SOME EXPECTATION MODELS USED BY SELECTED GROUPS OF MIDWESTERN FARMERS

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Earl J. Partenheimer

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This is to certify that the

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by

Earl J. Partenheimer

An Abstract

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ABSTRACT

When acting as a farm manager a farmer makes estimates of the future value of many variables on the basis of information which is currently available to him. In making these estimates he uses expectation models as guides for gathering and analyzing relevant information.

The five types of expectation models examined in this study were (1) product price models, (2) input price models, (3) models used in predicting the behavior of humans, (4) government action models, and (5) models used to predict new technology.

Data used in this study were obtained from parts of the Interstate Managerial Survey conducted in the summer of 1954. A total of 1075 farmers from Kentucky, Indiana, Iowa, Kansas, Michigan, North Dakota, and Ohio were asked questions dealing with various phases of the management process.

Very little was known of the expectation models of farmers when the study was planned. It had been hypothesized that farmers used rather simple mechanical price expectation models, and these hypothesized models were used in planning the IMS. Since no more promising alternatives were available, the same models were hypothesized, initially, in planning questions dealing with the other types of expectations. However, pretests of the schedule indicated that farmers did not generally use these types of models.

The final questions on expectations were of the open-ended type and were designed to obtain responses which indicated the models used by farmers. The information obtained was cross-tabulated with other characteristics of the respondents.

The price expectation models discovered by the open-ended non-structured questions were based on economic concepts and reflected a rather high degree of economic maturity on the part of farmers. Government action, new technology, and human expectation models were less well developed, probably because theories in these areas are not so well developed as economic theory.

For product prices, the expectation models most often used were supply, supply-demand, and government action. In the case of input prices, the government action model was replaced in importance by a general or unspecified labor costs model. Use of these models indicates that farmers are more familiar with economic concepts than had previously been hypothesized. The price expectation models used by farmers were associated with education, use of marginal concepts in figuring costs and returns, and product for which the price expectations were being formulated. Empirical content, integration of conceptual and empirical content, and conceptual completeness of the models were present to a surprising degree and were studied to the extent allowed by the data.

The questions dealing with human expectations were oriented towards early evaluations of strangers. Most farmers expressed a willingness to evaluate some characteristics of strangers on first contact. Symbols and activities which were easily observable were the usual basis for these evaluations. Along with other speculations and hypotheses, it was suggested that the kinds of evidence used might change as the farmers had opportunity to gain information about the stranger from experience and from other people.

Most farmers expected changes in national, state, and local government policies and programs affecting farmers within two years. However, the reasons given for expecting changes appeared to be quite naive. Some hypotheses concerning farmers' expectations of government action were advanced for testing in the future.

Most farmers expected changes in farming methods and inputs within two years. About two-thirds of the respondents used modified trend models in formulating their predictions. The remainder made their predictions on the basis of production needs, public willingness to accept change, adoption costs, or a pessimistic outlook.

Approved Glenn L. Johnson
Major Professor

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

The need for management arises from uncertainty surrounding the future value of many relevant variables. Within this uncertain environment the manager may be regarded as performing six functions:[1]

1. Recognizing and defining problems
2. Gathering information
3. Analyzing
4. Decision making
5. Action taking
6. Accepting responsibility for the decision

These six steps are all interdependent and may occur simultaneously.

When acting as a farm manager, a farmer often makes estimates of future values of the relevant variables. In making these estimates, he logically uses information which is worth more to him than it costs.[2] In gathering this information and in organizing it, a guide is needed as to what information

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[1]Adapted from Bradford, L. A., and Johnson, G. L., Farm Management Analysis, John Wiley & Sons, Inc., New York, 1953, p.7.

[2]Both "worth" and "cost" are used in a subjective context.

is important in predicting the future values of the variables. For example, if the farmer is predicting the price of wheat at some future time, he may consider current and prospective supplies of wheat to be the only important determinant of future prices. Another farmer may believe that the price of wheat depends entirely on the support price set by the government. A third farmer may believe both of these are important but that other types of data are also necessary for accurate prediction. Such frameworks for guiding the collection and analysis of information used for prediction are the subject of this study. They will be referred to as "expectation models."

A farmer formulates expectations concerning many things in managing a farm business. Some of these are:

1. Input and product prices
2. Crop yields and livestock production rates
3. Technology
4. Institutions
5. Behavior of people with whom the farmer deals.

This study deals with all but the second of these five. Information was gathered as to what types of expectation models were used by farmers and various attributes of these models. This information was compared with other characteristics of the farmers using the different models.

A study of the expectation models used by farmers can:

1. Provide a list of models to be tested for efficiency by researchers and thus enable the extension service to give farmers information with which to evaluate the reliability of their models.

2. Guide researchers and extension men in disseminating information which farmers need in order to use their models for prediction.

3. Aid in selecting variables for predicting supply response.

4. Aid researchers in their study of the decisions process, per se.

Review of Literature

Expectation models are not new in economics. Price expectations are mentioned frequently throughout economic literature but the other types of expectations are rarely considered. Marshall describes a short-run price expectation model for barley.[3]

> Thus, when buying or selling barley, they (the grain dealers) take account of the supplies of such things as sugar, which can be used as substitutes for it in brewing, and again of all the various feeding stuffs, a scarcity of which might raise the value of barley for consumption on the farm. If it is thought that the growers of any kind of grain in any part of the world have been losing money, and are likely to sow a less area for a future harvest; it is argued that prices are likely to rise as soon as that harvest comes into sight, and its shortness is manifest to all. Anticipations of that rise exercise an influence on present sales for future delivery, and that in its turn influences cash prices; so that these prices are indirectly affected by estimates of the expenses of producing further supplies.

Marshall considers somewhat different factors in his long run model for the supply of wool:[4]

> Again, in estimating the normal supply of wool, he would take the average of the past several years. He

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[3]Marshall, Alfred, Principles of Economics, Macmillan and Co., Ltd., 8th Ed., London, 1946, p. 337.

[4]Ibid., p. 365

> would make allowance for any change that would be likely to affect the supply in the immediate future; and he would reckon for the effect of such droughts as from time to time occur in Australia and elsewhere; since their occurence is too common to be regarded as abnormal. But he would not allow here for the chance of our being involved in a great war, by which the Australian supplies might be cut off; he would consider that any allowance for this should come under the head of extra-ordinary trade risks, and not enter into his estimate of the normal supply price of wool.

In his chapter on "The Elasticity of Wants," Marshall emphasizes the dynamic aspects of future demand.[5] He mentions many of the factors which would be included in a model for estimating demand schedules.

Knight[6] states that perfect knowledge is the chief simplification of reality necessary for achieving perfect competition. Profits arise because of the failure of competition. Entrepreneurs contract for productive services at fixed rates in advance and sell their products after production. "Thus the competition for productive services is based on anticipations."[7]

Knight[8] goes on to distinguish between <u>risk</u>, a measurable uncertainty, and <u>true uncertainty</u>, an unmeasurable uncertainty. In a risk situation, the probability distribution of a group of outcomes is known. But in an uncertainty situation, the

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[5]<u>Ibid.</u>, pp. 102-113

[6]Knight, F. H., <u>Risk, Uncertainty, and Profit</u>, Houghton Mifflin Co., Boston, 1921, p. 197.

[7]<u>Ibid.</u>, p. 198

[8]<u>Ibid.</u>, p. 233

distribution of outcomes is unknown because it is usually impossible to form the distribution. Each uncertainty situation considered is unique to a large degree.

Knight points out that "Any degree of effective exercise of judgment, or making decisions, is in a free society coupled with a corresponding degree of uncertainty-bearing, of taking the responsibility for those decisions."[9]

Keynes also casts the entrepreneur into an uncertain environment.[10] "An entrepreneur, who has to reach a practical decision as to his scale of production, does not, of course, entertain a single undoubting expectation of what the sale-proceeds of a given output will be, but several hypothetical expectations held with varying degrees of probability and definiteness." Keynes introduces expectations into his definitions of the marginal efficiency of capital, aggregate supply price, and liquidity preference. These, along with the expected marginal propensity to consume, are used in determining effective demand, the volume of employment, the rate of new investment, the real wage rate, and the rate of interest.

Keynes makes an interesting statement which may be important in studying expectation models.[11] "It is reasonable,

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[9] Ibid., p. 271

[10] Keynes, J. M., The General Theory of Employment, Interest, and Money, Harcourt, Brace and Co., New York, 1935, p. 24, footnote 3.

[11] Ibid., p. 148

therefore, to be guided to a considerable degree by the facts about which we feel somewhat confident, even though they may be less decisively relevant to the issue than other facts about which our knowledge is vague and scanty."

Hicks states that:[12]

> ...people's expectations are often not expectations of prices given to them from outside, but expectation of market conditions, demand schedules for example. . . . people rarely have precise expectations at all. . . . there will be a certain figure or range of figures, which they consider most probable, but deviations from this most probable value on either side are considered to be more or less possible.

Increased dispersion of expectations, according to Hicks, would generally have the same effect as a reduction of the most probable price. He conceives that entrepreneurs discount the most probable price for changes in dispersion of possible prices and for changes in willingness to bear risks in order to get a representative expected price. In his analysis Hicks uses this representative expected price as a single valued expectation. He feels that there should be an economics of risk to go along with his "dynamic" economics.

Hicks lists three types of factors which influence price expectations.[13]

1. Non-economic—
   weather, political news, people's state of health, people's psychology.

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[12]Hicks, J. R., Value and Capital, Oxford at the Clarendon Press, Oxford, 1939, p. 125.

[13]Ibid., Chap. 16

2. Economic, but not closely associated with price movements--
   market superstitions and news bearing on the future movements of demand or supply.

3. Actual experience of prices--
   past and present prices.

Hart[14] states that the study of fluctuations becomes necessary when the assumption of equilibrium is abandoned. When markets are in diequilibrium, prices, inputs, and outputs change through time. Therefore, future prices and alternative production functions must be used in addition to the data needed for planning under equilibrium conditions. The entrepreneur's optimum plan, given his expectations, is the one which maximizes the present value of anticipated net receipts, taking net receipts in a cash accounting sense.

In his discussion of business planning under price uncertainty, Hart[15] makes three assumptions:

1. The entrepreneur has a definite price expectation (most probable price) for each relevant future date.

2. The entrepreneur recognizes the possibility of higher and lower prices at each date and puts a numerical probability on each.

3. The dispersion of possible prices around the most probable price for a given date will be reduced as that date approaches.

The entrepreneur's primary method of meeting uncertainty is the postponement of decisions until more information is available, i.e., the preservation of flexibility. Some forms of

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[14]Hart, A. G., "Anticipations, Business Planning, and the Cycle," Quarterly Journal of Economics, Vol. 51, 1936-37, pp. 273-297.

[15]Ibid.

flexibility are inventories of finished or half finished goods, choice of products and processes, and liquidity (capital flexibility).

Tinbergen[16] and later Modigliani[17] discussed the notions of horizon in planning. Tinbergen states that the expectations relating to the near future will be given more weight in planning than those relating to times further in the future since longer term expectations are so unsure that they must be discounted heavily. Modigliani goes on to point out that an optimal first move may be more important than an organization that appears to be optimal when considering the entire life of the firm. Also, much information relevant at a given point in time is likely to accumulate at no cost as that time approaches.

Empirical Studies of the Price Expectations of Farmers

Most of the empirical work concerning the expectations used by farmers in planning production has been limited to price expectations. Yield expectations have received some attention. Expectations of institutional arrangements, new technology, and the actions of people with whom the farmer deals have been neglected.

Most supply response work done in the past has been based

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[16]Tinbergen, J., "The Notions of Horizon and Expectancy in Dynamic Economics," Econometrica, Vol. 1, 1933, pp. 247-264.

[17]Modigliani, F., "The Measurement of Expectations," Econometrica, Vol. 20, 1952, pp. 481-483.

on the assumption that farmers expect future prices to be related to prices in recent marketing periods. But Nerlove[18] states that, "Farmers react, not to last year's price, but rather to the price they expect, and this expected price depends only to a limited extent on what last year's price was." He modifies the traditional analysis slightly by estimating statistically the weights to be attached to the recent prices in estimating future supply responses. Nerlove states that other factors such as the actions of the Commodity Credit Corporation also affect expectations. However, the assumptions that Nerlove makes still regard farmers to be quite naive. Present prices and recent past prices may form a starting point, but many other factors are relevant in formulating price expectations.

D. B. Williams[19] assumes that farmers' expectations of future prices were in the form of a probability distribution. He asked questions to determine the range and the mode of the distribution. He found farmers used several factors in formulating corn price expectations such as government action, expected size of crop, and last years' prices.

W. F. Williams[20] studied the effects of milk price

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[18]Nerlove, Marc, "Estimates of the Elasticities of Supply of Selected Agricultural Commodities," Journal of Farm Economics, Vol. 38, May 1956, pp. 496-509.

[19]Williams, D. B., "Price Expectations and Reactions to Uncertainty by Farmers in Illinois," Journal of Farm Economics, Vol. 33, pp. 20-40.

[20]Williams, W. F., "An Empirical Study of Price Expectations and Production Plans," Journal of Farm Economics, Vol. 35, pp. 355-370.

expectations on production plans. He found that:

1. Price expectations become more exact as the time of selling approaches.

2. There was a tendency to project recent prices into the future with little change.

3. Expected trends in all farm prices were used to modify recent prices as a basis for predicting future prices.

4. Expectations of a group of farmers approach a normal distribution.

5. Older farmers were less uncertain in their expectations and were more accurate in their estimates.

6. There was more confidence in expected yields, facilities, and production than in expected prices.

Heady's Expectation Models

Heady lists eight mechanical models for predicting prices and yields which he hypothesizes that farmers might use.[21] He calls these "naive" models to distinguish them from the econometric models that are often used by agricultural economists.

The first of Heady's naive models uses mean yields and prices. The average over a period of years is taken as the most probable future value. The length of the series probably depends on the number of years that the farmer has been in business. Heady believes that this model is used widely in predicting yields.

Another of Heady's models is called the "random outcome"

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[21] Heady, E. O., Economics of Agricultural Production and Resource Use, Prentice-Hall, Inc., New York, 1952, Chapter 16, pp. 475-496.

model. The use of this model assumes that a farmer picks a figure at random from some relevant range, and then uses this figure as a price or yield prediction.

Heady believes that many farmers project current prices or their opposites in predicting future prices. By opposites he means relatively high prices in period one will be followed by low prices in period two and vice versa. The system may also be used with yields.

A fourth model involves the use of modal yields or prices. This model is equivalent to the mean model if the distribution is symmetric.

The fifth model is the trend model.

The normal or parallel period is the sixth considered by Heady. Some farmers using this model expected product prices to follow the same pattern after World War II as after World War I.

A futures prices model may be used for short run price expectations. Heady believes that the best use of this model is in deciding whether to store or sell a product.

The eighth naive model mentioned by Heady is the outlook model which uses information provided by people who specialize in this work.

Darcovich and Heady[22] tested these mechanical models against realized prices. The mean absolute error was the

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[22]Darcovich, W. and Heady, E. O., Application of Expectation Models to Livestock and Crop Prices and Products, Iowa Agr. Exp. Sta. Res. Bul. 438, Ames, Iowa, 1956.

criterion used to rank the models. For livestock prices, the outlook model and projection of current year's prices had the smallest mean errors and random outcome and average models had the largest mean errors. For crop prices, the trend (a weighted moving average) and outlook models had the smallest mean errors, and the random outcome and average models had the largest mean errors.

Darcovich and Heady did not investigate the extent to which farmers use these models, if at all. Kaldor and Heady[23] found that the same farmer used more than one expectation model depending on the information available to him and the confidence he has in the information. Some of the models used were similar past periods, supply, and projection of current or recent prices. The formulation of expected prices usually began with the current price. This was adjusted for what the farmer considered relevant supply and demand factors. If the farmers had little information to work with, they formed their expectations by projecting current prices or recent price trends into the future.

The Interstate Managerial Survey

The risk subcommittee of the North Central Farm Management Research Committee conceived the idea of an empirical

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[23]Kaldor, D. R., and Heady, E. O., An Exploratory Study of Expectations, Uncertainty, and Farm Plans in Southern Iowa Agriculture, Iowa Agr. Exp. Sta. Res. Bul. 408, Ames, Iowa, 1954.

study of the decision-making process.[24] Johnson and Haver[25] summarized and extended slightly the body of generalizations concerning the decision-making process. Plans were laid for a broad inter-state, interdisciplinary empirical study to test some of the hypotheses and determined the relevance of the classifications, concepts and ideas summarized by the work of Johnson and Haver. Meanwhile, a conference on Risk and Uncertainty in Agriculture was held in Bozeman, Montana, in August of 1953[26] at which agricultural economists and others from the Great Plains and the North Central regions exchanged old ideas and research techniques and developed new ones with emphasis on the dynamic aspects of agriculture.

The final result was the Interstate Managerial Survey (hereafter referred to as the IMS) conducted by the Indiana, Iowa, Kansas, Kentucky, Michigan, North Dakota, and Ohio

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[24]The following description of events leading up to the Interstate Managerial Survey and the brief description of the Survey was taken from articles by H. R. Jensen, C. B. Haver, Joel Smith, G. L. Johnson, D. W. Thomas, L. S. Hardin, and E. O. Heady under the title "Progress and Problems in Decision Making Studies," Journal of Farm Economics, Proceedings Number, Vol. 37, 1955, pp. 1097-1125. See this reference for a much more complete description of the formulation of the Interstate Managerial Survey. See also, Halter, Albert N., Measuring Utility of Wealth Among Farm Managers, Unpublished Ph.D. Thesis, Michigan State University, 1956, Chapter II and Appendices A and B.

[25]Johnson, G. L., and Haver, C. B., Decision Making Principles in Farm Management, Ky. Agr. Exp. Sta. Bul. 593, Lexington, Ky. 1953; and Johnson, G. L., Managerial Concepts for Agriculturalists, Ky. Agr. Exp. Sta. Bul. 619, Lexington, Ky. 1954.

[26]See Great Plains Council, Proceedings of Research Conference on Risk and Uncertainty in Agriculture, N. D. Agr. Exp. Sta. Bul. 400, Fargo, N. D., 1955.

experiment stations. In addition to agricultural economists, Joel Smith from the Sociology Department of Michigan State University participated in the study and personnel from the Iowa State College Statistical Laboratory helped design the sample. The survey involved 65 questions which can be divided into seven categories[27] dealing with:

1. Types and sources of information
2. Analytical problems and processes
3. Expectation models
4. Strategies
5. Knowledge situations
6. Propensities to buy insurance and to take risks as related to the disutility of losses and the utility of gains in income and assets.
7. Other characteristics of the respondents.

As the schedule was being developed and pretested, it became apparent that the time required per interview was too long. Therefore, six field questionnaires were set up with some of the questions not being asked on all of the questionnaires. In some instances enough data were sought to test rigorously developed hypotheses; in other instances only open ended nonstructural probing questions were used in an attempt to gain preliminary insights.

The schedule was pretested and revised a number of times and an interviewer training school was held after the schedule

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[27]Jensen, H. R., "Progress and Problems in Decision Making Studies, The Nature of the Study," Journal of Farm Economics, Proceedings Number, Vol. 37, 1955, pp. 1097-1101.

was in final form. As the schedules were collected, they were sent to supervisors who checked them. This procedure was adopted in order to spot weaknesses and minimize the number of schedules taken before weaknesses were corrected. A total of 1075 acceptable schedules were taken.

