

THE STUDY OF AGRICULTURAL
PRICES IN GERMANY.

BY

K. A. H. MURRAY

AND

V. CORNEA.

Agricultural Economics Research
Institute, University of Oxford.

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K. A. H. MURRAY, M.A., B.Litt., B.Sc., Ph.D.,
and V. CORNEA, B.Litt.,

*Agricultural Economics Research Institute, University of
Oxford.*

At the present time, price studies may be divided roughly into three categories according to their purposes:—

- (1) to provide the farmer with current market prices, so that he may buy or sell on as free a market as possible;
- (2) to acquaint the farmer with the market price situation, either currently or, if possible, in advance, so that he, individually, may attempt to co-ordinate his production or marketing with market requirements; and
- (3) in recognition of the resistance of agriculture to certain economic forces, to supply the information necessary to regulate and to "plan" the adjustment of production and consumption.

Although there has been an abundance of price data in Great Britain, although agricultural statistics have been used to a great extent as a background to economic history and economic theory, and although the principle and practice of statistical methods now in use were formulated chiefly in Great Britain, yet price analysis has not taken so large a place in systematic research here as it has in other countries. More rapid development of statistical price studies has occurred in the United States, and considerable headway has been made in Germany.

In many ways, conditions in Germany make the line of approach to the various agricultural economic problems more applicable to those of this country than do conditions in the United States. Germany has a fairly dense population; agricultural production is generally on a small scale, undertaken for the important industrial markets close at hand; and, normally, it is more of an importing than an exporting country as far as agricultural products are concerned. Only 25 per cent. of the gross income of farms is derived from crops, 62 per cent. being obtained from live-

stock products and 13 per cent. from horticultural produce.*

The basis of all price studies is the collection and compilation of adequate, accurate, and representative price data. On these depend the farmer's knowledge of the market and also any further analysis.

The German system of price collection has its own characteristic features. Two main bodies are concerned with the collection and dissemination of agricultural prices:

- (1) The National Bureau of Statistics (Statistisches Reichsamt), and
- (2) The Union of Agricultural Chambers† (Deutsches Landwirtschaftsrat) which includes a special department for price statistics (Die Preisberichtsstelle).

As far as agricultural prices are concerned, the offices performed by the former correspond closely with those of the Statistical and Economics Branch of the Ministry of Agriculture in this country.

The collection of statistics by the "Preisberichtsstelle" is undertaken chiefly for advisory work to acquaint farmers with the current market price situation, and to help the individual farmer in buying and selling, rather than for the purposes of further price analysis. It obtains its data first hand from some 2,000 farmers in different parts of the country; the statistics are therefore almost unique in that they yield the prices received *on the farm* and not at some later stage in distributive channels. The value of these farm prices for analytical purposes is evident when it is recalled that it is the farm price that influences production just as it is the retail price that influences consumption. The data on sales and purchases are collected according to commodities, grouped into districts, and averaged, and a report is then sent back to the farmer giving his own price along with the average price for similar grades of a commodity within the area, the prices given by the different types of buyers, co-operatives, commission agents, brokers, breweries and the like, as well as estimates of production, numbers of live stock, farm stocks, production intentions and outlook information. The information is collected yearly, quarterly,

* "Agrarpolitik in Zahlen," *Deutsche Bauerschaft*, Berlin, 1932.

† The Union of the German Agricultural Chambers is a compulsory organization representing all the interests of agriculture; there are forty-one districts throughout Germany, each of which has a democratic election of representatives. The principal objective of the *Landwirtschaftsrat* tends towards the technical improvement of agriculture rather than political representation.

monthly, weekly and, for some commodities, even daily. It is distributed at similar periods by means of special publications, news sheets, periodicals, the daily Press, telephone and radio.

The collection and dissemination of price statistics is but a small part of the purposes of price studies. Owing to the slow turnover in agriculture it is not enough to know the market situation at the time when production is first planned, but it is desirable to gauge in advance, if possible, the state of the market when the product is ready for sale. For this purpose and for the further end of price control, price analysis of the factors causing price fluctuations becomes essential.

