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Long-Time Movements in Agricultural Prices

Price analysis is coming of age. It used to be an inconspicuous economic discipline, wherein empirical quantitative data fleshed out the bare bones of economic theory — a nice economic exercise, but not much more. Now it is becoming an indispensable basis for government and business operations running to billions of dollars. Policies of this order of magnitude now are adopted or rejected on the basis of technical coefficients of elasticity of demand, partial regression coefficients, derived by the use of distributed lags, inverted matrices, and simultaneous equations. Terms like these, so much Greek to many people a generation ago, are gradually intruding into their everyday language now.

The field of price analysis is of necessity breaking up into specialized parts. One of the most important and well developed of these parts is agricultural price analysis. Agricultural income remains low, and more government programs are being developed to supplement or replace the free market as the allocator of resources and incomes. These programs require more and more agricultural price and other analyses. The results of these analyses are no longer merely academic curiosities; they are immediately put to work as bases for huge programs, often with a blithe disregard of their limitations that causes palpitations of the heart among their originators.

Enormous quantities of data are becoming available for analysis. Esoteric analytical tools of a high degree of sophistication are being developed to deal with them, and the electronic computer has become not merely a luxury but a necessity. The brain reels in the attempt to keep ahead of the flood of new data, concepts, and equipment.

But, brain-reeling or not, progress rolls on. New concepts and symbols arise and rapidly become institutionalized, even in hierarchies. This is illustrated by the following tongue-in-cheek classification of academic jargon and research tools, based originally on an article which classified social status into two classes — upper class, denoted by U, and lower class, denoted by non-U:

> *Symbol* is U (i.e. correct, proper, legitimate, appropriate); *word* is non-U. *Variable, role,* and *interaction* are U. So are *model,* especially *equilibrium model, matrix,* and *cell* (*cells in a matrix* is exceedingly U). *Empirical* is U, as in *empirically oriented* . . . . *Process* is as U as it can be . . . . *Quantitative* is U, as against *qualitative* non-U . . . . U articles feature *correlations. Mathematics and statistics* are U . . . . *Game theory* is ultra-U in U circles.[1]

One recent technical bulletin in the field of price analysis,[2] half an inch thick and including several tables with more than 700 coefficients each, carried out to 5 decimal places, has become a best seller among price analysts and policy makers. One of the coefficients in one of these tables, showing that the demand for turkeys is elastic (— 1.4) became the basis for recommending to the turkey producers that they do not seek to reduce turkey production, since with an elastic demand that would reduce their total income. Meanwhile, a program to reduce corn and other feed grains production goes into effect, where the demand is inelastic (— 0.5 for corn) so that reduction increases total income.

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 cause 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

[1] Arnold A. Rogow, "A Short Note on U and Non-U in Political Science," *Western Polit. Quart.* Vol. 13, No. 4, Dec., 1960.

[2] G. E. Brandow, "Interrelations Among Demands for Farm Products and Implications for Control of Market Supply," Pa. State Univ. Agr. Bul. 680, Aug., 1961.

of one hundred years or more — and then proceed to shorter and shorter periods.

The wholesale prices of farm products in the United States annually since 1800 are shown in Figure 1.1, along with the wholesale prices of nonagricultural products and the ratio of farm to nonfarm products. This graph shows how the credit expansions associated with four major wars threw up four sharp peaks in agricultural and nonagricultural prices alike.

Figure 1.1 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 for more than 150 years, while the trend of nonagricultural prices has been slightly 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 in the lower section of Figure 1.1, where the agricultural price index each year is divided by the nonagricultural price index and the ratio between the two is plotted as so much below or above a straight base line running across the chart.

The chart indicates that up to 1920, the prices of farm products were rising relative to nonagricultural prices. After 1920, however,

