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THE DISPARATE STABILITY OF FARM AND NON-FARM PRICES¹

A. F. HANAU

Göttingen University, Federal Republic of Germany

IN treating the disparate stability of farm and non-farm prices, it is important to state just what kind of prices one is talking about. As far as price fluctuations are concerned, there are characteristic differences in the movements of agricultural and industrial prices. The extent of the fluctuations, however, should hardly be smaller for the prices of non-farm raw materials than for agricultural products. Furthermore, there are some farm prices that fluctuate violently and others that are relatively stable. A thorough analysis must therefore take into consideration some circumstances other than farm and non-farm prices.

Whether a product is of primary or secondary origin is only one of the factors which influence its stability. Farm prices generally fluctuate more frequently and more violently than non-farm prices. This is particularly true when one compares the producer prices of farm products with those for industrial manufactured goods. Other important features which deserve attention in a comparison of prices are:

(i) The stage of processing. Is it concerned with raw materials, semi-finished goods, or finished goods? The prices of raw materials fluctuate more than those of finished goods.

(ii) The trading state. Conditions are different at the producer's level from those at the wholesale level—world market or national market—and again from those at the retail level (consumer level). Prices fluctuate more at the producer's level than they do at the consumer's, and more on the world markets than on national markets, since international trade is hampered considerably by import restrictions.

(iii) Market organization or market structure. Market conditions vary in the degree of competition. With restricted competition, which is the usual market organization for many manufactured goods, prices tend to be steadier than for basic agricultural products and for raw materials traded in perfect competitive markets.

(iv) Elasticity of demand with regard to income and prices. It can

¹ See charts, pp. 141-7.

be shown that violent price fluctuations are connected with a limited price elasticity of demand. Such a limited price elasticity is characteristic of all foodstuffs which are consumed in quantities near the saturation level. This is largely true of the cheap starchy basic foods but in prosperous countries it applies to the more expensive animal products and other protective foods as well. Also, as income increases, the price elasticity at the producer level declines more sharply than the price elasticity at the consumer level, because as a result of rising margins the producer's share of the consumer price drops. A high elasticity of demand in relation to income or connected with credit buying for investment will cause sharp price movements if the supply is inelastic but if it is elastic (expandable and contractable) it will not have so much effect on prices.

(v) The behaviour of supply must also be taken into consideration with respect to: elasticity; supply cycles in accordance with the cobweb model; influence of technical advances (in direct production or in the production of substitute products); autonomous and accidental fluctuations in supply, or control of supply. I shall go into the problems of supply dynamics in greater detail later. If the price movements are classified according to the criteria listed, interesting parallels and differences become apparent which a global and simple comparison between primary and secondary products does not fully reveal.

Being dependent on nature, *primary production* is exposed to numerous fluctuations in supply and price, which do not affect industrial production in the same way. We may list here: seasonal fluctuations from month to month or from season to season; the dependence of yield on weather; the dependence of production cycles on growth of plants and animals (cobweb tendencies—but of varying duration—with particular kinds of vegetable and coffee, with poultry farming and egg production, with pigs and beef cattle). Such behaviour is only exceptionally of importance in *industry* and for good reasons: there is no biologically conditioned rhythm of growth, for supply is controlled (administered prices) and the demand is more elastic.

Industrial undertakings can adjust supply to demand in a way which is hardly possible for farms. Non-biological production and the market structure of restricted competition are not the only reasons for this. Further important reasons are:

If market prices fall below costs, an industrial enterprise loses money and is unable to go on producing, i.e. to buy raw materials or to pay wages and interests on loan capital. It follows that, even in

the rare case of perfect competition, industrial enterprises must meet unsatisfactory prices by cutting production; they can, of course, and usually do concentrate production on the most profitable factories. If a temporary reduction in supply is necessary, it can be achieved in industry by introducing short hours or by dismissing a certain number of employees. The men who are dismissed can either be employed in other sections or can keep their heads above water with unemployment benefits. Industrial undertakings are all the more ready to cut production if in accordance with the price-cost position (depending on the marginal cost curve) it can reduce their losses. This adjustment in industry is often made easier by moderate price reductions for, if the demand is elastic (as it often is on the industrial market but seldom on the agricultural), these slight reductions bring about a considerable increase in demand (or vice versa) and this accelerates the absorption of temporary surpluses. If, however, there is a general decline in demand, which cannot be cured by the price and output policy of the enterprises, then full employment policy is designed to protect industries against such unfavourable developments.

The growth of industrial production is everywhere dependent on expensive commercial manufacturing processes and continued capital investment. Buildings, machinery, and installations are necessary as well as additional technicians, skilled and other workers. These circumstances keep industrial supply relatively closely bound to the price-cost relation. 'No increase in production, unless costs are covered' is the rule here.¹ But costs are not rigid. They are rather in constant flux for they are always being altered as competition and technical advances influence them. These costs, however, must be largely paid in cash (raw material costs, wages, interest for loan capital, &c.) and must therefore be earned; otherwise, investment to increase production to any great extent is out of the question.

Apart from the climatically conditioned fluctuations I have already mentioned, the conditions obtaining in agricultural production are radically different from those obtaining in industry. As a result, agricultural supply exercises an influence on the formation of prices which deserves particular attention. Thus, temporary surpluses cannot be overcome in agriculture by working short time or by cutting production. Because the goods are perishable, it is difficult

¹ 'Specialized investments once made are *utilized* so long as the revenue from sales exceeds the *additional* costs of production. Investments in the production of the new commodity are made only if it is expected that prices will cover the *total* cost of production.' Arthur R. Burns, *The Decline of Competition*, New York and London, 1936, pp. 537 f.

and expensive, if not impossible, to store them until the market returns to normal. In addition, the demand for agricultural products in relation to price and income is more or less inelastic; consequently, in many cases, agricultural surpluses cannot be absorbed with equal rapidity either by cutting prices or by increased incomes as is the case with industrial goods. Again, in contrast to industry, on the family farm, wages, managerial returns, interest on capital and rent have to be paid as a rule only partly in cash because often the same groups of people are owners, operators and workers. The peasant family, therefore, keeps up production even when the prices of its products do not cover all costs. In such a position it can sometimes even make investments by cutting its own consumption. Its endeavours are directed first and foremost to achieving the maximum family income and only secondarily to a high wage per hour. Farmers often stay on the land out of enthusiasm for their work and for the independence it affords them. Alternative employment is seldom available, particularly in the under-developed countries but also in industrialized countries for older farmers. For these reasons underpaid workers are kept in agriculture, and submarginal land is still used. Productive expenditure is even increased, for thereby *individual* farms are enabled to gain higher incomes than they would otherwise obtain.

Once more in contrast with industry, these factors cause the supply to be kept high or even to be increased, when prices do not cover the full costs (including 'comparative' wages). We may then say that too many resources are employed in agriculture—labour, capital, and land. But important factors, partly conditioned by nature which are hard to influence, are responsible for that. First, in general, more people are born on farms than can be employed in agriculture—a result of rapid technical development and slow development of the demand for food. As long as country children are hampered in taking up other occupations, by tradition, lack of schooling and training, isolation and environment or because not sufficient jobs are available, there tends to be too much labour in rural areas. Secondly, an increase in production can often take place without increasing and perhaps even by lowering the marginal costs, because the fixed costs of the whole farm are relatively high. Among the fixed costs or rigid factors we must include on a short- or medium-term view the land available, the working capacity of the family, the animal and mechanical draught power, and the subsistence fodder for the animals. Therefore, each single farm tries indefatigably to increase production; the individual farmer cannot foresee the capacity

of the market. Where production technique is well developed, the total supply outstrips the demand and puts pressure on the price level. If the total supply, for any reason at all, is too high for the demand, the farmers still keep to their production level, because a reduction in production would not improve the position of the individual farm. This can be called the 'downward rigidity of supply'.