The IMS Questions on Expectation Models

In the field of expectations, the various areas are not uniformly developed. In certain areas fairly well developed theories have been constructed while in other areas the theories are quite tentative. Still other areas are almost completely devoid of any theoretical structure. In the least developed areas there are very few known facts which could be used as premises. These conditions are reflected in the expectation questions in the IMS. Some of the questions were designed to test specific hypotheses. Others were designed merely to gather insights and information useful in building hypotheses. In general, the field of price expectations is more advanced than the other expectation categories.

Care has been taken to avoid throwing away useful information. Occasionally just a few observations provide the basis for hunches that can lead to further productive research. Because of the undeveloped stage in which we currently find the study of farmers' expectations, it is important that no information be lost.

The IMS questions dealing with price expectation models were originally formulated with Heady's[28] classification of

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[28]Heady, op. cit.

models in mind. It became apparent in early pretests that farmers used much more sophisticated price expectation models than those hypothesized by Heady. The questions were then revised to an open-ended form in order to learn what types of models were used and to avoid structuring responses along preconceived lines. Categories into which the models reflected in the responses of farmers could be coded were formulated by studying a group of responses. The responses were coded into these categories under the joint direction of Glenn Johnson, Joel Smith and Albert Halter, two agricultural economists and one sociologist. Presence of empirical content, integration of conceptual and empirical content, and conceptual completeness of the models were also coded.

Open-ended probing questions were also asked concerning the expectations of farmers concerning new technology, institutions, and the behavior of people with whom the farmer associates. The coding procedures mentioned above were used. The questions on expectations are shown in Appendix A as they appeared in the interview schedule.

The above information was punched on I.B.M. cards and the totals were tabulated. This information was then cross tabulated with certain characteristics of the respondents, which we shall refer to as control variables, to ascertain the kinds of farmers using different models in various ways. The control variables are listed in Appendix C.

Possible Sources of Bias and Error

It might be hypothesized that farmers' responses to the questions were influenced by a desire to impress the interviewer but several precautions were taken to minimize this possibility. Neutral probe questions were included in the interview form. In the early questions concerning a specific type of expectation an attempt was made to keep the farmer's thinking in areas familiar to him. If he did not answer the earlier questions, more general questions were asked, and answers to these questions could have been biased by a desire to please the interviewer. Even then the farmer would have to be familiar with the models, reflected in his responses although he did not use them.

Seven states cooperated in the IMS. When the state in which the respondent resided was cross tabulated with the control variables even a casual inspection of the contingency tables revealed large differences between states. These differences probably result from different physical and social environments. Differences between states in physical and social environments were revealed by Halter's work.[29] He found statistically significant differences between states in the distribution of many of the control variables shown in Appendix C. Statistically significant relations are found between the control variables and the dependent classifications in the following two chapters of this report. Thus, relations between states and dependent variables can result from

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[29]Halter, A. N., op. cit.

the dependence of both on the same physical and social environment.

Although in most cases there was not enough information for chi-square tests, inspection reveals important differences in responses obtained by interviewers within a state. There were differences in this respect between the responses dealing with price and those dealing with human expectation models. There were far fewer differences between interviewers on questions dealing with expectations concerning new developments and government action.

The greatest differences between interviewers within a state were found in Michigan. This was probably due to the fact that schedules were taken in two completely different areas within Michigan with only part of the interviewers going to the one area. Other states with important differences between interviewers were North Dakota and Indiana. Part of the differences between interviewers within a state can be due to the geographical concentration of the respondents contacted by a specific interviewer. Some of these differences, however, probably result from interviewer bias despite the precautions taken to avoid it.

Cooperators in each state indicated the area or areas in which the schedules were to be taken and the number of schedules they wished to collect. As a result, the sampling rates differed in different sampling areas. The rates varied from 1 to 11.9 in Kentucky to 1 to 168.9 in Iowa.[30] Since no

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[30]Haver, Cecil B., "Progress and Problems in Decision Making Studies, The Universe of Farms Studied," Journal of Farm Economics, Proceeding Number, Vol. 37, 1955, p. 1103.

weighting procedure was employed to adjust the data, any generalizations resulting from this study will be strictly applicable only to the farmers in the sample rather than to the universe from which the sample was drawn. Since the eight strata sampled are not a random sample of any specified universe, and since the study is largely exploratory, the biases introduced by failure to weight according to differences in sampling rates should not be critical.

Statistical Test Used

The cross tabulations were set up as contingency tables, and the chi-square test was used on each contingency table to test the hypothesis that the two characteristics which were cross tabulated were distributed independently.[31]

In order for the chi-square test to give reliable results when applied to contingency tables, the expected values in each cell must be greater than some minimum. The minimum value has been set as "at least five" or "at least ten" by different writers, but recently the criterion has been liberalized somewhat. Cochran[32] recommends that for tests involving more than one degree of freedom, no cell should have an expected value less than one, and fewer than 20 percent of the cells should have an expected value of less than five. This criterion

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[31]For a discussion of the chi-square test see Cochran, W. G., "The X^2 Test of Goodness of Fit," The Annals of Mathematical Statistics, Vol. 23, No. 3, 1952, pp. 315-345.

[32]Cochran, W. G., "Some Methods for Strengthening the Common X^2 Tests," Biometrics, Vol. 10, 1954, p. 420.

which we shall call Criterion I was used in deciding whether there were enough data for a chi-square test.

As stated earlier, one of the primary objectives of this study is to suggest hypotheses for future investigation. In this case we should be able to use a less severe criterion than when we are interested in testing a specific hypothesis. To identify more of these possible relationships, we will require that not more than forty percent of the cells have an expected value of less than five and that no cell has an expected value less than one. This criterion will be called Criterion II. The "forty percent" figure was chosen subjectively. When Criterion II is used in later sections of this dissertation, it will be explicitly stated that this has been done. Though Criterion II is used mainly for formulating hypotheses, the process of formulating hypotheses will not be based solely on empiricism.

The procedure followed in deciding whether the chi-square test could be used on a contingency table is stated below:

1. If the contingency table meets Criterion I, the chi-square test was used.

2. If Criterion I was not met, and the logic of the situation permitted, the rows and columns were combined. In cases where this could not be done, columns or rows with very few observations were omitted. If either of these operations or a combination of them resulted in a contingency table which satisfies Criterion I, the chi-square test was used.

3. If the above operations resulted in a contingency table which did not meet Criterion I, but satisfied Criterion II, the chi-square test was used. The fact that a table meets only Criterion II will be noted in the discussion of the results.

4. If Criterion II was not satisfied after the grouping operations described above, then the available data were considered insufficient for a chi-square test.

Each hypothesis was tested at the .01 level of significance. If the hypothesis was not significant at the .01 level, it was tested at the .10 level. In discussing significant relations, the level of significance is shown in parentheses after the characteristic by which the data are cross-tabulated.

CHAPTER II

PRICE EXPECTATION MODELS

Farmers commonly make their production plans and marketing decisions on the basis of an expected price. That farmers do react to expected price is indicated by changing proportions of acreages planted to different crops, cycles in livestock numbers, changes in marketings from day to day and year to year, substitutions among inputs, and many other commonly observed phenomena. Since farmers do react to expected price they must have some guides for use in gathering and analyzing information to formulate such expectations. We have called these guides "price expectation models."

Product Price Expectations

One of the objectives of the IMS was to determine what price expectation models are used by farmers. Respondents were asked what they expected the price of the most important commodity produced on their farm (excluding dairy products) to be at the next marketing period.[1] Dairy products were

[1]The questions are shown in Appendix A, question 25b. Of the 532 farmers who were asked the question, 402 gave a specific price forecast. More respondents were willing to answer a more general question "Do you expect the price (of the most important commodity of the farm, excluding dairy products) at marketing time to be higher than, lower than, or the same as it was at the same time last year?" Only 75 said they expected the price to be higher, 279 thought the price would be lower, and 150 said they expected the price to be the same as it was

excluded because their prices are relatively stable and often fixed by market orders. The respondents were then asked how they arrived at their price estimates, and the models reflected in their answers were coded. If the questions concerning a specified product did not elicit reference to a model, a series of more general questions was asked. These questions are shown in Appendix A, question 25c. The models reflected in the answers to these questions were coded separately from those previously mentioned.

The models revealed by both series of questions varied from vague to complete. For example, any mention of supply as a factor in the determination of price was coded as a supply model while a complete specification of a supply schedule would have been coded the same way. In later sections the use of empirical information and the completeness and consistency of the models will be discussed.

More than one model was indicated by some responses. For instance, a respondent may have referred to an expected downward trend in all farm prices as well as to expected government support prices. This response would be coded as reflecting both a "general trend of all farm prices" model and a "government action" model. However, no single response was coded in more than one of the three categories: supply, demand, or supply-demand.

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a year earlier. Seventeen said they did not know and the expectations of eleven respondents could not be determined from their replies.

Models for Specific Products

Price expectation models coded from the answers to the questions involving a specific product will be considered first. For the most part, these responses dealt with products whose production was already under way.[2] Price expectations of this type are used in modifying current production processes and in making marketing decisions.

Models Used

Of the 532 farmers who were asked how they arrived at their price estimate, 429 answered the question, and 394 of the answers indicated the use of at least one product price expectation model.[3] Of these 394 respondents, 68 percent used a supply model; 31 percent used a government action model,[4] 17 percent used a supply-demand model; 9 percent used a lag or extension of recent and/or current events model; 7 percent used an inflation-deflation, level of employment, and business activity model; and 5 percent used a general trend in all farm prices model. In total the other 11 models plus the "other model" category accounted for only 17 percent of the 649 models which were coded. A listing of the models used is shown in Table I.

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[2]The length of time between the interview and the next marketing period for the product is shown in Appendix A, number 55.

[3]The products to which the responses refer are shown in Appendix B, Table I.

[4]There would probably have been a higher proportion of government action models if dairy products had not been excluded from consideration.

Economists generally agree that demand schedules for agricultural products are relatively stable over the comparatively short spans involved here. Given stable demand, variations in price result from changes in actual and expected supply. Thus, farmers' reliance on supply as the determinant of short run price changes is entirely rational if they tacitly assumed demand to be constant. Of course, the use of supply-demand models would also be rational.

Next to supply models the model most often used was the government action model. Nearly all of the government action models were used for cash crops. When the schedules were taken there were surpluses and prospective surpluses for many of these crops and price support programs were either in effect or contemplated. Thus supply plus the support levels could determine price. If the respondents expected supply to be equal to or greater than that which would be consumed at the support price, their use of a government action model is rational.[5]

The supply models, supply-demand models, and government action models accounted for 70 percent of the models coded from the question on price expectations for specific products. In most cases the remaining models refer to at least one of the factors which determine price.

The models used by the IMS respondents did not agree

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[5]Most government action models were used in conjunction with supply models.

with those hypothesized by Heady.[6] If we deny Heady his outlook model for a moment, the empirical models which might fit into his classification are the trend models, cyclical models, seasonal models, futures market models, and the lag or extension of recent and/or current events models. These account for only 11 percent of the 649 models coded from farmer responses.

Heady's eighth model is the outlook model. The outlook model involves the adoption of expectations from land-grant colleges and other agencies which in turn employ supply-demand models. Though these sources provide data which farmers use in their predictive apparatus, IMS results do not indicate that farmers blindly accept price predictions by these organizations as a basis for planning.

It would appear that Heady has underemphasized the effect of the economic education that has been carried on through the extension service, government programs, farm magazines, non-governmental farm organizations, and other such sources. The IMS gives evidence that farmers are more sophisticated economically than he had presumed at the time he wrote his text on production economics; in a later article written with Kaldor and discussed earlier in this thesis, he was more aware of the economic models.[7]

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[6]Heady, E. O., Economics of Agricultural Production and Resource Use, Prentice-Hall, Inc., New York, 1952. The models hypothesized by Heady are briefly described on p. 7f.

[7]It should be remembered that the IMS models were coded from the replies to open-ended questions on expectations. Many

Characteristics of Farmers Using Different Models

The models were cross-tabulated with the control variables shown in Appendix C and the results set up as contingency tables. Certain relations between the models and the characteristics were hypothesized. Each hypothesis[8] was tested in three steps:

1. The chi-square test was used to test the null hypothesis that the two variables (X_1 and X_2) which were cross tabulated in the contingency table were independent. The null hypothesis was tested at the .01 level of significance. If there was no significance at the .01 level, the null hypothesis was tested at the .10 level. In discussing statistically significant relations, the level of significance is shown in parenthesis after the control variable.

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respondents might have given an affirmative answer if they were asked whether they used one of the models hypothesized by Heady. IMS respondents were asked such a question regarding Heady's parallel or normal period model. The question was "Is there any special year or group of years you think of as typical for purposes of comparison in trying to figure out what prices to expect." A total of 341 said they did not use such a period while 105 reported that they did. But none of the 105 respondents referred to a base period in their replies to the open-ended questions from which the IMS models were coded.

[8]The term "hypothesis" will be used only to refer to hypotheses concerning the direction of a relation between two variables. When speaking of a hypothesis of independence tested by a chi-square test, we will use the term "null hypothesis."

2. If the null hypothesis was rejected, the direction of the relation between X_1 and X_2 was examined to see if it supported the hypothesis.
3. If the null hypothesis was not rejected, the table was examined to find if there was any indication of a relation between X_1 and X_2 which was not strong enough to cause the null hypothesis to be rejected.

Models used by relatively few respondents were deleted from the contingency tables before the chi-square tests were run, as such models would result in many cells with low expected values and these low expected values would, in turn, invalidate chi-square tests.

The models retained were (1) supply, (2) supply-demand, (3) lag or extension of recent and/or current events, (4) general trend in all farm prices, (5) inflation-deflation, level of employment, and business activity and (6) government action. Two of the product price expectation models have long descriptions. For ease of discussion the "lag or extension of recent and/or current events" model will be called the "lag" model, and the "inflation-deflation, level of employment, and business activity" model will be called the "business activity model."

Hypothesized Relationships

The supply-demand model is the classical model of economic theory. In this chapter a preliminary hypothesis is that the more economically mature farmers will be more likely to use the supply-demand model than those who are not so well

acquainted with economic principles.

Education may include economics. In any event, it adds to the intellectual maturity needed for an independent pursuit of economic knowledge. Other educational activities might also provide economic knowledge. We will hypothesize, therefore, that:

> As education increases, the use of the supply-demand model will increase while the use of other models decreases.
>
> Those who had agricultural training in high school or college use relatively more supply-demand models and less of the other models.
>
> Those who participated in (1) 4-H or FFA, (2) training courses outside of formal schools, or (3) extension meetings and meetings of non-governmental farm organizations, are also more likely to use supply-demand models and less likely to use the other models.

Over the years, experience may teach farmers economic principles. Therefore, we shall hypothesize further that:

> As age and years of farming experience increase, the use of the supply-demand models will increase, and the use of other models will decrease.

Farms were classified as to type on the basis of the products produced. The answers to questions on price expectations were related to the most important product produced on each farm, exclusive of dairy products. As crop prices are more often supported by government action than are the prices of livestock products, we hypothesize that:

> Cash crop farmers use government action models relatively more and other models less than fat stock farmers, while dairy and general farmers will be intermediate.

It is reasonable to expect that farmers who have a familiarity with marginal concepts to be familiar with other economic concepts. We will hypothesize, therefore, that:

Those who use marginal concepts will use supply-demand models relatively more than other models.

Tests of Hypotheses

In discussing the results of the tests of the hypothesis, two conventions will be adopted throughout this paper. When the terms "more" or "less" are used in reference to a specific cell in a contingency table, they will mean that the observed value is considerably greater or smaller than the expected value in cell. Thus the terms are relative, not absolute. The second convention is that if a certain category is not mentioned in a discussion of a particular contingency table, then all of the observed values for that category are near their respective expected values.

Results of the chi-square tests indicated that the type of expectation model used for product prices depended on three of the five education variables--years of formal schooling (.01), agricultural training in schools (.10), and participation in 4-H and FFA (.10). The null hypothesis of independence was not rejected and no indication of a relation was found between the models and training courses outside of formal schools, or attendance at extension or non-governmental farm organization meetings.

As the amount of formal education increased, the supply-demand model and the business activity model were used more. The supply model and the government action model were used less as education increased. Respondents who had agricultural training in high school or college used the supply-demand model more often, and the supply model and lag model less often,

than those who did not have such training.[9] Thus, the hypotheses involving these two characteristics were confirmed.

Respondents who had belonged to 4-H or FFA used more lag models and less government action and business activity models than those belonging to neither. This was not in agreement with the hypothesis. It would seem that a category containing former FFA members and one containing those who had agriculture in high school should agree. But the category containing the FFA members has many more 4-H than FFA members. The difference in the two categories probably results from differences between those in 4-H and those taking agriculture in high school. Lack of a sufficient number of observations prevents more detailed investigation.

Chi-square tests indicated that the models depended on age (.10) and years of farming experience (.10), but in neither case did the data reveal a relation consistent with the hypothesis. The relations in the contingency tables for these two variables are quite erratic. Unidentified variables associated with age and years of experience may be responsible for the interrupted trends.

Age did not bear a constant relationship to models used. For instance, the supply model was used more by the respondents under 35 years and between 45 and 54.9 years old, while respondents in other age groups used the supply model less often. The supply-demand model was used more by the 35 to 44.9

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[9]Of course, amount of education and agricultural training in high school or college are not independent.

age group and less by the other groups. The lag model was used more by those under 35 and less by the other groups. As age increased, the proportion of respondents using the business activity model increased. The government action model was used more by the 35 to 44.9 group and less by the 45 to 54.9 age group.

Similarly farming experience did not bear a consistent relationship to models used. Men who had farmed 15 years or less used far more lag models than those who had farmed for a longer time. Except for those farming more than 40 years, the use of the business activity model increases as years of farming experience increases. The group who had farmed for more than 35 years used more government action models than other age groups.

A chi-square test indicated that the models used depended on the type of farm (.01) under criterion II. The hypothesis concerning this relation was substantiated. Except for fewer government action models among dairy farmers, the general and dairy farmers used about the same proportion of each model as all farmers taken together. Fat stock farmers used far less government action models, and more supply models, general trend in farm prices models, and business activity models. Cash crop farmers were just the opposite of fat stock farmers. There were too few of the other types of farms to be included in the test.

A chi-square test indicated dependency between the

models used and the use of marginal concepts (.10).[10] The hypothesis involving this relation was partially supported by the data. Those who used a method of figuring costs and returns that indicated an understanding of marginal concepts used more supply-demand and government action models, and less supply models, than those using some other method of figuring costs and returns.