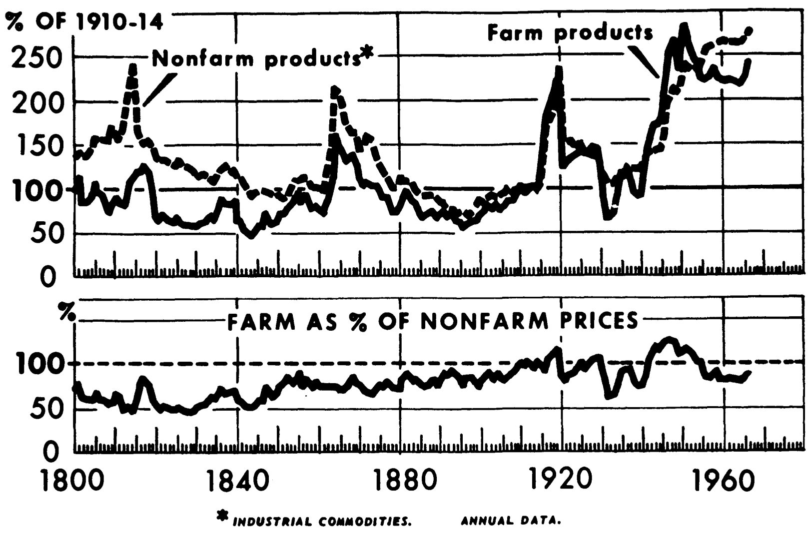

Fig. 1.1 — Wholesale prices of farm products and of industrial commodities, United States, 1800–1967, and ratio of farm to nonfarm prices. Index numbers: 1910–14 = 100.

the opposite happened; agricultural prices began to decline relative to other prices. World War II brought agricultural prices up again, but only briefly. Since 1950 they have been declining.

What does this mean? Does it mean that agricultural prices have been below nonagricultural prices most of the past 160 years, or that agricultural prices struggled up for 100 years before attaining equality with nonagricultural prices in 1910–14, and then climbed above nonagricultural prices during the 1940's but have since fallen below nonagricultural prices again?

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 $2 a bushel, and the price of a plow is $400, 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 Figure 1.1, the base period 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 the lower part of Figure 1.1. 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.

Relative Shifts in Supply and Demand Curves

Study of Figure 1.1 raises several questions. Why did agricultural prices rise, relative to nonagricultural prices, from 1800 to 1920, decline thereafter until World War II, and then rise and fall again?

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 the distinction between supply and production, and demand and consumption. Supply is the whole series of quantities that would be offered for sale at 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.

What happened after 1800 was simply this: Agricultural prices rose because the demand curve for farm products moved to the right more rapidly than the supply curve moved. But after 1950,

TABLE 1.1
INDEX NUMBERS OF FARM OUTPUT, CROP PRODUCTION PER ACRE, AND POPULATION, UNITED STATES, 1950–67

Year	Population 1950 = 100	Farm Output 1950 = 100	Crop Production per Acre, 1950 = 100
1950	100	100	100
1951	102	103	101
1952	103	107	107
1953	105	108	100
1954	107	108	104
1955	109	112	108
1956	111	113	110
1957	113	110	111
1958	115	119	126
1959	117	120	122
1960	119	123	130
1961	121	124	133
1962	122	126	136
1963	124	130	142
1964	126	130	137
1965	128	134	145
1966	129	131	143
1967†	130	137	145

* Source: *Handbook of Agricultural Charts*, USDA, Agr. Handbook 348, Oct., 1967, pp. 9, 26.
† Preliminary.

the supply curve moved to the right more rapidly than the demand curve moved.

It is difficult for economists to measure the movements of these curves directly, much as physicists cannot see and measure directly the movement of an electron. But physicists can see and measure the path an electron makes in a cloud or bubble chamber, and economists can trace the movements of the intersection points of demand and supply curves, and measure the chief factors that cause the curves to move.

Table 1.1 and Figure 1.2 show that United States farm output and total United States population increased at about the same rate from 1950 to 1957, but that after 1957 output rose to about 4 per cent higher than population. By 1967 it was 7 per cent higher than population.

The rapid increase in farm output after 1950, especially marked after 1957, did not result from an increase in acreage. Total acreage in the United States remained practically constant. The increase in farm output resulted almost entirely from the rapid adoption of new technology in agricultural production. This increased yields

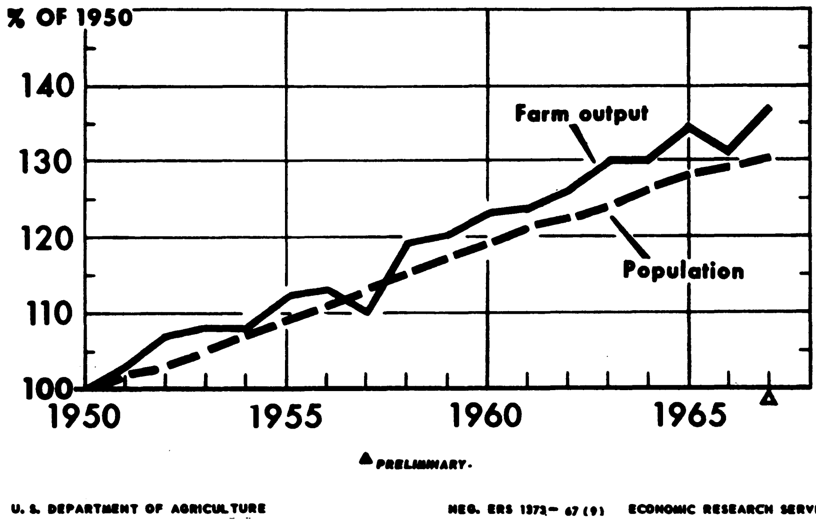

Fig. 1.2 — United States population and farm output, annually, 1950–67.

per acre dramatically; from 1950 to 1967, crop production per acre increased 45 per cent.[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.

