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APPLICATION OF REGIONAL PRICE ANALYSIS

124

BY

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The study of prices in their various relationships has received a large amount of attention during recent years. Dr. J. D. Black reporting in Volume IV of the "Preliminary Report of a Survey of Economic Research in Agriculture in the United States During the year July 1926--July 1927", gave a comprehensive classification of the work which had been done previously, and was being done during that year. Since the price analysis endeavors following 1927 have been pursued very much along the same general lines of procedure, with, of course, some refinement in method and emphasis in different topics, it is possibly well, at this time to briefly review Dr. Black's classifications.

The Price Analysis research work field was broadly classified into six different main classes

1. Collection and assembly of price data.
2. Price measurement
3. Factors affecting the general price level
4. The relation of farm prices to the general price level
5. Factors affecting prices of specific commodities
6. The determination of and nature of "Price-fixing", "Necessary-price", "Fair-price", etc.

In the field of Agricultural Economics the marketing man is interested in prices because of their effect upon the technique of marketing; the Farm management man because of their relation to the profitableness of the enterprises selected by the individual and the locality; the Land utilization man because of their effect upon the advisability of encouraging the adoption of these enterprises for which the land is physically and economically best adapted.

The Bureau of Agricultural Economics, and other nation-wide research agencies have quite logically taken the lead in price studies dealing with problems of national significance. A number of publications have been issued by such agencies dealing with problems of method and procedure, the general aspects of agricultural prices and with the commodity viewpoint--from both the specific commodity and the combination-of-commodities angles. It seems to the writer that the general aspects of the price problem should be pursued by agencies nation-wide in character and that such institutions should attack these problems first. Then the agencies in the various states, serving smaller areas, should build upon the general analyses and localize the information to apply to their particular area or region--much the same relationship as is now existing between the Bureau of Agricultural Economics, the Federal Extension office and the various states in the Outlook work. Of course, those agencies serving the nation should endeavor to localize the general information provided they have time and funds remaining after the general analyses are made. Now in regional price studies we are more particularly interested in "Factors Affecting the Price of Specific Commodities", "The Relation of Prices Paid Farmers to Central Market Prices", and in the collection of representative data which will permit correct analysis. This type of price analysis may be subdivided into:

- A. Factors affecting supply, including the relation of prices to subsequent supply.

- B. Factors affecting consumers and dealers demand
- C. Factors affecting the fluctuations which are more or less typical of many of our price series. Such as trends, cycles, seasonal, and short-time movements.
- D. Cash vs. future prices.
- E. Margins of spreads between prices in dealers' and consumers' markets.
- F. Market differentials.
- G. Market grade and class differentials.

The collecting of data adequate for a worthwhile regional study is in itself, as yet, quite a problem for most of the commodities with which we are interested in the Western States. Generally speaking, there is a very limited amount of information available and much of that is only for a short period. Since the regional problem is one of bringing the analysis as close to the individual farmer as possible so that he may be able to use it or his county agent may be able to interpret it for him, there is always the question as to which information is the most representative. Farm prices are lower than central market prices and the differential varies from time to time. For instance in some unpublished work at the Idaho Experiment Station it was found that there was a seasonal variation within the deviation between the Idaho farm price of hogs and the Portland price of hogs during the period 1910-29. The mean monthly differential, in favor of Portland was \$1.86, with a standard deviation of \$0.20, while the variation from month to month ranged from \$1.65, in May to \$2.53 in July. From the viewpoint of the hog producer, which price is more likely to fit his conditions?

The matter of reliability of Farm Price has been given thorough treatment by F. L. Thomsen in Missouri Experiment Station Research Bulletin No. 151, entitled, "Variations in Local Prices for Farm Products and Supplies in Missouri". The regular "farm price" quotations were found to be reliable thermometers of price movements for the state as a whole--the correlation between the Bureau of Agricultural Economics farm price and special quotation of eggs, butterfat, and corn was .9954 \pm .001.