Other Relationships

Characteristics other than those referred to above may be related to the types of models used by the respondent. As was discussed previously, one of the objectives of this study was to find unsuspected relations that may be indispensable parts of a cogent theory of expectations. In order to accomplish this objective, all of the characteristics were cross-tabulated with the models and chi-square tests were run on the resulting contingency tables to test for independence. This was done regardless of whether or not a

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[10]Respondents were shown two examples of computations on the basis of which a decision was to be made as to how far a hog enterprise should be expanded. One involved marginal concepts while the other method did not. Respondents were then asked whether they used one of these two methods, both methods, or another method. If they used another method, they were asked to describe it. In this case, the description was examined to see whether or not it indicated an understanding of marginal concepts. Those who said they used the illustrated method which involved marginal concepts, and those who described some other method which indicated an understanding of marginal concepts were put in one category for the chi-square tests. The other category contained those who said they used the other illustrated method or described a method not involving marginal analysis. There were too few in the category saying they used both methods to be included in the test. See Appendix A, number 12.

specific hypothesis was advanced. Some of the seemingly significant relations identified by these tests may be spurious but others, though not previously hypothesized, may turn out to be useful in theory development. Future research will be needed to confirm or disconfirm the tentative conclusions reached here.

The chi-square tests indicated that product price expectation models used depended on the percent of total acreage acquired through renting (.01); the number of difficulties encountered in acquiring information and making decisions (.10); and, under Criterion II, the proportion of total income arising from farming (.10). Although the null hypotheses of independence were not rejected, there does appear to be some relation between the expectation model used and both the type of error which the respondent feels is most important and whether or not the respondent was out of farming for a while.

As the proportion of total acreage acquired through renting increased, the use of government action models increased and fewer respondents used supply models and business activity models. Those who rented part of their land used relatively more general trend (in all farm prices) models than respondents who owned all or rented all of their land. More farmers who owned all of their land and less of those who rented part of their land used the supply-demand model. As most government action models were used by crop farmers, the above distribution of models suggests the hypothesis that

cash crop farmers rented a higher proportion of their land than farmers concentrating on the production of other products.

In another of the IMS questions not handled in detail in this thesis, the respondents were requested to rank the five types of information--price, production, new development, human, and institutional--according to the difficulty of their acquisition. They were then asked to name any additional difficulties encountered in acquiring information and making decisions. The rankings of the five information categories were not significantly related to the models used. However, those who mentioned relatively few additional difficulties used less supply-demand models and more general trend (in all farm prices) models and government action models than those mentioning more such difficulties. A possible explanation of this result is a possible correlation between the amount of information needed and the difficulty in getting it. A supply-demand model requires more information so the person using it would have more difficulty in obtaining sufficient information.

Although there were no important differences in the models used by part-time and full-time farmers, there were differences among part-time farmers. Respondents obtaining less than three-fourths of their total gross income from farming used less supply models and more business activity and government action models than those who obtained a higher proportion of their gross income from farming.

Respondents expressing most concern about taking action when they shouldn't used relatively more supply-demand and lag models, and less supply and government action models; those who were equally concerned about both types of error did the opposite. Farmers expressing most concern about not taking action when they should were intermediate. This pattern is similar to that found with education. Those with more education may be more concerned about taking action when they should not, and those with less education may have stated that they are equally concerned about both types of error.

Those who had been out of farming and then re-entered farming used relatively more supply-demand models and less government action models than those who had never changed occupations since beginning to farm. No explanation is advanced for either of these relations.

Models Without Specific Product Reference

Some of the respondents did not give responses reflecting a model to the question regarding their price expectations for the most important product produced on their farms. As was explained previously, these men were asked the three more general questions shown in Appendix A, Question 25, part C. The answers to these questions do not refer to a specific product as did the answers to part B.

Models Used

Again the models used were coded from the replies. Of the 162 respondents who were asked the questions in part C,

158 gave answers which indicated the use of at least one model. Of these 158 respondents, 56 percent used a supply model, 28 percent used a supply-demand model, 21 percent used a war model, 20 percent used a business activity model, and 20 percent used a government action model. The other models accounted for only 17 percent of the 274 models which were coded.

Again there were many models used in addition to those hypothesized by Heady in 1952. The thirteen trend, cyclical, seasonal, futures market, and lag models coded were covered by his models.[1] This is only five percent of the 274 models coded from the responses to these questions.

Characteristics of Farmers Using Different Models

The models coded which had no specific product reference were cross tabulated with the control variables shown in Appendix C. Again many of the models were used by relatively few respondents and were deleted. Five models were included in the contingency tables. They were the supply, supply-demand, business activity, government action, and war models.

Hypothesized Relations

All but one of the hypotheses advanced for the previous group of models can be used for the models coded from the answers to the more general questions (see p. 29). The hypothesis dealing with the type of farm must be eliminated because the replies are no longer tied to a specific product.

Tests of Hypotheses

The null hypothesis of independence was not rejected in the case of any of the five education variables. However, more supply-demand models and fewer supply models were recorded as years of formal education increased. This is in agreement with what was found regarding models coded from the responses to the questions concerning a specific product.

The chi-square tests did not indicate dependence between the models used and either age or years of farming experience, but as the age of respondents increased, more business activity models and fewer supply models were used. Those between the ages of 35 and 44.9 used more government action and less war models than older and younger respondents. Although these results do not support the hypothesis, they agree with the relations found between age and the models coded from the responses to the questions involving a specific product which also denied the direction of the hypothesized relationship.

The null hypotheses of independence between the models used and the use of marginal concepts was rejected under Criterion II (.10). Respondents who indicated a use of marginal concepts used more supply-demand models and less government action models than those using some other method of figuring costs and returns. This supports the hypothesis and is in partial agreement with what was found in the previous section.

Other Relationships

There was some indication of two relations which were

not hypothesized. Although the null hypotheses of independ- were not rejected, the models used appeared to be related to whether the respondent had ever lived in a city, and whether the respondent had ever had children in 4-H and/or FFA. Respondents who had lived in the city used more supply-demand models and less war models than those who had always lived on a farm. Farmers who at some time had children in 4-H or FFA used more supply-demand and business activity models and fewer supply models than those who had never had children in either of these organizations. There were no similar relations in the comparisons involving models used in arriving at price expectations for a specific product.

Differences in the Distribution of the Two Groups of Product Price Expectation Models

A comparison of the models coded from the responses to Parts B and C (specific and general questions) of the question on product price expectations is shown in Table I. The supply, lag, government action, seasonal, and trend models were used relatively more by those responding to part B of the question. Supply-demand, business activity, war, and foreign trade models were used comparatively more often by those who were asked part C.

An inspection of Table I reveals that some of the differences between the two groups of responses are very large, but that there is a strong general similarity between the rankings in the two distributions. Though this fact leads to the recommendation that future detailed work on product

Table I. Comparison of Frequency with Which Models Were Coded from 394 Responses Dealing with a Specific Product at the Next Marketing Period and from 158 Responses with No Specific Product or Time Reference

Model	Coded from: Part B[a] Number of Respondents Using Model	Part B[a] Percent of Respondents Using Model[c]	Part C[b] Number of Respondents Using Model	Part C[b] Percent of Respondents Using Model[c]
Supply	266	67.5	88	55.7
Government Action	122	31.0	31	19.6
Supply-Demand	67	17.0	44	28.0
Lag[d]	35	8.9	1	.6
Business Activity[e]	26	6.6	32	20.3
General Trend in Farm Prices	21	5.3	6	3.8
Similar Product Analogy	18	4.6	10	6.3
Seasonal	17	4.3	3	1.9
Quality	16	4.1	6	3.8
War	13	3.3	33	20.9
Trend	13	3.3	2	1.3
Demand	12	3.0	5	3.2
Political	7	1.8	3	1.9
International Situation in General	4	1.0	2	1.3
Futures Market	4	1.0	1	.6
Foreign Trade	2	.5	6	3.8
Cyclical	1	.3	1	.6
Other	5	1.3	0	.0
Total	649		274	

a/ Refers to models coded from part B of question 25. Questions in part B referred to a specific product.
b/ Refers to models coded from part C of question 25. Questions in part C did not refer to a specific product.
c/ The percentages refer to the proportion of all respondents who used a specific model in their responses to the designated set of questions.
d/ Lag or extension of recent and/or current events model.
e/ Inflation-deflation, level of employment, and business activity model.

price expectations be product oriented, it still lends considerable confidence to other types of more general studies. The responses given to the more general questions (part C) may reflect the distribution of models used by farmers over different spans of time, while the distribution for specific products (part B) is limited to the next marketing period.

Another factor might be partially responsible for the differences in the distributions of the two groups of models. Part C was asked only when the interviewer thought the response to part B did not contain a model. There could have been other differences between those who gave an acceptable answer to the first group of questions and those who did not. For example, older men might be more (or less) likely to give an acceptable answer to the question dealing with expectations for a specific product. Since older respondents did use more business activity models, there would be relatively more (or less) business activity models among the models coded from the answers to the question dealing with a specific product.

Characteristics of the Models

The rest of the discussion of product price expectation models will be concerned with the content and completeness of the models used. Both the models coded from the question on a specific product and those from the question with no specific product references are included in the totals.

Empirical Content of Models

Some of the responses to the questions on product price expectations contained only conceptual models. Other responses contained only empirical comments from which conceptual models were inferred. Still others contained both conceptual models and empirical data. Of the 493 respondents who gave answers which indicated the use of at least one model, 297 had some empirical content in their responses. There was no empirical content in 176 responses, and in 20 cases the presence of empirical content was questionable.

Hypothesized Relations

We would expect persons who think inductively to be more likely to have empirical content in their models than those who depend on deductive thought processes as deduction can be based on non-empirical premises. We shall hypothesize that:

> A higher proportion of farmers who used induction have models with empirical content than those using deduction, while those who indicated they used both are intermediate.
>
> The same relation should hold concerning the method of thinking which respondents indicate is "most natural" for them to use.

Students are introduced to deductive sciences in their formal schooling. This is particularly true in college. Thus those who had college training might depend less on induction. We will hypothesize that:

> Respondents who had attended college would be less likely to have empirical content in their models than would those with less education.

Tests of Hypotheses

In the case of the first hypothesis, the corresponding null hypothesis of independence was rejected. Farmers indicating that they used mainly or only induction had less empirical content in their models than those using mainly or only deduction (.10).[11] Those who indicated about equal use of both methods were intermediate. Although the null hypotheses of independence was not rejected the responses concerning the "more natural" thinking method followed the same pattern. These results are the exact opposite of what was hypothesized. The data did not support the hypothesis involving education. This is not surprising since the education hypothesis was based on the hypotheses concerning thinking methods.

These results suggest that one of three things occurred: (1) There is a divergence between thinking methods used and the methods farmers said they used, (2) the question on thinking methods was not designed properly, or (3) an error was made in deducing the hypothesis. Of these three alternatives, the third is plausible. In deducing the hypothesis, the proportion of deductive thinkers reasoning from non-empirical premises was probably over estimated.

Other Relations

Again there were indications of relations which were not hypothesized. Chi-square tests indicated dependence between the presence of empirical content and whether the respondent

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[11]For the question on thinking methods, see Appendix A, Number 13.

was raised on a farm (.10), type of training received besides formal schooling (.10) and use of marginal concepts (.10). There did appear to be relations between the presence or absence of empirical content and whether the respondent had been in 4-H or FFA, whether the respondent had received agricultural training exclusive of formal schooling, and the proportion of land acquired through renting although none of the respective null hypotheses of independence were rejected.

Respondents who spent none or only part of their childhood on farms gave relatively fewer responses with empirical content than those who spent all of their childhood on farms. As membership in 4-H and FFA is related to where the childhood was spent, we expect similar responses from the two groups. This was only partly true. Farmers who had belonged to both 4-H and FFA gave more responses with empirical content but the opposite was true for those who belonged to only one of the two. Those who belonged to neither organization had the same proportion of responses with empirical content as the respondents as a group.

Those who received training besides formal schooling gave more responses with empirical content than those with no such training. Of the respondents who did have added training, those who had veteran's "on the farm" training were less likely, and those with mechanical training relatable to agriculture were more likely, to have responses with empirical content.

Farmers renting fifty percent or more of their land had empirical content in their responses more often than those

who rented less than half of their land. Men who indicated a use of marginal concepts had more responses with empirical content than those who used some other method of figuring costs and returns.

No explanation is advanced as to why men who spent all their childhood on farms, who belonged to both 4-H and FFA, or who had mechanical training relatable to agriculture, should have empirical content in a relatively high proportion of their responses. The relations involving proportion of land rented and the use of marginal concepts are also unexplained.

Integration of Conceptual and Empirical Content of Responses

Its presence in a response does not insure that empirical data contribute to the formulation of price expectations. In order to contribute effectively to prediction, the conceptual model should be integrated with the empirical data. In 208 cases the conceptual model was inferred from empirical comments. Of the 285 respondents who had conceptual models in their responses, only 69 had integrated the conceptual and empirical content of their responses; in 188 responses such integration was not present. These 188 responses contained 176 replies with no empirical content, and 12 cases where both conceptual and empirical content were present but the two were not integrated. The presence or absence of integration could not be ascertained in the remaining 28 responses.

The 69 respondents who had the conceptual and empirical contents of their responses integrated were compared with

the 188 who did not integrate the conceptual and empirical content. These two groups will be referred to as those with integrated models and those without integrated models.

Hypothesized Relations

We previously contended that the better educated farmers would be more mature economists. Since integration of economic theory and empirical data facilitates the formulation of expectations, we will hypothesize that:

> As education increases the proportion of integrated models will increase.
>
> Agricultural training in high school or college is associated with integrated models.
>
> Respondents who have integrated models are more likely to have participated in training courses outside of formal schools, 4-H or FFA, extension meetings, or meetings of non-governmental farm organizations.

Length of farming experience, and therefore age, should allow a farmer to observe the accuracy of his expectations, and, if necessary, improve his methods of arriving at expectations. Assuming that integrated models are superior in this respect, we will hypothesize that:

> As either age or years of farming experience increase, the proportion of integrated models will increase.

Assuming that use of marginal concepts indicates a degree of economic maturity we can hypothesize that:

> Those using marginal concepts will have a relatively high proportion of integrated models.

Tests of Hypotheses

There was no indication of a relation between the presence or absence of integration and either the amount of formal

schooling or the presence of agricultural training in high school or college. The same was true regarding attendance at extension meetings and meetings of non-governmental farm organizations.

A chi-square test indicated dependence between the presence of integration and agricultural training exclusive of formal schooling (.10). Under Criterion II, the null hypotheses of independence between integration and participation in 4-H and/or FFA was also rejected (.10). Respondents who had received agricultural training exclusive of formal schooling were more likely to have integrated responses. The same was true for those who had 4-H and/or FFA experience.[13] Both of these tendencies are in agreement with what was hypothesized.

A chi-square test indicated dependence between the presence of integration and the number of years the respondent had farmed (.10). Age, however, was not related to integration. Those who farmed for 25 years or less were more likely to have the conceptual and empirical content of their responses integrated than men who had farmed for a longer period. This relation is just opposite of what was hypothesized.

The presence or absence of integration was not related to whether the respondent indicated a use of marginal concepts. In fact, the presence or absence of integration was

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[13]A conflicting element was introduced by another control variable. Although the relation was not significant, men who had children in 4-H and/or FFA had relatively less integrated models than the category containing those who had no children and those whose children were in neither 4-H nor FFA.

the only characteristic not significantly related to the use of marginal concepts.

Other Relations

Chi-square tests also indicated dependence between the presence or absence of integration and total debts (.10), the proportion of land acquired through renting (.10), the number of difficulties encountered in acquiring information and making decisions (.10), the method of thinking used (.01) and the most natural method of thinking to use (.10). Interviewees who reported no debts were less likely to have the conceptual and empirical content of their responses integrated than those who were in debt. There was also an increase in the proportion of respondents having integrated responses as the proportion of land acquired through renting increased. As the number of difficulties encountered in acquiring information increased, there was an increase in the proportion of respondents who had the conceptual and empirical content of their responses integrated.

Respondents who said they used mainly or only induction in arriving at conclusions were much less likely to have integrated responses than those stating that they used mainly or only deduction. Those who said they used both methods were intermediate with respect to the integration of the conceptual and empirical content of their responses. The same pattern of responses was obtained when the presence of integration was compared with the responses to the question about which of these thinking methods is most natural to use.

Completeness of Model

The product price expectation models used by the interviewees were examined to determine if they were conceptually consistent and complete enough to yield unique price expectations. The models meeting this criterion will be called complete models. Of 493 respondents who used at least one model, 80 had models which were classified as complete and the remaining 413 were incomplete in one or more respects. All respondents who used either supply models or demand models were put in the incomplete category.

Hypothesized Relations

We will assume that education is commensurate with intellectual maturity. This suggests the following hypothesis:

> A higher proportion of respondents with complete models will be found among those who have had more formal education; had agricultural training in high school or college; had agricultural training exclusive of formal schooling; had been members of 4-H or FFA; or had attended extension meetings or meetings of non-governmental farm organizations.

Assuming that experience also leads to intellectual maturity, we can hypothesize that:

> Those with more farming experience -- and therefore the older age groups -- will have a higher proportion of complete models.

Since both the use of marginal concepts and the use of supply-demand models are assumed to reflect familiarity with economic concepts, we will hypothesize that:

> Respondents who indicated a use of marginal concepts will have a higher proportion of complete models.

Economic theories are complete deductive systems. These

theories are used in formulating economic price expectation models. We will hypothesize that:

> Men indicating that they used primarily deduction will have a higher proportion of complete models than those using mainly or only induction. The same relations will be true of the more natural thinking method.

Tests of Hypotheses

Not one of the five educational variables was related to the completeness of the models, nor was there any indication of a relation between completeness of the model and years of farming experience. Neither the most used nor the most natural methods of thinking were consistently related to the completeness of the model.

A chi-square test indicated dependence between the completeness of the model and age (.10). As age increased, the proportion of complete models increased up to the 35 to 44.9 age group and then decreased until age 65 was reached. Those in the 35 to 44.9 and the 65 and over age groups were most likely to have complete models, while those under 25 and between 55 and 64.9 were less likely to have such models. Of course this pattern of responses does not support the hypothesis.

The chi-square test did indicate dependence between the completeness of the models and the use of marginal concepts (.01) using the groupings outlined previously.[14] Those who used marginal concepts had a higher proportion of complete models. Though this supports the hypothesis, it is misleading

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[14]See footnote 10 of this chapter.

as those saying they used either of the illustrated methods had relatively many complete models, while those who described another non-marginal method had relatively few complete models. Thus aggregating the two quite different non-marginal groups led to a confirmation of the hypothesis, which the original data do not support.

Other Relations

There were indications of several other relationships though no logical explanations for them were apparent. Chi-square tests indicated dependence between the completeness of the models and whether the respondent spent all of his childhood on a farm (.10), whether or not the respondent had ever been out of farming (.10), gross income (.10), the proportion of income arising from farming (.10), the proportion of land acquired through renting (.10), and the sum of additional difficulties mentioned (.10). Under Criterion II dependence was indicated between the completeness of the models and the type of farm (.01) and net worth (.10). Although the null hypothesis of independence was not rejected at the level of significance used there appeared to be some relation between the completeness of the model and the type of error considered to be most important.

Farmers who spent all of their childhood on the farm had a higher proportion of complete models than those who had spent part or all of their childhood off the farm. There was also a higher proportion of complete models among respondents who had farmed all their life as compared to those who had left farming for a while.

Respondents who had average gross incomes over the last three years of $13,000 or more were less likely to have complete models than the other gross income categories. There were also fewer respondents with complete models among those who obtained three-fourths or more of their income from farming.

