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**ANALYSING THE DEMAND FOR FARM PRODUCTS.**

by

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**SUMMARY.**

The following article is intended mainly as a brief report on certain overseas developments in a field of considerable interest to agricultural economists, viz., Demand Analysis. The article uses that term to indicate a number of statistical methods for analysing such economic information as market prices and the volume of sales of a farm product, in order to see if their respective variations over a period of time exhibit a consistent relationship which would be a useful guide in anticipating future prices or sales volume.

Four possible uses for a statistical analysis of the demand for a farm product are suggested. These are: (i) regular appraisals of the short-run economic prospects for agriculture as a means of advising the farmer, for example, what is likely to happen to the demand for his product in the event of an increase in price; (ii) estimation of long-run changes in the demand for food with variations in such factors as population and national income; (iii) estimation of the market prospects for the likely farm products of an agricultural region which is to be developed; (iv) guidance in formulating or appraising agricultural policy aimed at achieving such goals as improved returns to growers.

The techniques of Demand Analysis involve some fairly elaborate statistical methods which have been undergoing development for the past 50 years. Although some formidable obstacles have confronted workers in this field it has nevertheless been possible to establish organizations able to supply farmers regularly with forecasts of the market prospects for their products in a forthcoming season.

The United States Department of Agriculture has been publishing forecasts of this nature for some 30 years with fairly satisfactory results. In certain agricultural industries in America, influential groups have placed reliance on information of this character when making preparations for a forthcoming season.

Most farmers attempt, at some time during the course of the year, to anticipate the season's outcome. Government organizations have accepted at least some of the responsibility in this problem, for example, by regularly making crop forecasts. It is reasonable to expect that in any expansion of Governmental services to farmers some thought will be given to providing regular appraisals of the market prospects for important agricultural products.

### **1. INTRODUCTION.**

The market place represents a focal point for the rural producer because of the role it plays in the valuation of his farm products.

A study of such market phenomena as the relationships between the quantities of farm commodities sold on the market and the prices realized from such sales is important in understanding the process of valuation. It may also be important as a means of indicating the likelihood of a predictable relationship between future prices or sales volume and those which obtained in the past.

The branch of economic analysis which attempts to measure these relationships is known as Demand Analysis. In discussing this topic the present article will be concerned with the application to actual market data of the concept of demand elasticity, which is measured in economic theory by the relative change in quantity of a product demanded expressed as a proportion of the corresponding relative change in price.

By incorporating market statistics into this theoretical framework the analyst hopes to be able to say in respect of a particular commodity, for example, what change in price can be expected to accompany a given change in the demand for the product.

It has become commonplace to point out the handicaps under which the economist operates by reason of his inability to conduct controlled experiments in pursuance of his research objectives. Similarly the inadequacy of empirical data and the frequent unreliability of essential statistics have been used to explain the want of precision in economic research when undertaken on a quantitative basis.

Demand analysis is probably one of the best fields of modern economic research to illustrate both the handicaps described above and the attempts being made, despite those handicaps, to devise quantitative research methods.

## 2. BACKGROUND TO RESEARCH IN DEMAND ANALYSIS.

The theory enabling economists to study the problems of demand on a numerical basis was enunciated early in the nineteenth century.<sup>1</sup> Towards the end of that century the technique of correlation had been developed to a stage where it could be applied to the study of relationships between such market factors as price and quantity.

By 1914 several practical applications of this theoretical work had been made in Europe and America. These applications were made mainly in respect of agricultural commodities. H. L. Moore<sup>2</sup> in the United States, for example, attempted to estimate price elasticities of the demand for such commodities as corn, hay, oats and potatoes. Another example of this work was R. A. Lehfeld's analysis of the demand elasticity for wheat.<sup>3</sup>

Following these and other pioneers in the field of demand analysis Henry Schultz built upon their work. After some studies of the demand and supply of agricultural commodities, for example, sugar, he fully elaborated the major methodological bases for demand studies in his comprehensive work *The Theory and Measurement of Demand*, published in 1938. In that book Schultz included studies of the demand for sugar, corn, cotton, hay, wheat, potatoes, oats, barley, rye and buckwheat. Furthermore, he examined the inter-relations of demand for such groups of commodities as sugar, tea, coffee and also for beef, pork, mutton.

