CHAPTER 1

Long-Time Movements in Agricultural Prices

The prices of most farm products are highly variable. They change from year to year, from month to month, and from day to day. Some of them change from hour to hour, and even from minute to minute. Changes also take place continuously in the relations between the prices of farm products and the prices of other products.

These changes at times appear irrational or capricious, beyond the realm of reason to explain, and beyond the power of man to control. The tides, storms, and waves of the ocean similarly appeared capricious to the early mariners. Science, however, has laid bare most of the reasons for these movements in the level of the ocean. It has been able to explain them in terms of natural forces which can be measured and predicted, if not controlled. As long ago as 1872, Lord Kelvin designed a machine that could predict tidal movements with mathematical precision for any desired time in the future. Storms are caused by more complicated forces. They can, however, be predicted several days ahead, and the length of time of prediction is steadily being lengthened.

In economics, progress has been difficult. This is partly because economics is a younger science; partly because the "constants" in economics are not so constant; and partly because the causes are more numerous and complex.

Practically all of the tidal movement of the ocean, for example, can be explained by the gravitational pulls of two heavenly bodies, the moon and the sun. Furthermore, those pulls remain constant over long periods of time. By contrast, economic forces are numerous, and their effects change over periods of time as incomes and tastes change and as production technology changes.

The relatively simple problem of predicting tidal movements is difficult enough.[1] The actual tidal movement of the ocean's surface at any particular point is determined not only by gravitational forces but also by the configuration of the coast line. At the bay of

[1] *See*, for example, the article on "Tides" in the *Encyclopedia Brittanica.*

Fundy, for example, the range of tide reaches fifty feet, while at certain islands in the Pacific it never exceeds two feet. The amplitude of the tidal movement, and its shape, therefore, has to be predicted separately for each point. In addition, storms blowing offshore or onshore affect the height of the water at the coast from hour to hour. Occasional seismic shocks create additional disturbances. Tidal predictions are only rough first approximations. The actual level of the water differs considerably from the predicted level. The tidal prediction holds only *caeteris paribus;* the physicist has to use the qualification much as the economist does.

In economics the price analyst has to take numerous forces into account, and the effects of these forces change over periods of time. The price analyst's problems, therefore, are more complicated than the physicist's tidal prediction problem. In some ways, however, they are more rewarding. Tidal forces can only be predicted; they cannot be controlled. But economic forces can be controlled, and the economist can help to show how to control them.

LONG-TIME PRICE MOVEMENTS

Agricultural price movements are caused by different forces according to the length of time involved. Long-time movements, for example, are caused by changes in population, in the technology of production, in real income per capita, etc. These forces are slow to move. Short-time movements are caused by different forces—annual variations in weather, wars, booms, and depressions. Still shorter movements are caused by still other forces.

The analysis of agricultural price movements over periods of time, therefore, can be broken down into several parts according to the length of time involved. Our analysis will begin with the broadest perspective—with price movements over long periods of one hundred years or more—and then proceed to shorter and shorter periods.

The wholesale prices of farm products in the United States are shown annually for the past 150 years in Figure 1, along with the wholesale prices of nonagricultural products.[2] This figure shows how the credit expansions associated with four major wars have thrown up four sharp peaks in agricultural and nonagricultural prices alike.

[2] Data from *1946 Agricultural Outlook Charts,* USDA, 1945, p. 10, and earlier issues.

The inflationary forces at work during World War II were far stronger than in the earlier wars, but they were kept under better control. The price peak during World War II was only about

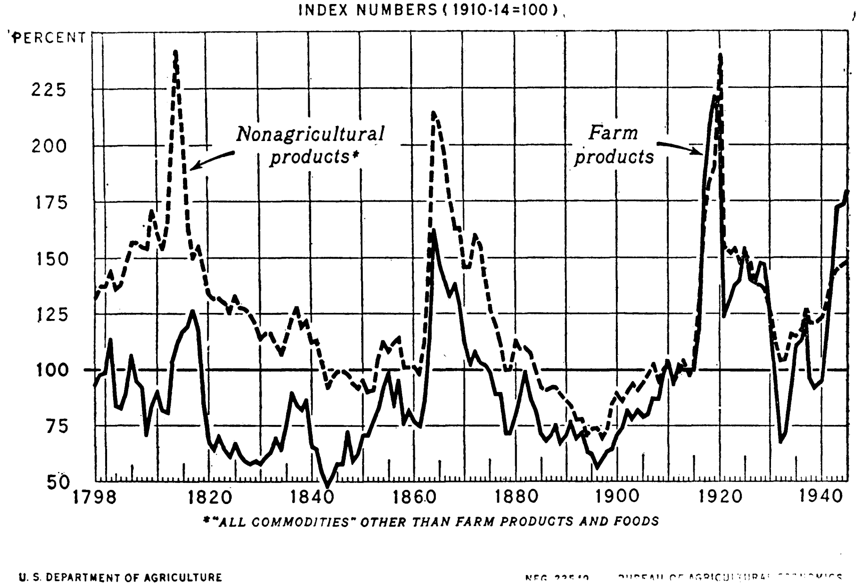

FIG. 1.—Wholesale prices of farm products and of all commodities other than farm products, United States, 1798–1945. Index numbers (1910–14 = 100).

two-thirds as high as the previous peaks. After World War II, however, prices rose about as high as after World War I. The nation apparently is not able to control inflation in peacetime as well as in wartime.