Farmers who owned all of the land they farmed had a smaller proportion of complete models. The opposite was true for those who rented all of their land while the respondents who rented part of their land were intermediate in this respect.

Respondents listing more difficulties in acquiring information and making decisions had a lower proportion of complete models than those mentioning less difficulties.

Dairy and fat stock farmers had the smallest proportion of complete models. Fruit and vegetable farmers and general farmers also had smaller proportions of complete models than all farmers taken together. Seventy-one percent of the farmers with complete models were classified as cash crop farmers while only 35 percent of all farmers interviewed were so classified.

As net worth increased, there was first a decrease and then an increase in the proportion of complete models. The trend was not continuous. Higher proportions of complete models were found among respondents having a net worth under $10,000 or between $50,000 and $69,999. The lowest proportions were found when net worth was between $25,000 and $29,999 or between $40,000 and $49,999.

Respondents who were most concerned about taking action when they should not had a relative high proportion of complete models. The opposite was true among those who were equally concerned about both types of error. Those most concerned about not acting when they should had the same proportion of complete models as did all respondents taken together.

Input Price Expectation Models

The foregoing discussion has been concerned with the way in which farmers formulated their product price expectations, but input prices also change over time. The outputs of some farms are inputs on other farms. These commodities have wide price variations. The prices of non-farm produced inputs also change, although they are not usually so volatile as the prices of farm produced inputs.

Some inputs are purchased frequently, while others such as land or major pieces of machinery are purchased only at much longer intervals. The questions on input price expectations in the IMS tended to detect the models used in formulating price expectations for frequently replaced inputs.[15] Again, open-ended, probing questions were used. These questions are shown in Appendix A, number 26.

Models Used

The questions on input price expectations were asked of

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[15]The inputs to which the models refer are shown in Appendix B, Table III.

172 farmers of which 157 gave responses indicating the use of at least one model. The number and percentage of respondents using each model are shown in Table II. Supply, supply-demand, and business activity models were used often, just as they were with product price expectations. Government action and lag models were less important as would be expected. Taking their place in importance are various labor and other production costs models, a model relating input price to output price, and the demand model.

The use of a model relating input to output price demonstrates that at least some farmers realize that the prices of farm produced inputs, which are used mainly in agriculture, depends on the price of the products they are used to produce. From the standpoint of the entire agricultural economy these inputs are priced using the opportunity cost principle. Use of the production costs model suggests use of the full cost pricing principle.

Comparison of Input Price Expectation Models with Control Variables

The input price expectation models were cross-tabulated with the control variables. Models with relatively few observations were eliminated and the remaining cross-tabulations were set up as contingency tables. The five models included in the tables were supply, supply-demand, general or unspecified labor costs, business activity, and the model relating input price to output price.

Table II. Expectation Models Coded from 157 Responses to Questions on Input Price Expectations

Model	Number of Respondents Using Model	Percentage of Respondents Using Model
Supply[a/]	52	33.1
Supply-demand[a/]	37	23.6
General* or unspecified labor costs	33	21.0
Business activity[b/]	23	14.6
Model relating input price to output price	19	12.1
Demand[a/]	15	9.6
Government Action	14	8.9
General production costs[c/]*	13	8.3
Non-labor production costs*	13	8.3
War	12	7.6
General trend in prices	11	7.0
Business monopoly*	9	5.7
Strike cost and labor wage level*	6	3.8
Trend	6	3.8
Similar input analogy	3	1.9
Seasonal	2	1.3
Lag[d/]	2	1.3
Other	1	.6
Total number of models	271	

* Also coded as either a supply model or a supply-demand model.

a/ No response was coded as indicating the use of more than one of the three models; supply, demand, and supply-demand.

b/ Inflation-deflation, level of employment, and business activity model.

c/ Responses were coded as indicating the use of this model only when they referred to costs, but did not specify whether they were referring to labor costs or non-labor costs.

c/ Lag or extension of recent and/or current events.

Hypothesized Relations

Except for services and a few added components such as chemicals and minerals, three of the input categories are farm produced. These are (1) seeds, (2) commercial feeds and supplements, and (3) feed grains and roughages. These three

categories account for 43 percent of the inputs coded. Farmers using these commodities as inputs may have the same price expectation models as the farmers who produce them. Thus, much the same hypotheses used for product price expectation models are appropriate:

> As education increases the use of the supply-demand model will increase, and less of the other models will be used.
>
> Those who had agricultural training in high school or college, had agricultural courses outside of formal schools, had been 4-H or FFA members, or had attended extension meetings or meetings of non-governmental farm organizations, will use relatively more supply-demand models and less of the other models.
>
> Older and more experienced farmers will use relatively more supply-demand models.
>
> The use of marginal concepts will be associated with the use of the supply-demand model.

Tests of Hypotheses

Chi-square tests indicated dependence between the models used and years of formal schooling (.01), agricultural training in high school and/or college (.10), and attendance at two or more extension meetings in the past year (.10). The same was true for 4-H and FFA membership (.10) under Criterion II. No indication of a relation was found between the models used and agriculture courses outside of formal schooling or attendance at meetings of non-governmental, farm organizations.

As the amount of schooling increased, the use of supply models decreased and more respondents used supply-demand models. Those who had agricultural training in high school or college used more supply-demand and general or unspecified

labor cost models, and less supply and business activity models, than the remaining respondents. The same pattern was obtained when those who had been in 4-H and/or FFA were compared with those who had been in neither. Respondents who attended two or more county agent or extension specialist meetings used more supply-demand models and models relating input price to output price than those attending less than two such meetings. The first group used less supply models and business activity models than the second group. In each of these cases the data supports the hypothesis.

No indication of a relation was found involving the models used and either age or years of farming experience. A chi-square test did reveal dependence between the model used and the use of marginal concepts (.10) under Criterion II. Respondents using a method of figuring costs and returns that indicated an understanding of marginal analysis used more supply models and fewer business activity models and general or unspecified labor costs models. However, these results do not support the hypothesis, since no relation involving a supply-demand model and the use of marginal concepts was observed.

Other Relations

Chi-square tests indicated that the models used were also dependent on net worth (.10) under Criterion I, and on average gross income over the past three years (.10) under Criterion II. Respondents with an average gross income over the past three years of $8,500 or more used fewer supply models

and more supply-demand models than those with small gross incomes.

The pattern obtained when net worth was compared with the input price expectation models was erratic. Respondents with a net worth under $20,000 used more supply models and slightly less of each of the remaining models. Farmers in the medium net worth categories used less supply and supply-demand models and more of the other three models. Those with a net worth of $70,000 or more used more supply-demand models and less of all the other models except the supply model.

The use of the supply-demand input price expectation model was positively associated with increased schooling, other educational variables and large net worth and gross income. In most cases, a category using many supply-demand models, also used relatively few supply models. The converse was also true.

Summary and Conclusions

Models

A very high proportion of IMS respondents used price expectation models showing at least some degree of economic maturity. Most of these models contrast sharply with the mechanical models which agricultural economists previously tended to assume that farmers used. Supply and supply-demand models were used far more often than any other model for both inputs and products with the exception of certain crops whose prices are supported by government action. If large surpluses are tacitly or explicitly assumed, then the government action

models are, in effect, supply-demand models. Other product price expectation models used relatively often were the lag model, business activity model, general trend in all farm prices model, similar product analogy model, and war model. In the case of input price models, the general or unspecified labor costs model, the business activity model, and a model relating input price to output price followed the supply and supply-demand models in frequency of use.

The fact that IMS responses indicated the use of far more supply models than demand or supply-demand models suggests several hypotheses:

(1) Supply information is more readily available, or considered more accurate than demand information.

(2) Although farmers did not mention demand, they tacitly assumed that the demand for their products is inelastic and stable, and thus that variations in supply cause most price variations.

(3) Farmers may be more familiar with the concept of supply and its effects than with the concept of demand. This may be true because farmers become familiar with supply concepts through the operation of government programs, and because of the emphasis which the Extension Service and farm magazines place on supply information.

Characteristics of Farmers Using Different Models

As the amount of formal education increased among the farmers surveyed, there was an increase in the use of supply-demand models and a decrease in the use of supply models. This was true for both specific and general product price expectation models as well as input price expectation models. There is some evidence that our formal education system either provides some economic concepts, or that it furnishes

the curiosity and mental equipment with which economic concepts can be obtained. Similar consistent relations were not found between the models used and the educational variables not associated with formal schooling.

The use of supply-demand product price expectation models was also associated with the use of marginal concepts in figuring costs and returns. This was expected since both reflect a relatively high degree of economic maturity. The corresponding test in the case of input price models gave confused results.

Government action models were mainly used by cash crop farmers. Fat stock farmers used far fewer government action models and more of the other five models tested.

There were other relations involving age, years of farming experience, proportion of land acquired through renting, net worth, and gross income, but these relations were so confounded with each other and with formal schooling and type of farm that no conclusions were drawn. Further work is needed to isolate relations involving these variables.

A major problem encountered in studying the models used by farmers is variation in the extent to which they are developed. In this study, all references to a particular model were treated alike even though they ranged from bare references to rather completely worked out models. The problem was made more difficult to handle by the large number of models used which prevented observations from over 500 farms from being adequate for testing on most of the models. The most used models need to be studied more thoroughly.

Attributes of the Models

It was surprising to find that the product price expectation models used by farmers were well enough developed to allow consideration of such attributes as the conceptual completeness of the model and integration of conceptual and empirical content. This was not true for the other types of expectation models discussed in this study.

Only 80, of the 493 responses indicating use of at least one ascertainable product price expectation model, contained models that were conceptually consistent and complete enough to yield a unique expectation. Yet 402 respondents were willing to make a price forecast. In many cases the forecasts were probably arbitrary or based on intuition, hunches, and guesses as well as unmentioned economic models and information. More research is needed in this area.

Positive relations were hypothesized about relationships between the amount of formal education, and presence of empirical content, integration of conceptual and empirical content, and the conceptual completeness of the models. The data did not support these hypotheses. However, there was some indication that the first two of these attributes (empirical content and integration) were positively related to participation in both 4-H and/or FFA and agricultural training courses exclusive of formal schooling.

Speculations and Implications

Though this study has increased our knowledge of price expectations used by farmers importantly, our knowledge of

farmers' price expectation models is still quite incomplete. Further breakdowns of the models isolated herein into categories of completeness are needed. Possible variations in the models used by different environmental groups should also be investigated. Other areas needing attention are differences in the models used for different products and inputs, how models change as economic conditions change, and the effect of length of run on the models used. We will use insights gained from studying the IMS data in combination with introspection and speculation to hypothesize some possible findings in these areas.

(1) Previous work has emphasized that a person's price expectations are sometimes in the form of a probability distribution, and that the range of this distribution decreases as time passes because more information becomes available.[16] However, there may be more involved than a mere increase in the amount of information. Increased information may enable the farmer to use more complete models which narrow the probability distribution. Two hypotheses to be tested are that (a) models become more complete as the time approaches when the price will be realized, and (b) farmers with more complete models predict price within a narrower range.

(2) We have found that there was a significant difference among states in the expectation models used and there are similar indications for smaller geographic areas. Though

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[16]See review of literature in Chapter I.

at least part of these differences are due to differences in the products produced between areas, there probably are other avenues through which environment affects the models used. For example, farmers' price expectation models may be determined by their concept of "what is" with respect to how economies are organized and their concepts of "what ought to be" with respect to the organization of the economy. Such beliefs and values are partially interdependent. A full understanding of price expectation models held by farmers probably requires more investigation of values and beliefs than carried out herein.

(3) The type of farm gave indications of the models used for various products, but more might have been learned if the models had been classified according to the inputs and products to which they referred. The model or models used by a farmer for his primary product may influence models used for other products.

(4) Economic conditions may also affect the models used. Conceivably, pessimism or optimism resulting from economic conditions could lead to the use of a trend or reverse trend factor to modify expectations. Economic conditions may also have indirect effects by influencing the values and beliefs discussed in (2) above.

(5) The length of run for which plans are being made is probably one of the main determinants of the models used since the usefulness of alternative models depends on available information. The price expectations considered in the study were, in most cases, for products whose production was already

under way, and for inputs which were currently being used in a production process. Supply and demand forecasts and information on government programs are relatively reliable at this stage. This probably accounts for the wide use of supply, supply-demand, and government action models revealed by this study. However, at the time a production plan is being determined, supply information is relatively poor. This makes supply and supply-demand models less useful. In their place we might have more business activity, general trend in all farm prices, lag, cyclical, and seasonal models. For longer periods — say two or three production cycles -- trend, political, general trend in all farm prices, and cyclical models may be relatively more important. In some cases war models might be quite important in this intermediate length of run. In making long run decisions the farmer might have little more than trend to use in formulating price expectations.

Studies of the effects of length of run may explain the differences between the models discussed in the IMS and the models which most supply response studies attribute to farmers. In Chapter I we discussed a model suggested by Nerlove in which he predicts prices using a weighted average of past prices with the weights empirically determined.[17] Similarly, in a current study at Michigan State University, it was found

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[17]Nerlove, M., "Estimates of the Elasticities of Supply of Selected Agricultural Commodities," Journal of Farm Economics, Vol. 38, 1956.

that the hog-corn ratios in t and t-1 are significantly related to farrowings in t.[18] The success of these studies strongly suggests that farmers use present and recent past prices to predict future prices. Such models were coded as "lag" models in the IMS. Yet, only nine percent of the IMS respondents gave replies which indicated the use of such models.

This leads to several alternative hypotheses which should be investigated to improve our work on supply analyses.

a. IMS responses referred to very short run expectations; farmers use more lag models when formulating somewhat longer run expectation.

b. The nine percent of the respondents who did use lag models are responsible for an important part of the variations in supply.

c. Aggregation of the individual supply responses resulting from the use of models found in the IMS would lead to the same results as if lag models were universally used.

d. Supply analysts could improve their predictions of supply response by incorporating the models which IMS responses indicated that farmers used.

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[18]Conference with John N. Ferris of the Department of Agricultural Economics, Michigan State University.

CHAPTER III

EXPECTATIONS CONCERNING PEOPLE, GOVERNMENT ACTION, AND NEW TECHNOLOGY

Farmers face many types of uncertainty besides price uncertainty. Yield uncertainties resulting from unpredictable variations in weather, insects, and diseases are frequently discussed. Less often mentioned are the uncertainties arising from people with whom the farmer deals, from government action, and from new technology. This chapter contains three major sections dealing with these three areas. As almost nothing is known about how farmers formulate their expectations in these three areas, the chapter is a pioneering one.

Human Expectations

A farm manager does business with people about whom he does not have perfect knowledge. In fact, such persons may be perfect strangers to the farmer. Though business dealings involve some degree of trust and good faith, the farmer often wants to adopt an optimum strategy in his business dealings. Before the farmer can trust another person, or before he can adopt an optimum strategy, he needs to know certain characteristics of the person. These characteristics must be assessed in an imperfect knowledge situation.

In the planning phases of the IMS, it was hypothesized

that farmers used mechanical models, similar to the price expectation models hypothesized by Heady,[1] in formulating their expectations concerning people. Structured questions were designed to obtain data to use in testing the hypothesis that such models were used, and to gather information about the models. Early pre-tests of the schedules indicated that the hypothesized mechanical models were not used by farmers. A sociologist with psychological training[2] was consulted in reformulating the questions on human expectations. Because of a lack of theoretical structure, he devised open-ended questions to gain insights concerning expectation models used by farmers rather than to test a priori hypotheses.[3] Farmers were asked if they had some idea as to what to expect from a person they were about to meet. This question was followed by probe questions designed to find the attributes of the stranger which farmers thought they could appraise, and the basis on which the appraisal was made.

Bases Used by Farmers in Evaluating Strangers

Of the 543 respondents asked the questions on human expectations, 427 indicated that at least some characteristics of a stranger could be evaluated on first contact, while 56

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[1]Heady, E. O., Economics of Agricultural Production and Resource Use, Prentice-Hall, Inc., New York, 1952.

[2]Dr. Joel Smith formerly of the Department of Sociology and Anthropology of Michigan State University and now of Duke University.

[3]The questions are shown in Appendix A, number 27, as they appeared in the interview schedule.

respondents did not believe such evaluations could be made on first contact. These two groups will be referred to as early evaluators and slow evaluators respectively. The remaining 60 farmers did not answer the questions. The reasons given by the farmers for feeling as they did are shown in Table III.

Further information was obtained on three of the categories in Table III. Data from respondents who thought evaluations could not be made on first contact will be discussed first. The responses of those who said they evaluated strangers on the basis of a general attitude will be discussed next. This will be followed by a consideration of information from those who said they evaluated strangers on first contact on the basis of such variable evidence as general appearance, dress, speech, and actions.

Of the 56 farmers who stated that strangers could not be evaluated on first contact, 52 said they adopted a "wait and see" approach. These 52 men are in a learning situation as defined by Johnson.[4] That is, the subjective cost of getting more information is less than the utility of the added information. Thirty-three of these men did not specify what they eventually used as a basis for appraisal, fifteen indicated that they depended primarily on trial on a limited basis, and four said they waited to get information from

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[4]Johnson, G. L., "Learning Processes, The Individual Approach," Proceedings of Research Conference on Risk and Uncertainty in Agriculture, N. D. Agr. Expt. Sta. Bul. 400, Fargo, North Dakota, 1955.

others on the stranger. The men who were willing to evaluate some characteristics of a stranger on first contact probably relied on these same two factors for both revision of early appraisals and evaluation of other characteristics of the stranger.

Several possible reasons could be advanced as to why some men were unwilling to evaluate any characteristics when they had the same opportunity to make observations as the early evaluators. The slow evaluators may be less skilled in observation and/or analysis and as a result they obtain less information from the same opportunities for evaluation as early evaluators. Thus, further information might have a higher subjective value than the subjective cost of obtaining it. Another possibility is that the slow evaluators might want added information before making a decision. Either the subjective cost of attaining more information is less for them, or they place a higher subjective utility on additional information. The latter situation might result from the realization that some previous evaluations on the basis of such evidence were found to be in error.

Several "general attitudes" were given as a means of evaluation of strangers on first contact. These attitudes and the number of times each was mentioned are shown in Table IV. The use of these attitudes does not require analysis of observations since the evaluation is actually completed before the farmer meets the stranger. However, these attitudes are probably used only as a first approximation rather than a final appraisal. Evaluation of variable

evidence, trial on a limited basis, evaluation of past performance, and/or information from others would surely be used in addition to these basic points of view to make later appraisals.

Use of Variable Evidence by Respondents

Eighty-two percent of the 483 respondents who replied to the questions on human expectations indicated that they believed variable evidence could be used to evaluate some characteristics of strangers on first contact, or to plan initial strategies to use in dealing with the strangers. The two most commonly used kinds of variable evidence, symbols and activities, were mentioned about equally often. Among the symbols, dress and clothing were used most often as a basis for evaluation. The activity most often referred to was the quality of speech content. A detailed listing of the kinds of variable evidence used to evaluate strangers on first contact is given in Table V. From Table V we can hypothesize that farmers are favorably impressed by appropriate dress and modest but "to the point" speech content. This may be of interest to extension men, business men, and others who have contacts with farmers, as well as to students of human behavior.

