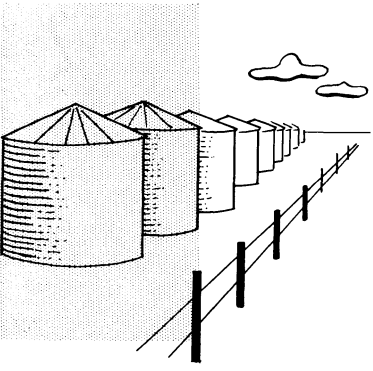

CHAPTER 3

The farm problem defined; its causes; unique characteristics of agriculture—needs and progress in adjustment.

Nature of the Farm Problem

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THE NATION'S COMMERCIAL FARMS are in the midst of a problem of growth stemming from rapid technological and economic advance. Economic and technological advance might place premiums on products from and returns in farming if the United States were a poor nation. However, the nation is wealthy and per capita incomes are great. Hence, further rapid progress in technological and economic development multiplies farmers' problems within farming and in comparison with other segments of our economy. It also calls, through the market, for adjustment in the land, labor, and capital used in farming.

Growth has been a main characteristic of the U.S. economy in postwar years. Starting from a 1947–49 base period and in money terms, gross national product increased by 90 percent to 1959, partly due to price increases. Total disposable income (amount people have to spend after taxes) increased by 83 percent and income per capita of the nonfarm population rose 40 percent in this period.

In the same time span, farm income has declined, both absolutely and relatively. Total net income from farming declined by 20 percent from 1947–49 to 1959. Income per capita from farm sources increased by only 16 percent, even though the farm population decreased by 30 percent.

We have attained a level of economic development and per capita income where further economic progress does not reward farm and nonfarm sectors equally.

The decline in net income of farming has not come

TABLE 3.1

FARM POPULATION, LABOR FORCE, AND INCOME PER PERSON IN FARMING AND IN THE NONFARM LABOR FORCE

Year	Farm population	Farm population as percent of U.S. total	Persons employed on farms	Income per person in farming		Income per person of nonfarm population
				From farming	*All sources*	
	(*million*)		(*million*)			
1946	26.5	18.7	10.3	$ 644	$ 806	$ 1,295
1947	27.1	18.8	10.4	644	825	1,394
1948	25.9	17.7	10.4	765	962	1,534
1949	25.9	17.4	10.0	567	767	1,511
1950	25.1	16.5	9.9	626	838	1,585
1951	24.2	15.7	9.5	751	983	1,763
1952	24.3	15.5	9.1	711	962	1,849
1953	22.7	14.2	8.9	666	931	1,902
1954	22.1	13.6	8.6	660	925	1,849
1955	22.4	13.6	8.4	610	894	1,975
1956	22.3	13.3	7.8	600	901	2,073
1957	21.6	12.6	7.6	665	974	2,102
1958	21.4	12.3	7.5	768	1066	2,066
1959	21.2	12.0	7.3	690	1001	2,131

Source: USDA Agricultural Outlook Charts, 1960.

because farming has lagged in efficiency and production. To the contrary, farmers have improved technology rapidly, with productivity growing accordingly. Farm production increased by about 50 percent over the 20 years 1940–59, and even by 25 percent in the ten years 1950–59.

While income has increased per person remaining in farming, this increase has been slower and smaller than for workers and managers in other industries. In general, the return to resources employed in farming has been much lower than for resources of the same quality employed in other industries.

Income from farming per person has scarcely increased in the postwar period (Table 3.1). Total income from all sources, per person in farming, has increased about 20 percent mainly due to farm families turning to more off-farm work. However, the income per person of the nonfarm population grew much more rapidly, increasing by about 65 percent since 1946.

THE FARMER'S DILEMMA AND PRODUCTION ADJUSTMENT

Farm families find themselves faced with a dilemma. Individually, it is initially profitable for them to adopt new technologies and to increase capital expenditures and farm production accordingly. But farming is highly competitive and demand elasticity is extremely low. Therefore, income is depressed as the majority of farmers improve their operations and aggregate production is increased.

It is not profitable for the individual farmer to retrench, discarding recent technology and the capital investment it represents. If he does so, he finds the diminution in his own production too small to show up in the total supply, or to have any effect in increasing market price. He would end up producing less at a lower price and with a greatly reduced income.

The competitive nature of farming is a strong force leading to continued technological and economic progress. But at the same time, this progress, which benefits consum-

ers in variety and favorable price of food, causes short-run income burdens on farmers.