This is unfortunate. The evidence is clear that inflation benefits some but injures many, and that it is likely to be followed by a deflation that injures almost everybody who was not injured before.

Farmers benefit from inflation while the inflation is proceeding. Agricultural production changes much less from year to year than industrial production. The increase in the demand for farm products causes a greater rise in agricultural prices than in agricultural production. Many of the charges intervening between the producer and the consumer—freight charges, rents, taxes, interest, some wage rates, etc.—remained fixed, or change only slowly. If farmers were getting half the consumer's dollar originally, and the consumer's prices rose 25 per cent with no change in middleman's margins, then prices received by farmers would rise 50 per cent. Since a large share of farmers' expenses are fixed expenses—interest, taxes, etc.—farmers' net incomes increase still more than their gross incomes. During World War II, the retail prices of food rose about 40 per cent; agricultural prices (at the farm) rose about 100 per cent; gross farm income more than doubled; and net farm income nearly trebled.[3]

Other groups, who live on incomes that remain fixed in dollars and cents (such as some salary and wage groups, bond holders, those who are living on life insurance, annuities, etc.), suffer during inflation. If prices rise 25 per cent, their fixed incomes will buy only

$\frac{100}{125} = 80$ per cent as much as before.

In the deflation that usually follows inflation, the shoe goes on the other foot. The prices received by farmers fall farther than other prices. Farms bought at high prices during inflation may be lost during deflation. The receivers of fixed incomes benefit during deflation, or at least the harm they suffered during inflation is reduced. But many workers lose their jobs and have very little income to spend.

Accordingly, one important objective of national policy is to counteract both inflationary and deflationary forces, and to stabilize prices, employment, and incomes at as high a level as possible. A good deal of progress was made in controlling inflationary forces during World War II. It remains to be seen whether as much progress can be made in controlling deflationary forces after the reconversion to peace has been effected. Some progress can be expected, for the monetary and banking system is better able to withstand deflation now than formerly; and much has been learned about the role of fiscal policy—taxing and spending—during the past twenty-five years.

LONG-TIME RELATIVE RISE IN AGRICULTURAL PRICES

Figure 1 shows how the long-time trend of agricultural prices, insofar as it can be distinguished through the four upheavals just mentioned, has been level or slightly upward over the past 150 years, while the trend of nonagricultural prices has been slightly

[3] *1946 Agricultural Outlook Charts*, 1945, USDA, p. 3.

downward. The trend of agricultural prices gradually rose, relative to the trend of nonagricultural prices, up to the time of World War I.

This relative rise in agricultural prices is shown more clearly in Figure 2, where the agricultural price index each year is subtracted from the nonagricultural price index and the difference between the two is plotted as so much below or above a straight base line running across the chart. The gradual rise of agricultural prices relative to nonagricultural prices is shown most clearly by the heavy line connecting the ten-year averages.

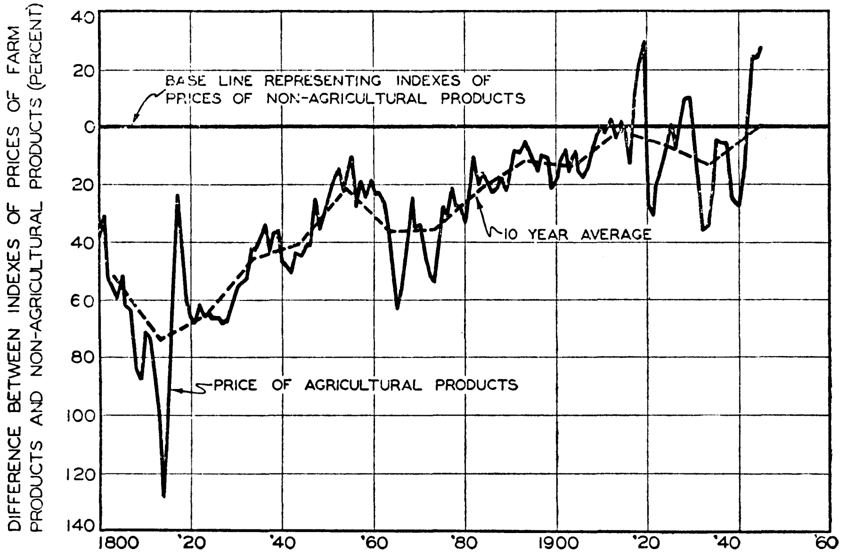

FIG. 2.—Differences between the indexes of wholesale prices of farm products and of all commodities other than farm products, United States 1800–1945. (1910–14 = 100).