Although the use of such characteristics as these symbols and activities in evaluating people may indicate that farmers are naive judges of people, it should be pointed out that these answers may merely indicate that the respondents believe symbols and activities are better than nothing as a

Table III. Basis for Evaluating Strangers on First Contact and Reasons Given by Other Respondents as to Why Such an Evaluation Can Not be Made

Responses	Number
Basis for Evaluation of Strangers on First Contact:	
Assessment of Variable Evidence	396
General Attitude	10
Intuition, Instincts, Feelings	2
Any Two of the Above Three	19
Total Number of Respondents	427
Reasons Why Strangers Cannot Be Evaluated on First Contact:	
Simply Feels that Everyone is Different	42
Own Experience or That of Others Demonstrated the Impossibility of Making Accurate Judgments	7
Unqualified Statements that Early Evaluations Are Not Possible	7
Total Number of Respondents	56

Table IV. General Attitudes Used by 21 Respondents as a Basis for Evaluating Strangers on First Contact

Responses	Number
People are to be Trusted	6
Strangers are not to be Trusted	6
Strangers are Accepted as Trustworthy Until they Prove Otherwise	2
Strangers are Salesmen	2
People are all the Same	2
Others	3

basis for evaluation. The responses gave no indication of the degree of confidence which the respondents had in their evaluation. The wording of the questions encouraged hints, regardless of their reliability. It is not known whether farmers are generally willing to bear the consequences of a

decision based on such nebulous foundations except in forced action situations.

These contentions regarding kinds of information used by farmers were supported by other data from the IMS.[5] Oral information from others was the most important source of information on people. A breakdown of this source of information revealed that neighbors and relatives were mentioned twice as often as any other group. Other important groups were (1) bankers and lending agents and (2) dealers, salesmen, and buyers.

Past experience ranked next to oral information from others as a source of information on people. The third most important source of information on people was that gained by observing the experience of others in dealing with the people who are to be evaluated.

At this point we must remember that the questions on human expectations in the IMS elicited responses that dealt with first impressions of strangers. But few people with whom a farmer has business dealings are complete strangers to him. Perhaps first evaluations of strangers are of less importance to a farm manager than continued evaluations of other people with whom he does business. A manager must not only make earlier evaluations more complete, but also be alert for possible changes in the behavior of other people as well as for the possibility that his previous evaluations may have

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[5]Johnson, G. L., and Haver, C. B., Agricultural Information Patterns and Decision Making, Tentative Draft of Bulletin, Michigan State University, 1958.

TABLE V. Kinds of Variable Evidence Used by 415 Respondents to Evaluate Strangers on First Contact and the Number of Respondents Using Each Kind of Evidence

Kind of Evidence		Number of Responses
Symbols		
Physical Symbols:		
Total Physical Appearance of Body		21
Physique	13	
Carriage, Posture, Walk	4	
Age	4	
Appearance of Face		48
Facial Expression	42	
Physical Condition of Face	4	
Unspecified	2	
Appearance of Hands		8
Physical Condition of Hands	6	
Use of Hands	1	
Unspecified	1	
Dress and Clothing		151
Uniform (e.g., Suit, Overall, Tie)	27	
Quality and/or Age of Clothing	2	
Appropriateness of Apparel for Role	9	
Cleanliness, Neatness, etc.	70	
Unspecified	43	
Things He Has with Him		61
Any Aspects of Means of Transportation	30	
Brief Cases, Clipboards, Books, Papers, etc.	18	
Products Being Sold	7	
Others	4	
Unspecified	2	
Oral Symbols:		
Style of Speech (Rate, Accents, Smoothness, etc.)		11
Skill in Speech (Good Talker)		6
Diction, Grammer, Vocabulary		19
Uses an Apparently Stereotyped Notion of Social Type as a Model (e.g., Occupational, Drinker, etc.)		21
Activities		
Speech and Talk:		
Conversation		45
Action of Strangers as a Conversational Participant	33	
Unspecified	12	
Subject Discussed		31
Ability to Discuss Matters Relevant to Farming	6	
Any Other Specified Subjects	12	
Unspecified	13	

Qualities of Content of Speech		154
Immodest or Nonpropitious	76	
Misleading Content	32	
Organization of Content	46	
Quality of Speakers Tone		7
Quantity of Speech		8
Actions and Gestures:		
Quality of Actions and Gestures (e.g., Politeness, Assurance, Honesty)		22
Specific Actions and Gestures		38
Unspecified		71
Approach and Greeting:		
Ease, Directness, Honesty		10
Other Specified Aspects		8
Unspecified		15
General Impressions		
Disposition and Attitude		32
Character and Morality		15
Personality		33
Other Specific Kinds of Evidence		21
Not Ascertainable		7

been in error. In making these types of appraisals farmers would put emphasis on analysis of past performance and information from others as well as on such indicators as symbols, activities, and rules of thumb.

Another point which should be mentioned is the kind of problem faced by the farmer. If the problem is a very serious one, it is reasonable to expect a farmer to place a high marginal value on information to use in solving the problem. Thus a farmer might rely on an appraisal based on symbols in deciding whether to lend a stranger a tool to change a tire, but refuse to lend him a truck on the basis of such information.

Attributes of Strangers That Are Predicted

Of the 427 respondents who believed they could use evidence to evaluate strangers on first contact, 291 gave examples of the characteristics which they believed could be identified. The remaining 136 respondents who were willing to evaluate strangers on first contact gave no ascertainable examples. The examples of characteristics which farmers thought they could assess can be grouped as follows:

66 respondents believed they could identify the occupations of some strangers.

203 respondents said they could determine some personal characteristics of strangers.

88 respondents indicated they could either assess the acceptability of the stranger or ascertain the proper strategy to use in dealing with him.

12 respondents said they could assess character and personality in addition to other attributes.

10 respondents mentioned other attributes which they believed they could ascertain on first contact.

The first two groups were broken down further. A total of 37 respondents said they could use evidence to identify salesmen. Seventeen thought they could identify other farmers, and twelve said that they could use evidence to tell the occupation of custom-operators, landlords, buyers, dealers, or others engaged in occupations related to agriculture. Eleven men said that college and government employees had unique characteristics which denoted their occupation. Farm laborers, bankers, and oil men were each listed by five respondents as being identifiable. An inspection of sample of the responses indicates that occupational identifications

were usually made on the basis of symbols. For instance, salesmen were often identified by oral symbols, dress and clothing, and car.

A total of 203 respondents said they could use evidence available on first contact to ascertain certain personal characteristics of strangers. These characteristics and the number of respondents mentioning each are shown in Table VI. The personal characteristics mentioned most often in Table VI may be the ones which farmers would most like to evaluate before deciding whether or not to do business with a particular stranger. The first item represents characteristics which determine whether it would be "safe" to do business with the stranger. The second item is made up primarily of qualities which determine whether associations with the stranger would be pleasant.

Although symbols were sometimes used, activities and general impressions were most often used to identify personal characteristics of the stranger as well as to assess his acceptability or to ascertain the proper strategy to use in dealing with him.

The second and third categories of characteristics which farmers thought they could identify (personal characteristics and acceptability of the stranger or the strategy to use in dealing with him) are closely related. In fact, the main difference between them may well be the accidental choice by the farmer of the level at which to answer the question. Symbols and activities are used by the farmers to determine

TABLE VI. Personal Characteristics that 203 Respondents Stated They Could Ascertain from Variable Evidence on First Contact

Characteristic	Number of Responses
General Moral and Ethical Evaluations (e.g., goodness, badness, honesty, trustworthiness, dependability, religiousness).	122
Characteristics That May Be Situationally Specific or Are Not Primarily of a Moral Overtone (e.g., modesty, laziness, organizing ability, alertness, sloppy thinking, observant, windbag, friendly, nosey, fair, pest, braggart, manners, practicality, cooperativeness, work qualities).	87
Socioeconomic Position	13
Education, Information, Intelligence, Experience	18
Stranger's Involvement with Situation and/or Respondent.	4
Stranger's Self-conception or Self-involvement (e.g., pride, ambition, self-assurance).	10
Purpose (e.g., what he wants; what he will do; what he will talk about; what he has in mind).	24
Others	13

personal characteristics which are used as a basis for judging the acceptability of a stranger or the strategy to use in dealing with him. Since the question did not specify the level at which to answer, some farmers referred to acceptability and strategy directly, while others referred to the personal characteristics which are used as a basis for determining acceptability and/or strategy. This becomes more evident on examination of Table VI, of the personal characteristics which farmers mentioned.

Comparison of Early and Slow Evaluators[6]

The 427 respondents who believed they could reach some conclusions regarding strangers on the basis of evidence obtained on first contact were compared with the 56 farmers who believed more evidence was needed. These two groups were compared with respect to the characteristics shown in Appendix C.

Hypothesized Relations

Farmers who have come into contact with many people have had more experience at interpreting symbols and activities and have had more time to test the reliability of their general attitudes, intuitions, instincts and feelings. As a result they may be able to make earlier evaluations. Farmers who are cautious in other ways may be expected to be cautious in making evaluations of strangers. These two suppositions lead to the following hypotheses:

> There will be a higher proportion of early evaluators among those who were members of 4-H and/or FFA; had agricultural training outside of formal schools; did off-farm work; hired labor; rented land; attended

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[6]Some grouping had to be done to get cells with large enough expected values to use chi-square tests. For instance, all men willing to evaluate strangers on first contact were compared with those not willing to make such early evaluations. Possible relations between the reasons given by farmers for their willingness to make such evaluations and other characteristics of the farmers could not be tested. The same was true of other breakdowns of the data in this chapter. Even in the comparisons that were tested, some grouping had to be done among the categories under the control variables.

None of the schedules containing the question on the use of marginal concepts also contained the questions on expectations concerning people, government action, or new technology.

extension meetings or meetings of non-governmental farm organizations; or had more formal schooling.

The group of farmers who were more concerned with not acting when they should will contain a relatively high proportion of early evaluators.

Tests of the Hypotheses

Chi-square tests indicated dependence between the proportion of early evaluators and whether the respondent did off-farm work (.10), used hired labor (.10), rented land (.10), and whether the respondent attended extension meetings and meetings of non-governmental farm organizations (.10). Although the null hypotheses of independence were not rejected there did appear to be a relation between the proportion of early evaluators and both the amount of schooling and whether the respondent had agricultural training outside of formal schools. No indication of a relation was found between the proportion of early evaluators and participation in 4-H and/or FFA.

There was a higher proportion of early evaluators among farmers doing off-farm work and among those who used hired labor or rented land. Respondents who attended both extension meetings and meetings of non-governmental farm organizations were more likely to be early evaluators. Farmers who attended neither of the two types of meetings were more likely to be slow evaluators, while those attending only one were intermediate. As the amount of formal schooling increased there was a continuous increase in the proportion of respondents in the early evaluator category. Those who had additional agricultural training outside of formal schools were also more

likely to be early evaluators. Thus the data were generally in agreement with the first compound hypothesis.

There is another possible explanation for the relations between educational variables and proportion of early evaluators. The more educated may be able to get more information from a given number of observations. Education may make a man a more keen observer and/or increase his analytical ability. Thus, given the same opportunities for observation, the better educated person may obtain more data and/or get more information from the data available.

Although the null hypothesis of independence was not rejected, there was a slightly higher proportion of slow evaluators among those who were most concerned about not acting when they should. This is the opposite of what was hypothesized.

Other Relations

Several relations were found where no specific hypothesis was advanced. A chi-square test indicated that the proportion of early evaluators depended on the insurance code (.10). Respondents using many formal and informal insurance schemes included a higher proportion of early evaluators. At first glance it might seem surprising to find that men who use many insurance schemes would "take a chance" by making quick evaluations of strangers. But Freidman and Savage[7] have shown

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[7]Freidman, M., and Savage, L. J., "The Utility Analysis of Choices Involving Risk," The Journal of Political Economy, Vol. 56, No. 4 (August, 1948), pp. 279-304.

that it is not inconsistent for individuals to have increasing marginal utility for gains and increasing marginal disutility for losses, at least over some range. It is consistent for people with such utility functions to simultaneously gamble and insure. Johnson[8] has stated that many farm managers appear to have such a utility function. Halter[9] found that a high proportion of IMS respondents gave answers to hypothetical gains and losses questions which were consistent with Freidman and Savage's utility function. Thus, those who insure may also "take a chance" by evaluating some characteristics of strangers on first contact without being inconsistent in their actions.

A chi-square test indicated that the proportion of early evaluators depended on whether the respondents had agricultural training in high school or college (.10). Respondents who had such training were more likely to be early evaluators than the remaining farmers. This is associated with a positive relation between education and the proportion of early evaluators.

Using Criterion II, a chi-square test indicated dependence between the proportion of early evaluators and the "more natural" method of thinking used (.10).[10] Farmers considering

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[8]Johnson, G. L., Op. Cit.

[9]Halter, A. N., Measuring Utility of Wealth Among Farm Managers, Unpublished thesis, Michigan State University, 1956.

[10]There was no evidence of a relation between the proportion of early evaluators and the "most used" method of thinking.

induction as the "more natural" method for them to use included a higher proportion of slow evaluators than either those who thought of deduction as most natural or those who said both methods were equally natural for them to use.

Although the null hypothesis of independence was not rejected, there was an increase in the proportion of slow evaluators as age increased. This suggests two hypotheses. Older farmers may have learned that early judgments of people may turn out to be wrong, or the older men may be more cautious in making decisions.

Summary and Implications

This study (1) clearly indicates that there is a field of human expectations which can be investigated and (2) has led to the suggestion of some initial hypotheses to be tested.

The responses to the IMS questions on human expectations revealed some information about farmers' appraisal of strangers. Most farmers expressed a willingness to evaluate at least some characteristics of strangers on first contact. Nearly all of these evaluations were based on physical and oral symbols, and activities rather than some basic principle such as "Strangers are accepted as good until they prove otherwise." Physical symbols were used most often as clues to the occupation of the stranger. Several relations were found between the proportions of early evaluators and the control variables.

Although some tentative conclusions were reached regarding the initial appraisal of strangers by farmers, the IMS

data have failed to produce complete descriptions of models which farmers use in predicting the actions of business associates.[11] How uncertainty with respect to people affects the exercise of the managerial function was not specifically investigated in the IMS.

Insights gained from responses to the IMS questions and further more or less speculative thought leads to the following suggested hypothetical framework which might be used in planning future studies of the human expectations of farmers.

A farmer has to decide what action to take in dealing with a problem involving another person when he does not know what the other person's actions or reactions will be. He knows that these actions and reactions depend importantly on certain characteristics of that person, such as those listed in the first six items in Table VI. The farmer gathers and analyzes information on these characteristics. The decision he makes and the strategy he adopts depends on the particular problem he faces and, in part, on his evaluation of this and other information.[12] As he learns more of the characteristics

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[11]Simon Yasin, a graduate student in sociology at Michigan State University, intended to use the data on human expectation from the IMS to predict the actions of farmers in dealing with strangers for a Ph.D. dissertation. After studying the data, he came to the conclusion that there was not sufficient information for a Ph.D. thesis designed to establish models and predict actions.

[12]In this discussion, a "strategy" is considered as a "plan to be adopted in dealing with a person in a specific situation." Thus, some of the possible strategies might be: (1) refusing to do business with a person, (2) requiring the person to sign a contract and post a surety bond, (3) concocting a scheme to outwit the other person, and (4) acting with an attitude of complete faith and trust in the other person.

of the other person, he can handle more important and more complex problems involving that person with a higher probability of being successful. We shall think of success as being measured in terms of self-esteem, opinion of others, and personal ethical standards as well as in terms of present and future net income.

We can think of the farmer as having a scale running from zero to infinity. A person about whom the farmer knows absolutely nothing is placed at zero on the scale and a person about whom he has perfect knowledge is placed at infinity. As the farmer learns more about the other person he moves him farther to right on the scale. If he finds some of the information previously used is unreliable, or if there is an error in analysis, he may move the person to the left on the scale.

Now let us begin with a person at the zero point on a farmer's scale (a stranger) and follow the movement to the right. We shall assume that the stranger is one with whom the farmer has business problems for ease of exposition, but the principles should also be as valid for social and family problems.

The initial appraisal of the stranger could be based on any of several things. The farmer would be most likely to observe symbols and activities, and to use these as clues to the characteristics of the stranger. Other possibilities would be the use of some general principle or of intuition and instincts. Whatever the basis of this initial appraisal, the farmer would not consider it adequate except for certain

rather simple but not necessarily unimportant problems. With respect to such problems a farmer might find himself making decisions at all of the levels of knowledge tentatively outlined by Bradford and Johnson.[13]

As the farmer moves his new acquaintance farther to the right along the scale, the basis for appraisal shifts. Although information from others, and to a smaller extent, trial on a limited basis, are still used, they become relatively less important. The main emphasis changes to analysis of past personal experience with this person and observation of his relations with other people.

As the acquaintance moves further to the right on the scale the farmer gains more and more confidence in his general opinion of the other person and it takes more conflicting evidence to change the opinion. In fact, the farmer may pay little attention to information on an old acquaintance until he is "shocked" by sharply conflicting evidence. This shock would again place the farmer in an active learning stage with respect to old problems and would likely create a number of new problematic situations. He would reappraise past performance and other old information and he would analyze any new information which was worth obtaining. In making the reappraisal the farmer would be alert for errors in

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[13]Bradford, L. A., and Johnson, G. L., Farm Management Analysis, John Wiley & Sons, Inc., New York, 1953, p. 29f. These knowledge situations are being reconsidered and, perhaps, redefined in another phase of the IMS.

observation or analysis which led to a false appraisal, and for error in placing the acquaintance on the scale. He would also be alert for possible changes in the characteristics of the acquaintance.[14]

Expectations of Government Action

Each farmer works in an institutional environment which modifies the alternatives available to him. Many restrictions imposed by institutions are fairly stable over time. However some important governmental restrictions change rapidly.

Government policies have always had a strong and, in recent years, direct impact on the farm economy. Price supports, production controls, regulation, grading and inspection affect the price and quantity of an agricultural product as well as the location and methods of production. On an individual farm, government action is important in determining both what to produce and how to produce it as well as the price which will be received. We have already seen that the price effects of government actions are so important that many farmers consider these actions to be a major — or the only — determinant of price.

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[14]Another possibility is that the values and beliefs of the farmer himself might change. This might change the interpretation he puts on each piece of information, the amount and kind of information he wants before making a decision, and/or the decision he makes.

A shock with respect to one person may affect a farmer's evaluations of other people by decreasing his confidence in (1) certain types of information or (2) his own ability to make evaluations.

Government policies and programs are initiated in political processes which are influenced by changes in the convictions of individuals and groups and variations in the political power of these same individuals and groups. As convictions and political strength change, government policies change, and these changes can seldom if ever be predicted with certainty. However, farmers try to predict the policies and the resulting programs, although they realize that there may be error in their predictions.

In constructing the interview schedule for the IMS, it was hypothesized that farmers use simple mechanical models, analogous to the price expectation models hypothesized by Heady, in formulating their expectations of changes in government policies and programs affecting farmers. However, the pretests again indicated that these models were not the only kinds used and that they were not widely used. The question used in the final schedule form asked if the respondent expected changes in national, state, or local government programs and policies for farmers within two years. This was followed by questions asking why the respondent felt as he did (see Appendix A, Number 28).