Under economic growth, with national income increasing and farm production outpacing population growth, farmers have been caught in a price-cost squeeze. A decline in income for farm families has resulted except for those who increased scale and decreased per unit costs more than enough to offset the decline in price. This adjustment is impossible for all farmers because of the limits on land area in farming. Generally, some farmers can expand only if others reduce their acreage or give up farming. The extreme difficulty of increasing demand for major farm products serves to restrain all farmers from simultaneously increasing production, as a means of beating the price-cost squeeze.

INFLUENCE OF FARM PRICES ON USE OF FIXED RESOURCES

Farmers do, of course, make adjustments in their production as prices change. For individual commodities they are highly responsive to both increases and decreases in prices. History of changes in production of such commodities as hogs and soybeans proves this to be true. As price of an individual commodity such as pork increases relative to the price of competing products, hog numbers are increased readily, considering the time lag necessary for formulating breeding plans after change in the price. With a decrease in pork prices, relative to prices of feed and competing commodities, hog numbers and marketings are decreased readily, given time for farmers to change their production plans. Acreage of soybeans or other crops change similarly as prices of these products change relative to the prices of competing crops.

These types of changes have little effect on the total quantities of resources used in farming and on total farm production. As soybean acreage is increased or decreased relative to corn, for example, total farm production remains about the same.

Total production does not respond so readily to price changes in both directions. Over time with improvements in technology, favorable farm prices have encouraged rapid increases in total farm production.

As farm prices have declined relative to farm costs and to returns on labor and capital in other economic sectors, farm production has not shown a similar tendency towards rapid retraction. Even in the depths of recession, total farm production has not declined as in other industries.

This short-run tendency of farm production to be maintained under unfavorable prices, or even to increase during these periods under the force of improved technology, evidently arises for several reasons.

An important portion of the costs in farming are fixed and continue in the same magnitude regardless of the amount produced. The individual farmer's opportunity to change plans and limit income reduction comes largely from his ability to adopt new technology or use more land, labor, and capital, and expand production by a greater proportion than the increase in his direct costs. Evidently enough farmers do make these adjustments so that reduction in production by some farmers who must curtail or cease production during periods of unfavorable prices, is completely offset.

A more important variable relating to maintenance of farm production is the fixity of some costs or resources in the industry. Some of these are fixed in quantity for relatively long periods of time. At one extreme is land which is fixed absolutely and with few alternatives to farm uses, except for the small portion devoted to industrial, residential, transportation, and recreational uses.

Even the quantity of buildings and machinery is highly fixed for an important number of years, once investment has been made in them. As long as they will pay any returns above their salvage value in other uses, they continue to be employed in farming. Land is an extreme example of this limited flexibility in use of farm resources. Its reser-

vation price, the level of return necessary to keep it in production, is extremely low since the major part of it has no alternative use except for farming. Hence, regardless of the level to which crop prices decline, farm and ranch land continues to be held in production as long as the return from it covers the cash costs of the crops and livestock produced on it.

The value of an important quantity of land, buildings, and machinery used in farming tends to decline, with appropriate time lag, as readily as the prices of the commodities which they produce. Aside from government support prices, a decline in livestock prices is accompanied with a decline in feed prices, so that production of livestock continues even under general recession of prices and income. Similarly, given a decline in crop prices, land is continued in production on rented farms since the share value of rental declines with crop prices. On owner operated farms, land is not withdrawn from production as long as prices at a lower level cover out-of-pocket costs. Even when one farmer relinquishes his farm and moves from farming, a neighboring operator usually stands ready to take it over and keep it in production.

The combination of competitive structure, fixed costs, and flexible costs of items originating on the farm tend to maintain over-all farm production during prolonged periods of unfavorable prices and incomes. In other major industries made up of a few large firms a reduction in demand is more quickly accompanied by curtailed production and release of labor and raw materials and the variable costs which they represent.

The rate at which total farm production might be curtailed, under an extremely long period of unfavorable farm prices and income, is not known. Obviously though, if unfavorable prices and low incomes prevailed for a sufficiently long time, more land would be withdrawn from intensive agricultural uses — such as field crops — and diverted to forestry, grasses, and similar uses. Along with these shifts

in use of land would come shifts in employment of labor and capital. These land use shifts would tend to become concentrated in particular geographic locations or communities rather than spread evenly through all farming regions.