The chart indicates that up to 1914, the prices of farm products were rising relative to nonagricultural prices. After 1918, however, the opposite happened; agricultural prices began to decline relative to other prices. World War II brought agricultural prices up again, but the decline may reappear after reconversion has been completely effected.

What does this mean? Does it mean that agricultural prices have been below nonagricultural prices most of the past 150 years, or that agricultural prices struggled up for 100 years before attaining equality with nonagricultural prices in 1910–14, and then relapsed?

It does not mean this. The position of the agricultural price line as a whole, relative to the position of the nonagricultural price line, has no significance in itself. There is no way of measuring the inequality of these two groups of prices—no way of measuring whether one is "above" or "below" the other—except by reference to some base point. If the price of wheat is $1 a bushel, and the price of a plow is $120, one cannot say merely by direct comparison of the two prices that one is "higher" or "lower" than another. All that can be said is that one is higher or lower than its *usual* or *normal relation* to the other.

Strictly speaking, even this statement is open to question. It implies that things do or should stay put. But in a world so full of change as ours, what is *usual* or *normal*? If the attempt is made to define it objectively as *average*, then the question arises—average over what period of years? And the further question remains—can what is usual, normal, or average for one period of years be considered so for a later period?

Even loosely speaking, then, prices or groups of prices can be compared with each other only by reference to some *usual* or *normal* relationship between them. Strictly speaking, all that can be done is to compare them with respect to their relation in some other period, without implying that the relation should be the same now as it was then.

Where two groups of prices represented by index numbers (which are expressed in terms of some base year or period) are compared, that base year or period usually is taken as the basis of the comparison of two price series. In the case of the two price series shown in Figures 1 and 2, the base is the same for both series; the average of the prices in 1910–14 is taken as 100, in each case. The two price indexes, therefore, necessarily stand at the same figure (100) in the base period. They are "equal" at that time, but only because that is their index base period when both are taken as 100.

If the same basic data were recomputed with some other year as the base, say the year 1800, the two indexes (agricultural and nonagricultural prices) would both stand at 100, i.e., be "equal," in 1800. The effect of this on the chart would be to leave the horizontal line representing nonagricultural prices where it is, but to shift the irregular line representing agricultural prices up about

40 points as a whole. Agricultural prices then would be "above" nonagricultural prices most of the years after about 1840—about 40 points above in 1910–14—and well above every year since. But this appearance would be as misleading as the appearance of Figure 2. All that either chart shows is that agricultural prices are higher or lower in relation to nonagricultural prices *than they were in whatever year or period is chosen as a base.* The comparison is only as valid as the validity of the base period for representing equality or equilibrium today.

1909–14 PRICE PARITY

The validity of the 1910–14 period as a basis for price comparisons might be merely an academic question. Actually, it is far from academic. It is a question of great practical public importance. Agricultural price control programs use the 1910–14 period as the basis for much of their commodity loans and price floors, and their operations run into billions of dollars.

The basis that these programs use is the relation between the prices received by farmers for the products they sell, and the prices they pay for the goods (and services) they buy. The index base period for the prices received by farmers is the five-year period August, 1909, through July, 1914. The index is the same index that is shown in Figures 1 and 2, only computed on a slightly different base (August, 1909–July, 1914, instead of 1910–14). The index of prices paid by farmers is different from the index of nonagricultural products shown in Figures 1 and 2. It is the index of prices of the goods and services (interest and taxes) used by farmers in production and family living. It runs back only to 1910. The base period for this index is 1910–14. (Calendar years had to be used because this index was compiled only on a calendar year basis from 1910 to 1922.)

The purpose of the compilation of these price indexes is to provide a measure for determining whether farm products have the same purchasing power as they had in the base period.

Thus if the index of prices received stood at 150 but the index of prices paid stood at 160, farm products would have less purchasing power, not more, than they had in the base period. They would have only $\frac{150 \times 100}{160} = 94$ per cent as much purchasing power per unit as they had in the base period. Their purchasing power would be 6 per cent less than equality or parity with their purchasing power in the base period.

The methods by which parity prices are computed, and the strong and weak points of parity prices, are discussed fully in Chapters 14 and 15. It is shown there that parity prices are not good bases for price control programs, nor accurate measures of the economic status of agriculture. The point of chief interest here, however, is comparatively simple. It is the fact that the validity of any measure of parity rests upon the representativeness of its base period, and that the shortcomings of the existing official measure of parity are accentuated with the passage of time, as the base period recedes farther and farther in the past and becomes less and less representative of the present.