To speak of a general inelastic supply in agriculture would not be completely true. If adequate areas are available, they can be cultivated quickly and easily by modern machines. Wherever the soil is not the most important factor of production, where other means are used to increase the yield the total production per acre can be considerably expanded with the natural time lag. Particular kinds of crops or animal products can expand much more quickly than the total production if the employment of production factors needs only to be shifted and not increased. There are certain conditions for increasing total production which are not fulfilled everywhere in the world at every time and in the same way. These conditions are, in particular, that there should be favourable price relations for agricultural products (this depends on the stage of technical and economic development), that the country population be sufficiently well educated to understand modern methods of production and that farmers endeavour to increase their incomes to give their families a higher standard of living. Because these conditions are absent from some parts of the world where an increase in food production is most urgently needed, the elasticity of supply is smaller than in the more fully developed countries which already have higher nutritional standards. This is particularly applicable if new areas cannot be brought under cultivation or can be cultivated only with the help of capital, which is in particularly short supply in such countries. If favourable prices and price relations encourage an increase in supply in primary industries, there are nevertheless fundamental differences between primary and secondary industries in their dependence on the price-cost relation.

Industrial supply, as I have mentioned, is relatively closely dependent on the price-cost relation. Agriculture is not dependent on strictly commercial methods of production. Seen on a world scale, remarkably varied methods of production exist side by side, and in certain circumstances fail to provide the family with adequate wages or to pay interest on the family's capital. Therefore the level of total agricultural production and exports is not closely dependent on the cost-price relation, not only on a world scale but also nationally. As

a result, the price level of agricultural products is more closely related to the supply/demand situation than to full costs.

We have to take into consideration a further factor of great importance, namely *price supports and government subsidies in agriculture*. While price supports keep the producer's price higher than it would be if allowed to develop freely, and while subsidies separate producer's prices from market prices, agricultural production receives a particular stimulus in countries where such methods are applied. There are important reasons for support, for example the intention of giving the farmer an adequate income; the memory of times of need, and the impossibility of accurately predicting future scarcity or surplus; the desire to soften the effect of extreme price fluctuations, a desire aiming at some kind of stability but mostly leading to price supports. International effects of such national policies, designed to prevent low prices and incomes in the agriculture of one land, may produce low prices and incomes in another country and on world markets.

On the demand side too, there are important reasons for the characteristic differences in the movements of industrial and agricultural prices. But in agriculture we must differentiate between the demand for foodstuffs on the one hand and the demand for industrial raw materials of agricultural origin on the other. Recently the importance has been recognized of the relationship discovered a hundred years ago by the German statistician Engel between the income of the household and the expenditure for food. This law is of great significance for agriculture. In recent years the economists of various countries have endeavoured to discover refined methods of representing 'Engel curves'. But in the meantime processing and service charges have gained an importance they did not have in Engel's times, and this importance grows as incomes increase. The so-called Engel's law states that as income rises the expenditure for food rises but not in proportion, so that the percentage of total expenses spent on food declines. In a country with a high income *per caput* this rule no longer holds so clearly. The reason for this lies in the fact that processing and services complementing the food are demanded in proportion (or even more) to consumers' incomes. These charges are included in the consumer price but are not received by the farmers. Therefore, the share of the consumer price which goes for primary production is falling in the sense in which Engel's law was originally intended and understood. For these and other reasons (for example, because as income rises better qualities are demanded), the income elasticity of the quantitative demand is

much smaller than the income elasticity of the monetary demand (expenses). The quantitative demand for food increases more slowly when consumption approaches saturation. Therefore, in the more highly developed regions of the world we have reached the position that technical development makes a high and rapidly increasing agricultural production possible, while, since the population is increasing only slowly in western Europe and the elasticity of demand has decreased, the rate of increase in demand has become relatively small. As before, there are other parts of the world, where a moderate increase in production does not keep pace with the strong increase in demand, which is conditioned by an even quicker population growth and an even higher income elasticity of demand. This is the situation in many of the less fully developed regions. Within the generally inelastic demand for foodstuffs there are, we know, considerable differences: the basic demand for cereals is rigid, for animal products less inelastic and for fruit and luxury foods highly elastic. Changing over production or its utilization to more elastic goods has contributed greatly to the absorption of the increasing agricultural production in the last hundred years. Such opportunities for expansion of consumption have become less numerous in the better fed parts of the world. Another most important consequence of a limited elasticity of demand is its effect on price fluctuations. We know that a low price elasticity means a high flexibility of prices, if supply is changing. For example, a low price elasticity of -0.2 means that a 1 per cent. change in supply brings about a 5 per cent. change in prices; or, to express it differently, when prices fall by 1 per cent. then consumption rises only by 0.2 per cent. Furthermore, price elasticity is generally lower at the producer level than at the consumer level because of the rigidity of margins. The higher the margins are in relation to consumer prices, the greater is the decrease in price elasticity from the consumer to the producer level. If margins increase with higher consumer incomes, price fluctuations at the producer level increase too. This is an important reason for price stabilization for inelastic goods in general, but is specially important in high income countries, where demand elasticity for food is low. The formation of *international* prices is largely determined by the production surpluses in the developed areas, as long as the low producing and undernourished countries do not possess enough buying power to close the gaps in their nutrition by increasing their imports or by decreasing further exports of food. The rapid increase in population and the high income elasticity of demand in the less well developed and partly undernourished countries, from

an economic point of view, appear to have no decisive effect on world markets at the moment.¹

Agricultural Prices in an Unstable Economy

When, after the First World War, researchers began to investigate trade cycles comprehensively they considered closely the movement of agricultural prices in seven- to eleven-year cycles. The results of these investigations for the period before 1929 and especially before 1913 can be summarized as follows. On the whole, prices for agricultural products were relatively unaffected by *small* variations in general business conditions. On closer consideration, we see that those agricultural products which were least affected were those for which the income elasticity of demand is small. The prices of agricultural products with a perceptible or even high income elasticity, however, were more closely connected with the variations of income, i.e. animal products, other protective foodstuffs, and luxuries. Those agricultural products which are used for the manufacture either of consumer goods with a relatively high income elasticity or for investment goods dependent on income and credit must be particularly sensitive to trade cycles. This fairly close relationship between the trade cycle and the prices of agricultural goods with a high income elasticity of demand is more or less disturbed, however, by the independent monthly, yearly or longer variations in supply, brought about by weather or by production cycles, that are characteristic of agricultural products. If, in the last two or three years, when incomes have been relatively stable (after twenty-five years of extensive variations in income and price level), we have observed independent movements of the agricultural price level and of single agricultural prices, we can recall similar experiences in previous times when income variations were small.

Since the great depression of the early 1930's every government has endeavoured to achieve a sustainable economic growth. Also, the idea of seven- to eleven-year trade cycles has been given up. I shall not discuss here the prospects for the new policies for economic growth, but would like to deal with the more or less longer term disequilibrium between supply of and demand for agricultural

¹ It is open to question, whether these countries will eventually import more or export less food than now. As the developed countries are now able to increase production more rapidly than consumption and even to produce surpluses, one could conclude that food supply will become easier with industrialization. This, however, is no automatic process but is dependent also upon the rate of growth of population and income, the availability of primary resources, economic policies, &c. Many developed countries have undergone times of increasing food imports and do still import considerable amounts of food and other agricultural products.

products or, in other words, to discuss the periods which clearly show a decline or an increase in the agricultural price level. Gradual movements in the agricultural price level of relatively long duration or violent ones of only a few years' duration have occurred mainly in conjunction with similar movements in the general price level.

Movements in the Agricultural Price Level in Conjunction with Similar, though Weaker, Movements in the General Price Level

We are acquainted with the significant periods in which farm and non-farm prices have moved side by side. If we go back as far as the beginning of the nineteenth century, I need only remind you of the following events.

First, there were the inflationary periods during and after wars, or as a result of political unrest, followed by deflation. As examples I would cite the Napoleonic Wars, the war between England and the United States in the beginning of the nineteenth century, the American Civil War in the sixties, the Franco-Prussian War from 1870 to 1871, the First and Second World Wars. Only after the last World War has the inflation during the war and immediately after it not been followed by deflation. Agricultural prices rise and fall in such periods parallel to the general price level. If, however, prices are allowed to move freely, agricultural prices tend to fluctuate more, so that on the ascent the terms of trade improve in the farmer's favour, and on the descent they worsen to his disadvantage. Within the various countries, larger rises in prices, however, are usually prevented for social reasons by the introduction of price ceilings.

Secondly, there were the 'long waves' of price movement. In the 1920's Kondratieff investigated the so-called long waves (of perhaps 40-60 years) of price movement in general and the price relation between non-farm and farm products in particular.¹ For example, the following troughs and peaks may be established as measured by Burns and Mitchell on the well-known English *Sauerbeck-Statist* wholesale price index:²

<i>Trough</i>		<i>Peak</i>
1789	. .	1813
1849	. .	1873
1896	. .	1920
1933	. .	?