ECONOMIC GROWTH PROBLEM

Farming in a wealthy, growing economy will generally face a cost-price squeeze, and a less favorable income situation than other major economic sectors. The reason lies in the so-called magnitudes of income elasticities of demand. Income elasticity indicates for a particular commodity, or particular groups of commodities, how much more food consumers will buy as their incomes increase — expressed as percentage. If expenditure increases by 1 percent with each 1 percent increase in consumer income, the income elasticity is 1.0, indicating that expenditure on the commodity, or the demand, increases in the same proportion as income. If, however, the increase in expenditures is only .5 percent, the income elasticity is only .5, indicating that growth in demand for the commodity approximates only half the rate of growth in income.

Industries which produce commodities with high income elasticities are in the most advantageous position to use more resources and increase production as national and per capita income grow.

Those industries of low income elasticities are much less favored, largely because they represent commodities for which the consumer is well supplied and has little capacity for further expansion. Evidently, the income elasticity for that part of food produced on U.S. farms is only .15 percent, meaning that, on the average, a 1 percent increase in per capita income causes only a .15 percent increase in expenditure on food.

As incomes of consumers increase, food no longer becomes their major concern. They want relatively more home appliances, better housing, medicine and health serv-

ices, recreation, travel, and education. As the U.S. consumer's income increases, he does not buy any more pounds of food, but simply changes the composition from fats, starchy foods, and such staples to more fresh vegetables, better cuts of meat, fruits, etc. Food consumed per person, measured in pounds, has not increased in the last 40 years. Even this .15 percent increase in expenditures for food represents largely demand for improved quality and more processing and retailing services.

In contrast, consumer expenditures increase rapidly on many nonfood products as income grows even more than 1 percent.

This situation will continue, aside from temporary setbacks, as national and per family incomes continue to increase. "Good living" no longer is characterized simply by getting enough food, clothing, and shelter for subsistence. Use of the nation's resources will shift accordingly under further economic growth, with a declining proportion of national income from farming and a smaller proportion of labor and other resources used in it. Consumers express their wishes through prices paid in the market.

The consumer's willingness to pay higher prices for nonfarm goods and services keeps up the cost of steel, labor, petroleum, and other materials which produce the "more luxury" goods. Consequently, the cost of tractors, lumber, fuel, fertilizer, and other cost items of the farm is kept up, because of the nature of consumer demand and the organization of industries which produce and fabricate these materials.

This, then, is the major cause of the farm price squeeze in a period in which national income is growing and farm production has moved ahead of the rate of population growth. This cost-price squeeze plus signals from the consumer that he believes too many productive resources are employed in farming had already started in the 1920's. It is not a phenomenon of postwar years; it is not a "hangover" from war. It was, of course, obscured by the abnormal de-

mand conditions of depression of the thirties and the war conditions of the forties. Now it is back with us as a mark of a wealthy society in which hunger is the concern of few.

The tendency for farm production expenses to press upward, due to inflation and demand for labor and capital by other industries, and the rigidity of prices for farm supplies, while farm commodity prices decline, is illustrated in Figure 3.1. Production expenses have taken an increasing proportion of gross farm income since the end of the war. Even between 1950 and 1959, production expenses of farming increased on the average from 60 percent of gross farm income to 70 percent.

The increasing proportion of expense to gross farm income arises from adoption of new technology, increased use of capital in farming, and from the shift in consumer demand toward more fresh fruits and vegetables and higher quality meats, and away from such staples as potatoes, cereals, fats, and oils.

EFFECT OF EXCESS FARM PRODUCTION ON PRICES

Surpluses and low returns in farming arose because the productivity of resources used by farmers increased and the amount of these resources used remained large relative to demand. Even under economic growth and income elasticities of zero, the farmers' position would be relatively

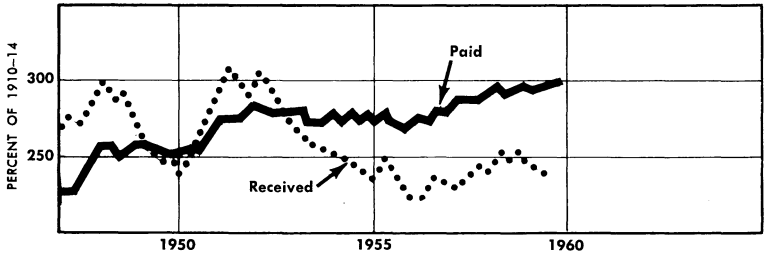

Fig. 3.1 — Trend in prices paid and prices received by U.S. farmers, 1950–59.