One of the most obvious ways to improve the existing measure of parity would be to use a more recent base date than 1910–14.[4] The five years 1935–39 just before World War II, for example, would be twenty-five years closer to the present than the old 1910–14 base. The Federal Reserve Board revised the weights and content of its monthly index of industrial production in 1940, shifting it from its previous 1923–25 base to 1935–39 base. Three of the four members of a committee appointed by the president of the American Farm Economics Association in 1940 to report on the problem of an adequate base for agricultural price indexes voted in favor of adopting the 1935–39 base, but no further action on the matter has yet been taken.

CHANGES IN SUPPLY AND DEMAND

Study of Figure 2 raises several questions. Why did agricultural prices rise, relative to nonagricultural prices, from 1800 to 1920, and decline thereafter until World War II?

The long-time movements in agricultural prices are caused, like any other price movements, by changes in supply and in demand. The extent of the price movements depends upon the elasticities of supply and demand, as well as upon the extent of the changes in the supply and demand.

For analytical purposes, it is essential to keep clearly in mind

[4] For two opposing views on this proposal, *see* F. A. Pearson and K. R. Bennett, "The Case for the 1910–14 Base," and E. L. Butz, "A Base in the 1920–29 Period for Farm Price Studies," *Journal of Farm Economics*, XXI, No. 1, February, 1939, pp. 243–46 and 247–52.

the distinction between supply and production, and demand and consumption. Supply is the whole series of quantities that would be produced at a series of different prices. It is the whole supply schedule; in graphic terms, it is the whole supply curve. A change in supply means a change in the location or position of the whole curve. But production is simply the quantity produced at a specified point on the supply curve. It is the horizontal distance from zero on the quantity axis to the point where the demand and supply curves cross at a particular point in time. Production may change while supply remains constant. The same sort of thing is true of demand as distinguished from consumption.

RELATIVE SHIFTS IN SUPPLY AND DEMAND CURVES

What happened from 1800 to 1920 was this: Agricultural prices rose because the demand curve for farm products moved to the right more rapidly than the supply curve moved.

Can we measure this movement to the right in the position of the supply and demand curves?

Bluntly, we can't. We can measure the movements of the intersection points of the demand and supply curves, but we do not have enough data to enable us to measure the movements of the curves themselves. We can only measure some of the chief factors that cause the supply and demand curves to move.

CHANGES IN SUPPLY

Two or three of these factors are shown in Table 1.[5] This table shows that the farm labor force (persons on farms ten years old and over) increased steadily from 1870 to 1910, but declined, slowly at first and then more and more rapidly, from 1910 to 1940. Technological improvements, however, increased the productivity per worker, so that total production increased continuously up to 1940. The data are shown in graphic form in Figure 3.

The effects of technological changes that increase yields without requiring extra labor, on the position of the supply curve, can be measured fairly accurately. If hybrid seed corn, for example, has increased yields per acre 20 per cent, it has shifted the supply curve 20 per cent to the right.

[5] This table, Figure 3, and some of the analysis in this section are taken from John M. Brewster, "Farm Technological Advance and Total Population Growth," *Journal of Farm Economics,* XXVII, No. 3, August, 1945.

TABLE 1

CHANGE IN FARM LABOR FORCE, AGRICULTURAL PRODUCTION, FARM WORKER PRODUCTIVITY, AND TOTAL POPULATION GROWTH, 1870–1940

(1870 = 100 for all indexes)

	Farm Labor Force (Persons 10 years and over)			Agricultural Production		Productivity Per Worker		Total Population		
Year	Number*	Index	Percentage Change†	Index‡	Percentage Change†	Index	Percentage Change†	Number§	Index	Percentage Change†
1870	6,849,772	100	....	100	....	100	....	38,558,371	100	....
1880	8,584,810	125	25	152	52	122	22	50,155,783	130	30
1890	9,938,373	145	16	190	25	131	7	62,947,714	163	26
1900	10,911,998	159	10	242	27	152	16	75,994,575	197	21
1910	11,591,767	169	6	276	15	163	7	91,972,226	239	21
1920	11,448,770	167	− 1	304	10	182	12	105,710,620	274	15
1930	10,471,998	153	− 9	338	11	221	21	122,775,046	318	16
1940	9,162,574	134	−13	378	12	282	28	131,669,275	341	7

* U. S. Bureau of the Census, *Population* (Sixteenth Census of the U. S.), Series P-9, No. 11, December 8, 1944.

† From preceding decade.

‡ For 1870, three-year average centered on year indicated. For other years, five-year averages similarly centered. Data since 1909 are derived from BAE index of volume of agricultural production for sale and for consumption in the farm home, *Agricultural Statistics 1943*, USDA. Data prior to 1909 derived from the Ideal Index computed by Frederick Strauss and Louis H. Bean, Tech. Bul. No. 703, December 1940, *Gross Farm Income and Indices of Farm Production and Prices in the United States, 1869–1937*, Table 59, p. 125.