Concomitant with this applied work there were developments by European and American mathematicians of the statistical methods appropriate to such studies and indeed to the use of statistical methods in economic analysis in general. The Cowles Commission located in the University of Chicago was perhaps the most active of the American groups studying and sponsoring the analysis of economic data on a quantitative basis.

The development of new methods, of which the above are examples, led to the development of a special type of economic analysis which has become identified with the general title of econometrics. In 1930 the Econometric Society was organized for the benefit of those interested in this approach.

Ragnar Frisch wrote in the first (January, 1933) issue of that Society's journal, *Econometrica*, that each of the three viewpoints "of statistics, economics and mathematics is a necessary, but not by itself sufficient, condition for the understanding of the quantitative relations in modern economic life. It is the unification of all three that is powerful. And it is this unification that constitutes econometrics".

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<sup>1</sup> A. Cournot, *Researches into the Mathematical Principles of the Theory of Wealth*, (first published in 1838).

<sup>2</sup> H. L. Moore, *Economic Cycles: Their Law and Their Cause*, New York, 1914.

<sup>3</sup> R. A. Lehfeld, "The Elasticity of the Demand for Wheat", *Economic Journal*, Vol. 24 (1914), pp. 212 ff.

### 3. THE FACTORS INFLUENCING MARKET DEMAND.

All the factors which are considered to have some influence upon the demand for a farm product are fully specified in order to evaluate the significance of their effect upon demand. In setting out these factors consideration would naturally be given to the basic food habits of the individuals who are actual or potential consumers of the product concerned. These habits may be studied as they are observed in family units or in the aggregate as they are represented in statistics of the total market demand. Other factors affecting the demand for a product would include the income and expenditure patterns of consumers as well as the supply of the product in question and the supply of competing items of consumption.

In addition to these more obvious physical factors, there are forces of a diverse sociological character operating within the market which are also instrumental in determining price-quantity relationships. These forces represent a complex of institutional factors including laws, established trade practices, marketing agreements and the behaviour of various organizations concerned with the productive and distributive processes. If these sociological factors are thought to require the major emphasis, an agricultural economist will make his investigation centre around the behaviour of individuals and groups and the dominating influence of institutions. Thus he will describe the market process by means of a detailed statement of the operation of heterogeneous factors, many of which cannot be measured.

It is often apparent that such economists consider that the theoretical concepts of demand and supply functions are inadequate in explaining actual market situations. But if a research worker is content to study the details concerning a problem without seeking some underlying principle or theory to guide him, his study can degenerate into a passive accumulation of fact.

Recent decades have seen an increase in the numbers of economists who view the marketing process through the medium of a theoretical model. Such a model can be constructed from a manageable number of strategic variables which have been selected from the complex of influential factors. This increasing attention to the statistical approach can be deemed an effort, not to supplant time-honoured methods entirely, but to seek means of analysing market phenomena with greater clarity and also to devise more effective methods of prediction.

In order to carry out the analysis on a quantitative basis the analyst selects such factors as income, employment, the general pattern of consumer expenditure and the prices and quantities applicable to the given commodity and its likely substitutes. These factors are measurable, and if reliable empirical data can be found to support the appropriate statistical analyses, the resultant description of the forces at work in the market will be fairly precise and objective, so that conclusions drawn as to possible future situations will be less dependent on personal judgment and intuition.

The contemporary research worker can thus approach a marketing problem in either of the above ways or some compromise thereof. From a detailed description of the marketing process, conclusions will be based largely on the investigator's personal judgment as to the relative

significance of the factors outlined in his description. Alternatively, he can select from the complex of factors those deemed significant for his purposes and which can be measured. The conclusions in the latter case will be largely governed by the solutions to the equations he has postulated.

#### **4. ANALYSING THE DEMAND.**

Having specified the factors which influence the demand for a product it is then necessary to measure the effect of each of these different factors. The measurement is undertaken by constructing a model which sets out the relationship between the factor under study, called the dependent variable, and the different factors which are considered to have a significant influence on that variable, these are termed the independent variables.

The relationship is expressed in the form of an equation, for example, the price of Valencia oranges is a function of the quantity of Valencia oranges, the quantity of other citrus fruit, the quantity of other fresh fruit, and national income.

