior is the focus for which economists have the best comparative advantage. From this viewpoint, the expected utility maximization model is only a conceptual framework for derivation of hypotheses concerning aggregate behavior. For aggregate research, this discussion endorses Young, et al. in giving preference to the empirical approaches which infer risk preferences from behavior rather than direct elicitation. The Efficient Capital Market Model (Sharpe, Jensen) is an approach for conceptualizing aggregate risky behavior which merits some consideration by agricultural economists in addition to the approaches previously used.

For research on risk preferences under Objective 2, the psychological literature suggests some hypotheses which warrant consideration. In particular, concern about the generality and stability of risk preferences could be empirically evaluated with a series of preference elicitations for the same individual in different decision contexts and at different points in time. In addition, it may be interesting to compare risk aversion coefficients derived from direct elicitation with attitudes towards risk quantified with psychological scales. These research topics have priority in increasing understanding of the applicability of the expected utility maximization model to individual farm decisions.

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