§ *U. S. Census, 1940*, Series P-44, No. 21.

(Source of entire table: John M. Brewster, "Farm Technological Advance and Total Population Growth," *Journal of Farm Economics*, XXVII, No. 3, August, 1945, p. 513.)

Technological changes that reduce the cost of producing the same yield, say 20 per cent, also can be measured; they shift the supply curve 20 per cent downward.[6] The difficulty comes in determining

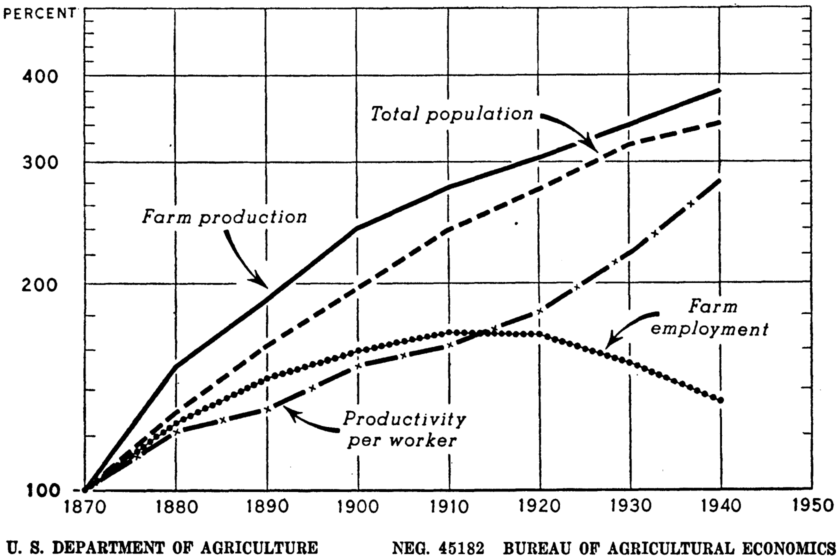

FIG. 3.—Farm production, farm employment, farm labor productivity, and total population, United States, 1870–1940. Index numbers (1870 = 100).

how much a technological change of this sort has decreased production costs. The job of adding up these effects for each product, and determining how much the supply curve for farm products as a whole has shifted, is almost impossible. Therefore, it is almost impossible to measure accurately how much the position of the supply curve for farm products has moved over the past 150 years. The relative rise in prices from 1800 to 1914 shows that up to World War I, the demand curve moved to the right faster than the supply curve did, so that the demand curve cut the supply curve at higher and higher points. It is almost impossible to say how much of the increase in production was the result of the demand curve's cutting the supply curve at a higher point, and how much was the result of the supply curve's moving to the right also. Conceivably, although not probably, the supply curve might have been very elastic and might not have moved at all.

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[6] *See* Chapter 6 and the Appendix for an elaboration of the distinction between vertical and horizontal shifts in the position of supply and demand curves.

The trend of agricultural prices since World War I has been roughly horizontal. This means that the supply curve for farm products since World War I has been moving to the right at about the same rate as the production. That rate has been nearly 1 per cent per year. Prospects for the rate of movement in the future are discussed at the end of this chapter.

CHANGES IN DEMAND

Changes in demand are also hard to measure. Some of the chief factors that determine the demand can be measured, but not all of them.

The chief factor is the rate of population growth in the United States. This rate is shown in Table 1 and Figure 3. The figure shows how the rate of growth is slowing down with the passage of time, from about 3 per cent per year in the decade of the 1870's to less than 1 per cent per year at present.

This would not necessarily mean an equal slowing down in the rate of increase in the demand for food. The per capita demand for food might be increasing, because of changes in income, in tastes, in technology, or in the composition of the population; and this increase might be great enough to offset or more than offset the declining rate of population growth. Actually, however, the trend of the per capita demand for food (insofar as it can be measured by the per capita consumption of food) has remained practically constant over the past forty years at about five pounds per day.[7]

The composition of the demand for food, however, has changed materially during the past thirty-five years. Figure 4 shows that the per capita consumption of fruits and vegetables has increased about 40 per cent since 1911, while the consumption of grain products and of potatoes has declined 30 per cent. These changes in the consumption of different foods could have resulted entirely from changes in the supplies of those foods causing the supply curves to cut the demand curves at different points from their previous points, the demand curves remaining unchanged. But the evidence points the other way. The greatest reduction in labor costs have been made since 1910 in the production of field crops such as grain and potatoes, and the least, in the case of fruits and vegetables,

[7] Harold Barger and Hans H. Landsberg, *American Agriculture, 1899–1939: A Study of Output, Employment, and Productivity.* National Bureau of Economic Research, 1942, p. 309.

dairy products and other animal products.[8] This indicates that changes in demand induced most of the changes in production (and consumption) shown in Figure 4.