Using figures derived from actual market statistics for such variables over a period of years, an analysis of the correlation between the dependent and independent variables will indicate how much of the variation in the price of the commodity during that period has been explained by the factors specified. The correlation analysis may reveal, for example, that over 90 per cent. of the variation in price was so explained and that the equation can therefore be regarded as adequate.

Analysis of the price-quantity relationships in respect of meat products, for example, may indicate that in the period reviewed a 10 per cent. increase in beef consumption was associated with a price decline of slightly less than 5 per cent. If price-quantity relationships remain consistent, and if there is no significant change in consumer behaviour or the marketing system, this information will provide a useful basis for anticipating market prospects for a forthcoming season.

It has been assumed in the above example that the relationship in question can be adequately expressed by a single equation. This assumption seems to be valid in respect of many farm products because the supply of commodities is not significantly affected by price during the period in which marketing takes place. If the supply of Valencia oranges, for example, were affected by the price during the marketing period, a second equation would have to be set up to take account of this influence.

Because of the probable inadequacy of the statistical data, as well as the increased complexity associated with the addition of a second equation, it seems that any price-quantity relationship in Australian markets which cannot be validly represented by a single equation hardly merits further attention.

#### **5. SOME THEORETICAL CONSIDERATIONS.**

There is a discrepancy between the theoretical demand curve and the statistical derivation of a demand curve which calls for comment. The demand schedule upon which the theoretical demand curve is based lists the various quantities of the product which will be purchased at various prices at a given instant of time. The statistically derived

demand curve, on the other hand, is based on empirical data showing the various quantities of a product marketed, and the realizations from the sales thereof over a period of time in the past.

### **Market Levels.**

Once the available statistics are accepted as reliable and adequate enough to solve the demand equation, the problem arises as to what level of the distributive system the analysis should focus upon. In other words, the investigator has to decide whether to use retail prices, which represent prices at the point of consumption, or wholesale prices which, although they strictly are only representative of the demands of wholesale merchants, may be argued to reflect both the effective demands of consumers and the prices paid to farmers.

The assumption that the price of a farm product at the retail level simply reflects the wholesale price which in turn reflects the price paid for the products on the farm implies that there is no force engendered within the marketing system which will bring about a change in the price-quantity relationships. Theoretically at least, with each change in the ownership of a commodity there is involved a new demand schedule. Since there are costs added during the marketing process, for example, commissions and handling charges, these may require a new demand equation.

If this condition were accepted as the essential pattern of the marketing process the task of analysing the demand for a farm product would be extremely complicated. However, there is some empirical foundation, based on the observed behaviour of farm, wholesale and retail prices, for believing that the relationship is, in fact, not so complicated. Furthermore, if the analysis makes use of average annual statistics of prices and quantities for fairly lengthy time periods, the application of relatively simple models of the market seems valid.

### **Aggregation.**

In order to restrict the number of variables in an equation, a number of quite different items are grouped together or aggregated. Statistical procedures involving aggregation have become a familiar feature of a good deal of contemporary economic analysis. They have become, moreover, a common characteristic of work in demand analysis. The major reason for the aggregative approach is that it reduces to a manageable level the number of variables in the economic situation under analysis. In many economic problems these different variables can be so numerous as to make effective analysis impracticable.

While aggregation is useful it does involve certain problems of interpretation. The problem may be illustrated by the following example. An analysis of the demand for beef at the retail level would involve the grouping of many different qualities of that meat into one aggregate class. It may be argued that each distinct quality of meat, for example, fillet or brisket, has its own characteristic demand and price. The retail prices of fillet, rump and sirloin steak may be double those ruling for silverside, brisket and minced steak. By aggregating the demands of many individuals for different classes of meat, it is possible that an important change in consumer tastes, for example, a change from sirloin steak to minced steak, may be disguised in the process.

**Sources of Data.**

As already indicated, there are two main sources of statistical material for a demand analysis. The first is from family budget data; the second from market statistics.

In order to obtain the former type of data, surveys are conducted covering a large number of households representative as to income levels, number of persons in the household etc. Statistics in regard to income and expenditure are gathered and analyses are carried out to determine, if possible, the relationship between income and expenditure. The regressions are ultimately interpreted in terms of demand functions.

Market statistics, as the second source of data, include details of the total quantities of a particular farm product bought in the market place over a period of time and the relevant prices and income. With this data it is then possible to formulate and solve the type of equation previously mentioned.