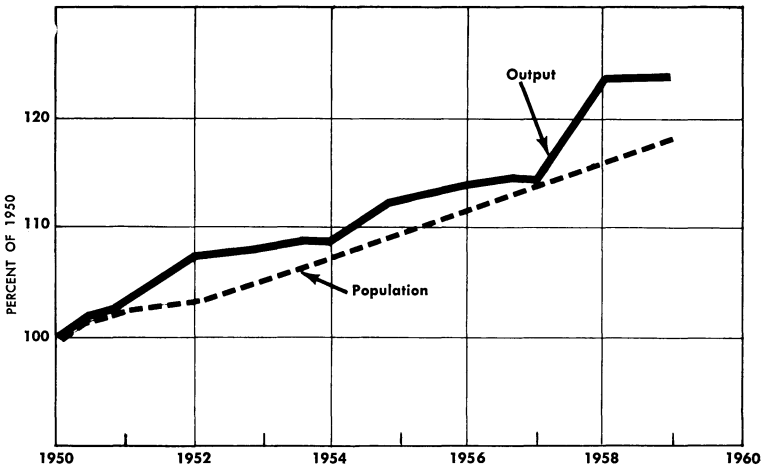

Fig. 3.2 — Indices of growth in farm output and population in the United States, 1950–59.

favorable, if increase in production only paralleled population growth. Or, if increase in production exceeds that of population, markets outside the country would be needed to enable returns on resources used in farming (especially labor and capital) to compare favorably with those used in other industries. Rate of increase in farm production has consistently exceeded the rate of population growth in the last decade (see Figure 3.2). The average rate of increase in farm production was 2.4 percent over the 10-year period 1950–59. The average rate of increase in population was only 1.7 percent in the same period.

This difference in growth rate is small. However, because of the so-called low *price* elasticity of demand for major farm products, the difference in growth rates causes severe depression of farm prices and income. Price elasticity of demand is different from income elasticity of demand in this respect: price elasticity is an indication of change in quantity purchased by consumers as the price

of the commodity itself changes — expressed in percentages. For example, if a 1 percent increase in quantity purchased is accompanied by a 1 percent decline in price, the price elasticity is —1.0. An increase in amount marketed then will leave income from the product approximately unchanged. If, however, the decline in price is greater than the increase in amount purchased, the price elasticity is less than —1.0 and a larger supply will return less total value than a smaller supply.

In contrast, a price elasticity greater than —1.0, (increase in supply accompanied by a smaller percentage decrease in price) allows a greater supply to bring more revenue in the market than a smaller supply. The difference is illustrated in Table 3.2 where we assume an original output of 100, a price of $1.00 and a total value of $100 (million).

In the new situation A, price elasticity is high — greater than —1.0. Consequently as supply is increased by 10 percent from the original situation, price declines by only 5 percent. Even with the decline in price, total value increases. Total value is increased, with more supply, because price declines by a smaller percentage than the increase in supply. (The demand elasticity is greater than —1.0.) In new situation B, however, price elasticity is low (less than —1.0) and a 10 percent increase in supply causes a 20 percent decrease in price. Since price declines

TABLE 3.2

EFFECT OF PRICE ELASTICITY ON SUPPLY, UNIT PRICE, AND TOTAL VALUE

	Supply	Unit price	Total value
	(million)		*(million)*
Original situation	100	$1.00	$100
New situation			
A (price elasticity 2.0)	110	.95	104.5
B (price elasticity 0.5)	110	.80	88

by a greater percent than the increase in supply, total value also decreases. The decline in price more than offsets the increase in supply.

Unfortunately, from a farm income standpoint, the situation in farming is that of B. Demand is inelastic, from a price-quantity standpoint. A modest increase in production can cause a marked decline in price and income.

As illustrated in Figure 3.2, the rate of increase in farm production has been only slightly greater than the rate of increase in population or number of domestic consumers. Yet, because demand for farm products is so inelastic, this small excess places a heavy burden on prices and farm incomes. Past demand studies have shown that for each 1.0 percent increase in output, hog prices decline by about 2.5 percent; cattle and calves, veal, and poultry by about 1.7 percent; eggs by about 5 percent; dairy products by 5 percent; and feed grains by about 2.5 percent. Wheat has about the same elasticity as feed grains if it is used for this purpose. The price decline for a 1 percent increase in production is much greater for wheat used as food. These figures apply to the situation in which quantity of the individual product increases. The price of an individual commodity also decreases when the quantity of a competing or substitute commodity increases.[1]