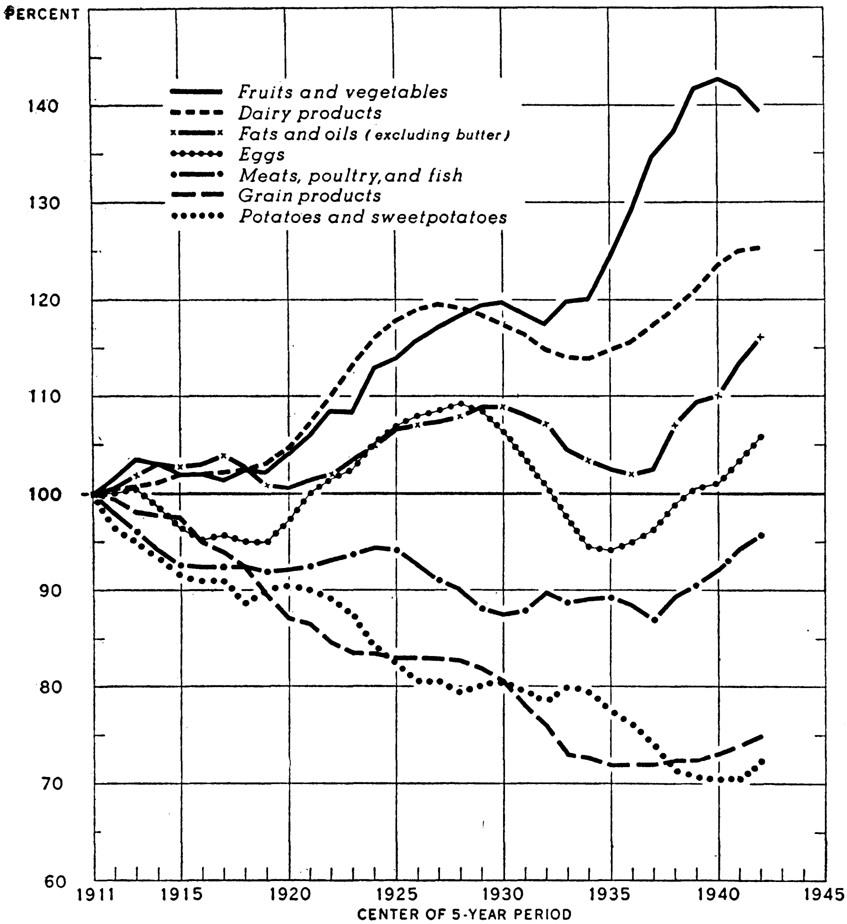

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FIG. 4.—Trends in per capita consumption of foods, by groups. Five-year moving averages (1909–13 = 100).

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[8] John A. Hopkins, *Changing Technology and Employment in Agriculture*, BAE, USDA, May, 1941, pp. 118 and 123. J. C. Schilletter, Robert B. Elwood, and Harry E. Knowlton, *Vegetables*, WPA, National Research Project, September, 1939, p. 85.

These changes in demand apparently resulted from the steady shift out of muscular occupations into sedentary ones; from nutritional education; and in some cases, from advertising.

An important factor that affects the per capita demand for food as a whole, as well as the relative demand for different foods, is income. If income changes, the demand for food changes. The relation between the two changes is examined in the next section.

LONG-TIME ELASTICITIES OF SUPPLY AND DEMAND

The effects of long-time changes in supply and demand depend upon the long-time elasticities of supply and demand as well as upon the extent of the change.

Supply: The long-time elasticity of supply of farm products is unknown. Only a very rough estimate of it can be made.

During World War I, agricultural prices more than doubled. Agricultural production, however, increased only 5 per cent. During World War II, agricultural prices nearly doubled. The total acreage in crops increased very little over the 1935–39 average, (only 1 or 2 per cent) but total agricultural production increased about 33 per cent.[9] Most of this increase resulted from other things than high prices—good weather (especially as contrasted with poor weather in 1935–39), technological progress, the large carryover of grains from earlier years, patriotism, etc. Perhaps only one-third to one-half of the increase resulted from the 100 per cent rise in prices. If so, the elasticity of supply would be only 0.1 or 0.16.

Over a longer period of years, and with other prices constant, the elasticity of agricultural supply probably would be higher than this—perhaps two or three times as high. But that would still leave it below 0.5.[10]

The elasticity of agricultural supply when prices decline is probably smaller than when prices rise. It is harder to drive land out of production by low prices than to bring it in by high prices. In cases where prices and employment are declining in other industries as well as in agriculture, for a few years at least the elasticity of supply is likely to be negative. From 1929 to 1932, while

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[9] *Agricultural Statistics,* 1944, pp. 408 and 423.