The rapid adoption of statistical methods of analysis and their adaptation for economic data have increased the possibilities of accurate generalizations from past occurrences. Correlation analysis and its refinements have opened up the way to measure co-variation, although it is now recognized that the establishment of relationships is not in itself a sufficient basis for forecasting and that quantitative measurement is by no means final. Careful and logical reasoning, the distinction of cause and effect, the satisfactory explanation of time-lags and the like are now a complementary part of statistical price analysis. Both quantitative and qualitative analysis are integral parts of price studies:

There is neither time nor space to outline the various methods by which the study of agricultural prices is being undertaken in Germany. Before detailing one line of approach that appears to have a special significance in this country, a characteristic feature of the organization of German price research is worth noting—research on a commodity basis covering large marketing areas. Each particular commodity is then integrated into a larger industry, e.g., the live-stock industry, and this is placed within a larger unit, so that a general synthetic outlook is obtained. The most advanced studies are dealt with by bodies, constituted principally for specialized market research, such as the Reichforschungsstelle für Landwirtschaftliche Marktwesen, the Institut für Landwirtschaftliche Marktforschung, and the Institut für Konjunkturforschung.

For several years, price forecasting was the principal aim of many studies. The underlying object was the stabilization of price through the closer co-ordination of supply to

actual pig populations during 1930, based on the December, 1929, census.*

Date.	Actual (in millions)	Forecast.	Percentage error.
June, 1930	19·8	19·6	1·0
September, 1930	23·4	22·3	4·7
December, 1930	20·9	20·9	0·0

The percentage errors, both for the total number of pigs and for the numbers in the individual classifications, are being gradually reduced as the factors causing them are discovered and discounted.

Where the time required to increase or decrease the supply is as short as it is with pigs, an annual census is of little significance. A contract system for a year ahead may be some guide as to what supplies may be expected on the market, but unless it covers the entire pig industry it is not very reliable. A quarterly census may be a surer guide to production plans.

Much of the more recent work on agricultural prices has been directed towards the analysis of the inter-relations of demand, supply and price through the use of demand curves. The aim of these demand curves is to indicate how the price of a commodity varies with the quantity available. The main problem is twofold: (a) to construct curves for any product to show how prices would vary with changes in supplies under existing conditions, and (b) to discover how these curves would change with alterations in the conditions affecting the demand for the product in question.

The solution of these problems becomes very important when regulation of commodity prices is the aim of the State or some body such as a producers' board. The State may determine to increase the production of some commodity to a certain volume; the question then arises, what price is necessary to bring forth that supply? A producers' board must calculate what price is necessary to move the available supply into consumption. Or, if it decides to fix its price by some other criterion, it must estimate how large a part of the supply will be taken at this price and how much must be taken off the market. Such estimates can

* Von der Warth: "Die Voransbestimmungen des Deutschen Schweinbestandes und der Schweineauftriebe." *Berichte über Landwirtschaft*, Sonderheft, 39, 1931.

be made approximately by a rough and ready comparison of prices and supplies, but they can be obtained more accurately by the construction of demand curves.

The German workers have, in general, followed two main lines of approach—the historical study of the relationship shown between prices and supplies, and the study of consumers' budgets.

The study of past relationships between supplies and prices can show how price has varied as supply has changed, but in many instances supply has not been the only variable; alterations in demand may also have occurred. The most important causes of demand changes are found in the following:—

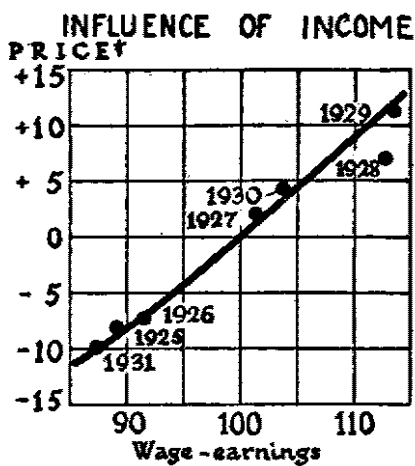
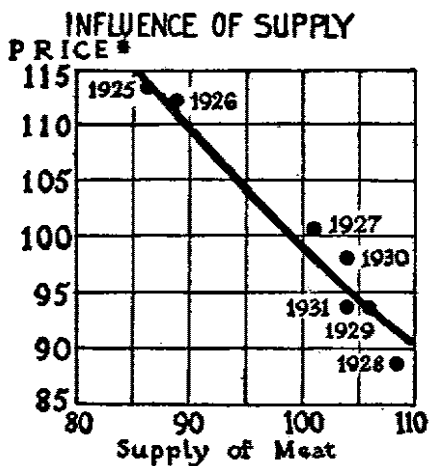
- (1) In general, purchasing power, including changes in the value of money, which may be considered as working through demand; these can be allowed for by correcting the price by some selected index of purchasing power.
- (2) In the purchasing power of those consuming the product.
- (3) In the prices of competing products.
- (4) In taste.
- (5) In the expectation of future price alterations.