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.[4] The difficulty comes in determining 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

[3] "Handbook of Agricultural Charts," USDA Agr. Handbook No. 348, Oct., 1967, p. 9.

[4] See Chapter 7 and Appendix *A* for an elaboration of the distinction between vertical and horizontal shifts in the position of supply and demand curves.

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.

The trend of agricultural prices between World Wars I and II declined; we deduce from this that the supply curve moved to the right faster than the demand curve. The trend of prices then rose rapidly during World War II, because of the rapid increase in demand. After the war, agricultural prices declined again; they reached a lower point relative to nonagricultural prices than the level reached in 1910–14.

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.

The chief factor affecting the demand for farm products is the rate of population growth in the United States.

Population in the United States used to grow at such a steady rate that up to about 1920, forecasts of population growth up to the year 2,000 were made with considerable confidence.[5] One such forecast is marked A in Figure 1.3.

After 1920, however, immigration decreased, birth rates decreased, and the rate of population growth began to slow down. Population experts then began to revise their estimates downward. The downward decline in the rate of growth accelerated during the 1930's, to about 0.7 per cent per year. Projections were made then by responsible population experts that the decline in the rate of growth would continue until the population would level out at about 140 million by 1965, and actually begin to decline thereafter. This projection is shown by the curve marked C in Figure 1.3. Comparisons were made with the logistic curve shown in the lower part of the chart. O. E. Baker of the USDA, and others made many speeches about the dismal prospect for the United States and especially for United States agriculture.

These projections might well have been borne out if the depression conditions of the 1930's had continued. But the life of the forecaster is hard. In actuality, World War II and the prosperity that came with it reversed the decline in the birth rate and forced the experts to revise their projections upward. At first they merely raised the point at which the population would level out and post-

[5] J. S. Davis, "Implications of Prospective United States Population Growth in the 1960's," *Milbank Memorial Fund Quarterly*, Vol. 2, April, 1961.