[10] Gerhard Tintner, in a paper designed to demonstrate a method of statistical analysis rather than to reach conclusions useful for policy makers, comes up with an estimate of the elasticity of agricultural supply of 6.401. But he hastens to add: "This estimate seems much too high." Gerhard Tintner, "Multiple Regression for Systems of Equations," *Econometrica,* XIV, No. 1, January, 1946, p. 36.

agricultural prices were drastically declining, the total acreage of fifty-two crops planted in the United States *increased* each year over the preceding year.[11] If other prices had not been declining also, it is probable that the acreage would have decreased, rather than increased. But how much it would have decreased, it is impossible to say. One can only estimate that the average long-time elasticity of supply must be low, probably below 0.5.

Demand: Later chapters of this book show that the short-time (year-to-year) elasticity of demand for most individual farm products (at the farm) is less than unity. The long-time demand probably is more elastic than this; people will change their consumption of different products more in one direction over a period of years than they will back and forth from year to year.

On the other hand, the demand for food as a whole undoubtedly is less elastic than the demand for any one food item. If the supply of pork decreases, for example, consumers will turn to other meats, and to other foods than meats, rather easily; but if the supply of other foods decreases too, consumers will pay high prices in an attempt to avoid having to get along with less total food. Thus the long-time elasticity of the demand for food at the farm may even be lower than the short-time elasticities of most individual farm products.

Studies of the relation between income and expenditures for food throw a little more light on this matter. The income-elasticity of food expenditures is variously estimated.[12] Schultz uses a rough average, 0.25. The sources he quotes seem to us rather to indicate a figure of about 0.4 over the income range that includes the bulk of the people in the United States. Some of the most recent data show a considerably higher elasticity than this—about 1.06 for the income range \$545–\$994, about 0.95 for the range \$545–\$3,979, and about 0.54 for the range \$3,979–\$11,941.[13] This relation is shown graphically in Figure 5.

In any case, the price-elasticity for food must be somewhat greater than this income-elasticity. Changes in income have much

[11] *Agricultural Statistics 1944,* USDA, p. 408.

[12] A dozen or more authors' estimates are referred to, for instance, in T. W. Schultz, *Agriculture in an Unstable Economy,* McGraw-Hill, 1945, pp. 65–68.

[13] Willard W. Cochrane, *High-Level Food Consumption in the United States,* BAE, USDA Misc. Pub. No. 581, p. 33. These computations are based on data from A. C. Hanson and J. Cornfield, *Spending and Saving of the Nation's Families in Wartime,* U. S. Bur. Labor Statistics Bul. 723, Washington, 1942.

the same effect on the proportion of income spent for food as changes in the level of all prices with income constant. And the effect would be greater if only the level of agricultural prices changed. Thus the price elasticity of the demand for food probably exceeds 0.4; but nobody knows for sure how much it exceeds 0.4. The elasticity may lie between 0.6 or 0.8, the figure used by the USDA a few years ago.[14] Or it may be as high as 0.9 or 1.0, the figure indicated by the most recent income studies.

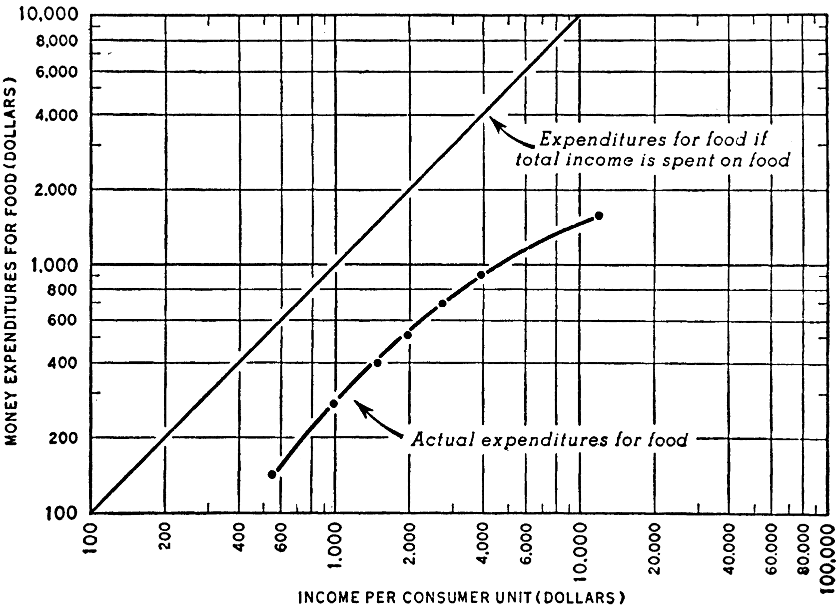

FIG. 5.—Total expenditure for food related to income, all family and single consumer units, United States, 1941. (*Source*, USDA Misc. Pub. 581, 1945, p. 34.)

This is the elasticity at the retail store. Farmers get about half of the consumer's dollar spent for food, and the marketing margin varies less in dollars and cents than retail food prices vary.[15] The elasticity of the demand for food at the farm, therefore, must be less than the elasticity at the retail store.