NATURE OF FARMING

The competitive nature of farming and low price elasticity of demand for farm products promote economic progress from the standpoint of total society. They cause pressure on the individual to improve technology and increase productivity. Consequently, since the magnitude of demand for food is tied quite rigidly to the size of population or number of consumers, the strong trend is for each unit to be produced at lower cost. Resources used in farming

[1] Stated in terms of elasticity of demand, percentages in this paragraph would be: Hogs, — 0.4; cattle, calves, veal, and poultry, — 0.6; eggs, — 0.2; dairy products, — 0.2; and feed grains, — 0.4.

are thus "saved," so that they can be diverted to other economic sectors where consumers desire other goods and services as their incomes increase. The extent of these savings over the past two decades is indicated in Table 3.3. Not only has the U.S. consumer had a wide variety and quantity of food for selection, but each unit of food has been produced at lower cost. With growing population, total food requirements or demand have increased, but it has been possible to produce this greater amount with about the same total quantity of resources as previously. Without this improved efficiency, total resources used in farming would have needed to increase by upwards of 45 percent between 1940 and 1959 to allow for growth in population and improved nutritional standards.

TABLE 3.3

INDICES OF FARM PRODUCTION AND RESOURCES USED, U.S., 1940–58

Year	Total farm production	Total farm resources used	Resources per unit of production
1940	100	100	100
1941	104	100	96
1942	117	104	90
1943	115	104	90
1944	118	104	89
1945	116	102	89
1946	120	102	85
1947	116	102	89
1948	127	103	81
1949	123	104	84
1950	123	104	84
1951	130	107	82
1952	132	107	81
1953	133	106	80
1954	133	106	80
1955	138	105	76
1956	140	105	75
1957	140	105	75
1958	152	103	68
1959	152	103	68

Source: USDA

As individual farmers use more capital resources and push production upward against the inelastic demand for food and fiber, income per farmer can be maintained only as there are fewer farms and farmers. Declining number of farmers has been the main source of resource savings in farming over the past 20 years. Farmers who remained in the industry have, on the average, expanded their use of capital other than land by over 100 percent since 1940. These capital expenditures took place in adopting new technology and extending existing technology.

By individual categories, the increase in capital expenditures were 135 percent for machinery, 142 percent for fertilizer and lime, 125 percent for feed and livestock, and 37 percent for miscellaneous items. But at the same time, the number of farms declined by 30 percent and total farm labor declined by 47 percent. The substitution of capital for labor left total value of resources used in farming about the same while total production increased by 52 percent.

The drive by individual farmers to use new capital and technology on the existing farming area is particularly encouraged in a competitive farm industry with an inelastic demand for its products. It is an unending process because the gains to the individual farmer from expending production are partly or entirely dissipated as the majority of farmers follow this procedure and farm prices and income are depressed in the manner explained above. Hence, the process becomes continuous as the individual farmer tries to increase his income by increasing production and lowering unit costs.

But because of low demand elasticities, and especially in a growing economy where alternative employment of labor and capital is available at favorable rates, farm families with limited capital and managerial ability particularly find that they can increase their income by transfer to nonfarm industries. As they do so and income and farm resources are recombined into fewer remaining farms, economic gains to society are realized. In general, use of labor

in farming can be decreased as capital is substituted for it. With some surplus labor and machinery in major producing regions, farm consolidation can take place with a saving of total costs in farming relative to total production. When two farms of 160 acres are consolidated, for example, the new farm unit seldom needs to duplicate the machinery of the two previous units.

SURPLUS LABOR LOWERS FARM INCOME

Conservatively figured, considering some change in the composition of farm production, only about 50 percent of the 1940 farm labor force was needed to obtain the 1959 production. Labor was freed to produce other goods and services desired by consumers in a wealthy and growing economy. Declines of important magnitude took place in the farm labor force and farm population between 1940 and 1959. Even though farm population declined by 30 percent and farm employment by 45 per cent, this change was not large enough to bring labor returns in farming to a level comparable with other industries. The farm labor force would have had to decline by another third of the 1959 level if net income per worker in farming were to equal the average wage return of workers in manufacturing industries [even with additions to farm income of (a) 20 percent for cost of living differentials and (b) 6.7 billion dollars of income from nonfarm sources]. Even then, this level of return to a third smaller farm labor force would have allowed no interest return on the capital used in farming.