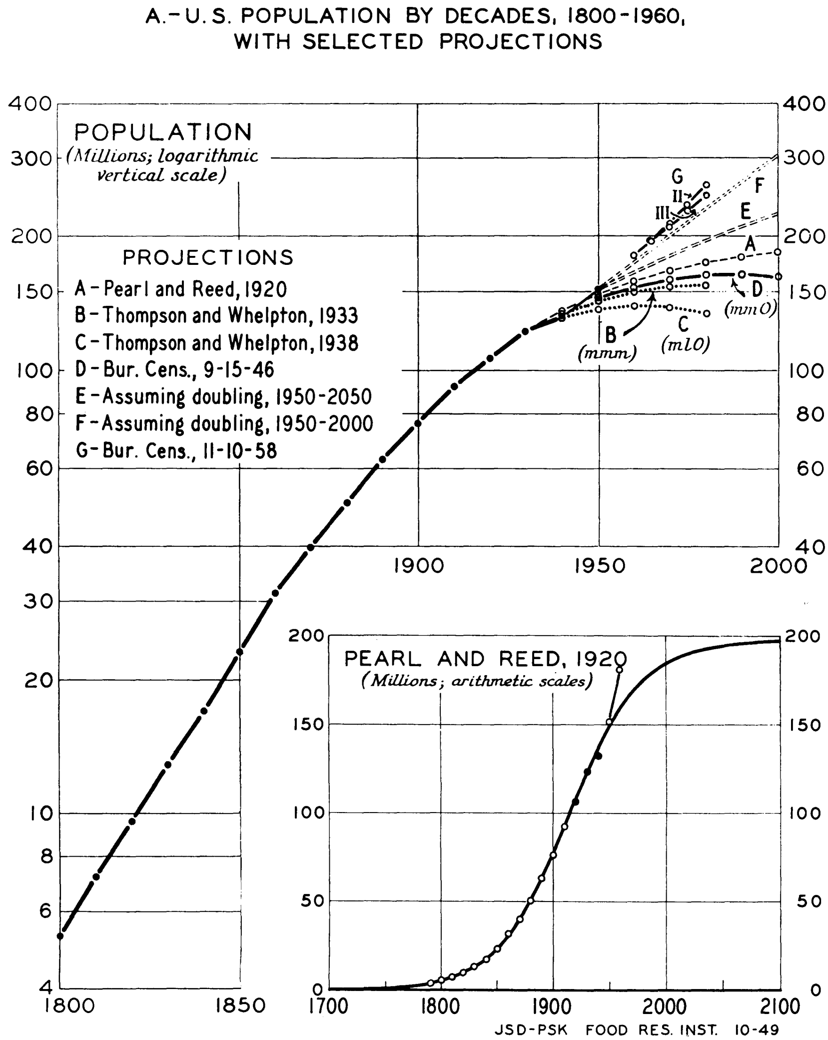

Fig. 1.3 — United States population by decades, 1800–1960. (Source: J. S. Davis in **Milbank Memorial Fund Quart.,** Vol. 2, Apr., 1961).

poned the date about 100 years. Some of these more recent projections are shown in the upper part of the chart. They also turned out to be too low. The actual growth by 1950 and 1960, at the rate of about 1.8 per cent per year, is shown by the short straight line in the lower part of the chart.

Relation Between Income and Food Consumption

The relation between population and food consumption, other things (age distribution, income, etc.) being equal, is roughly 1 to 1.

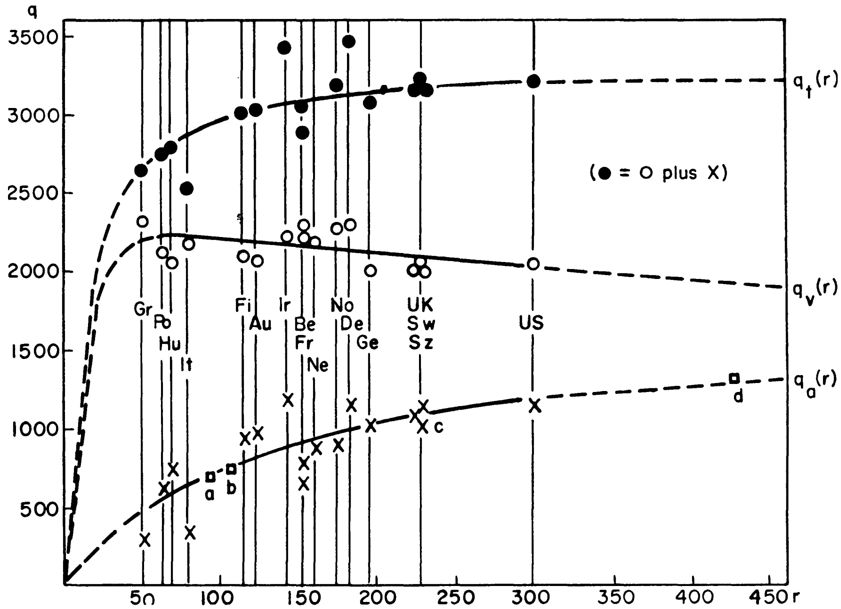

Fig. 1.4 — Relation between income and food consumption (measured by calorie intake) by nations. Countries are identified as follows: Gr = Greece, Po = Poland, Hu = Hungary, It = Italy, Fi = Finland, Au = Austria, Ir = Ireland, Be = Belgium, Fr = France, Ne = Netherlands, No = Norway, De = Denmark, Ge = Germany, UK = United Kingdom, Sw = Switzerland, and US = United States. Special points in the diagram are labeled as follows: **a** = farm and forestry workers; **b** = small farmers; **c** = industrial workers and low grade employees; and **d** = middle class.

Ten per cent more people demand 10 per cent more food. But the relation between income and food consumption — the income elasticity of the demand for food — is much less than 1 to 1. An increase of 10 per cent in income results in much less than a 10 per cent increase in food consumption.

This income elasticity of the demand for food can be measured by observing either the change in the *consumption* of food with a given change in income, or the change in the *expenditures* for food.

The relation between income and food consumption (measured by calorie intake) by nations is shown in Figure 1.4.[6] The curve in the lower part of the chart shows that the consumption of animal foods (meat, milk, etc.) increases with income, although at a de-

[6] L. Jureen, "Long-Term Trends in Food Consumption: A Multi-Country Study," *Econometrica,* Vol. 24, No. 1, Jan., 1956, pp. 1–22. The curves in Figure 1.4 are based on data before World War II. Curves based on 1949–51 data are closely similar.

clining rate. The curve in the middle shows that the consumption of other foods rises to a peak at the low-income end of the scale, and then *declines* slightly with further increases in income. The curve at the top, representing the sum of animal and other foods, runs almost horizontal from the middle of the chart to the right-hand end; that is, total food consumption is almost unaffected by income above about 3,000 calories (the level in the United States); the income elasticity of food consumption above that level is almost as low as zero.