¹ N. D. Kondratieff, (1) *Die langen Wellen der Konjunktur*, (2) *Die Preisdynamik der industriellen und landwirtschaftlichen Waren (zum Problem der relativen Dynamik und Konjunktur)*. Archiv für Sozialwissenschaft und Sozialpolitik. 56. Bd. (1926), p. 590, und 60. Bd. (1928), p. 1.

² Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*. National Bureau of Economic Research, New York, 1947, p. 432.

During the rise of the long waves, the years of upswing of the seven- to eleven-year cycles tend to predominate, and during the fall, the years of contraction. As we know, Schumpeter saw in the long waves the rhythm in which great technical advances have been introduced and absorbed. The first long wave (from about 1790-1840/50) reflected the industrial revolution, the beginning of the industrial age. The second long wave (1840/50-1895) was the steam and steel period, in which rail and sea transport made rapid strides. The third long wave, from 1895, took its impulse from electricity, chemistry, and the internal combustion engine. Other investigators, however, do not see real cycles in these long waves. They regard them as developments called into play by extraneous factors and not repeatable in the same way with any regularity.¹ The most important causes such as technical advances, wars, the opening of new countries to world trade, and the variations in gold production as a result of new finds or the working out of old ones, are considered to be mainly accidental. During the falls of the long waves, agriculture passes through long depressions, as it did after the Napoleonic Wars, from the seventies to the nineties, and after the First World War. Agricultural prices rise more on the upward slope of a long wave and fall more on its downward slope than do the general price level and non-farm prices. This tendency which agricultural prices show within the long waves is explained by Kondratieff as a consequence of special conditions in agriculture):²

1. Agricultural production is less elastic and cannot be so quickly expanded or contracted as industrial production;³
2. The consumption of a considerable proportion of agricultural products (most of the foodstuffs) is less elastic and is subject only to relatively unimportant fluctuations under the influence of price changes;
3. Primary producers are as a rule less well organized and thus not in a position to push their interests on the market.

I cannot conclude this section on the long waves without making two important qualifications. First, Kondratieff established—just as we did in the section dealing with the effect of wars on price movements—that agricultural prices move more in the long waves

¹ See C. v. Dietze, 'Agrarkrisen, Konjunkturzyklen und Strukturwandlungen', *Jahrbücher für Nationalökonomie und Statistik*, 137, vol. 1931, pp. 513-28, in particular pp. 525-8.

² N. D. Kondratieff, *Die Preisdynamik der industriellen und landwirtschaftlichen Waren*, p. 59.

³ See: Warren and Pearson, *The Agricultural Situation*, New York, 1924, pp. 22 ff.; H. Belshaw, 'The Profit Cycle in Agriculture', *Economic Journal*, Mar. 1926, pp. 29-32.

than do industrial prices. He came to this result, however, after considering the price movements in England only. The price movements in the U.S.A. did not always show a clear result. Second, if we take prices for animal products, which meet with relatively elastic demand, this tendency does not make itself felt. Apart from the great crisis of 1930/2, when nominal and real incomes were subject to a sharp contraction, and apart (perhaps) from the latest development in Europe, although prices for animal products have fluctuated, they have been fairly favourable on the whole, over and above all short or long waves, in comparison with non-farm prices.

Thirdly, the Great Depression of 1930/2. I do not wish to treat this at length. I only want to point out that agricultural prices were affected much more adversely by the downward movement in prices than were non-farm prices. One could say even more appropriately that the prices of primary products fell much more than the prices of secondary products. Development at that time was characterized by a sharp contraction in income and in total demand. Industry met the shrinking demand by limiting production. Farmers could not do that. They had to suffer sharp declines in the prices they received, without receiving corresponding reductions in the prices of the goods they had to buy, not to mention taxes and interest on debts. So far, I have said nothing about the causes of the depression. They are very much in dispute. Many agricultural economists are of the opinion that the surpluses, which began to pile up before the outbreak of the crisis in the autumn of 1929, and the decline in the price of some agricultural products such as wheat and sugar which play an important part in world trade, formed the seeds of the depression. I do not need to clarify this dispute at the moment; it suffices to say here that it was the contraction in total demand *in the course of the depression* which had the most unfavourable influence on the prices and income of agriculture everywhere.

Movement in the Agricultural Price Level Independent of Similar Movements in the General Price Level

It can be shown that agricultural prices usually move in the same way as the general price level but more sharply. Let us now consider the question whether there are not larger and longer *independent* movements upwards or downwards in agricultural prices. The most important recent example of independent movement in agricultural prices is the decline since 1951. This really began about 1948; the Korean War interrupted it temporarily. It shows clearly that in agriculture a period with price-depressing surpluses can last for a

considerable time, even when the general economic situation is booming and the purchasing power of consumers is increasing. The decline in prices and income in agriculture would have been even more widespread if many countries had not adopted extensive support measures, particularly in allowing large state-owned stocks to accumulate. On the other hand, price supports and import restrictions have certainly encouraged production in these countries and kept it higher than it would have been without them. Moreover, these protective measures in favour of primary producers also have somewhat restricted consumption.

The Terms of Trade between Agriculture and Manufacturing in the Long Run

Professor Theodore Morgan of Wisconsin has carried out extensive investigations on this subject. My attention was first drawn to his findings by the following note in *Econometrica*¹ on his arguments at the Detroit Meeting of the Econometric Society:

There is a widely held opinion that the terms of trade between world agriculture and manufacturing have been shifting historically to the advantage of manufacturing. This opinion is mainly based on League of Nations data, reproduced and added to in the United Nations' *Relative Prices of Exports and Imports of Under-developed Countries*. These data are inadequate for two reasons:

(1) Statistics covering a much longer period are available, in which the U.N.'s 1876 to 1948 years are only an atypical episode. A British series calculated for 1801 to 1953 shows a huge rise and fall in the terms of trade plus much instability—not a single trend. (2) As has been pointed out elsewhere, the British data used in the above series are not adequate to measure prices *within* the raw material and food producing countries of the world. Their inadequacy arises from two counts, both of which increasingly understate the position of primary producers as the decades have gone by: (a) qualitative improvements, which take place predominantly in manufacturing, are inadequately taken account of; and (b) falling transportation costs in the world have caused primary producers of the world to receive a larger and larger proportion of the value in Britain and other importing countries, of the products they have been shipping abroad; and to pay for their imports of manufactures prices that have been above prices of manufactures in Britain and other industrial countries by a smaller and smaller proportion.

As a check on the above reasoning, I have tried to find reasonably reliable long-run data relevant to the issue from countries or regions of the world other than the United Kingdom. I have finally used data from six countries—the United States, India, Japan, New Zealand, the

¹ Vol. xxv, No. 2, Apr. 1957, p. 360.

Union of South Africa, and Brazil. Of these six series, two show a major relative price rise for primary products, the rest various changes or ambiguity. The data do not show a general worsening of the price position of primary producers.

Professor Morgan has very kindly allowed me to look through a very comprehensive paper on the subject, which he intends to publish in an American periodical.¹ He could not discern on a world scale any tendency for primary producers' terms of trade to become worse over a period of a century. One could object, perhaps, that the last years of his investigation, 1952 and 1953, were comparatively favourable for primary products and that the decline in prices which has occurred in the meantime justifies a more pessimistic opinion. I incline to the view that the search for a secular trend in the terms leads to no clear result. The following considerations, however, seem to me to be important:

- (a) The terms of trade are very unstable over both short and long periods.
- (b) Even if we could establish beyond doubt that the terms have become better or worse, we could draw only limited conclusions from this, for the following reasons:
 1. Many machines and equipment have become more efficient or can be applied in more ways. Furthermore, with better education, farmers are learning to exploit their inputs to greater advantage.
 2. Particular means of production have become relatively cheaper, others have become more expensive. A good manager replaces expensive means of production, when possible, by cheaper ones. A price index of inputs variably weighted to take such factors into account would show a smaller rise in costs than one with constant weights.
 3. Price comparisons between agricultural and industrial goods on a particular trade level can be useful for an understanding of the terms in foreign trade but not in the same way for the farm. The farmer sells his goods at producer's price (prices received) but buys at customer price (prices paid). Margins or transportation costs can alter the really effective terms in such a way that the terms expressed, e.g. in wholesale price index numbers, are meaningless.
 4. The development of productivity is of paramount importance. A branch of the economy which increases its productivity per man more than the other sectors do, can be subjected to falling terms without losing income and profits. In reverse, when productivity

¹ I regret that I cannot yet say when and where this paper is to be published.

increases less in agriculture than in the other sectors (as it mostly does), the producers' terms must improve if their incomes are to keep in step with those in the other sectors.