Finally, a considerable proportion of farm products is fiber

[14] USDA, *Report of the Interbureau Planning Committee on Distribution Programs*, December, 1941, mimeo., pp. 44 and 59.

[15] *Price Spreads Between Farmers and Consumers for Food Products, 1913–44*, BAE, USDA Misc. Pub. No. 576, 1945, pp. 22–24.

(used for clothing and other purposes), not food. If agricultural fiber becomes scarce, it is easier to replace it by nonagricultural fiber than it is to substitute other things for food if food becomes scarce. The demand for farm products, therefore, must be somewhat more elastic than the demand for food alone.

It is difficult to sum up all this in a sentence. Perhaps about the best that can be done is to say that the elasticity of the demand for food, at farm prices, probably is higher than 0.5 but lower than 1.0.[16]

PROSPECTS FOR THE FUTURE

In the light of the analysis of past agricultural prices movements given above, what are the prospects for agricultural prices over the predictable future?

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[16] This raises an interesting question. If the demand for agricultural products is inelastic, a large production brings in a smaller total income to agriculture than a small production. Technological improvements in agriculture that increase agricultural production, therefore, leave agriculture with a smaller gross income than before.

Suppose, for instance, that agricultural gross income is 10 billion dollars, and that an increase in agricultural production of 10 per cent lowers agricultural prices 15 per cent. Agricultural gross income then would fall from 10 billion to $110 \times 85 = 9.35$ billion dollars. This would be a decline of 6.5 per cent.

Would agriculture improve its position, therefore, by waging a campaign against technological improvements in agriculture?

It would of course be impossible to enforce such a program. Native Yankee ingenuity on six million farms would continue to figure out better ways of producing things. And this activity would not be limited merely to mechanical gadgets. A Pfister would still, as an individual, develop such things as hybrid seed corn, as he did during the 1920's. Agriculture would hardly try to police all its members and forcibly head off that sort of ingenuity.

Would agriculture benefit in any case, if it were possible to police six million farmers?

In the short run, "agriculture" might. "Agriculture" might retain a higher share of the national income by producing only one blade of grass instead of two. But that would not benefit individual farmers, and it would obviously harm the rest of the economy. It would not benefit individual farmers, for the birth rate in agriculture is higher than necessary to provide enough farmers to grow the food and fiber needed by the nation as a whole, and a steady stream of people must move off the farm to keep agriculture from becoming overcrowded. Increasing agriculture's share of the national income would merely slow down the emigration from agriculture and the larger share would simply be divided into smaller pieces.

If technological progress were stopped and agricultural production ceased to expand, the increase in total population in the United States would continue to increase the demand for farm products. That would increase total agricultural income, perhaps 5 per cent within ten years. But the effect would be merely to slow down the rate of movement off farms, to the point where income per farmer would remain about the same as before. The thing that keeps individual farmers' incomes at all in line with urban incomes is the movement of surplus farmers off farms. Measures that reduced or stopped this movement would defeat themselves, and leave the rest of the nation of course worse off than before.

Supply: It was shown above that most of the factors causing the recent increase in agricultural production were permanent factors. After only a slight and temporary recession, therefore, most of the increase in production will persist. Further increases are likely to take place as further improvements are made in production practices.

The supply of agricultural products is likely to continue to increase in the future, at about the same rate as it has since about 1900, and for the same reasons. By 1900 most of the farming territory in the United States was settled. Most of the increase in agricultural supply since that time has resulted from improvements in production practices, and further improvements are likely to continue to be made in the future. For some time to come, agricultural supply is likely to continue to increase at its twentieth century rate of about 1 per cent per year.

Demand: The domestic demand for farm products, however, is likely to increase less rapidly than the supply.

The chief determinant of the demand is the size of the population. The rate of population growth has been slowing down, and this slowing down is likely to continue in the future. The rate of population growth already has declined below 1 per cent per year. It already is increasing less rapidly than the supply is increasing, and the difference between the two rates of increase is likely to become greater in the future.

It is unlikely that increases in per capita income will be great enough to offset the relative decline in the rate of population growth (relative to the rate of increase of agricultural supply). This means that the long-time trend of agricultural prices in the future is likely to decline.

Before World War I, most people believed that the prices of farm products in the United States, and the prices of farm land, would continue to rise in the future relative to other products, much as they had risen in the past. This seemed the more likely since most of the farm land in the United States had been taken up by that time, and the previous rapid expansion in farming area had about reached its limits.

Events after World War I, however, rudely shook this belief. Some of these events, such as the passage of the immigration laws, could not well have been foreseen. In any case, agricultural prices by 1938 and 1939 were lower than they had been in 1909–14, in dollars and cents; and they were 25 per cent below parity.

It took another war (World War II) to bring agricultural prices up again. There is every reason to suppose that within a few years after World War II, agricultural prices will decline again toward their prewar levels. The long run outlook is for prices to decline still further.