Returns to labor in farming consistently lagged behind wage rates in manufacturing and service sectors of the economy. This condition prevailed because of the historic excess of births in the farm population over farming opportunities. The large labor supply born within the farming industry, much larger than replacement rates for farm operators, helped cause overproduction and lowered prices of commodities and, on the average, to keep returns to labor

low. Of course, not all farm workers had the education, skill, and experience to make them comparable with wage workers in manufacturing and service industries. This is a condition which can be remedied by society through improved educational, counseling, and employment services.

TECHNOLOGICAL ADVANCE AND ECONOMIC PROGRESS

Farmers adopted production-increasing technology not simply because of its discovery, but because it was profitable to do so. Few farmers adopt new techniques for the sake of being innovators *per se*. Largely they do so because they can thus increase profits. They can increase profits only if new materials and machines are priced favorably relative to the price of products they produce. This has been the condition over recent decades. While all prices increased due to inflation, prices of important production supplies did not increase as rapidly as farm commodities in early postwar years. Accordingly, the actual cost of these farm supplies decreased; their prices were lower relative to commodity prices than they were in postwar years. As Table 3.4 indicates, the prices of fertilizer, machinery, and all cost items were lower in the 1950's relative to prices received by farmers than in the prewar period 1935–39 when surpluses also existed, or even during the war.

Farm commodity prices declined generally, relative to

TABLE 3.4

INDEX OF PRICES RECEIVED AND PRICES PAID BY FARMERS, 1935–59. 1935–39=100.

Index of:	Period				
	1935–39	*1940–44*	*1945–49*	*1950–54*	*1955–59*
Prices received by farmers ...	100	144	231	252	221
Price of fertilizer	100	100	132	150	151
Price of machinery	100	102	130	173	191
Price of labor	100	178	333	395	455
Price of land (alone)	100	112	188	254	325
Prices paid, all costs	100	122	184	220	229

Source: USDA

the prices of farm production items and compared to the prewar period in the past five years. The decline in farm prices was eased by government support prices and, with improved technology, an economic climate favorable to increased production has been maintained. Farm supplies purchased from nonfarm sectors have not declined even with recent depression of commodity prices. However, without support prices at levels of recent years, price ratios would have been less favorable to purchase of those items from nonfarm sources and to increased production.

These favorable price ratios not only favor greater use of these production items, but also favor their substitution for land and labor. By 1955–59 the price of machinery had risen by only 91 percent while wages of hired farm labor, a main resource for which machinery substitutes, had increased by 355 percent. Similarly, the price of fertilizer, a resource which serves as a substitute for land, increased by only 51 percent while land price increased by 225 percent. Unlike labor, land was not withdrawn from production over the last two decades. Cropland remained almost constant. Price supports and government programs employed over the period retarded adjustments in land used for farming.

Recent technologies also include those which require a larger farming unit and a greater production per farm, if they are to be used profitably. Cost advantages for farms with larger acreages or animal numbers arise mainly from mechanical innovations relating to power, machinery, equipment, and buildings. Power units, field machines, harvesters of greater capacity, and larger crop handling equipment particularly increased the size or acreage range over which it is possible to get declining per unit costs in cotton, corn, wheat, and other field crops. Increased capacity and productivity of these machines has greatly increased the number of acres, animals, and birds which can be handled by one man or the farm family. Since the fixed costs of these high capacity machines are greater than those of machines in prewar days, the per unit costs decline more

sharply with larger production. For the same reason, the economic disadvantage pinches more sharply farms of small acreage.

ECONOMIC PROGRESS AS IT AFFECTS FARMERS AND THE NATION

Technological improvement, in farming and nonfarm sectors, is the important source of economic progress and rising per capita incomes. Without improvements in technology, limits to the size of national income would soon be encountered: or while national income might increase gradually with population and size of the labor force, per capita income would decline as population grew.

Fortunately in the United States, particularly as a result of technological advance and improved skill of people, national income has grown more rapidly than population, with a consequent rise in income per capita. Labor productivity has increased throughout the economy, as well as in farming. The nonfarm worker can obtain his family's food requirements with fewer hours of work than at any previous time in history. But also, because of technological progress in farming and other industries, farm people also can acquire nonfarm goods and services with a smaller outlay of labor than in previous decades.

This general type of progress, with more goods and services available with less human effort, is valued highly by U.S. and other societies. It is desired no less in farming than in other industries. Farming has contributed importantly to this process, as labor has been freed for use in other industries and capital requirements per unit of food production have been kept relatively low.