By use of the graphical multiple correlation method, it is often possible to establish a relationship between prices, supplies and some index or indices measuring one or more of the above alterations in demand. If such a relationship can be established, it is possible not only to obtain the demand curve for the commodity in question under existing demand conditions, but also to show how it would fluctuate as the relevant demand factors alter. It must be admitted that some demand changes, such as the last two above, cannot be measured accurately, and, if these are important factors, then this method of deriving demand curves cannot yield very accurate results.

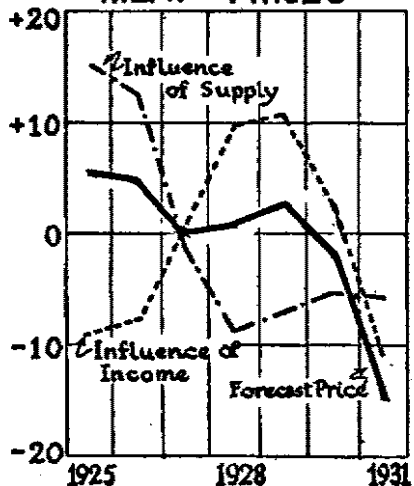
The use of multiple correlation methods is shown in a study by Hanau* showing the influence of supply and demand in determining meat prices. Taking the total consumption of pig meat, beef, veal, mutton and lamb as the supply factor and using wage earnings adjusted by a cost-of-living index as the demand factor, he established the relationships indicated in the diagram overleaf.

The upper left-hand diagram indicates the relation between supplies of meat and retail meat prices when the effect of changing incomes is eliminated; as supplies increase prices fall. The upper right-hand diagram shows the effect

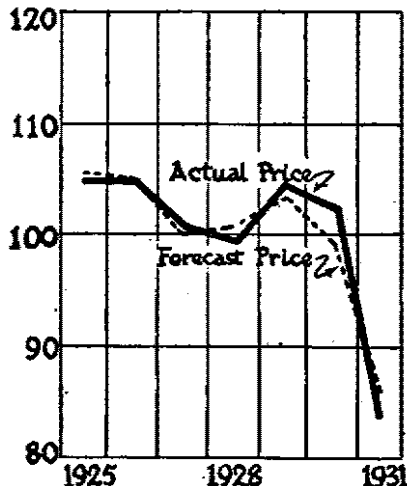
* Hanau, A.: "Auswirkungen der Wirtschaftskrise auf den Deutschen Fleisch und Schlachtviehmarkt." *Blätter für Landwirtschaftliche Marktforschung*, June, 1932.



INFLUENCE OF SUPPLY AND DEMAND ON RETAIL MEAT PRICES



FORECAST OF RETAIL MEAT PRICES



of changes in consumers' incomes on retail prices with the effect of alterations in supply eliminated as incomes rise, prices rise.

The lower left-hand diagram indicates for each year how retail prices of meat would have moved if affected:—

(1) By supply changes only, i.e., if consumers' incomes had remained at a normal level during the period studied. This line, the influence of supply, is derived from the upper left-hand curve showing the relationship between supplies and prices. For instance, in 1928, when supplies of meat were about 8 per cent. above normal, prices would be about 9 per cent. below normal.

(2) By alterations in income only, supply being maintained at a normal level throughout. This line, the influence of income, is obtained from the upper right-hand curve showing the relationship between incomes and prices. For example, in 1928, when incomes were about 13 per cent. above normal, prices would be 10 per cent. above normal.

(3) By both supply and income alterations. This curve, the forecast price, is the sum total of the two other curves, the cumulative effect of supplies and incomes. Thus, in 1928, the supply situation alone would give a price 9 per cent. below normal, while the effect of income alone would give a price 10 per cent. above. As a result the forecast price for 1928 was 1 per cent. above normal. In 1931, a "supply" price of 5 per cent. below and an "income" price of 10 per cent. below gave a forecast price of 15 per cent. below.

The lower right-hand diagram gives the forecast retail prices and the actual retail prices. The two lines diverge to a small extent owing to the fact that the actual prices are not explained entirely by the relationships studied, and that certain other factors have a slight influence.