Two major problems to which a demand analysis may be directed are appraising short-run changes in demand and the allied task of forecasting short-run fluctuations in commodity prices, and secondly the more elusive problem of estimating long-run changes in the demand for farm products.

The first problem is relatively simple once the appropriate statistics have been obtained. The estimation of long-run changes in the demand for farm products has a much less satisfactory basis. The problem of estimating a nation's food consumption 20 years hence, for example, must necessarily be considered in a much broader setting of trends in population, national income and employment as well as the overall pattern of the nation's food consumption. Annual statistics for such variables as population and income are fairly reliable but extrapolation of these are subject to wide margins of error. Birth rates and migration, for example, are liable to marked variations in the long-run.

**6. SOME APPLICATIONS OF DEMAND ANALYSIS.**

As indicated earlier, individual work in this field has been performed in several countries during the past forty years, notably in Sweden, Holland, England, and the United States.

In addition to these valuable efforts on the part of individuals there have been several large-scale attempts to incorporate the approach into the routine marketing services to agriculture. An outstanding example of this work is found in the commodity appraisal reports of the United States Department of Agriculture.

**Commodity Appraisal in the United States.**

Each year the U.S.D.A. convenes an Outlook Conference. At this meeting an appraisal is made of the economic prospects for American agriculture during the ensuing year. In subsequent months, of course, these appraisals are continuously re-examined and revised.



According to James P. Cavin, a former Head of the Division of Statistical and Historical Research, which assumed a major responsibility in this work, the agricultural forecast had three phases:—

1. "A forecast of the general level of economic activity in the United States (*disposable income was used as the guide in this phase of the analysis*)<sup>4</sup> together with a forecast of the level of foreign demand for goods and services from this country;
2. a translation of this forecast into its meaning for agriculture as a whole that is, in terms of the anticipated general level of agricultural prices and of farm income;
3. a more detailed forecast of the impact of the general level of demand for agricultural product on the prices to be received for and the income to be obtained from the sales of the individual crops and livestock products".<sup>5</sup>

The main concern in the above forecasts is, of course, to anticipate changes in the prices of and demand for various commodities in the ensuing season as compared with the past season. Much of the work in demand analyses carried out by the U.S.D.A. is therefore adapted to suit the requirements of its many Outlook Statements.

As a result of their extensive statistical analyses of the variables encountered in the study of price-quantity relationships the U.S.D.A. arrived at some interesting approximations as to the relationships between the prices received by farmers, disposable income, value of agricultural exports and volume of farm marketings. However, the Outlook and Situation Board which authorizes the issue of the statements does not rely solely on this approximation—it is accepted as a first guide only.

The relationship as set out by James P. Cavin<sup>6</sup> is as follows: "On the average, a 10 per cent. change in disposable income results in approximately a 12 per cent. change in prices in the same direction; a 10 per cent. change in the value of agricultural exports in almost a 1½ per cent. change, also in the same direction; and a 10 per cent. change in the volume of agricultural marketings in about a 17 per cent. change in the opposite direction."

If such relationships can validly be assumed to hold true in the real world, even if only approximately, they form a useful indication not only to the commodity analysts trying to forecast next season's price but also to those attempting to frame agricultural policy or to analyse the implications of any given policy. In fact, the results of commodity appraisals have been put to such uses in the United States.

#### **Outlook and Situation Reports.**

The U.S.D.A. issues Situation Reports for the following industries: Livestock and Meat, Poultry and Eggs, Vegetables, Wheat, World Sugar, Tobacco, Wool, Feed, Fats and Oils, Fruit, Dairy and Cotton. Reports are also issued to cover such important phases of agricultural production and distribution as Fertilisers, Marketing and Transportation, Farm Cost and Farm Income. *The Agricultural Outlook for 1954* reviewed prospects for 32 commodities.

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<sup>4</sup> The statement in italics is inserted by the author of the present article.

<sup>5</sup> J. P. Cavin, "Forecasting the Demand for Agricultural Products", *Agricultural Economics Research*, Vol. IV, No. 3 (July, 1952), p. 66.

<sup>6</sup> *op. cit.*, p. 72.