The relative contribution of the farm labor force has increased greatly in the last century (Table 3.5). Even in the last decade, the number of persons supported by one farm worker has increased from 15.5 to 26. Without advance in farm productivity since 1910, nearly 20 million

TABLE 3.5

PERSONS SUPPORTED BY FARM WORKERS AND FARM LABOR "SAVINGS" FOR THE NATIONAL ECONOMY, FROM TECHNICAL CHANGE AND CAPITAL INVESTMENTS

Year	Number persons supported by one farm worker	Percent increase over previous 10 years	Persons actually employed in farming	Persons needed to produce food at 1910 productivity rates in farming	Labor force "saved" by farm advance, compared with 1910
			(million)	*(million)*	*(million workers)*
1850...	4.2	3	5.7	.....	.....
1860...	4.5	7	7.3	.....	.....
1870...	5.1	13	8.0	.....	.....
1880...	5.6	8	10.1	.....	.....
1890...	5.8	7	11.7	.....	.....
1900...	7.0	20	12.8	.....	.....
1910...	7.1	1	13.6	13.6	0.0
1920...	8.3	6	12.5	14.9	2.4
1930...	9.8	18	11.0	15.4	4.4
1940...	10.7	9	11.0	16.5	5.5
1950...	15.5	46	9.9	21.8	11.9
1960*..	26.0	58	7.1	26.3	19.1

* Preliminary

Source: Based on data in USDA Agricultural Outlook Charts for 1959 and 1960.

more workers would have been needed in farming to meet domestic food needs and exports at 1959 levels.

The portion of gain in economic progress to society contributed by the farm industry has not been made without sacrifice on the part of the farmer. True, other industries contribute to economic progress and they adjust labor and other resources accordingly. Down through history, changes in technology and demand have revolutionized the structure of some industries and diminished the relative magnitude of others. Capital has been substituted for labor, or workers have shifted from industries with low income elasticities of demand to those where the elasticities are higher. Table 3.6 indicates the general types of long-run adaptations which have taken place.

TABLE 3.6

SHIFTS IN DISTRIBUTION OF U.S. LABOR FORCE AMONG INDUSTRIAL SECTORS, 1890–1920 AND 1920–50

Industry	1890		1920		1950		Change 1890 to 1920	Change 1920 to 1950
	No.	*Percent*	*No.*	*Percent*	*No.*	*Percent*		
	(*000*)		(*000*)		(*000*)		(*percent*)	(*percent*)
Farming	9,990	42	11,120	27	7,015	12	+ 11	− 37
Forestry & fishing	180	1	280	1	127	0*	+ 56	− 55
Total primary	10,170	43	11,400	28	7,142	12	+ 12	− 37
Mining	480	2	1,230	3	1,035	2	+156	− 16
Manufacturing	4,750	20	10,880	27	15,930	27	+129	+ 46
Construction	1,440	6	2,170	7	3,940	7	+ 51	+ 82
Transportation & utilities	1,530	7	4,190	10	4,750	8	+174	+ 13
Total secondary	8,200	35	18,470	45	25,758	44	+125	+ 40
Trade & finance	1,990	8	4,860	12	12,650	22	+144	+160
Personal services	640	3	1,630	4	3,600	6	+155	+121
Other services	2,570	11	4,810	11	9,310	16	+ 87	+ 94
Total tertiary	5,200	22	11,300	27	25,560	44	+117	+126
All industries†	23,570	100	41,170	100	58,460	100	+ 75	+ 42

* Less than 1 percent.

† Exclude unallocated workers.

Source: Fabricant, Solomon, "The Changing Industrial Distribution of Gainful Workers." *Conference on Income and Wealth.* Vol. XI. National Bureau of Economic Research, Inc., New York, 1949; and Stigler, George, "Trends in Employment in the Service Industries," National Bureau of Economic Research, Inc., New York, 1956. Comparable data for primary, secondary, and tertiary classification estimated from data in the *U.S. Census of Population, 1950.* Vol. II, Part I.

The farm industry has faced all of these types of adjustments. New technology in the form of mechanical and biological innovations substitutes for both farm labor and land. With low price and income elasticities of demand in farming, the farm industry cannot expand as rapidly as others where income elasticities are higher. Because of these low demand elasticities, a rate of growth in production which exceeds population growth severely depresses farm income. The demand for farm labor shrinks accordingly and migration must take place if (1) persons with limited opportunities in farming, because of lack of capital and managerial ability, are to take advantage of alternatives elsewhere in the economy where they can earn higher incomes and (2) those who remain in farming are able to operate with enough capital and land and on a scale which will provide their families with satisfactory incomes.