The income elasticity of the demand for one important food, meat, in the United States is shown in terms of quantities at three different times (1942, 1948, and 1955) in Figure 1.5. It is interesting to observe from this figure that the income-quantity elasticity of the demand for beef remained roughly constant over the years shown (the curve for 1955 is higher than the others, but it retains about the same slope), but for pork it changed from positive to negative from 1942 to 1955. It would be interesting to observe what changes have taken place in the years since 1955, but the 1955 data are the most recent available. They were obtained from a large and expensive United States survey of food consumption conducted in 1955 which was repeated in 1965, but the analyses of the 1965 data are not all published yet.

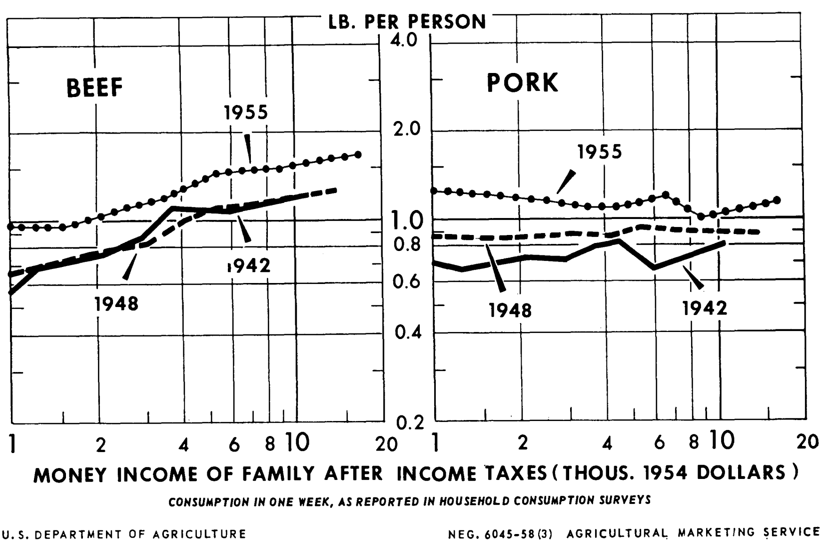

Fig. 1.5 — Urban per capita consumption of beef and pork as related to income in 3 specific years, 1942, 1948, and 1955.