5. No clear conclusions for the future can be drawn from the development of the terms of trade in the past. It is hard to appraise something which results from a multitude of factors. Moreover, much more research on prices of individual commodities or groups of commodities is needed. Broad or general price index numbers do not appear to be adequate tools to elucidate the terms of trade and to get meaningful results.¹

Conclusions. Causes of the Larger Fluctuations in the Agricultural Price Level and of the Commodity Terms of Trade

From empirical observation of the movement of prices in the last 150 years and from the interpretation of this in the technical literature on the subject, I draw the conclusion that both monetary and non-monetary factors are responsible for the larger upward and downward movements in the agricultural price level. There have been periods in which either set of factors has been the dominant influence while the other has been of little importance. And there have been periods when both have been active simultaneously. To argue that one set of factors has been decisive in general seems to me to be vain and useless. In some periods, agricultural prices as a whole, as I have mentioned, have risen and fallen more sharply than non-farm prices. Does this *spread* in the price movement alone point to the fact that, besides monetary influences on the general price movement, non-monetary factors were at work, causing the special movement in farm prices? The answer is not simple. It probably depends on the extent and duration of the deviation shown by farm prices from the other similar but weaker price movement. For every larger upward or downward movement in the general price level must lead to a certain spread in the price movement.² Prices of raw materials vary more than prices for finished products; wholesale prices vary more

¹ The recent study by M. K. Atallah, *The long-term movement of the terms of trade between agricultural and industrial products*, Netherlands Economic Institute, Rotterdam, 1958, presents a most interesting approach to the problem. It is, however, much too general to lead to realistic results. Dr. C. M. Castillo in discussing another paper in the Conference (on International Organizations) mentioned coffee as an example of the deterioration of the terms of trade of coffee producing countries. He was wrong, however, in presenting this as a case against the findings of Professor Morgan to which I have referred. The recent decline of coffee prices is a first consequence of very favourable terms in the past eight years, which—as in previous periods—have stimulated overproduction.

² See also G. F. Warren and F. A. Pearson, *Prices*, New York, 1933.

than consumer prices; prices on the world market vary more than the prices on the home market; under perfect competition prices fluctuate more than under imperfect competition; and, finally, farm prices fluctuate more than non-farm prices. The reasons probably lie mainly in the rigidity of wages, taxes and margins and in the difference in market structure. It may often be a question only of time-lags, so that, some time after a larger upward or downward movement in the general price level has been concluded, the earlier terms are restored. From this, I infer that only a particularly *large* spread of prices justifies the conclusion that an abundant or a short supply of primary goods is the main responsible factor.

Explanations, which give only one cause for the larger movements in prices do not do justice to the manifold interdependence of monetary and non-monetary factors. Furthermore, the idea that we are here dealing with more or less regular 'long waves', in which long-term rises and falls of a particular duration follow one another, leads to no fruitful result. In my opinion, we must confine ourselves to the facts, i.e. to a combination of all circumstances, which vary from period to period and, since the world is not economically coherent, from region to region.

I turn now to the decisive question: What are the characteristics of and reasons for the larger movements in the agricultural price level and in the terms of commodity trade, in so far as they are not caused by monetary influence? We can best appreciate the origin and disappearance of disequilibrium by imagining that supply and demand of production and consumption of foodstuffs are constantly racing each other. If demand gets ahead of supply, prices rise. If supply overtakes demand, surpluses are built up and prices fall. One need only look at the supply-shifter and demand-shifter more closely to recognize that in food and agriculture longer-term disequilibrium is hard to avoid.

Demand-shifter. The following factors do shift demand in the long run:

1. The growth in population.
2. The real income per head of population.
3. The elasticity of the quantitative demand in relation to income.

High rates of increase in these factors bring about a rapid and steadily increasing demand for foodstuffs. If, on the other hand, the population is growing only slowly, real income rising only very little, and the income elasticity of consumption low, as the result of extensive saturation, the demand increases only slowly.

Supply-shifter. The conventional means of increasing production are:

1. The expansion of the area under cultivation.
2. The increase in yield per unit of area.
3. The raising of animal production by increasing the number of livestock, by raising productivity per head and by improving the conversion of fodder.
4. Decreasing losses in harvesting and utilization of production.

As long as it is economically possible to bring new land under cultivation, the expansion of production by this means does not present any great difficulties. In North America and Europe this potential has been exhausted. The other ways of increasing production demand greater inputs of industrial production means (more capital) and more skill from the farmers. Great technical advances in the provision of cheaper fertilizer and insecticides, in plant and animal breeding, in better machines, and progress in the extension and application of modern production methods, and improved knowledge and skill in farm management—all these advances are increasing food production in many regions of the world. At the same time, human labour and animal power have been replaced by machinery. Thus, productivity per man has been increased, and areas have been released for food production. Of great importance in this respect are two considerations. First, increase in production has varied from period to period. It is often adversely affected by wars and political upheavals. In longer periods of peace, however, agricultural production gets into its stride again. The introduction and increased application of technical and organizational advances have become of paramount importance in this process. Second, up to the present not all parts of the world have been able to exploit the possibilities for increasing production at the same rate. The food supply in the less fully developed and densely populated countries is clearly too small and is even now increasing only slowly. For the developed countries and the world markets, however, the thesis formulated by W. Abel is valid—that 'the agricultural crises in the 19th and 20th centuries are rooted in the advances in production which in the industrial or capitalistic age strove to outstrip the increase in population, considerable as that was'.¹

The effectiveness of the price mechanism in food and agriculture. No one should be surprised that supply and demand do not square with each other, since in food and agriculture the development of

¹ W. Abel, *Agrarpolitik*, 2nd edn., Göttingen, 1958, p. 417.

production on the one hand and of consumption on the other are dependent on such vastly different factors. The heavy price fluctuations which result from this, cannot be wholly attributed to events on the side of demand or supply alone; they cannot be explained by a single cause. There are always changes in the relation between supply and demand, i.e. changes on both sides, which we must take into consideration. Prices are supposed to bring about an equilibrium between supply and demand. They do this satisfactorily so long as supply and demand react elastically to changes in price. But even for individual products the price mechanism does not function perfectly; this is particularly true of cases which display inelastic demand or cobweb fluctuations. For the *total* production and the *total* consumption of food-stuffs, the price elasticity of the supply—this is mainly inelastic downwards but not so upwards—and the price elasticity of demand are small and at least subject to considerable time-lags. Therefore, on free markets there can be wild fluctuations of price. Periods of scarcity and, even more so, periods of surplus can last for some time. Willard W. Cochrane of Minnesota has explained that 'the finest of lines separates the conditions of too much and too little in agriculture'.¹ He has also characterized the efforts of individual farmers to increase their production, efforts which result in depressing market prices:

Why in the face of falling farm prices and declining gross incomes do farmers persist in adopting new technologies, and thus expanding output? . . . In the main, the answer is to be found in the market organization of agriculture. . . . The farmer is a price taker; . . . because he is such a small part of the total market that he can have no perceptible influence on the market or on the market price. . . . *But the widespread adoption of this new technology changes the entire situation. Total output is now increased, and this increase in the supply of the commodity lowers the price of that commodity.* And where the price elasticity of demand at the farm level is less than -1.0 (i.e., demand is inelastic), as is commonly the case in agriculture, gross returns to the producers must fall. . . . *To stay even with the world these average farmers are forced to adopt the new technology.* The average farmer is on a treadmill with respects to technological advance.²

One could not describe the situation in the Western world more aptly. In other parts of the world the position is different; in some parts malnutrition and poverty are still predominant.

¹ Willard W. Cochrane, *Farm-Prices—Myth and Reality*, Minneapolis, 1958, p. 54.

² *Ibid.*, pp. 94–96.