The overall situation is comprehensively summarized in reports on Demand and Price, National Food and the Agricultural Situation. Additionally, the Foreign Outlook Charts depict United States exports and imports of agricultural commodities, together with world production and trade, in the products of major concern to American agriculture.<sup>7</sup>

The U.S.D.A. has been publishing its forecasts for more than 30 years. Recent attempts to evaluate its performance in an important section of this field<sup>8</sup> indicates that considering the fluctuations which had occurred during the period under review its overall performance was "commendable". There were, however, important weaknesses, notably in "the considerable variability in accuracy from year to year and from one classification to another". Again, the performance was significantly weak in regard to estimates of the prices received by farmers.

That success in this field of prediction is variable should not occasion great surprise. Nevertheless, Ezekiel has made the point that national agricultural forecasts, at 75 per cent. to 80 per cent., and frequently up to 90 per cent. accuracy, have been "substantially more dependable than those of individual business and economic appraisers".<sup>9</sup>

Similar outlook work in other countries, notably Canada, indicate results which compare favourably with accomplishments in the United States. Moreover, the Food and Agriculture Organization has achieved a similar level of accuracy in regard to world forecasts notwithstanding the greater difficulties arising out of increased complexity of the problems and inadequacy of statistical data.

#### **A Note on Californian Experience.**

In carrying out its work in commodity appraisal the U.S.D.A. has placed a good deal of reliance on the work of agricultural colleges and experiment stations in various States of the Union. In particular dependence has been placed on the intimate knowledge of the colleges and stations regarding regional problems and local conditions. Moreover, many of the State institutions have undertaken similar work directed especially towards providing economic guidance to important local industries.

Reference to some Californian marketing techniques is of interest, for that State offers some good examples of this type of market analysis

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<sup>7</sup> A comprehensive account of demand analyses for the major products of American agriculture, as well as a detailed description of the statistical methods used, is given in a U.S.D.A. Bulletin. See K. A. Fox, *The Analysis of the Demand for Farm Products*, Technical Bulletin 1081, U.S.D.A., 1953. See also, K. A. Fox, "Factors Affecting Farm Income, Farm Prices and Food Consumption", *Agricultural Economics Research*, Vol. III, No. 3 (July, 1951).

A comprehensive treatment of similar work carried out in the United Kingdom for the period 1920-38 is contained in *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-38*, Vol. I, by R. Stone, Cambridge University Press, 1954.

<sup>8</sup> J. D. Baker and D. Paarlberg, "Outlook Evaluation—Methods and Results", *Agricultural Economics Research*, Vol. IV, No. 4 (October, 1952).

<sup>9</sup> M. Ezekiel, "Agricultural Situation and Outlook Work, National and International". *Monthly Bulletin of Agricultural Economics and Statistics*, F.A.O., Vol. III, No. 6, pp. 20-21.

carried out independently at the local level. Detailed market analyses for such crops as plums, citrus and peaches<sup>10</sup> have been made by research workers, especially those associated with the University of California.

The investigation of price-quantity relationships in respect of Californian fruits would have in mind the possibilities of indicating ways of improving grower returns and evaluating the effects of a marketing programme; or perhaps indicating what production plans and marketing programmes are likely to achieve maximum returns to the grower in the light of the characteristics of the demand for his product.

The results of such studies are not only of interest to the respective industries as a whole, but the representatives of each industry are by no means adverse to calling upon the research worker for special advice when making decisions as to the appropriate quantity and quality of fruit to be harvested in a forthcoming season.

Some of the fruit industries of California seem well adapted to take advantage of this sort of approach to their marketing problems. Organizations handling the packing, processing and disposal of the growers' produce are very vigorous, are often strongly supported by laws and regulations, and have access to numerous large and well-organized markets over the United States. One outstanding example of this highly skilled managerial control is found in the Californian citrus industry.

Sunkist Inc., formerly the California Fruit Growers' Exchange, is able, by reason of various Federal and State marketing agreements, to regulate the volume of shipments of citrus from California. It has within its ambit many large-scale packing and shipping units. It has a highly efficient system of collecting news of market conditions rapidly and relaying it to the packing sheds. It has been able to negotiate special freight agreements with railroad companies enabling it, *inter alia*, to divert shipments in transit at nominal or low costs, and in some cases at no cost. Thus it is free to move a shipment out of an unsatisfactory market into one where prices are reported higher or to re-route consignments in transit to take advantage of fluctuations in prices on the various accessible markets.