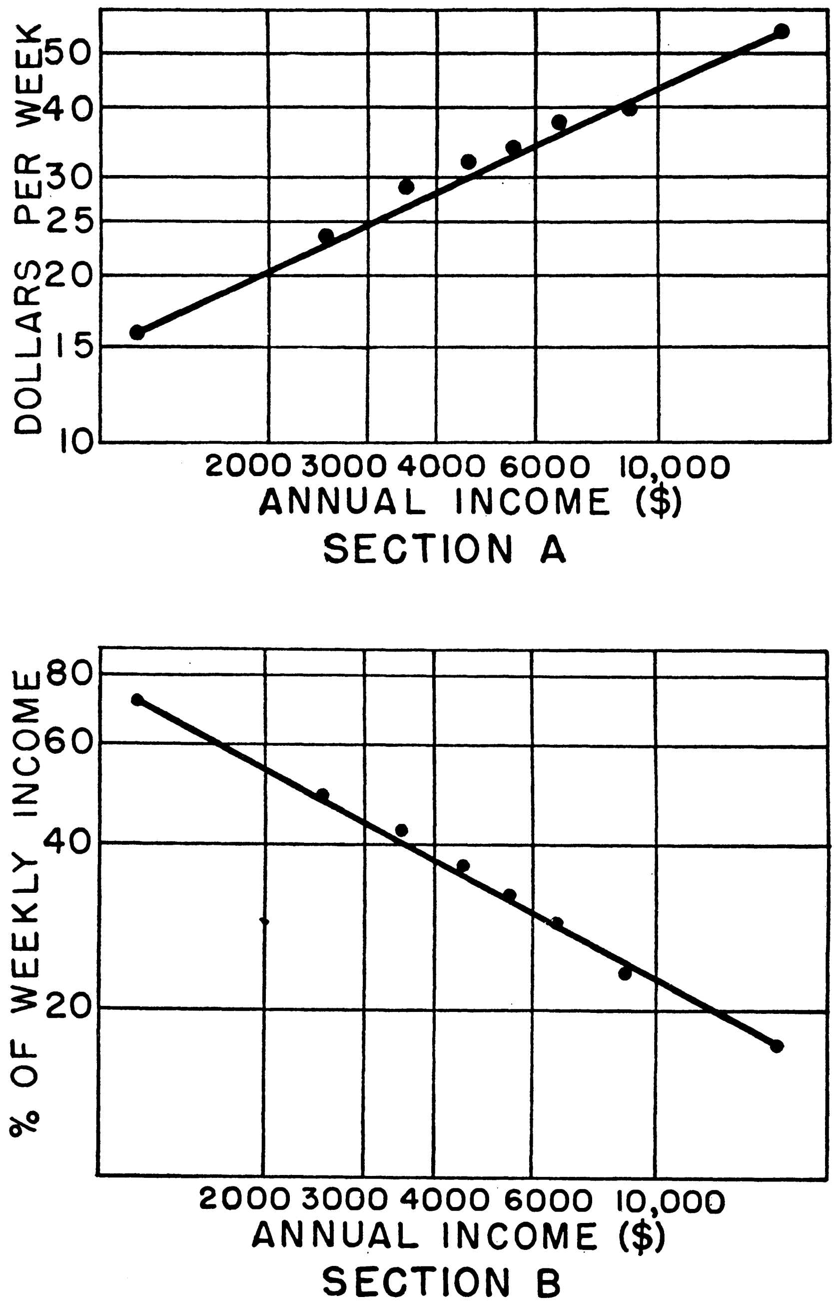

Fig. 1.6 — Weekly family food expense, April–June, 1955, by income groups: Section **A** in dollars; Section **B** as per cent of income.

Income Elasticity of Food Expenditures

The income elasticity of expenditures for food, measured in money, is higher than the income elasticity of the consumption of food measured in physical units (pounds, calories, etc.). The elasticity is less than 1 to 1 (it is therefore called "inelastic") but it is some distance above zero. The inelasticity of the income-food expenditure curve was first demonstrated by Ernst Engel in Belgium in 1895; it is referred to now as "Engel's Law."

Engel's work showed that high-income groups spent more money per capita for food than low-income groups; but the high-income groups spent a smaller *proportion* of their incomes for food than the low-income groups. A number of statistical studies since Engel's time have revealed similar relations between income and expenditures for food in other countries.

An income-food expenditure curve for urban consumers in the United States, based on the data given in Table 1.2, is shown in Figure 1.6. The upper part of the chart (Section A) shows that high-income urban groups spend more money for food per family than low-income groups. The straight line drawn through the dots shows that, on the average, a family with 1 per cent more income than another did not spend 1 per cent more money for food; it spent only 0.44 per cent more. The income elasticity of family expenditures for food, then, was 0.44.

The lower part of Figure 1.6 (Section B) shows that, although high-income groups spend more money for food per family than low-income groups, what they spend is a smaller percentage of their incomes. The general conclusion is this: The bigger the family income, the smaller is the percentage of the income that is spent on food.

The percentage spent on food per family by the high-income groups would be still lower than it is, were it not for the fact that families in the high-income groups are larger than families in the low-income groups, as Table 1.2 shows. The average family size of the highest income group ($10,000 and over) is 3.80 persons; this is larger than the size of the lowest income group family, 2.88 persons. It used to be said that "the rich get rich and the poor get children." This does not appear to be borne out by Table 1.2. The high-income groups have large families, however, not only because high incomes are conducive to fertility, but also because income and family size both increase with the passage of time. Normally a young couple begin married life at the bottom of the ladder with a small income and no children. Bigger pay checks and children come along together

TABLE 1.2
MONEY VALUE OF FOOD USED PER HOUSEKEEPING HOUSEHOLD PER WEEK, SPRING, 1965, UNITED STATES

Urbanization and 1964 Money Income After Taxes	Household Size*	All Food	Money Value of Food Used at Home			Expense for Meals and Snacks Away From Home
			All†	Bought	Home produced	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(*dollars*)	(*persons*)	(*dollars*)	(*dollars*)	(*dollars*)	(*dollars*)	(*dollars*)
All urbanizations						
All households ‡	3.29	35.01	28.91	26.95	1.27	6.11
Under 3,000	2.57	19.62	17.82	15.10	1.79	1.80
3,000–4,999	3.39	30.20	26.23	23.91	1.60	3.98
5,000–6,999	3.59	37.48	31.52	29.71	1.18	5.96
7,000–9,999	3.60	43.09	34.79	33.45	.78	8.30
10,000 and over	3.63	54.16	40.01	38.42	.98	14.15
Urban						
All households ‡	3.16	35.51	28.74	27.83	.31	6.77
Under 3,000	2.26	18.39	16.58	15.39	.36	1.81
3,000–4,999	3.19	28.77	24.60	23.79	.26	4.17
5,000–6,999	3.44	37.20	30.93	30.02	.32	6.27
7,000–9,999	3.53	43.17	34.42	33.63	.26	8.75
10,000 and over	3.56	55.20	40.06	39.10	.42	15.15
Rural nonfarm						
All households ‡	3.50	33.32	28.63	25.77	1.93	4.69
Under 3,000	2.85	19.72	17.98	14.35	2.40	1.74
3,000–4,999	3.70	32.26	28.73	25.29	2.30	3.53
5,000–6,999	3.90	37.70	32.33	29.71	1.89	5.37
7,000–9,999	3.80	42.75	35.73	33.81	1.32	7.02
10,000 and over	3.83	50.83	40.06	37.81	1.35	10.77
Rural farm						
All households ‡	3.99	35.68	31.85	21.32	9.80	3.82
Under 3,000	3.81	27.76	25.82	15.43	9.73	1.94
3,000–4,999	4.00	35.19	31.42	20.76	9.97	3.77
5,000–6,999	4.16	40.20	35.84	25.36	9.71	4.36
7,000–9,999	3.95	42.65	37.08	26.83	9.41	5.57
10,000 and over	4.41	47.90	40.18	28.86	10.31	7.72