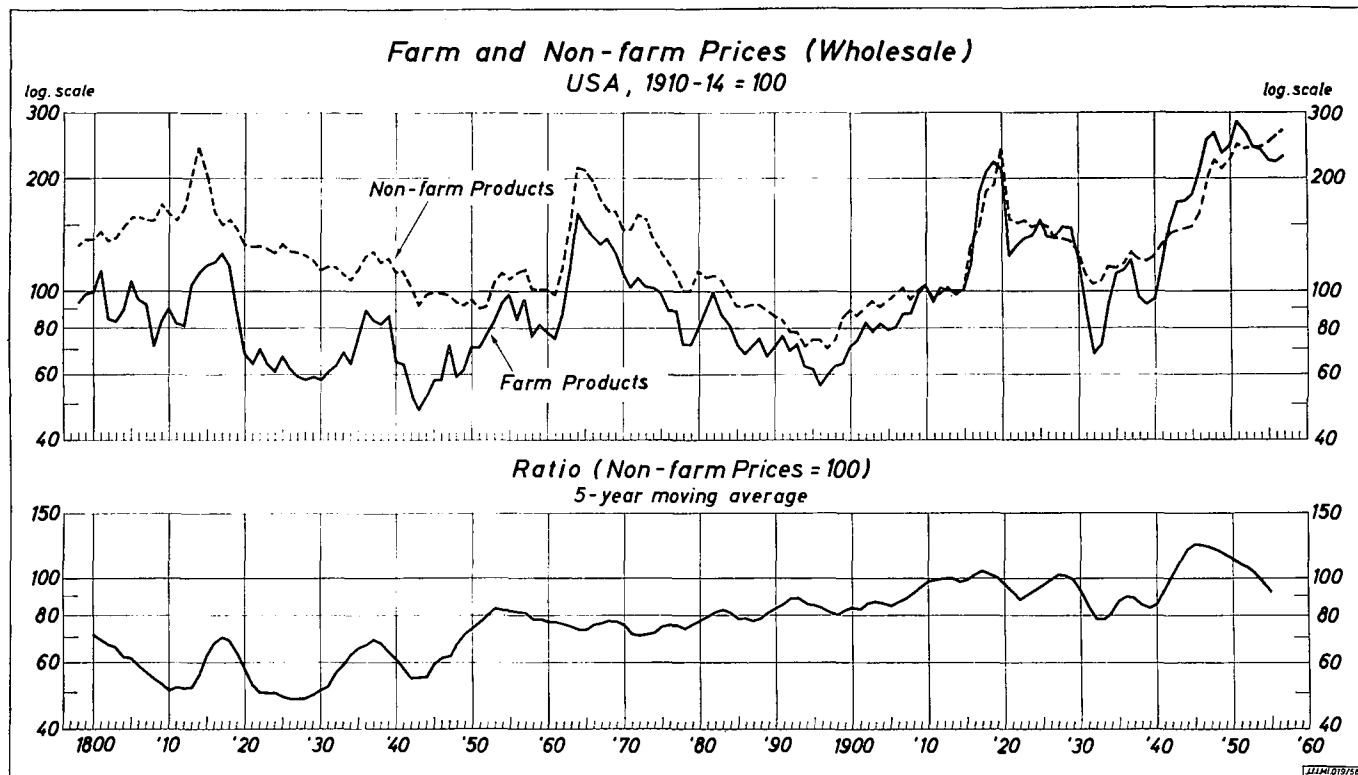


DIAGRAM I

The Outlook for Farm Prices

At present, most of the authors in areas with surpluses expect this price depressing situation to continue for the next ten or twenty years. Although I am optimistic about the possibilities for increasing world agricultural production, I would not venture a prognosis on a global scale. The future food situation in many parts of Asia seems to me largely unsettled, especially with regard to the increase in population. This concerns half the world's population. This increasing population will not only demand more food but continuing industrialization will strengthen the desire for an improved diet as real income per head increases. At present, the inadequate food supply in many parts of Asia does not prevent surpluses in other parts of the world from depressing prices on the world market. Who knows how long such a situation will last?