Price Analysis--the term "price analysis" often scares the student or the layman and sometimes the agricultural economist. Yet, he will turn right around and attempt to analyze prices by comparing the conditions existing during one year to those of another and sometimes even use the informal or elementary statistical method of combining his analogy with data and trying to measure, in his own mind, the relation existing between several years. Of course, when the agricultural economist speaks of price analysis he usually means the formal statistical analysis which may or may not include correlation methods. The Extension economist in Farm Management or Marketing must (and the Extension men in Horticulture, Animal Husbandry, Agronomy, etc. do very frequently) use some form of price analysis for interpreting economic conditions and making recommendations.

In so far as price analysis in the western states are concerned, the conclusions which have been presented have sometimes been in publications dealing

solely with prices but have more often been in publications dealing with several phases in the distribution of the commodity under scrutiny. The studies can broadly be classified under the headings of:

1. Factors affecting demand and supply.
2. Market differentials
3. Market grade and class differentials.

Several of these will be briefly mentioned, Dr. R. B. Heflebower's "Factors Relating to the Price of Idaho Potatoes", (Idaho Experiment Station Bulletin No. 166). This is a correlation analysis where the influence of four independent variables on the price of potatoes in Idaho have been statistically measured. The four factors considered were (1) the price level and the production in (2) the western states, (3) the central states and (4) the eastern states. The analysis showed a correlation of .9706 with a standard error of .13. The market class differential between Idaho potatoes and potatoes grown in the central states was measured with varying conditions of supply. A regression equation for forecasting potato prices was computed. Recognizing with Dr. J. D. Black that "for a long time yet, a keen observer of the market and intimate inside knowledge of market conditions and developments will forecast the market more successfully than the scientist armed only with his statistical computations" it seems that such forecasting formula should be helpful to either a farmer or dealer who can connect his knowledge with the statistical tools.

The analysis of the potato market class differential has been carried further by Dr. L. H. Bean (1) and by the writer (2). The premium paid for Idaho potatoes in Chicago being rather definitely related to the proportion of the total supply of potatoes--which is produced in the Western States. Idaho potatoes bringing a comparatively higher price when the Western States produce a small per cent than when the Western States produce a large per cent of the total U. S. crop. This problem of premiums may mean that, in the future, Western potato growers will find it more profitable to sacrifice premiums and compete on a lower production cost basis.

It is a matter of more or less common knowledge that the western states have a favorable market differential for hogs on account of being a deficit area. Since 1910 the price of hogs in Portland has been consistently above Chicago prices with the exception of two years, namely; 1916 and 1917. This differential has ranged from -\$0.58 in 1916 to \$2.02 per cwt. in 1926. This differential constitutes quite an important factor from the viewpoint of hog producers in the western states successfully competing with the experienced hog producers in corn belt states. Quite naturally, during recent months, with low price wheat and the comparative strong position of hog prices, the hog enterprise in the western states has received a decided impetus. Just how far the enterprise can be expanded and the area still remain a deficit area is problematical. We are working on this problem here at the Idaho Station--trying to measure the possible expansion that may take place before western hog prices are on a "minus transportation" basis rather than on a "plus transportation" basis. This, of course, does not mean to signify that western hog producers will necessarily find it more profitable to limit their

(1) "Factors Affecting Prices and Production of Idaho Potatoes" U.S., B.A.E.
 Mimeographed.

(2) "The News Letter, Univ. of Idaho, College of Agriculture, Jan. 16, 1931

production so as to maintain a deficit area for they may find it comparatively more profitable to expand the hog enterprise and compete with the corn belt for the southern and eastern markets. However, in the opinion of the writer, it is doubtful that the western hog producer can profitably compete for such markets, at least, for several years in the future.

In the matter of market grade and class differentials it would be unjust not to mention the California Experiment Station "Series on California Crops and Prices", Washington Experiment Station Bulletin No. 242, "Washington Apple Prices and Costs of Shipping Point Marketing Services", by Hampson and Dummeier, and, of course, many other creditable publications too numerous to mention here but which have presented information on price differentials. The publications named above have rather outstandingly pointed out the differentials paid for grades and classes of the commodities with which they are dealing.