Similar curves were constructed to indicate the influence of supplies and of consumers' incomes on wholesale meat prices, effects of different magnitude compared with those on retail prices.

From such curves, it was shown that the total expenditure on meat, considering all types of meat in the aggregate, moved in close relationship to the incomes of consumers; that a decrease in incomes was accompanied by a proportionately greater decrease in the consumer's expenditure on meat, since the more necessary items of expenditure in the consumer's budget take a greater proportion of the total income; that a still greater decrease occurred in the farm receipts for live stock as a result of decreased incomes owing to the more rigid costs of processing, manufacturing and distributing; that with decreasing purchasing power on the part of the consumer, prices can only be raised, or maintained, if the supply is decreased at a still greater rate. Not only were these relationships shown qualitatively but also quantitatively; e.g., how much supply must be reduced in the face of decreasing demand in order to maintain a stable income to farmers for live stock sold. The differences in the elasticity of demand for various meat products, beef, veal, mutton, pork, etc., and consequent difference in their price behaviour with varying supply conditions, suggest that further refinements in the supply analysis are necessary before a definite unifying policy could be adopted for the live-stock industry as a whole.

The second method is to obtain the demand curves direct from consumers' budgets. This method overcomes the difficulty of measuring changing demand conditions by estimating demand curves from the different amounts consumed by persons of different incomes at any one time. Its advantages over the first method is that it can be applied when demand factors, not readily measurable, have a substantial effect on price.

The possibility of forming demand curves from data obtained direct from consumers' budgets is shown in a study by Bauer.* From the budgets of 2,000 families, labourers, employers, and civil servants, he estimated the relative elasticity of the demand for various foods. The coefficient of elasticity at different income levels was obtained as follows: if an increase of 1 per cent. in income raised the consumption of a commodity by 0.8 per cent. then the coefficient of elasticity would be +0.8. It would be unity if consumption changed to the same extent as income. If consumption decreased 2 per cent. as a result of a 1 per cent. increase in income, the coefficient would be -2. The following table gives some of the results of this study. Only

COEFFICIENTS OF ELASTICITY OF THE PER CAPITA EXPENDITURE ON MEAT.

	Wage earners.			Salary earners.		
	700 Rm.	1350 Rm.	1800 Rm.	900 Rm.	1350 Rm.	2900 Rm.
Meat and meat products	0.93	07.9	0.68	0.87	0.74	0.05
Beef	0.87	1.15	1.27	0.81	0.74	0.34
Pig meat	0.72	0.67	0.58	0.66	0.58	0.06
Veal	2.16	1.98	1.96	1.98	1.41	0.91
Mutton	0.04	1.19	1.77	0.44	0.53	0.68
Minced meat	0.19	0.44	0.60	0.63	0.51	0.52
Offals	0.31	0.90	1.21	0.96	0.86	0.49
Bacon, ham and other meats	1.17	0.71	0.40	0.65	0.66	0.21

in three instances is an increase in income accompanied by a decreased expenditure, for mutton in the lowest income group and for pig meat and minced meat in the highest income group. The highest elasticity indicated is for veal, where a 1 per cent. increase in income resulted in a 2.16 per cent. increase of expenditure on veal in the lowest income group, and 0.91 per cent. increase in the highest. The

* Bauer, Dr. W.: "Einkommen und Fleischverbrauch." *Vierteljahrshefte zur Konjunkturforschung*, Sonderheft 28, Berlin, 1932.

expenditure on mutton in particular tended to increase as incomes increased among both types of consumers.

Similar data for rye, black bread, and potato consumption gave negative coefficients—the expenditure on these decreased with increased income.

The disadvantages of this method of approach are that it only gives the shape of the demand curve at any one time, and therefore cannot indicate how it would alter with demand fluctuations in time; that all types of consumers must be included and the collection of consumers' budgets is expensive; and that while the method can be used to compare the elasticity of the demand for two or more commodities, it cannot directly give the elasticity of demand for any one commodity. The fact, however, that it gives some guidance as to the behaviour of various types of consumers with conditions of changing purchasing power gives this method an important place in the study of agricultural prices.

These few examples of the price research work being carried on in Germany may serve to indicate some of the ways in which these studies aim at helping the farmer both directly and indirectly. They must form an integral part in the formation of an agricultural policy, since it is apparent that even the newest schemes are still relying on price to adjust production. They become all the more important when planning on the farm is to be supplemented by centralized planning, whether by producers' boards or by the State.