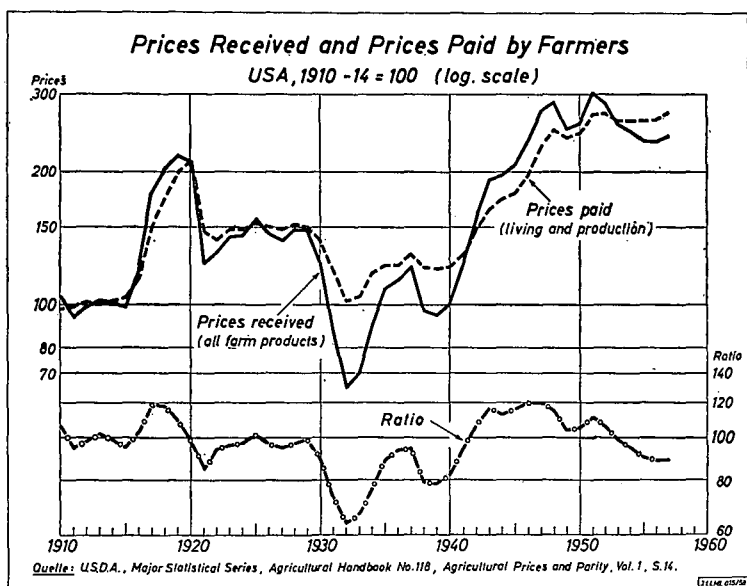


DIAGRAM 2

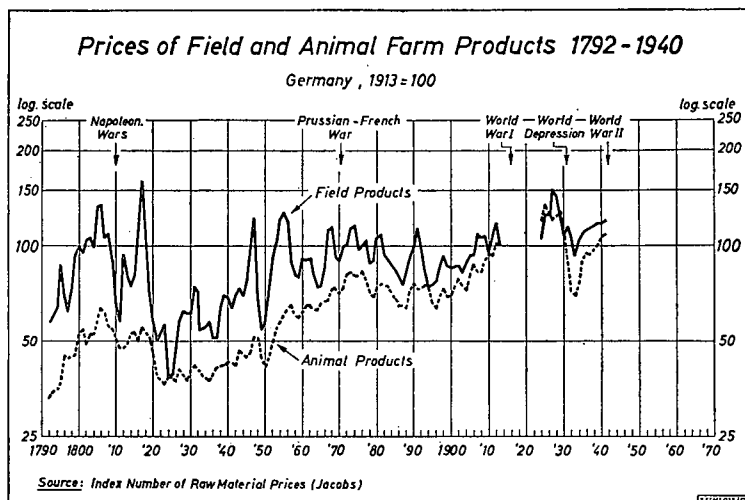


DIAGRAM 3

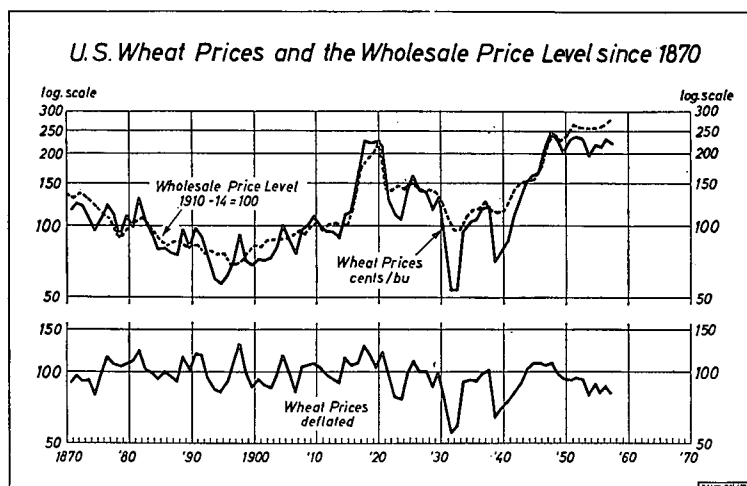


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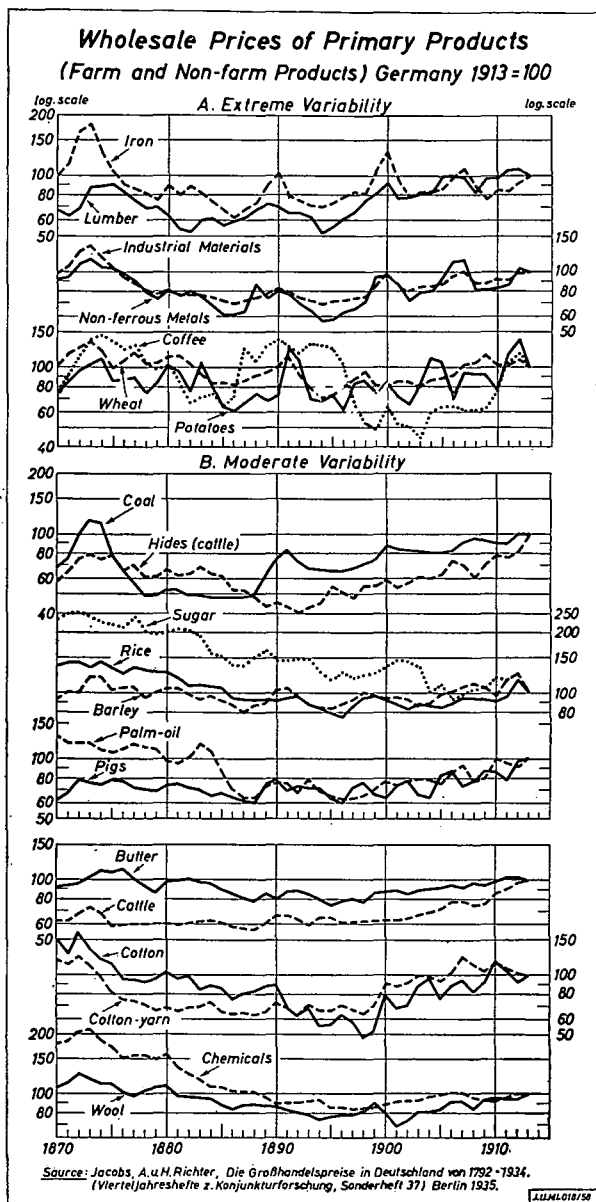


DIAGRAM 5

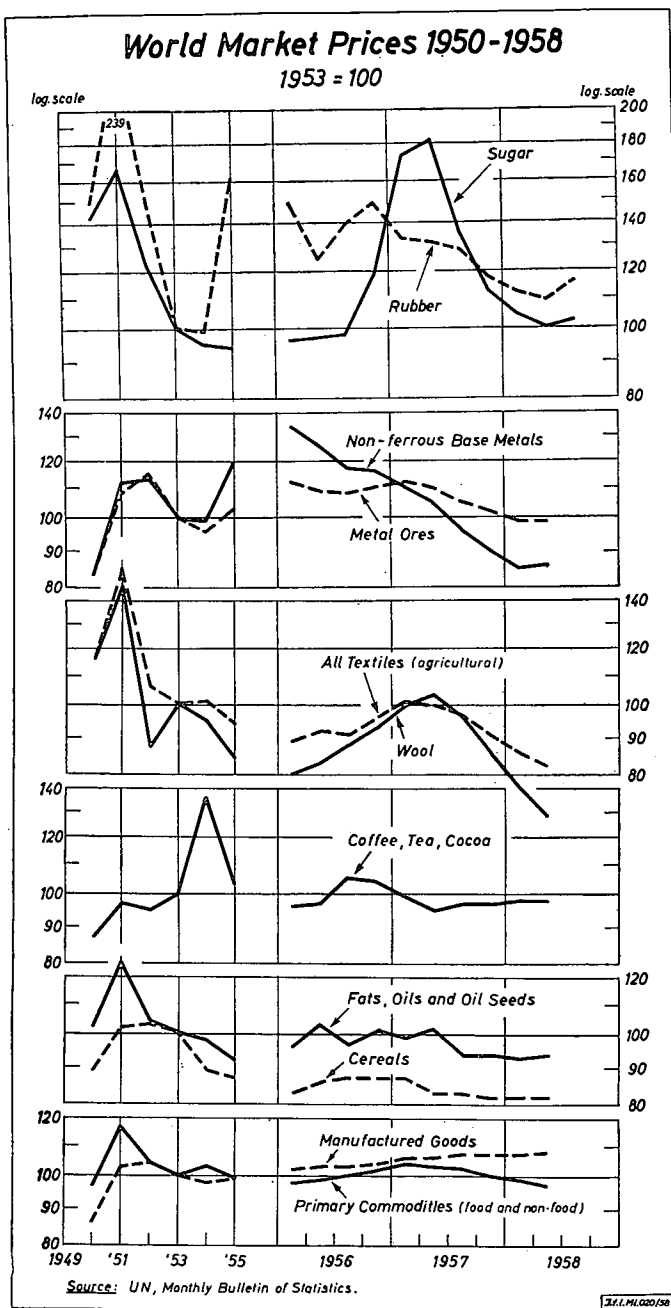


DIAGRAM 6

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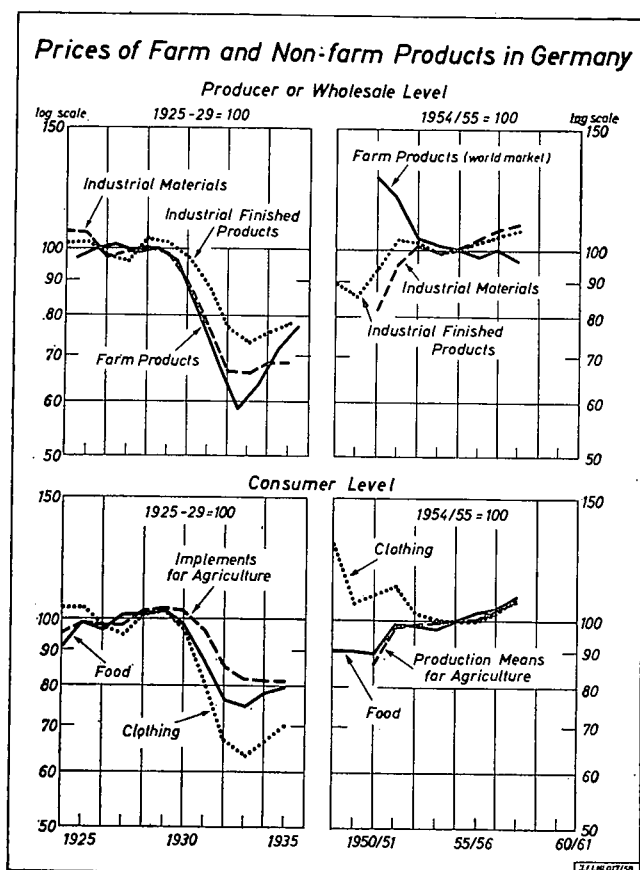


DIAGRAM 7

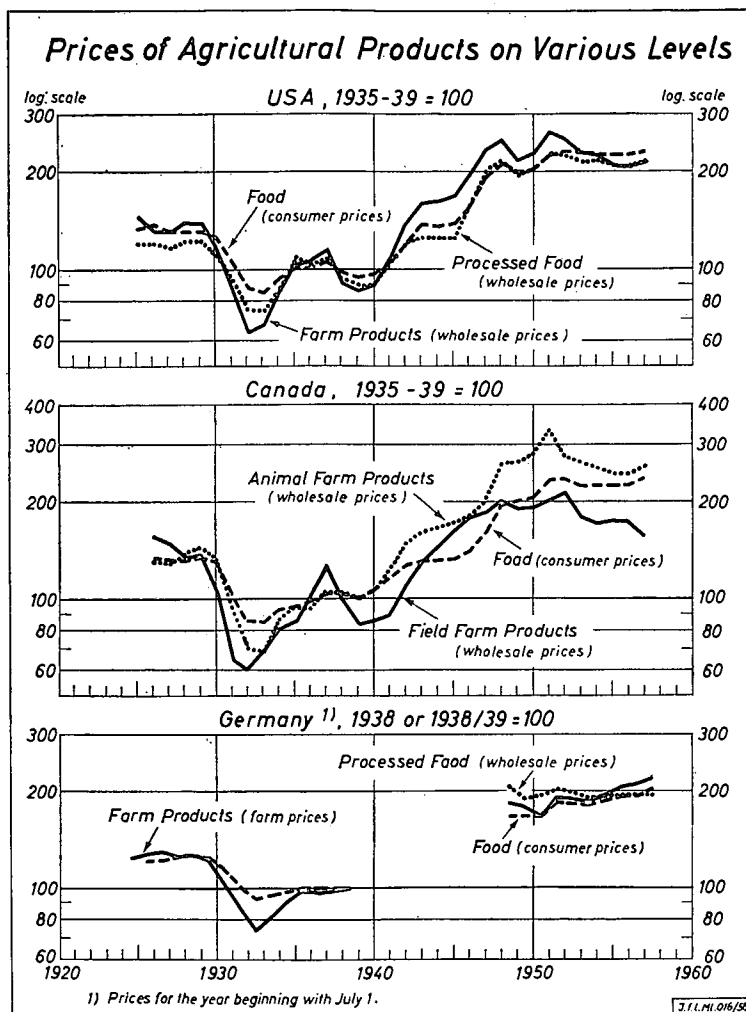


DIAGRAM 8

J. R. BELLERBY, *Institute for Research in Agricultural Economics,
University of Oxford, England*

We have just listened to an address filled with fact and inference, and I must confess that I have difficulty in discovering any point in it with which I could seriously disagree. In view of the comprehensiveness of the treatment it seems to me that the most suitable way of adding to the discussion will be to give any further available quantitative or other information bearing on certain of the problems which Professor Hanau has examined, especially those which he considers to be so far unresolved.