Source: *Money Value of Food Used by Households in the United States, Spring, 1965*, Food Consumption Survey, 1965–66, USDA, Sept., 1966.

* Total number of meals served from home food supplies divided by 21.

† Includes money value of food federally donated and received as gifts and pay.

‡ Includes households not classified by income.

with the passage of time. If income and family size were not positively correlated, the income elasticity of expenditures for food would be lower than the actual figure, 0.44.

The influence of family size can be removed by expressing the urban data in the form of expenditures for food per person instead of per family. When this is done, the income elasticity per person is shown to be only 0.29. For the United States as a whole, it is 0.37.[7]

The income elasticity of the *consumption* of farm-produced food measured at the farm level is much lower than the income elasticity of *expenditures* for food given above. It is about 0.12. This is the figure for food from all sources. The figure for purchased farm food, however, is about 0.24.[8]

PROSPECTS FOR THE FUTURE

Is the long-run trend of agricultural prices likely to continue upward? Or is the opposite likely to happen? Is the recent short-run decline likely to persist and develop into a new long-run trend downward? The outcome will depend on the relative speed of the increases in supply and demand.

Prospects for Demand

The effect of a further increase in per capita income on expenditures for food is likely to be less in the future than it has been in the past.

Per capita income can be expected to continue to increase in the future. But this increase is likely to have less increasing effect on per capita expenditures for food than it has had in the past. The reason for this is that the higher the income, the lower is the income elasticity of the demand for food.

This is shown in Figure 1.7 taken from a special analysis of the data collected in the 1955 Household Food Consumption Survey. Separate analyses were made for farm and nonfarm households because of differences in food consumption patterns and income levels. In each case, households were ranked by family income and divided into three classes. Within each family income class, per person consumption of food at home was related to money income per person after income taxes and to size of household. Elasticities of demand with respect to income for total food and for the principal foods were computed as a measure of the relationship.

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[7] See the fifth and eighth lines up from the bottom of Table 915, M. C. Burk, "Some Analyses of Income-Food Relationships," *Jour. Amer. Stat. Assn.*, Vol. 53, Dec., 1958, p. 915.

[8] Burk, *op. cit.*, p. 915.

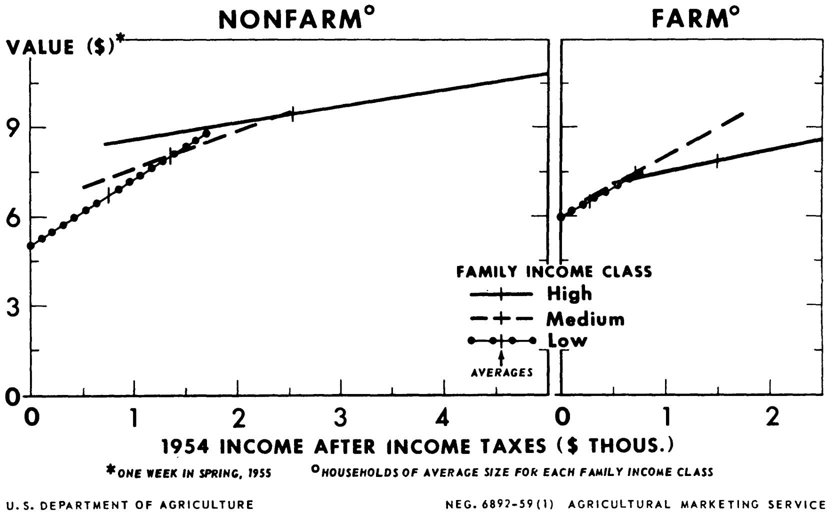

Fig. 1.7 — Per capita value of food and beverages consumed in 1955, by income groups: high, medium, and low. The lines overlap from one family income class to another because per person figures were computed within family income classes. Per person figures in a large, high-income household, for instance, might therefore be smaller than in a household with a medium or low income.