Expectations Reported

Of the 184 respondents who were asked the question, 112 replied that they expected changes in government programs and policies for farmers and 49 replied that they did not expect such changes. Nine men replied that there was only a fifty per cent probability of a change while fourteen said

they did not know if there would be a change.[15] The first three groups were asked their reasons for feeling as they did. Those who said they "didn't know" were asked if they tried to take the possibility of change into account in their planning.

Of the 112 respondents who said they expected changes in governmental farm programs and policies, 36 knew of intended or considered changes and two gave no ascertainable reasons for expecting changes. Fifty of the remaining 74 respondents gave reasons which were related to the state of farmer public opinion. The reason most often given by those who did not expect changes in governmental programs and policies was that the party in power was committed to and/or supports the (then) current program. Eighteen of those who expected changes, and seven of those who did not expect changes, mentioned farm problems in their reasons. Most of the other reasons given by both groups were related to political party control and vagaries of our political process. A detailed list of reasons given are shown in Table VII.

Models Used

The reasons given in support of farmers' expectations concerning changes in governmental farm programs and policies

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[15]Seven of these men said that the possibility of change depends on unpredictable factors. Apparently these men used Laplace's principle of insufficient reason, i.e., when the probability of each of a set of possible outcomes are unknown, it is best to regard them as equally probable.

TABLE VII. Expectations of Respondents Concerning Changes in Federal, State, or Local Government Farm Programs and Policies Within Two Years of the Time of Interview

Expectations and Reasons		Number of Respondents
Expect Changes to Occur		112
Reasons:		
There are Unsolved or Partially Solved Problems	18	
Reasons Related to Changes in Political Party Control		
Party Change Has Just Occurred	11	
An Election Is Coming Up	7	
Other Political Reasons	4	
Reasons Related to State of Farmer Public Opinion		
Stated as Such	19	
Implied by Predictions of What Farmers May, Will, or Will Have to Do	31	
Changes in Government Programs and Policies are Going on Constantly	15	
Knows of Intended or Considered Changes	36	
Other Reasons	3	
Not Ascertainable	2	
Do Not Expect Changes to Occur		49
Reasons:		
Problems Which Led to Present Government Programs and Policies Still Remain	7	
The Present Program Has Popular Support	5	
Specified Pressure Groups Support the Present Program	2	
Party in Power is Committed to and/or Supports the Current Program	19	
Government Has Tied Its Own Hands, Complexity of Current Program Makes It Hard to Change, or Inertia	8	
There is Never a Change Before Elections	2	
Changes Have Just Been Made and Must be Given a Chance	2	
Not Ascertainable	8	
Change and No Change Equally Likely		9
Reasons:		
Change Depends on Unpredictable Factors	7	
Other Reasons	2	
Don't Know		
Is the Possibility of Change Taken Into Account in Planning:		14
Yes	2	
No	11	
Not Ascertainable	1	

suggest five expectation models.[16] Fifteen men who said such changes are going on constantly were using trend models.

Another group of respondents tied their expectations of government action to the presence of problems. Eighteen expected changes in policies and programs because certain problems were not completely solved. Another seven men did not expect changes because the present programs had not yet solved the problems they were designed to solve. It appears that these men use a problem solving model with the government in the role of the problem solver.

Other farmers believe that the opinion of farmers is the prime determinant of agricultural policy. Included here are fifty men expecting changes in agricultural policy because of the state of farmer public opinion, and the seven who did not expect changes because of popular support or pressure group support of the present program. If farmers had added that these opinions are expressed through farm pressure groups, then this model would have been more complete. The activities of these pressure groups in addition to direct contact between electors and electees has an important influence on agricultural policy.

The fourth model suggested by farmers' reasons for expecting changes in agricultural policies and programs could be called a "party politics" model. Included among the users

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[16]Except for the trend model, each of the models discussed is actually a group of closely related models. Not enough information is available to separate out the detailed models.

of this model are the 22 men whose reasons for expecting changes were related to changes in party control; and the 29 who did not expect changes because of party commitments, governmental rigidities, or the belief that there is never a change just before elections. Each of these reasons is based on the respondents' conception of the limits placed on policy and program formulation by peculiarities of the operation of political parties.

The four models mentioned above fall into two groups which we shall call "simple" and "political." The trend model is simple in two ways: (1) After the model is adopted and the slope determined no further information is ever needed in formulating predictions, and (2) changes in programs and policies are assumed to be independent of political variables. Political models, on the other hand, must be accompanied by data on certain political variables (public opinion, party control, recognition of problems, etc.) in order to generate predictions. However even these political models do not indicate a very high degree of political maturity on the part of farmers.[17] There was no important reference to conflicts of interest between groups of farmers, or between agriculture and other segments of the economy. Only two men specifically mentioned pressure groups. No one mentioned the

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[17]Farmers may also be poorly informed about governmental policies and programs which affect them. See Murphy, W. D., Jr., Attitudes of Michigan Farmers Toward Government Production Control Programs as Shown by a 1954 Survey, Unpublished M.S. Thesis, Michigan State University, 1955.

relative influence of different farm organizations and other pressure groups. No specific mention was made of different blocs and political philosophies within Congress or the Administration, and their influence. The effects of administrative decisions on the impact of policies at the farm level were also neglected.

Characteristics Related to Expectations

The 112 respondents who expected changes in government programs and policies were compared with the 49 who did not expect such changes. The characteristics of the two groups which were compared are shown in Appendix C. Several relations were found but the reasons for these relations were not apparent.

A chi-square test indicated dependence between the proportion of men expecting changes and years of farming experience (.10) but there was no consistent relation between the two. A relatively high proportion of men expecting changes was found in the 16 to 25 year category while the 26 to 40 year category contained a low proportion. The proportions in the other categories were the same as for all respondents taken together.

Chi-square tests also indicated dependence between the proportion of respondents expecting changes in governmental farm programs and policies and whether the respondent had been in 4-H and/or FFA (.10), whether the respondent did part-time work off the farm (.10), the proportion of land acquired through

renting (.01), and the insurance code (.10).[18] The group who had been in 4-H and/or FFA included a relatively high proportion of men expecting changes in governmental farm programs and policies. The same was true of those doing off-farm work and those renting all their land. Farmers who rented some land, but less than half of the total, were more likely to expect no changes in government programs and policies for farmers. The proportions for the other tenure categories were close to those for all farmers taken together. The insurance code, though significantly related to the proportions expecting changes, showed no consistent pattern.

Summary and Implications

Of the 184 respondents who were asked if they expected changes in national, state, and local government policies and programs for farmers within two years, 112 expected changes, 49 did not expect changes, and 23 were undecided. The reasons given in support of their expectations indicated that farmers use at least four expectation models. The models ranked according to the frequency of use are the public opinion model, party politics model, problem solving model, and trend model. All but the last of these four are probably groups of similar models. Future research must not only separate and describe specific models, but also find how expectations in general

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[18]The insurance code consisted of the number of positive answers to 14 questions asking if farmers made use of various formal and informal insurance schemes (See Appendix A, Questions 30-43).

and the use of specific models affect the exercise of the management function and the resulting production plans.

In hypothesizing the use of mechanical models, the men who formulated the schedule tacitly assumed that farmers were political illiterates. The consequent rejection of most of the mechanical models was followed by the discovery of models which used data on political variables in making predictions, but even these models show little understanding of the groups and processes involved in policy formation and administration.

The question on expectations of government action in the IMS referred to national, state, and local government, but the answers were primarily in terms of national policy and programs. We shall continue to discuss expectations of national government actions, but at the end we will show why expectations of local and state government actions may be more accurate. The remaining discussion will consist of speculations which are based only partly on insights gained from the study of IMS data.

Farmers know that government policies and programs affect the relative profitability of alternative farm organizations. They believe that these policies and programs will change,[19] and that these changes may necessitate reorganization of their farms. Since farm reorganizations may involve costs, farmers would like to minimize this expense by correctly

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[19]Although many of the farmers questioned in the IMS said that they did not expect changes within two years, the answers would probably have been reversed if the question covered a longer time period.

predicting future policy and program alterations. However, most farmers are politically naive with respect to national politics. Their lack of knowledge concerning national policy and program formation leads them to use equally naive models for prediction purposes.

A small proportion of farmers (those using trend models) do not even try to tie their expectations to political variables. The users of the three models which we have classified as political models did not indicate much, if any, greater understanding of their political environment. For instance, the men who used the party politics model did incorporate data on political variables, but the variables which they used were superficial. Respondents using public opinion and problem solving models appear to have an idealistic conception of the functioning of government. The replies of these men also suggest that they project their own and their neighbors' opinions and problems to all farmers.

All of the models used by farmers to predict national government action may be so naive that they are no better than guesses. The IMS did not investigate the confidence which farmers have in their models. It may be that farmers recognize the inadequacy of their models and the resulting inaccuracy of their predictions. A hypothesis which might be tested by future research is that farmers have so little faith in their predictions of future national government actions that they do not use these predictions in choosing among alternative farm organizations.

Farmers may be in much better shape with respect to expectations of local government actions. Even if they employ the same models they use to predict actions of the national government, the resulting expectations will probably be much more accurate. Farmers have a much better understanding of local politics. Many farmers take an active part in local political activity and most of the others are familiar with local opinions, problems, conflicting interests, politicians, pressure groups, and the relative influence of different people and groups of people. Thus, they may be able to form quite useful public opinion, problem solving, and party politics expectation models. They probably have enough confidence in their expectations of local government action to use them in choosing among alternative farm organizations.

Farmers' understanding of the formation of state government policies and programs probably ranks somewhere between their understanding of local and national policy and program formation. As a result the accuracy of their expectations would also be intermediate. Farmers may have enough confidence in their expectations of state government actions to use them in choosing among alternative farm organizations.

Expectations of New Technology

The discovery of new farming methods and equipment can not be predicted with certainty. Even after the discovery of these new developments there is a period of trial before they are either discarded or widely adopted. These factors make a farmer unsure as to what technology to adopt when he

is planning his operations.

The importance of a proper choice of technology increases as the planning horizon lengthens, and as investments in durables increase. If he invests in untried methods or equipment he may find that they are unsatisfactory. If he uses tried methods or equipment he foregoes possible gains accruing to those who are the first to adopt successful new developments. The new developments may turn out to be so successful that they lower the costs structures significantly; this may increase production, lower price, and force all producers to accept the new development. A farmer who had chosen another technology would be faced with obsolescence of plant and equipment as well as the loss of the opportunity to obtain the profits going to those who adopted the successful technology at an earlier stage.

A farmer is faced with the choice of using a proven technology which appears to be most profitable; a more flexible proven technology which would allow him to shift methods with smaller losses through obsolescence; or a promising but unproven technology. The choice depends on the farmer's expectations concerning the development of new technology, his risk preference, and many other personal and/or subjective factors.

As with the previous types of expectations considered, it was hypothesized that farmers used simple mechanical models, similar to the price models hypothesized by Heady, in formulating their expectations of new technology. Again the pretests indicated that these were not the only models used

by farmers. Open-ended probing questions were designed for use in the final schedule form. Farmers were asked if they expected changes in farming methods and things used in farming within two years, and their reasons for feeling as they did (see Appendix A, Number 29).

Expectations Reported

Of the 184 respondents who were asked the questions on expectations of new technology, 137 said they expected changes in farming methods and things used in farming in the next two years.[20] Only 44 did not expect such changes and three replied they did not know if such changes would occur.[21] The reasons given to support these replies are shown in Table VIII.

Of the 153 ascertainable reasons given for expecting changes in technology, 93 were coded under the three headings: (1) "Things always change or must change," (2) Belief in progress," and (3) "Extrapolation of the present period of change." All of these denote the use of the trend concept. A modified trend model was also used by nine men

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[20]A certain technology may have been discovered years before, but if a farmer has just learned of it, this particular technology is new technology to him. Thus, what society considers the adoption of proven technology may be the adoption of new technology to the farmer.

[21]Changes were most often expected in crop and soil production practices and in machinery and equipment. These two categories were mentioned by 44 and 39 respondents respectively. Twenty-two farmers expected changes in fertilizers and fertilization rates. Thirteen men thought that livestock production practices might change and nine expected changes in feeds and feeding rates. Improvements in disease, insect, and weed control were expected by eight farmers. Other categories were mentioned by three or less respondents.

TABLE VIII. Expectations of Respondents Concerning Changes in Farming Methods and Inputs Within Two Years of the Time of Interview

Reason	Number of Respondents
Expect Changes to Occur	137
Reasons:	
Things Always Change or Must Change (Including statements that this position is based on experience).	71
Belief in Progress (as contrasted to undirected change).	9
Extrapolation of Present Period of Change (No implication that change is constant).	13
Public is Willing to Accept Change.	25
Changes in Farmers' Production Needs Require It.	16
Changes in Government Programs Will Require It.	7
Have Arrived at Necessary Basis for New Developments in Terms of the Level of Organized Scientific Knowledge.	3
Financial Ability to Pay for New Developments Exists.	3
Result of Experiment Station and/or U.S.D.A. Work (Must be stated explicitly).	2
Other Reasons	4
Not Ascertainable	13
Do Not Expect Changes to Occur	44
Reasons:	
Present Methods Are Adequate and/or Upper Limit on Progress Has Been Reached.	16
Farmers Lack Resources for Undertaking Change.	10
Present Period is One of Consolidation After Past History or Trend of Major Changes.	9
Two Years Is Too Short a Time Period for Major Changes	7
Present Situation Is Too Risky for Change--Caution Is Necessary.	1
Not Ascertainable	4
Don't Know	3

who said they did not expect changes because the (then) present period is one of consolidation after a past history or trend of major change. Thus two-thirds of the respondents

used some kind of a trend model despite the pretest rejection of structured questions including the trend model.

Other respondents use "public acceptance" models. Apparently, these 25 respondents believe that the adoption (and possibly the discovery) of new technology is positively correlated with a public willingness to accept change. Ability to finance changes in production methods may be part of this willingness to accept change. If this is the case then the "adoption costs" model is related to the public acceptance models. The adoption costs model was used by three men who expected changes and seven who did not expect changes.

Sixteen men replied that they expected changes because farmers' production needs require it. Added to these were seven men who said that government programs will require changes in technology, presumably because of the production effects of these programs. The men using these "production needs" models have faith that when new technology is needed it will be forthcoming. Johnson and Smith have suggested that the "needs" for new technology may be due, at least in part, to the inability of farmers to compete with other industries for labor because of the low marginal value product of agricultural labor.[22]

A "pessimist" model was used by 16 respondents who did

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[22]Johnson, G. L., and Smith, J., "Social Costs of Adjustment," to be published in Proceedings of Conference on Problems and Policies of American Agriculture, Center for Agricultural Adjustment, Iowa State College, Ames, Iowa, 1958.

not expect changes in farm technology. They either thought that present methods are adequate, or that the upper limit in progress had been reached. Seven men thought that two years was too short a time span for major changes to make themselves felt. All other models were used by three or fewer respondents.

Characteristics Related to Expectations

The 137 men who expected changes in agricultural technology were compared with the 44 respondents who did not expect changes. The characteristics of the two groups which were compared are shown in Appendix C.

Younger men are often thought of as relatively more interested in new developments than older men. On the basis of this assumption we shall hypothesize that:

> The proportion of men expecting changes in technology will be negatively correlated with age.

We have suggested that the expressed need for new technology may be due to the inability of farmers to hire labor. Assuming that the "production needs" expectation model is accurate, we can hypothesize that:

> Respondents who hire labor will be more likely to expect changes in technology.

Schools, the extension service, and other educational sources point out how technology has advanced and suggest that this advance will continue. We will hypothesize that:

> Education will be positively correlated with the proportion of respondents expecting changes in technology.

> The group who were in 4-H and/or FFA, had agricultural training in high school or college, had agricultural

training outside of formal schools, or attended two or more meetings of non-governmental farm organizations and/or extension meetings will include a relatively high proportion of those expecting changes in technology.

The null hypothesis of independence between age and the proportion of respondents expecting change was not rejected at the level of significance used, but there was an increasing proportion not expecting change until the 45 to 54.9 year age group was reached. Since those over 45 did not follow the trend we can not say that the data consistently supported the hypothesis. There was no indication of a relation involving the use of hired labor.

A chi-square test indicated dependence between the proportion expecting change in technology and years of formal schooling (.10). No relations involving the other educational variables were apparent. Those with 9 to 11 years of schooling were more likely to expect changes while those who quit school after 12 years were less likely to do so. Thus the data did not support either of the educational hypotheses.

Chi-square tests also indicated dependence between the proportion of respondents expecting changes in technology and both total debts (.01) and whether the respondents did off-farm work (.10). There is a very irregular trend indicating that debts <u>may</u> be negatively related to the proportion of respondents expecting changes in technology. The interruptions in the trend make this relation questionable. Men who did no off-farm work were somewhat more likely to expect changes in technology than part-time farmers.

Summary and Implications

Almost three-fourths of the 184 respondents who were asked the questions on expectations of new technology expected changes in farming methods and inputs within two years and most of these men used an expectation model involving some notion of trend. This may not be surprising. In thinking back over articles in magazines, extension talks, and college publications, the author (without an actual recheck of these sources) remembers the trend idea expressed regarding the development and adoption of new technology. Other models used have been called the public acceptance model, the adoption costs model, the production needs model, and a pessimistic model.

All of these models might be classified as "naive," but two questions must be answered before the models can be evaluated. These questions are:

> Do these models yield accurate expectations?
>
> If not, are there other models which can be used by farmers to get more accurate expectations?

We have stated that certain sources of information emphasized the trend model. But we have also stated that the production needs model may be correct. We can also think of cases where capital limitations might make the adoption costs model appropriate, and public acceptance might also be important because of a desire for social acceptance. Thus the model which yields the most accurate predictions may be a composite of these four, and possibly other factors should be considered in the model. Some farmers did refer to more than one of the above models.

The IMS was not designed to find how expectations of new technology affects the management process or the production decisions reached by the farmers. It would be desirable to know how the specific expectations influenced the production technology used and the scale of production. Farmers who expect changes may incorporate more flexibility in their plans than those not expecting changes. They might also be more diligent in keeping abreast of new technology in order to reduce the impact of obsolescence.

Insights gained from the study of the IMS data combined with independent speculation lead to the following hypothetical framework which might be used in planning future studies of farmers' expectations of new technology. It should be remembered that we are considering technology which is new to the individual farmer and not just new technology to society. What is an accepted practice or input to a farmer having close contact with an experiment station may be recently discovered technology or, even unknown, to a more isolated man.

Another distinction should be made at this point. "Expectations of new technology" refers to expectations of possible future technological developments. It should not be confused with a farmer's evaluation of an input or method of which he has just learned. We shall call this second process evaluation of new alternatives. The confusion can come about because evaluations of new alternatives involve formation of a different type of expectations, which we will call the "profit expectations," for each alternative. Formulation of profit expectations involves completely different types of

models than the formulation of expectations of new technology. In the analysis of other parts of the IMS data, Boyne and Johnson found that farmers used models based on aspects of static and dynamic economic theory in formulating profit expectations.[23] These contrast with the trend, production needs, public acceptance, adoption costs, and pessimistic models used in formulation of expectations for new technology.

We shall divide the remaining discussion into two parts -- (1) speculation concerning the reasoning which leads farmers to adopt the models they use for predicting new technology and (2) speculation concerning the use which farmers make of these expectations.