One of his cardinal findings is that the search for a long-term trend in the terms of trade between agriculture and industry leads to no clear result. He does not rule out the possibility of there having been such a trend, but finds no clear evidence of it. And he observes that one difficulty in obtaining evidence, at present, is the lack of an effective means of measuring the trend. He says, 'margins or transportation costs can alter the really effective terms in such a way that the terms, expressed, for example, in wholesale price index numbers, are meaningless'. With that statement one can only agree. A comparison based on changes in farm and non-farm wholesale prices appears to be of little relevance. But in the charts attached to his paper, Professor Hanau reproduces an index that seems much more suited to the purpose. In Diagram 2 he gives a graph of the *ratio* of the indices of *prices received* and *prices paid* by the farmer, in the United States. This surely comes as close to perfection as possible, as an index of the terms of trade, if this is to be composed purely of relative prices. The material for a similar index is available, I believe, in Canada; and no doubt one could be constructed for a fairly representative group of countries.

I should like to suggest here that, while keeping this relative-price type of index, we can develop from it a further index which shows the effect of changes in the terms of trade more fully and exactly. (In this I realize that I have already been preceded and that the Conference's discussion has been switched at some stages to what Professor Lewis has described as the factoral terms of trade.) If we may go back to Professor Hanau's Diagram 2, we can see that a further index of the terms of trade may be based on the simple fact that if *all* the prices paid by the farmer be subtracted from *all* the prices he receives, we get net farm income. We can go on from that to obtain the net farm income per producer. And, still further, we can show the ratio between this and net income per non-farm producer.

This *ratio* may be said to reflect the outcome of the change in *two expressions* of the *terms of trade*. On the one side is the difference between all prices paid and received by farmers; on the other is the difference between all prices paid and received by non-farm producers.

In preparation for this present comment, I made an approximate index of this kind for nine countries, mainly with a view to discovering what has been the effect of changes in the terms of trade since 1938. And for a similar number of countries I have similar figures going back before 1938. Perhaps, I may briefly note the results, and then ask Professor Hanau one or two questions arising from them.

1. Over the very long period, before 1938, there appears to have been something of the nature of a norm in the indices just described. The norm seems to have been somewhere between 50 and 60 per cent. That is, this has been approximately the ratio of farm income per producer to non-farm income per producer, on the average for the countries examined.

2. Since 1938, the indexes have in general shown a considerable rise. The figures for the nine countries examined are unfortunately not representative enough to justify much more than conjecture. They refer to the United States, Canada, Italy, Japan, Denmark, Norway, Finland, the Republic of Ireland, and Turkey; they are derived from a breakdown of gross domestic product rather than net income, and forestry and fishing are included with agriculture. In eight of the nine countries they show a rise in the index, sometimes a substantial rise, from 1938 to 1954-6—the latest years for which I could get figures.

3. The largest rise was in those countries which export animal products, or are linked with the British market.

4. In the course of the three final years, 1954, 1955, and 1956, there was no perceptible trend up or down. They appear to mark a period of 'hesitation' in the post-war decline in the ratio.

5. For a tenth country, namely, the United Kingdom, for which I obtained a longer series, the ratio in 1938 was about 67 per cent.—that is, once again, the ratio of farm to non-farm income per producer. Immediately after the war, 1946, it was as high as 93 per cent. and after some fall in 1947 it continued to rise and reached a peak of 105 per cent. in 1950. Since then, the ratio has dropped back to an average of 91 per cent. in the three years 1954-6, with a low point of 86 per cent. in 1955.

6. If we combine these figures with the evidence in Professor

Hanau's Diagrams 2 and 8 it may be deduced that for a considerable number of countries the index had reached a high plateau between 1942 and 1951-2, and that the present position is appreciably below the plateau. At a guess it may be about half-way between the plateau and the pre-war level.

The issue at this moment is, therefore, will the ratio fall further? Will the pre-war level be restored?

It seems to me that Professor Hanau's analysis has a direct bearing on the answer to this question. And I would like to persuade him, if I may, to give the answer. For example, much of his analysis was devoted to showing that agriculture suffers because of a persistent tendency to produce a surplus of farm products, and that a comparatively small surplus can have far-reaching adverse effects on the prices received by farmers. Does he, then, see anything in the world situation at present which would lead him to judge that there are new factors arising—factors which will prevent the emergence of surplus, or will diminish the degree of injury to farmers which a small surplus will cause?

Another significant aspect of his approach relates to the difference in the cost structure between agriculture and industry. In a family-farm system, he says, much of the cost of production is for maintaining the farm family—and this cost is all too flexible. It can be pressed down all the way to the most meagre level of subsistence. So, when the terms of trade go against agriculture, they may remain continuously adverse. The family-farm system covers probably more than half the earth. It is certainly not a minor question, therefore, to ask Professor Hanau if he sees any likelihood of change in this particular condition, or in its consequences, in the world in general.

Finally, there is an inquiry I should like to make in regard to a point which may not be explicitly emphasized in Professor Hanau's address, namely *the ease with which people can enter agriculture*. It is commonly said that a primary cause of low income on the land is that, once in agriculture, a man has the utmost difficulty in leaving it. This is undeniably true in the sense that he cannot easily transfer to other work. But farmers do, in reality, leave the industry at a rate of about 3 per cent. per annum. They die or retire at about that rate. And if others did not crowd in upon their heels, there would very soon be a shortage of manpower. The trouble surely begins at the point of entry, and that seems to be the practical point for action if it is hoped in the long run to improve farm income.

Entry can be influenced either by increasing the size of holdings, say, on the pattern of the Swedish law of 1947, or by applying

increasingly strict tests of efficiency to those who wish to enter. As my last query, then, may I ask Professor Hanau if he would give us some thought on the progress likely to be made either in adjusting the size of farms, or in developing husbandry as a profession, with specialized training or apprenticeship as the title to entry?

R. N. PODUVAL, *Ministry of Food and Agriculture, New Delhi, India*

Professor Hanau gave a number of factors to account for the large fluctuations in agricultural or farm prices as compared with non-farm prices. I should like to add one more, and that is the flow of supplies to the market, or the pace at which surpluses of agricultural produce are marketed. In some of the under-developed countries the reaction of the farmers to a price rise is to retain more of their produce for their own consumption and to part with less, as they can then satisfy their small cash transactions by exchanging a lesser amount of their produce; so that we get a situation somewhat akin to a backward-sloping supply curve. In these countries, therefore, production cannot be strictly equated with supply and it is this pace of marketed supply which has a predominant influence on the level of prices.

Another point I would like to mention is in respect of the concept of the terms of trade. I am not considering this concept on the world level but on the national level. Here I think we have to make a distinction between the terms of trade of the agricultural sector and the terms of trade of the farmer. It is found that in under-developed countries the terms of trade of the farmer represented by the ratio of prices paid to prices received are not so sensitive as the terms of trade of the agricultural sector represented by the ratio of agricultural to industrial prices. The reason for this is obvious, namely that the farmers in the under-developed economies make only small purchases of non-farm output. With so little dependence on non-farm output fluctuations in agricultural prices result in considerably smaller fluctuations in the farmers' terms of trade than in the terms of trade represented by the ratio of agricultural to industrial prices.

L. W. WIRT, *Michigan State University, East Lansing, Michigan, U.S.A.*

Dr. Hanau refers to the effects of business fluctuation upon agriculture. This is the sort of comment which we accepted in the U.S.A. largely on the authority of T. W. Schultz and which many of us still more or less accept—namely, that agriculture gains from rises in general business activity. Some very recent work by a colleague of mine, Dale Hathaway, suggests that this is no longer true.