The rate of change in consumption per person as income per person increased, as measured by the elasticity of demand with respect to income at the point of averages, differed considerably among low, medium, and high-income classes, and between farm and nonfarm households. For all food and beverages taken as a whole, these rates of increase in consumption as income rose tended to be greater for nonfarm than for farm households, and for lower than for higher income classes. For each 1 per cent increment in income per person in nonfarm households the value of food and beverages used at home per person increased 0.25 per cent in low-income households, 0.21 per cent in medium-income households, and 0.15 per cent in high-income households. In farm households the value of food and beverages used at home per person rose 0.08 per cent in low-income households, 0.19 per cent in medium-income households, and 0.15 per cent in high-income households.[9]

Prospects for Supply

A USDA study of the farm production potential of the United States by 1980 in relation to needs investigated whether the supply of farm products was likely to keep up with the demand.[10] The

[10] R. F. Daly and A. C. Egbert, "A Look Ahead for Food and Agriculture," USDA, *Agricultural Economics Research,* Vol. 18, No. 1, Jan., 1966.

study proceeded on the basis of demand levels developed from the following assumptions:

1. That U.S. population will be 245 million by 1980.
2. That the U.S. economy, as measured by gross national product, will expand at an annual rate of about 4 per cent and that real per capita disposable income will rise by 2.3 per cent per year.
3. That per capita consumption of farm products in total will show little change.
4. That exports will increase at the same rate as in the 1950–60 decade.

Based on these assumptions, the study concluded that the productive capacity of U.S. agriculture is more than sufficient to meet the projected 1980 needs of the U.S. population for food and fiber and to provide for a relatively high level of exports at the same or lower relative prices than in 1959–61. Total cropland harvested would be only a little above the 1959–61 level under the projections of yield and utilization that were made. Substantial adjustments in crop acreages, however, would be required — less oat and hay acreage, for example, and more soybeans and wheat.

An alternate assumption in the study was that all cropland currently diverted from production under various government programs would be planted to crops in 1980. This would mean about 30 million more acres in cropland than in 1959–61. Projected output under this assumption was more than 10 per cent above projected levels of use in 1980.

Another study of 1980 food needs and production potential considered alternate levels of exports and different farm program alternatives.[11] Domestic demand was assumed to increase with gains in population and per capita income and was projected at the same level under each of the various export-farm program alternatives. Three sets of projections were based on a free-market assumption, two of them with exports at the 1950–65 trend level and the third assuming all available cropland would be in production in 1980 and that the excess over domestic needs would be exported. The results of these free-market projections were summarized as follows: "Excess capacity will remain a significant factor facing the agricultural sector unless the nation adopts a policy of exporting all available quantities of agricultural commodities. This excess capacity will approximate 50 million acres of available cropland by 1980 if exports follow trends established over the period 1950–65." [12]

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[11] Earl O. Heady and Leo V. Mayer, *Food Needs and U.S. Agriculture in 1980,* National Advisory Commission on Food and Fiber, Technical Papers, Vol. 1, Washington, D.C., Aug., 1967.

[12] *Ibid.*

Three other projections were made in the same study assuming alternately:

1. Continuation of voluntary land retirement programs for feed grains and wheat, similar to those in effect during 1965 and 1966, and exports at the 1950–65 trend level.
2. Mandatory acreage controls, with strict quotas on acreage of wheat, feed grains, and cotton, and exports at the 1950–65 trend level.
3. Mandatory acreage controls but lower export levels due to cessation of export subsidies.

In each case, projected 1980 demands could be met with substantial cropland left out of production. Excess capacity under the three alternatives, measured by idled cropland, was projected at 48, 38, and 71 million acres, respectively. This would compare with 56 million acres retired under government programs in 1965.[13]

In general then, current projections imply that considerable acreage will still need to be held out of production in 1980 to prevent overproduction of farm products. If acreage is not controlled, the prospects are that agricultural production will continue to be excessive, and this will exert downward pressure on agricultural prices.

Only time can confirm or reject the accuracy of these projections. However, past projections of U.S. agricultural yields and output have typically been too conservative. For example, projections of 1975 crop yields made in a 1960 USDA study were reached by the mid-sixties for many crops. Exports of agricultural products have also expanded more rapidly than projected.

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[13] *Ibid.*