The scale of the marketing activities of Sunkist is illustrated by the number and size of the domestic markets to which it has access. These consist of auction markets in eleven large urban centres, viz., Baltimore, Boston, Chicago, Cincinnati, Cleveland, Detroit, St. Louis, New York, Philadelphia, Pittsburgh and also Los Angeles, where it conducts its own auction. In addition, it has access to over 600 carlot markets where it is able to sell fruit at private sale. Finally, the large-scale processing industry provides a valuable means of disposing of production surpluses.

#### **Possible Local Applications.**

Marketing processes in America would generally represent a contrast with those obtaining in Australia. Although there are various forms of market control, strong organizations such as Sunkist Inc., are not a

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<sup>10</sup>The following two publications are good examples of this work: J. Foytik, "Characteristics of Demand for California Plums", *Hilgardia*, Vol. 20, No. 20, (April, 1951); G. M. Kuznets and L. R. Klein, "A Statistical Analysis of the Domestic Demand for Lemons, 1921-41", *Giannini Foundation of Agricultural Economics Report* 84, 1943.

feature of the Australian marketing system. Market structures may not be as complex as those in the United States but the statistics for the main markets in that country seem much more adequate and reliable.

Although research workers in this field in Australia may consider themselves severely handicapped by the inadequacy of statistical data or the complexity of market situations, it must be conceded that such handicaps are even greater when an outlook appraisal is attempted for the world as a whole. However, that attempt has been made and with results which compare favourably with those obtained in the United States on a national basis.

It is reasonable to assume, therefore, that some of the local obstacles can be overcome. If investigation shows that the compilation of adequate market statistics is not feasible at present, then the alternative approach of gaining the appropriate consumption and expenditure data from a representative sample of households can be considered.<sup>11</sup>

## 7. CONCLUSION.

### Need for Improved Research Methods.

Although much has been written in textbooks and journals on marketing subjects, especially as related to agricultural commodities, comparatively little of what has been written is designed to improve methods for conducting research in this field.

In the United States, the passage of the Research and Marketing Act through Congress in 1946 was followed by a revival of interest in the topic in that country. Several books published in recent years have helped to improve the situation<sup>12</sup> and the U.S.D.A. has made marketing the subject of its Yearbook of Agriculture for 1954. However, a considerable deficiency still besets this field of study.

In commenting on this lack of a "wholly satisfactory book dealing with an advanced theory of marketing", O. V. Wells, Head of the United States Bureau of Agricultural Economics, stated at the Annual Meeting of the American Farm Economic Association in 1953 that marketing "is still the field in which agricultural economists are least sure, the field where they are most inclined to get lost in an ever-growing mass of detail".<sup>13</sup>

Support for the view that a mass of detail obscures economic thinking on the subject of marketing is found in the following quotation from Alderson and Cox:<sup>14</sup>

"What marketing men really seek is not an immediate statement of the generalizations to which effective study will in due course lead them, but a better statement of the problems to be solved and more ingenious methods to be applied in solving them. The multitude of facts thus far assembled seems to add up to very little. One must conclude that something has gone wrong with the method of attack—that a new and creative analysis is required."

<sup>11</sup> An example of this type of project has been reported in the *Journal of Farm Economics*, Vol. XXXVI, No. 3 (August, 1954), pp. 415-427; the article being, "Demand Analysis from the M.S.C. Consumer Panel", by G. G. Quackenbush.

<sup>12</sup> E.g.: F. V. Waugh (ed.) *Readings on Agricultural Marketing*, assembled and published under the sponsorship of the American Farm Economic Association, Iowa State College Press, Ames, Iowa, 1954.

<sup>13</sup> O. V. Wells, "A Survey of Contemporary Agricultural Economics", *Journal of Farm Economics* (Proceedings issue), Vol. XXXV, No. 5, December, 1953, p. 672.

<sup>14</sup> W. Alderson and R. Cox, "Towards a Theory of Marketing", *Journal of Marketing*, Vol. XIII, No. 2 (October, 1948), p. 138.

The stand taken in this article is that the approach to marketing problems implicit in demand analyses will assist in clarifying the mass of detail, and in defining with greater precision the problems to be solved. This type of economic analysis has its shortcomings, but it does provide valuable aid which the research worker cannot afford to neglect.