This work, which was presented by him as testimony before Congress about ten months ago, indicates that in the short-term business cycles since 1945 the prices which farmers have paid have advanced at least as fast as the prices which farmers have received; therefore farmers are not gaining from an upward movement in the price levels of agricultural products except in so far as they have inputs which are completely under their control. With our commercial agriculture, some 55, 60, or 65 per cent. of the inputs are purchased from outside; hence there is only a very small margin within which they have some kind of a cushion against unfavourable weather conditions or other disasters.

There are several possible hypotheses which we have not yet been able to verify. The one which we look upon as the most likely is that after a period of rising prices, and in a country in which there is a considerable amount of economic sophistication and economic literacy, those who operate and administer the prices which are charged to farmers do not normally permit these prices to lag very far, if at all, behind the prices received. The costs are no longer sticky. In developed countries with a larger degree of monopoly in sales of agricultural inputs it would be interesting to see if these same changes have occurred in the very recent past. As experience with inflation increases and as our business people have more knowledge of economic matters similar developments may occur in other countries.

A. M. KHUSRO, *University of Delhi, India*

If the experience of India is of any value to other under-developed areas, there are certain peculiarities in the behaviour of industrial and agricultural prices to be noticed. In a planned or semi-planned economy such as ours, investment undertaken by the governmental sector or the private sector obviously creates new incomes. It is usually supposed that when incomes increase the demand for food or the demand for consumption goods as such does not increase in the same proportion. We have the psychological law described by Keynes that when incomes of a society increase its consumption does not increase in the same proportion; and we also have Engels's law which says that the food demand does not increase in the same proportion as the increase in income. Nevertheless, in India during the last four or five years, as income has been rising the demand for food has been increasing at a very rapid rate and seems to have caught up very well. One suspects that the income elasticity of demand for food is very high indeed and much higher than the planners expected. This has meant that the demand for food has

risen so much as to pull up the price of food very much more than the price of industrial commodities. It follows that there are influences on the demand side itself which are raising agricultural prices much more than industrial prices. On the other hand, the supply of agricultural produce has obviously not been keeping pace with the demands of the time. As Dr. Poduval from my country has just pointed out, the usual law of supply does not seem to have been operating here in the last few years. What is happening, perhaps, is that the priorities of the farming community for industrial goods being more or less fixed, farmers need to sell less of their agricultural produce at higher prices to obtain the necessities of life in terms of industrial goods such as kerosene, and mill-made cloth. That is why there is clear evidence in this country that the supply of agricultural produce on the wholesale and on the consumer markets, has fallen off, and fallen off considerably, making our position worse—that is, making the prices of agricultural produce on the retail and wholesale markets higher than they would otherwise be. On the demand side and on the supply side we have these influences causing agricultural prices to rise much faster than industrial prices.

This seems to have had two major consequences in the last three or four years. First, national income is being redistributed somewhat in favour of the agricultural sector. This is particularly important because the agricultural sector is responsible for a large proportion of the total produce of the economy. Every shift in the distribution of national income in favour of the agricultural sector, which is largely the consuming sector and which saves little, has the effect of reducing the average propensity to save. That means a drying up of the resources for the national plan. Or to put it the other way round: the industrial-urban sector, now experiencing high food prices, is exhausting a large part of its income—and even increased income—on food; so that savings in absolute terms, and even relative to national income, are not rising adequately. I suppose that is why we have had some major planning difficulties in the last two or three years. I would suggest to this Conference and to fellow economists from abroad that this factor of relative changes in agricultural and industrial prices is of very great importance, particularly to economies such as ours which have embarked upon planned development in a serious manner.

G. P. WIBBERLEY, *Wye College, University of London, England*

I will not make any comments which come from study and thought on the details of this particular paper. Yet with two days of this

Conference gone it may be worth while to make a summary type of comment arising from the papers and discussions of yesterday and today.

My first reaction has been one of congratulation to the persons who have arranged the sequence of subjects. Many of us must have noticed how, right from the start with Professor Arthur Lewis's discussion of some basic problems, there has been a gradual unfolding of a connected, involved but relatively undisputed analysis of the shifting fortunes of agriculture, of the nature of the supply and demand for farm products and resources and the effects of these on farm and non-farm prices. This agreed analysis has explained and linked together situations in relation to agriculture from the extreme of self subsistence to the highly commercial farm structures of North America, parts of Europe and Australasia.

Economists have been criticized for presenting varied and self-cancelling analyses of the situations they have studied. It is quite amazing that in this international conference a pattern has been unfolded with a clear-cut design. No major analysis has seriously departed from analyses coming from previous speakers. We have, amongst ourselves, evolved a pattern which is clear, connected and has no major threads of dispute woven into it, no matter what particular type of national economy has been considered.

Yet this picture is tremendously complicated and the agreement covers only the analyses of what has been and what is. There is still the vast arena of possible and actual disagreement on what should be done and the order of its doing. But agreement on the analysis of the basic problem of agricultural development in national economies of many different types should make us more valuable as advisers in our home countries to those who control and direct policy. This comment is pertinent to the discussion of agricultural support measures to take place later in this Conference.

One fundamental fact is that no matter in what stage of change a national economy is, its farmers are on a form of treadmill. You will have noticed Professor Hanau's choice of this term, used by Cochran of Minnesota to describe the present position of American farmers and their terms of trade with other sectors of the American economy. Having just returned from a visit to the United States, I must say that the treadmill of their farmers seems to be rather luxuriously padded in comparison with the treadmill of some of the peasantry we have seen in India of recent days. But if the way in which farmers' own actions intensify some of their own basic problems is a form of treadmill, we should be careful not to be

disillusioned by the complexity of the analyses we have ourselves produced. Surely, in thought, we come back to the very things discussed at the beginning of this Conference by remembering that in highly developed countries, as well as in those which are climbing up in terms of improved material standards of living, agriculture has always, as it were, bled itself or been bled in order to improve the whole of the economy. If we agree about the nature of this bleeding, is not this, in itself, an important step forward?

A. HANAU (*in reply*)

I considered it a great honour to be invited to deliver a paper to this Conference. But I think it might have been a good plan to have had the second speaker from a less fully developed country. I know the shortcomings of my analysis, so I can endorse the amendments and comments my colleagues have kindly and aptly given in this stimulating discussion.

I cannot respond quickly to the far-reaching analysis of Mr. Bellerby, but we have all read his fundamental book on income. I hope he will publish a second volume with recent data from which we then can see his interesting calculations of the terms of trade. In this respect we talked of two different periods, I had in mind the long-term trend. With regard to the trend since 1938 we are in full agreement, but Mr. Bellerby's figures are much more fully elaborated than mine.

I think what Mr. Poduval said about the backward-sloping supply curve is very important. But I would like to ask how much statistical evidence there is for his conclusion. I agree entirely that farmers who buy only small amounts of industrial goods are less sensitive to the terms of trade than the farmers in North America, Australia, New Zealand, and western Europe.

I was very pleased to get the comments of Mr. Witt. I have gone through the comprehensive booklet he referred to on agricultural policy for commercial farmers in the United States. It presents, indeed, most interesting analyses by several authors, among them the very stimulating contribution of Mr. Hathaway on agriculture and business cycles. I think, however, that the observed increase of industrial prices while agricultural prices decreased in the last boom period was not only because of administered prices in industry and inflationary pressure but was also the consequence of the agricultural surpluses. If we had not had surpluses the boom period might have had a considerable influence on agricultural prices.

The most interesting report of our colleague, Mr. Poduval,

confirms my own conviction that there can be no global prescription for all parts of the world with regard to prices. Whether stabilization of price is good or not and how much there should be depends on many factors—for example, on the elasticity of demand for food, which is quite high here as Mr. Poduval has pointed out. In my paper I wanted to emphasize that some fundamental analysis is needed before we can touch upon price policies. If we apply the results of price analyses we find that different policies are appropriate for different commodities in different regions and, may be, in different situations. This is no straightforward answer but it corresponds to the very complex economic and social problem.

Now a last word on the comment of Mr. Wibberley. That we are so much in agreement has, I think, good reasons. Agricultural economics has developed very much in the last few decades. In consequence we now can draw on a basic literature in all parts of the world including publications of T. W. Schultz which have had a profound influence. But, I abstain from mentioning further names because there are so many authors who have contributed much to our present understanding. It is a matter of fact that we no longer know whether any idea stems from ourselves or from our able colleagues.