Speculation Concerning the Reasoning Leading to Adoption of Models Used

Farmers have observed many new developments in the inputs and methods used in farming. Though most of them reason that such new developments will continue to appear, they would like to predict both the rate at which these developments occur (variations from trend), and the areas in which they will occur.[24]

In searching for more useful models farmers try to find observable phenomena which precede these new developments.

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[23]Boyne, D. H., and Johnson, G. L., "A Partial Evaluation of Static Theory from Results of the Interstate Managerial Survey," Journal of Farm Economics, Vol. 40, 1958.

[24]Of course a few farmers interviewed (users of the pessimistic model) did not agree that there would be technological advance.

Some farmers have observed that when they or their neighbors have a particular problem the resulting search for a solution often turns up an input or method which is new to the people concerned. They have also heard of problem-oriented research in industry and in research institutions. As a result these farmers conclude that new farm technology will be developed to meet the production needs of farmers.

Other farmers have observed that their neighbors are more likely to adopt new inputs and ways of doing things when their income is relatively high. They also know that many of these changes require large cash outlays. From these premises they conclude that the development as well as the adoption of new technology is correlated with farm income.

Still other farmers have noticed, or thought they noticed, an increase in public willingness to accept change in recent times. There have been rapid changes in agricultural inputs and methods. As a result these men think that new technology is developed and adopted when the public is willing to accept change.

Speculations Concerning Use of Expectations

Now let us suggest how expectations of new technology may be used by the farmer. A farmer makes choices among alternative technologies. We have said that in making these choices he must evaluate each alternative; this involves formulating profit expectations. These profit expectations are

subjectively discounted net returns.[25] A farmer's expectations of new technology form one of the factors influencing the discount rate which he considers appropriate for each alternative. If new developments are considered imminent, alternatives involving relatively large fixed commitments would be discounted at higher rates, i.e., the farmer would be willing to sacrifice immediate income for flexibility. On the other hand, if no new technology were expected for a longer time, the alternatives involving the greater fixed commitments would be in a relatively more favorable position. In other words, the greater the probability of new developments, the fewer fixed resources the farmer will be willing to commit.

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[25]Net returns, income, discount rate, and profits are measured subjectively. A farmer may get personal satisfaction or dissatisfaction from doing things a particular way. Some farmers also get satisfaction from being the first to adopt a new input or method, while others get satisfaction from resisting technological advance.

CHAPTER IV

SUMMARY AND CONCLUSIONS

A farmer must commit resources in a time consuming production process. Since he does not know what the values of the relevant variables will be when the production process is complete, he cannot tell what the ex post optimum production plan will be. But there are indications, when production is begun, of what the values of relevant variables will be in the future. A farmer tries to identify an optimum ex ante plan by predicting relevant future values from information when the production process begins. As more information becomes available during the production process, the plan may be modified.

Farmers have some analytical apparatuses for guidance in selecting the relevant parts of the information available and showing how the information is used in formulating predictions. These analytical tools are called expectation models. The models have been classified by the variables which they are used to predict. In the IMS, questions were asked to elicit the expectation models used in predicting (1) product and input prices, (2) characteristics of humans, (3) government action, and (4) new technology.

The results reported here are a continuation of the work

summarized in the survey of literature in Chapter I. These results establish the empirical importance of some expectation models, reveal the existence of others, establish certain subject matter areas as fields in which to study expectation models and, lastly, provide insights and speculations which appear to be promising aids for the future study of expectation models.

Samples of the responses were examined to determine the information they contained and appropriate codes were established. In the case of product price expectations the models used, the presence of empirical content, integration and conceptual and empirical content, and the conceptual completeness of the models were coded. The models used were also coded for input price expectations. Willingness to evaluate strangers on first contact, the basis for evaluation, and the characteristics evaluated were coded from the questions on human expectations. Only the expectations of change and reasons for these expectations were coded from the government action and new technology questions.

These codes were cross-tabulated with codes applying to other characteristics of the respondents (see Appendix C). The resulting contingency tables were analyzed to find relations between the two groups of characteristics. Where enough observations were available chi-square tests were used on the contingency tables. Insights gained from the IMS data along with independent information were used as a basis for hypotheses to be tested in future research.

Price Expectation Models

Most of the price expectation models reflected in farmers' responses showed a much higher degree of economic maturity than agricultural economists had previously presumed farmers to possess. Supply and supply-demand models were used more often than any other model for products and inputs except for crops whose prices were supported by government action.[V] Other models often used in formulating product price expectations were the lag model, business activity model, general trend in all farm prices model, similar product analogy model, and war model. For input price expectations, the general or unspecified labor costs model, the business activity model, and a model relating input price to output price followed the supply and supply-demand models in frequency of use.

The fact that IMS responses contained many more references to supply than to demand suggests that farmers (1) consider supply information more accurate or easier to obtain than demand information, (2) tacitly assume demand is stable or inelastic and, thus, that most price variations are caused by fluctuations in supply, and/or (3) are more familiar with the concept of supply and its effects than with the concept of demand and its effects.

Among all three types of price expectation models studied, there was an increase in the use of supply-demand models and a decrease in the use of supply models as education increased. This result suggests that our formal educational

system either familiarizes people with economic concepts, or that it furnishes the curiosity and mental equipment which are necessary for learning these concepts. Similar consistent relations were not found between the models used and the educational variables not associated with formal schooling.

The use of supply-demand product price expectation models was also associated with the use of marginal concepts in figuring costs and returns. This was expected since both reflect a high degree of economic maturity. In the case of input price expectations, the corresponding test gave questionable results.

Government action models were used mainly by cash crop farmers. Fat stock farmers used far fewer government models and more of the other five models tested. Except for somewhat fewer government action models among dairy farmers, the general and dairy farmers used about the same proportion of each model as all farmers taken together.

Chi-square tests indicated dependence between the models used and age, years of farming experience, proportion of land rented, net worth, and gross income, but these relations were so confused with each other and with the relationships to formal schooling and type of farm that no conclusions were drawn.

Attributes of Price Expectation Models

It was rather surprising to find that the product price expectation models used by farmers were well enough developed to allow consideration of such attributes as the conceptual

completeness of the model and the integration of conceptual and empirical content. This was not true for the other types of models studied.

Of the 493 respondents who gave responses which indicated the use of at least one model, 297 also had some empirical content in their responses, 69 had the conceptual and empirical content of their responses integrated, while 80 had models which were conceptually consistent and complete enough to yield unique expectations.

It was hypothesized that both the presence of empirical content and the integration of conceptual and empirical content are related to the amount of formal education. The data did not support these hypotheses. However, there was some indication that these attributes (empirical content and integration) were positively related to participation in both 4-H and/or FFA and agricultural training courses exclusive of formal schooling. Neither formal nor informal vocational agricultural training were related to the conceptual completeness of the models.

Recommendations for Future Research

Insights gained from study of the IMS data have revealed several areas where further investigation may be profitable. The completeness of models needs further study. Possible variations in the models used by different environmental groups might also be investigated. Further study is needed concerning the models used for specific inputs and products, how models change as economic conditions change, and the

effect of length of run on the models used. Some hypotheses suggested were:

1. Models become more complete as the time approaches when the price will be realized.
2. Farmers with more complete models predict prices within a narrower range.
3. Differences between geographical areas in the models used arise from both differences in products and inputs and differences in environment.
4. Social and physical environment affect beliefs and values and these in turn affect the models used.
5. Economic conditions affect the models used.
6. The length of run for which plans are being made affects the models used.
   a. Supply and supply-demand models are used relatively more in short run planning.
   b. For somewhat longer run planning there is a relative increase in the use of business activity, general trend in all farm prices, lag, cyclical, seasonal, and war models.
   c. In long run situations farmers rely primarily on trend models.
7. Supply analysts might be able to improve their predictions of supply response by incorporating into their analysis more of the price expectation models which IMS responses indicate that farmers use.

Human Expectations

At the time the IMS was designed, human expectations had just recently been recognized as an area possibly worthy of investigation. No conceptual models had been suggested. At this point, one alternative open was to hypothesize that farmers used human expectation models similar to Heady's price models. When pretests indicated this was not true, open-ended probing questions were designed to find what models were used. The questions were worded in terms of the first evaluation of strangers.

Of the 483 respondents answering the questions on human expectations, 427 believed that at least some characteristics of respondents could be evaluated on first contact. Assessment of immediately observable evidence was used as a basis for evaluation by 396 of these men. Of the 56 who did not believe an evaluation could be made on first contact, 42 said such an evaluation could not be made because everyone is different.

There are several possible reasons why some respondents were unwilling to evaluate on the basis of evidence which others think is sufficient to make at least some judgments. The slow evaluators may want more evidence before making decisions, e.g., they place a greater utility on additional information. They might also be poorer observers and/or analysts than the early evaluators. As a result they would still be in the learning stage since they learned less from their opportunities for evaluation. A third possibility is

that the two groups interpreted the question differently. Early evaluators may have thought the question asked for indications of characteristics of strangers while late evaluators thought in terms of more accurate appraisals. Still another possibility is that the late evaluators were thinking in terms of more serious problems than early evaluators. As a result, they would not be willing to make decisions based on first impressions.

Many kinds of variable evidence were used as a basis for evaluating strangers on first contact. Included were symbols such as various aspects of physical appearance, activities such as speech and conversation, action and gestures, and approach and greeting, and relatively few "general impressions." Most often mentioned were aspects of dress and clothing, and quality and content of speech.

An important type of human expectation formed has to do with the characteristics of the person being evaluated. The respondents using immediately observable evidence to evaluate strangers on first contact most often listed personal characteristics of strangers as attributes which they could predict. These personal characteristics often had moral or ethical overtones. Aside from personal characteristics, the attribute which most farmers thought they could identify was occupation. Activities were most often used as a basis for evaluating personal characteristics while symbols were more likely to be used as clues to occupation. Both the characteristics specified and the type of evidence used in assessing these

characteristics may be of interest to people who meet many farmers as well as to students of human behavior.

Men who had many contacts with other people were relatively more willing to make early evaluations. Those making use of many insurance schemes were also more likely to be early evaluators. The proportion of early evaluators was also higher among respondents who had agricultural training outside of formal schools. Slow evaluators were more numerous among farmers considering induction as the "more natural" method of thinking than among the remaining respondents. A negative correlation was found between the proportion of early evaluators and age.

The IMS data on human expectations did not reveal that theoretical structures are used by farmers in formulating human expectations. Though this may be because no information was gathered on expectations concerning people other than strangers, it seems equally likely that the absence of such structures is related to a lack of such concepts in the fields of sociology and psychology and to lack of opportunity of farmers to get acquainted with the structures existing in those fields.

This lack of structure indicates a need for the development of a framework which might be used in future studies of human expectations. Thus, we shall first suggest how human expectations are used and then speculate how information is gathered and used to form human expectations.

A farmer may be regarded as facing the problem of

formulating a plan of action to use in dealing with another person. We have called these plans of actions "strategies." The success of each alternative strategy which the farmer might adopt depends on the strategies and counter-strategies employed by the other person. Although the farmer does not know what these strategies and counter-strategies will be, he believes that they depend upon certain personal characteristics of the person. The farmer's predictions of the personal characteristics and resulting strategies of another person form his "human expectations" regarding that person.

It was hypothesized that a farmer continually gathers information about another person regardless of whether he currently faces a problem in his associations with that person. He may be gathering this information for use in formulating expectations which will be used in solving future problems involving this person, or he may be motivated by an innate curiosity about people. However, a farmer may be more active in seeking information about a person when currently faced with a problem. Regardless of the motive for gathering information, it will usually be analyzed as it is gathered and will be used to modify or extend the evaluation of the person.

The amount of knowledge a farmer has previously obtained about another person may affect both the relative importance of different sources of information and the decisions he will make without gathering more information. When meeting a stranger for the first time the farmer relies on interpretation

of physical and oral symbols and activities. The farmer would place relatively little confidence in expectations based on such evidence, and he would use these expectations to plan strategies only in solving simple problems unless he were in a forced action situation.

As the farmer learns to know the person better he passes through a stage where he gains most of his information from other people and from trial on a limited basis. He gradually reaches a third stage where most information comes from an analysis of past performance though information from others is still important. At this stage the farmer has considerable confidence in his expectations and is willing to formulate his own strategies in connection with quite complex problems without seeking additional information about the other person.

The farmer may eventually reach a point where he is so certain of his evaluation that he pays little heed to further information unless "shocked" by evidence which conflicts sharply with his current evaluation. This shock would cause the farmer to reappraise past performance and other old information, and again actively seek new information. The shock might result from (1) previous errors in observation or analysis which led to a false appraisal, (2) errors in observation or analysis of the shocking information, (3) changes in the personal characteristics of the other person, or (4) changes in the personal characteristics of the farmer himself.

Expectations of Government Action

Though slightly more attention may have been given to expectations concerning institutional changes as compared to human expectations when the IMS was designed, both conceptual and factual information were virtually absent. Again it was hypothesized initially that farmers used simple mechanical models in formulating their expectations of government action, but the schedule pretests indicated that this was not generally and exclusively true. As a result questions were designed to find if farmers expected changes in government programs within two years and the reasons for feeling as they did. Although the question referred to national, state, and local government, most respondents answered in terms of national policy and programs.

Of the 184 farmers asked the question, 112 said they expected changes in government programs and policies. Aside from those who knew of intended or considered changes, the reasons most often given for expecting such changes were related to the state of farmer public opinion. The reasons were either stated as such or implied by predictions of what farmers may, will, or must do. The reason given most often by the 49 farmers who did not expect changes in government programs and policies was that the party in power is committed to and/or supports the current program. The remaining 23 respondents either said that change and no change are equally likely or said they didn't know.

The reasons given by farmers for expecting, or not expecting changes in government programs and policies for

farmers suggest the use of at least four different expectation models. Users of the public opinion model related their governmental expectations to the state of the opinion of farmers or of the public in general. Those using the party politics model thought that particular aspects of the effect of our political party system on the functions of government could be used to predict government actions. The problem solving model was used by those who thought of the government as an entity which observed difficulties and set up programs to alleviate these difficulties. Other respondents used trend models.

The large proportion of farmers expecting changes in government programs and policies affecting agriculture, along with the large number of government action price expectation models, emphasizes the awareness of farmers of the impact of government actions on their expectations. However, the reasons given for expecting changes in programs and policies indicate that farmers are politically naive. These two observations lead to the characterization of farmers as "naive realists" with respect to their expectations of government actions.

Most of the responses to the IMS questions on expectations of government action referred to national policies and programs. If farmers use the same models in formulating their forecasts of local government actions, they may be more accurate. This could result from the fact that farmers are relatively more familiar with local opinions, problems,

conflicting interests, politicians, pressure groups, and the relative influence of different individuals and groups.

Expectations of New Technology

Despite the attention given to the problem of technological advance and innovations by economists, virtually nothing conceptual or factual was available to IMS designers concerning how farm entrepreneurs form technological expectations. Even the definition of technology was then and still is confused among members of the profession.

In discussing expectations of new technology, it is possible to become confused because of the two ways in which the term "new technology" is used. Since we are interested in the individual farmer's expectations, we shall differentiate between these two meanings from the farmer's viewpoint. A farmer may think of new technology as a new method or input of which he has just learned. If he is thinking of "new technology" in this sense, then his "expectations of new technology" refer to his expectations of the performance of the new technology which we have called "profit expectations." The models which farmers use in formulating profit expectations involve static and dynamic economic theory.

"New technology" can also refer to inputs and methods which may become known to the farmer in the future. Thus, expectations of new technology are expectations of new developments which may occur. This is the sense in which we are discussing expectations of new technology. It is apparent from an examination of the reasons given by IMS respondents

for their expectations that they were thinking of new technology in this second sense (see Table VII).

After pretest rejection of mechanical models similar to those commonly used in connection with price expectation work at that time, the questions used in the final interview schedule were designed to ask if the farmer expected changes in farming methods and inputs within two years, and his reasons for his expectations. Of the 184 respondents who were asked the questions, 137 expected such changes, 44 did not expect changes, and three replied that they did not know.

Approximately two-thirds of the respondents used some type of trend model in giving the reasons for their expectations. This is not surprising in view of the emphasis on this model in agricultural literature. Other farmers who used a public acceptance model believe that there must be a willingness on the part of the public before new developments will be adopted. Users of the adoption costs model believe that the adoption of new developments is related to the ability to finance the adoption. There is some indication in other studies that the adoption of new technology is positively correlated with farm income.[1]

Still other farmers use a production needs model which

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[1]See Fettig, L. P., Purchases of New Farm Tractors and Machinery in Relation to the Non-Farm Business Cycle, 1910-1956, Unpublished M.S. Thesis, Michigan State University, 1958; and Hildebrand, P. E., and Partenheimer, E. J., "Socioeconomic Characteristics of Innovators," Journal of Farm Economics, Vol. 40, 1958.

is based on the assumption that the need for new technology causes its discovery and adoption. There is some evidence of a search for labor saving technology in areas where agriculture can not compete successfully with industry for labor. A small number of farmers were so pessimistic that they thought that present methods were adequate and/or that the upper limit on progress had been reached.

Trend, adoption costs, public acceptance, and production needs may all be important in the development and adoption of new technology. If this is true all four should be included in an expectation model. Some farmers did indicate the use of more than one of these factors in making predictions.

It was hypothesized that the need for formulating expectations of new technology arises, in part, from problems involving choices among alternative known technologies. In solving problems involving alternative technologies, the farmer logically predicts the present subjective value of the future income stream which would accrue to each of the alternatives. In discounting the future income streams, one of the factors which must be considered is the relative flexibility of each alternative. Flexible alternatives would be discounted at a lower rate if new developments were expected, but they would not receive this preferential treatment if the farmer thought technology were stagnant. In solving such problems, other kinds of information, and hence, other kinds of expectation models become relevant. For instance,

price expectation models including the analytical apparatus of profit maximization may become useful.

The dearth of developed theory on technological advance tempts one studying expectation models on technology to move on into the analytical aspects of problem solving in his search for order and conceptual structure.

Conclusions, Speculations, and Implications

This section contains conclusions, speculations, and implications involving more than one of the types of expectations studied. They arise both from the IMS data and from independent speculation.

(1) The process of gathering information used in formulating expectations is quite similar from subject to subject. Thus, those aspects of expectation models which are statistical in nature vary little from subject to subject. Expectations are formulated with respect to specific problems but the information used as a basis for these expectations is sometimes gathered continuously. Three motives for gathering the information are for use (a) in formulating expectations for use in solving a particular problem, (b) in formulating expectations in response to some future problem, and (c) in satisfying curiosity, i.e., gathering information for its own sake. These motives for gathering information may vary in relative importance from subject to subject. For example, the third motive may be particularly important with respect to information on new developments and humans.

(2) The analytical and synthetical aspects of expectation models used by farmers differ from subject to subject. These differences arise from at least two factors aside from differences inherent in the subject matter. These are differences in (a) the stages of development of the theories in the subject matter areas, and (b) in farmers' knowledge of these theories. Economic theories are relatively well developed and farmers are relatively familiar with these theories. As a result the price expectation models reflect a degree of maturity not found among the other models. The models used for predicting new technology reflect the lack of theory in this area. The political models indicate that farmers are not aware of the theories of political science. Farmers' responses to questions on human expectations did not reflect familiarity with the theories of psychology and sociology.