The long standing approach of market surveys, characterized by the study of actual market operations, has yielded significant details of the basic institutional, technical and geographic factors which give the market its dominant routine features. Empirical research of this nature can by its minute observation provide a detailed description of factors which may not be discernible or fully elaborated in a demand analysis alone. Such material also points up the essential complexity of the market which a statistical analysis may depict in general terms.

### **Summary of Uses.**

Some of the uses to which a demand analysis can be put may be summarized as follows:—

- (1) *Appraising Future Prospects.* Regular attempts to appraise the short-run economic prospects for agricultural commodities will rank as the major work of demand analyses. It is of both interest and importance to the rural producer, or the processor and distributor of a farm product, to know in approximate terms the market prospects for his product in the forthcoming season. To learn, for example, what is likely to happen to the consumption of the commodity he produces, or handles, in the event of an increase in price or, conversely, what prices are likely to obtain if production should markedly alter.
- (2) *Long-Run Demand for Food.* An extension of the problem discussed above occurs on a larger scale when attempts are made to estimate the future food consumption of a nation. The analysis in this case would seek to indicate if, and to what extent, future demand for farm products is likely to change with variations in such factors as population and national income. It is important to try to anticipate what is likely to happen to the pattern of food consumption in a period, for example, of rising incomes and increasing population. The analysis would be of value if it could give some indication as to the possibilities of a general switch from the cheaper, bulky foods, like potatoes and bread, to more expensive and protein-rich items such as meat and other animal foodstuffs. Such a change in food consumption over a period of years may be significant enough to require modification to the nation's agricultural policy.

Problems involving the long-run demand for food would assume greatest importance in times when a pressure on food resources was anticipated. This may result from a rapidly increasing population or some international emergency. These problems require special attention in an expanding economy like Australia if production is to be maintained at a level high enough to satisfy domestic demand and also export sufficient agricultural commodities to earn adequate overseas funds.

- (3) *Agricultural Development.* Research into the market prospects for agricultural commodities would logically be involved in plans designed to expand and develop farming regions or agricultural industries.

Irrigation projects and other public works of a developmental nature are expected to lead to an intensification of rural production in various parts of the Commonwealth. There is therefore scope for detailed statistical analyses as a basis for estimating the market prospects for the likely farm products of the regions to be developed.

- (4) *Market Policy and Strategy.* The analysis for a farm product as suggested in this article may be a very useful guide in efforts to achieve satisfactory returns for certain farm commodities. With the type of information the analysis seeks to discover it would be possible, for example, to indicate for a particular commodity the rate of flow to the market which would yield maximum returns.

Similarly, a Government attempting to formulate agricultural policy aimed at guaranteeing or securing improved returns to growers would profit by consideration of such data. Not only would it indicate the types of market institutions which would be appropriate, but it would further indicate fairly precisely any peculiarities in the market demand for different products which would call for special features in a marketing programme if it is to be effective. Conversely, a demand analysis offers a sound starting point for evaluating the effectiveness of existing market practices. Some use has already been made of this approach in the United States as a means of evaluating price-support and other marketing programmes.

#### **Economic Service to Farmers.**

In the field of economics reliable prediction is difficult and often impossible because of the variety of factors involved in any economic situation and the complexity of their relationships. However, the attempt to predict future events is an obligation that has to be met in some circumstances. Most entrepreneurs or managers, in rural and industrial enterprises alike, find it inescapable to some degree.

Such forecasts are likely to be personal judgments with varying factual bases shaped by the experience and intuitive skill of the forecaster. In order to better handle these problems the entrepreneur may reasonably look to modern economic science for guidance. Such assistance as is forthcoming will often involve elaborate statistical methods. While the business executive may have detailed data and a competent

staff to prepare the basis for his decision, the farmer is most likely to be dependent on the Government or a few special farming organizations.

Advising the farmer in respect of improved techniques of production is an important and accepted function of a Department of Agriculture. It is also recognized that the Department should further provide the background economic information which is essential to fully efficient and profitable production, hence increasing attention has been given to this aspect of the agricultural service to the farming community. However, in advanced nations it has become an established practice to provide important additional services, such as, giving the farmer information in fairly specific terms which will guide him in adjusting his farm programme, crop acreage and livestock production in accordance with the likely demand for his products on local and overseas markets.

Crop forecasting work is already accepted as a routine responsibility and one which is likely to expand. With developments in the field of short-term production forecasts it seems reasonable to expect that thought will be given to the development of comparable demand and price forecasts.

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