Now--What practical use can be made of studies of this nature? The western states, because of their distance from markets and of other physical factors peculiar to the type of farming carried on, have problems that are somewhat different to those of other areas. A good portion of the commodities are produced in irrigated sections where a greater degree of control over factors affecting quality can be exercised. Here the favorable differential by market grades and classes is important. But, we must know what those differentials are and their approximate limitations.

It would seem that statistical price analyses offer their greatest usefulness in the strengthening of the foundation for the gradual development, expansion and usefulness of various phases of the Outlook work--Outlook in its relation to Farm Management, Marketing and Land Utilization. Its place in Farm Management and Marketing can be very aptly illustrated by the study, "Factors Affecting Prices of Idaho Potatoes" mentioned above. By use of the regression equation and information from the Division of Livestock and Crop Estimates, the average price for the crop season may be estimated before planting, while the crop is growing, or after harvest. Then, after applying the index of seasonal variation, the average price for any month of the crop season may be estimated. This information may be used by farmers, dealers, and Extension Specialists although, of course, at present, is probably used chiefly by Extension Specialists and dealers. To the Farm Management Specialist the estimation before planting time in conjunction with his knowledge of market conditions, permits the formulation of recommendations, as to methods of handling and as to method and time to sell which will have more weight behind them and in which the Specialist himself will have a great deal more confidence.

The usefulness of the knowledge concerning the varying premiums paid to growers for a certain type and variety of product may be illustrated also by the premium paid for Idaho potatoes mentioned above. Perhaps, with this particular commodity the greatest benefit has been derived by the dealers themselves in deciding when to buy, how much to pay, and how long to store. From the farmers viewpoint the greatest benefit can probably here again come through the assistance of the Extension force and can very well be typified by the following sentence from the Federal Outlook for 1931, "The greater reduction in Idaho reflects the relatively large production in the far Western States compared with unusually low production in the central states". The Pacific Northwest Potato Committee has also made use of this type of material through

their Secretary, Mr. Harry Drobish, in formulating their recommendations relative to acreages to plant in 1931 by showing the Idaho farmers that they would probably gain two ways by adjusting their acreage to prospective demand. That is, they would gain by the smaller total supply offered in the U. S., and would get also a comparatively higher premium for their product. Just how much this caused farmers to reduce their planting intentions is problematical.

The statistical price analysis also contributes much towards the formulation of sound sales policies and loaning policies for cooperative concerns. For instance, the Federal Farm Board undoubtedly used some such analysis in arriving at their "peg" prices for wheat and cotton. However, even more valuable are the studies such as the Washington and California studies mentioned above showing market differentials and market grade and class differentials. Farmer Jones is bringing in Combination Extra Fancy Delicious and Farmer Smith is bringing Fancy Winter Banana Apples. How much shall be advanced to Farmer Jones and how much to Farmer Smith? There is an offer of \$1.50 for the Delicious and \$0.90 for the Winter Banana at the shipping point. Shall the offer be accepted or shall the apples be shipped? If they are shipped, shall they go to the same or to different markets? Such questions must be answered by established research agencies or by the cooperative itself.

As to the methods of disseminating price studies after they are completed. With this type of work as with many others it is helpful to maintain as close coordination between research and extension agencies as possible. Sometimes, this would probably mean different men doing the work and under other conditions only a thorough understanding of the work by the person extending the information. However, with work involving correlation methods, the duty of extending the information should, in the opinion of the writer, fall, in so far as possible, on the person making the analysis. Such analyses must be used by a person have in mind their limitations and the one making the study should have these limitations in mind more clearly than any other available person.

No one can question the value of statistical price analyses of factors affecting supply and demand and forecasting formulae, when used with discretion, in assisting the man who is familiar with marketing and production problems to understand present and to estimate future market conditions. Of course, such analyses have their limitations and these are usually more clearly realized by the person doing the work than anyone else. It would seem that we, here in the western states, have ample opportunity to link our particular price situations to the national situation by measuring those conditions peculiar to western products and markets. Of course, the value of such information lies in its usefulness. It forms invaluable foundation material for gradual development, expansion, and usefulness of Outlook work.