(3) Human expectation models must be unique in one additional way. In planning strategies to use in his contacts with other people, the farmer must remember that they react with personal strategies and counter-strategies of their own. All other types of models are used in an impersonal game situation where the opposing player's (nature's) strategies do not depend on the strategies of the farmer.

(4) Solving a single problem may call for the formulation of several types of expectations and the use of several analytical systems. Consider, for example, the problem of choosing between two alternative technologies. We have

discussed how profit expectations and expectations of new technology are involved in the problem solution. In addition, price expectations and expectations of government action may be needed in forming the profit expectations. Weather and yield expectations could also be used. Human expectations with regard to the actions of salesmen, buyers, and others will probably also be involved in the solution of such a problem.

(5) It is important in thinking about decision making to keep concept formation (on the part of the student of decision making) concerning expectations separate from concept formation with respect to problem solving; the first deals with relatively few types of information while the latter ordinarily involves a number of different types of information. Problem solving models are necessarily much more complex than expectation models.

APPENDIX A

This appendix contains the questions from the IMS from which data were obtained for use in this study.

1. Now first of all, how many acres, all together:

_____do you own?
(IF "ANY") This year how many of these are you actually using as:

_____crop land and rotation pasture
_____permanent pasture
_____rent out or put out on shares
_____remainder

_____are you renting this year?
(IF "ANY") How many of these are you actually using as:

_____crop land and rotation pasture
_____permanent pasture
_____remainder

2. What do you consider to be the main crop or livestock product on your farm?_____
What did you do with it last year?_____
What other crops or products did you market last year?_____

(IF MORE THAN ONE CROP AND/OR PRODUCT WAS MARKETED IN THE PRECEDING YEAR.) What proportion of your last year's total farm income did each of these account for? (LIST UNTIL 70% OF INCOME IS ACCOUNTED FOR.)

Main product_____ _____%
2nd product_____ _____%
3rd product_____ _____%
4th product_____ _____%
5th product_____ _____%
6th product_____ _____%
7th product_____ _____%
8th product_____ _____%
9th product_____ _____%
10th product_____ _____%

9. We've been talking about information needs that you may have had in making decisions about specific problems. However, there are a number of other difficulties involved in making decisions and acquiring information that you may also find to be problems. Here is a list of some of them. (HAND CARD TO RESPONDENT) I'd like you to tell me which of these or any other not on this list have been problems in your own experience.

_____1. Knowing when to change your production plans.
_____2. Recognizing the existence of problems.
_____3. Defining the objectives of your family.
_____4. Knowing when you are on the "wrong track" in your attempt to reach a desired goal.
_____5. "Putting your finger" on the difficulty when you know there is something wrong or when you know a problem exists.

_____6. Just keeping up with all of the new information relating to farming that constantly comes along.
_____7. Getting information organized in your own mind so that you can see what it means for you.
_____8. Knowing how and when to arrive at decisions (once you've organized the information) when some of it leads you to one conclusion and some to another.
_____9. Any others not on this list._____

_____

_____

12. a. Here is the information that a farmer has for deciding whether or not to put another $250 into machinery. (INTERVIEWER PRESENT CARD) His records indicate that his average gross income per $250 invested in machinery is $450. The average returns above fuel and labor costs per $250 invested in machinery are $275. Is this enough information to decide whether or not a farmer should invest another $250 in machinery?

___Yes: For what reasons?_____

_____

___No: Why not?_____

_____

___Don't know: What difficulties are you having in figuring this out?_____

_____

_____

b. Here is another way for him to figure it out. (INTERVIEWER PRESENT CARD) An analysis of records from his farm and other similar farms indicates that additional investments in machinery can be expected to return 25% on the dollar after the earnings of all other expenditures and investments are accounted for. This 25% includes profits, interest on the machinery investment figured at 5%, and depreciation figured at 10%. Is this enough information to decide whether or not a farmer should invest another $250 in machinery?

___Yes: For what reasons?_____

_____

___No: Why not?_____

_____

___Don't know: What difficulties are you having in figuring this out?_____

_____

_____

13. Two methods of arriving at conclusions are illustrated by the examples on this card (INTERVIEWER PRESENT CARD).

1. In some cases we draw conclusions from experience. Thus, we may notice that in certain situations certain results always seem to follow. On the basis of this, we conclude that these results always occur in this situation. An example might occur in fertilizing a field. Thus, if a farmer sees that the poor thin spots in a field respond to fertilizers more than the rich spots, he may conclude that poor thin spots <u>always</u> respond more than rich spots.

2. In other cases, we "reason out" conclusions about new situations facing us from facts and principles we know or assume to be true. For instance, a farmer may know or assume that a certain barn arrangement will save labor and then "figure out" how the use of this arrangement would affect the amount of labor which would be left over for use elsewhere in his business.

   a. Do you use both, mainly one, only one, or neither of these methods in arriving at conclusions?

      ___Both
      ___Mainly one: Which?_____
      ___Only one: Which?_____
      ___Neither
      ___Don't know

   b. Which of these thinking methods is most natural for you to use?

      ___Both
      ___One: Which?_____
      ___Neither
      ___Don't know

   c. Can you use one of these methods without using the other?

      ___Yes
      ___No
      ___Don't know

   d. What proportion of your thinking is like the first method? (PRESENT CHECKLIST)

      ___None
      ___Less than 1/4
      ___About 1/4
      ___Between 1/4 and 1/2
      ___About 1/2
      ___Between 1/2 and 3/4
      ___About 3/4
      ___More than 3/4
      ___All
      ___Don't know how much, but not all
      ___No answer

   e. What proportion of your thinking is like the second method? (PRESENT CHECKLIST)

___None
___Less than 1/4
___About 1/4
___Between 1/4 and 1/2
___About 1/2
___Between 1/2 and 3/4
___About 3/4
___More than 3/4
___All
___Don't know how much, but not all
___No answer

f. Could you give me another example of the first method of arriving at conclusions?

_____

_____

g. Could you give me another example of the second method?_____

_____

15. In deciding whether or not to buy a piece of land, a farmer can make either of two kinds of mistakes. He can buy land when he should not have. This mistake was made by many farmers after World War I. On the other hand, he can make the mistake of not buying land when he should have. This mistake was made by many farmers who did not buy land between 1935 and 1945. In making farm decisions, are you more concerned about taking action when it would have been better not to than you are about not taking actions when you should have, or are you equally concerned about both of these?

___More concerned about taking actions when shouldn't
___More concerned about not taking actions when should
___Equally concerned
___Don't know

21. In the last two years have you attended two or more:

County agent's or extension specialists meetings ___Yes ___No

Meetings of farm organizations like the Farm Bureau, the Grange, and the Farmers' Union ___Yes ___No

25. a. What do you expect the price of (INSERT NAME OF MOST IMPORTANT COMMODITY, EXCLUDING DAIRY PRODUCTS) to be at your next marketing time?_____
When would that be?_____

b. Do you expect the price of (NAME PRODUCT MENTIONED IN a.) at marketing time to be higher than, lower than, or the same as they were at the same time last year?

_____Higher
_____Lower
_____Same
_____Don't know

Still, if you had to make a prediction now, how would you figure it out?

_____

How have you arrived at this estimate?

c. (IF NO GENERAL MODEL IS GIVEN IN b., ASK THE FOLLOWING THREE QUESTIONS IN c.)

In general, what circumstances lead you to expect that the prices you receive will be higher than they were in previous years?

In general, what circumstances lead you to expect that the prices you receive will be the same as they were in previous years?

In general, what circumstances lead you to expect that the prices you receive will be lower than they were in previous years?

d. Is there any special year or group of years that you think of as typical for purposes of comparison in trying to figure out what prices to expect?

What reasons do you have for thinking of that period as typical?

26. a. We buy many things to operate our farms. Feed, fertilizer, and seed are just some examples. In deciding when to buy things, how do you usually judge what prices are going to be?

b. What are some of the things that you buy from time to time that get used up in production?

Under what conditions do you assume that the prices you will be paying for (INSERT NAME OF FIRST INPUT MENTIONED ABOVE) will be higher than they were?

Under what conditions do you assume that the prices you will be paying for (INSERT NAME OF FIRST INPUT MENTIONED ABOVE) will be the same as they were?

Under what conditions do you assume that the prices you will be paying for (INSERT NAME OF FIRST INPUT MENTIONED ABOVE) will be lower than they were?

_____

_____

27. No farmer operates his farm without having some contact with other people. He comes into contact with such people as farm laborers, men who do custom work, dealers, landlords, bankers, and so on. Do you usually have some idea as to what to expect from a person you're about to meet? (INTERVIEWER CODE)

___Has some idea: How can you tell what to expect from a person you've just met?

_____

(IF ANSWER INDICATES THAT HE DEPENDS ON INFORMATION FROM OTHERS) If you don't know anyone who could give you some information about the person, then how could you tell what to expect?_____

_____

_____

___Waits and sees: Are people so different that a man has to know new acquaintances for a while before he has some idea of what he can expect from them?

___ Yes: Are there any things you can look for in a person to give clues as to what to expect?

___No

___Yes: What are some of these things?_____

_____

What can we figure out from them?_____

_____

___ No: Well, then, what can you expect from people you've just met?

_____

_____

What are some of the things that make it possible to know what to expect from strangers?_____

_____

_____

___It's hard to say of depends: What does it depend on?_____

_____

_____

(IF ANSWER UNCLEAR, ASK FOLLOW-UP TO "DON'T KNOW")

___Don't know In selecting a regular hired man, how would you forecast whether he will make a good employee?_____

_____

_____

(IF "HIRED MAN" QUESTION NOT ANSWERED ADEQUATELY AND RESPONDENT IS A LAND LORD.)
In selecting a man to operate some of your land, how would you decide whether a man would make a good tenant? _____

_____

_____

(IF "HIRED MAN" QUESTION NOT ANSWERED ADEQUATELY AND RESPONDENT IS A TENANT.)
In looking for a man to rent from, how would you decide whether a landowner would make a good landlord? _____

_____

_____

28. Do you think there will be any changes in national, state, or local government programs and policies for farmers in the next two years?

___No: What are your reasons for feeling this way? ___

_____

___Yes: What are your reasons for feeling this way? ____

_____

___Change and no change equally likely: What are your reasons for feeling this way? _____

_____

___Don't know: Well, then, do you try to take these things into account in your planning?

___No

___Yes: How?_____

_____

29. a. Do you think there will be any changes in farming methods and things used in farming during the next two years?

___No: What reasons do you have for feeling this way?_____

_____

___Yes: What reasons do you have for feeling this way?_____

_____

For what kinds of things do you anticipate these changes?_____

_____

___Don't know: Well, then do you try to take these possible changes into account in your planning?

___No

___Yes: How?_____

_____

30. Could you have used more credit profitably last year?
___No
___Yes: Did you refrain from borrowing so as to have property to mortgage in case of trouble?
___Yes
___No

31. Was there any time in the last year when you didn't close what appeared to be a profitable deal because the person you were dealing with might not be reliable?
___Yes
___No

32. Was there any time in the last year when you added crops and livestock enterprises for the main purpose of getting your eggs in more baskets?
___Yes
___No

33. Was there any time in the last year when you refused to use your money for an apparently profitable purpose in order to "play it safe?"
___Yes
___No

34. Do you keep more tractor or horse power on hand than is necessary for average weather in order to handle the crop in case of poor weather?
___Yes
___No

35. Was there any time in the last year when you paid more for an item from a person you could trust, than you would have had to pay for the same item from a less reliable person?
___Yes
___No

36. Do you carry life insurance?
___No
___Yes: Do you carry additional life insurance to cover a debt for your family? ___Yes
___No

37. How about fire insurance? Do you carry any?
___Yes
___No

38. Was there any time in the last year when you kept on hand a reserve of cash or things easily converted to cash, like wheat, bonds and livestock, in case of unfavorable developments?
___Yes
___No

39. Do you ordinarily keep larger feed supplies than necessary to be able to change your mind on livestock numbers?
___Yes
___No

40. Do you ordinarily keep larger feed reserves than necessary to protect yourself against loss due to bad weather?
___Yes
___No

41. Do you make a practice of having available more hay or pasture ground than necessary in order to protect yourself against drought?
___Yes
___No

43. Do you carry collision insurance to cover damages to your car or truck?
___Yes
___No

59. a. Did you grow up on a farm?
___All of childhood spent on farm
___Part of childhood spent on farm
___None of childhood spent on farm

b.

What are the names of the schools you've attended?	How long did you go there?	Did they give you any training in agriculture?	
_____	_____	___Yes	___No
_____	_____	___Yes	___No
_____	_____	___Yes	___No
_____	_____	___Yes	___No

c. What was the last grade of school you completed?___

d. Have you had any additional training, such as short courses or vocational training?
___No
___Yes: What was it? _____ How long did it run? _____
_____ _____

e. Did you ever belong to:
a 4-H Club? ___Yes ___No
The Future Farmers of America? ___Yes ___No

61. Were you ever out of farming for a while?
___No
___Yes: For how long?_____
What kinds of work did you do during this time?
_____
Have you ever lived in a city?
___No
___Yes: What kinds of work did you do during that period?_____

62. Do you ordinarily do any work off the farm for income during the year?
___No
___Yes: Do you have regular year-round work, or do you just work off the farm parts of the year?
___All year: Is it a full day's work?
___Full day
___Part day
___Part of the year: What part of the year do you work?_____
Do you work a full day or just part of the day?
___Full day
___Part day

What proportion of your total gross income from all sources came from farming operations last year? (INTERVIEWER PRESENT CARD)

___Less than 1/4
___About 1/4
___Between 1/4 and 1/2
___About 1/2
___Between 1/2 and 3/4
___About 3/4
___More than 3/4
___Don't know how much, but not all
___No answer

63. a. We'd appreciate knowing who also lives here, their approximate ages, and whether they're dependent on you?

Relationship to Respondent	Age	Dependent (INTERVIEWER CHECK IF SO)
RESPONDENT	___	_____
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

b. Are there any other persons not living with you to whom you contribute financial support?
___No
___Yes: How many?_____

c. (IF RESPONDENT HAS ANY CHILDREN AT ALL) Have any of your children belonged to 4-H or FFA?
___Yes
___No

64. Did you use any hired labor in running your farm last year?
___No
___Yes: Did they work for you year round or part time?
___Year round: How many full time workers did you have?_____
___Part time: How many were there?_____
On the average, how many days did the average part-time worker work for you?_____

65. What was your average gross farm income in the last three years?_____

66. We'd like to establish an estimate of your net worth.
    a. Could you please give me your best estimates of the value of your assets at the beginning of the year. We want estimates of the actual values, not the book values for accounting purposes. The point is, what were these items worth to you.

Value of your land and buildings	_____
Value of your livestock	_____
Value of your machinery and equipment	_____
Value of your feed and crops	_____
Cash on hand	_____
Value of your stocks, bonds, and other investments	_____
Amount of money owed to you	_____
Value of your other assets	_____
(TOTAL)	_____

    b. Now, how about your financial obligations at the beginning of the year? What was the amount of:

Your real estate debt	_____
Your short-term notes	_____
Your other notes	_____
Your accounts payable (money you owe)	_____
Your household installment debts	_____
Your other installment debts not covered in short term notes	_____
Your other debts	_____
(TOTAL)	_____

NET WORTH_____

ENTER THE FOLLOWING

STATE_____

COUNTY_____

TOWNSHIP_____

INTERVIEWER_____

DATE_____

APPENDIX B

TABLE I. Product to Which Product Price Expectation Responses Refer, Interstate Managerial Survey, 1954.

Product	Number of Respondents
Hogs	170
Cattle, Beef, Veal, and Calves	64
Lambs	6
Eggs and Poultry	6
Milk*	3
Wheat	123
Corn	54
Soybeans	23
Field Beans	22
Potatoes	11
Burley Tobacco	11
Fruit	8
Truck and Garden Vegetables	5
Hay	4
Dark Tobacco	3
Flax	3
Sugar Beets	2
Barley	2
Milo	2
Not Ascertainable	10

*In some cases milk was the only product or dominated the farmer's thinking, so it was used despite the wording of the question.

TABLE II. Time Between Interview and the Time When the Product Will Be Sold, Interstate Managerial Survey, 1954.

Selling Time	Number of Respondents
1st Week	16
2nd or 3rd Week	25
4th or 5th Week	53
6th to 10th Week	107
3rd or 4th Month	103
5th or 6th Month	72
7th or 8th Month	15
10th Week to 9 Months (Where information was inadequate for coding in previous three categories, i.e., fall, winter, spring, etc.)	14
9th to 15th Month	65
Not Ascertainable	62

TABLE III. Input to Which Input Price Expectation Responses Refer, Interstate Managerial Survey, 1954

Input	Number of Respondents
Fertilizers	55
Commercial Feeds and Supplements	38
Seeds	18
Gasoline, Fuel, Grease, and Oil	18
Feed Grains, Feed Roughages, and Feed	17
Machinery	13
Spray Materials and Other Chemical Products Aside from Fertilizer	5
Others	4
Not Ascertainable	1
Not Answered	3

APPENDIX C

LEVELS AT WHICH NULL HYPOTHESES OF INDEPENDENCE WERE REJECTED
(Question Marks Indicate That There Was Evidence of a Relation Even Though the Null Hypothesis of Independence Could Not Be Rejected)

Control Variables	STUDIED VARIABLES								
	Price Expectation Models			Attributes of Product Price Expectation Models			Willingness to Evaluate Strangers on First Contact	Expectations of Change in Governmental Farm Policies & Programs	Expectations of Change in Farming Methods & Inputs
	Specific Products	Products in General	Inputs	Presence of Empirical Content	Integration of Conceptual and Empirical Content	Conceptual Completeness			
Years of Formal Schooling	.01	?	.01				?		.10
Agricultural Training in Formal Schools	.10		.10				.10		
Agricultural Courses Outside of Formal Schools				?	.10		?		
Participation in 4-H and/or FFA	.10		.10(II)	?	.10(II)			.10	
Attendance at Two or More Extension Meetings and/or Meetings of Non-Governmental Farm Organizations			.10				.10		
Age	.10	?				.10	?		?
Years of Farming Experience	.10				.10			.10	
Proportion of Childhood Spent on Farm				.10		.10			
Had Respondent Ever Left Farming and/or Lived in City	?	?				.10			
Participation of Respondents Children in 4-H and/or FFA		?			?				
Part-Time vs. Full-Time Farmers							.10	.10	.10
Proportion of Income from Farming	.10(II)					.10			
Average Gross Income Over Past Three Years			.10(II)			.10			
Net Worth			.10			.10(II)			
Total Debts					.10				.01
Type of Farm	.01(II)					.01(II)			
Tenure Status	.01			?	.10	.10	.10	.01	
Use of Hired Labor							.10		
Number of Difficulties Encountered in Acquiring Information and Making Decisions	.10				.10	.10			
Thinking Method Most Often Used			X	.10	.01				
Thinking Method That Is Most Natural to Use			X	?	.10		.10(II)		
Type of Error Considered To Be Most Important	?					?	?		
Insurance Code							.10	.10	
Use of Marginal Concepts in Figuring Costs and Returns	.10	.10(II)	.10(II)	.10		.01			

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HUMANITIES I