This adjustment problem is more difficult for farm people than for many industrial workers. There are several reasons why this is true, but two are particularly important. Especially important is the tie that holds the farm family to a particular piece of land and the country-wide dispersion of farming. It is not as easy for a western Kansas wheat farmer, for example, to shift to employment in the electronics industry at San Francisco as it is for a worker to shift between manufacturing or service industries within the city of Detroit. In the latter case, skills required in the two positions may be highly similar and the worker need not shift the location of his home. In addition to other complexities, transportation costs and lack of communication services hamper transfer of the Kansas wheat farmer.

Also important has been the educational training and vocational guidance facilities available in rural communities. Education and training directed at farm youth has focused on farming, even in regions where number of births greatly exceeds farming opportunities and out-migration has been necessary.

NEEDS FOR ADJUSTMENT

The economic problems of farming and the national economy over the past decade promise to continue in the 1960's. With further growth in national income, demand for farm products will not grow as fast as for goods and services produced in other sectors. Technological improvement will continue, with the effect of replacing labor in industries such as farming. Surplus-farm capacity and the tendency towards, or potential of farm surpluses, will continue over the next decade, unless unforeseen "breakthrough" comes in demand in such areas as foreign markets and new industrial uses, or unless we have effective controls on production.

The pressure for adjustment of the production and recombination of resources used in farming will continue. Two major sets of variables or forces are at work and will continue to call for adjustments in farming. On the one hand there are those facets of economic growth which place a "suction" on the farm industry from the outside. They cause the demand for products to grow differently, as the consumer uses his growing income to buy more of some goods and services and less of others. These forces tend to reward labor and capital more handsomely in industries other than farming, and cause these resources to be shifted accordingly.

On the other hand, technical advance making it possible to expand production will allow capital to replace labor in farming. In large part, the basic adjustments in farming must come from the production or supply side. This adjustment is possible only if the magnitude of resources used in production is changed.

Levels of farm income and returns on resources used in farming in future years will depend on the rate and extent to which resource combinations and total farm production are modified to correspond with consumer demand and national economic growth. Emphasis will continue to

be on farm labor, although some major adjustments in land use also are in sight.

Farming has contributed importantly to economic progress by meeting per capita food needs with fewer resources. Farm labor has been freed for use elsewhere in the economy. But much of the labor thus freed has been left stranded in faming with two consequences. First, the income of many farm families has been depressed, resulting in a level of living which is inconsistent with the degree and possibility of wealth and economic growth in the U.S. economy. Second, the consuming society has not gained all of the contribution possible from increased productivity in farming.

PROGRESS IN ADJUSTMENT

The adjustments in prospect for farming, both as a result of technical change within the farm industry and economic growth in the general economy, are not of revolutionary nature. The number of farms and the size of the farm population, aside from temporary recession periods, declined continuously over the past several decades. These trends took place with growth in the national economy during both prosperous and depressed periods for farming, although the rate of change was more rapid during years when income of farmers declined. For example, in the 1947–52 period of prosperity in farming, the number of farm workers declined by 1.2 million persons or 12 percent. During the period 1953–59, one of continued surpluses and depressed prices, the number of farm workers declined by 1.5 million or 17 percent.

In both periods, higher wages outside of farming "pulled" workers from farming, but in the latter period, low farm incomes also "pushed" labor from the farm industry.

Price support programs and other government farm programs have not prohibited the basic process of labor adjustment to economic growth. While prices of farm commodities drew forth a greater farm production than con-

sumers demanded, rising returns to capital and higher wage rates in other industries caused labor to transfer from farming. Government farm programs have likely been less important than positive programs in education, vocational guidance, and employment services to facilitate the movement of farm workers into better jobs.

It makes little sense for society to make large capital investment in promoting farm technology, which has the main effect of displacing farm labor, without investing equally in guiding this farm labor to production of nonfarm goods and services desired by consumers.

CHANGE IN RESOURCE ORGANIZATION ON FARMS

While the change in resource combinations of the total farm industry has been great, even greater changes have taken place in the resource combinations on individual farms. The resources used in farming (Table 3.7) emphasize these differences. Resources used in the total farm industry increased by only 10 percent over the 20-year period 1930–39 through 1950–58. While the increase in fertilizer, machinery, and livestock was large, the decline in labor used and the stable amount of land used tempered the total increase. Because of the decrease in number of farms, total resources per farm increased by 60 percent in this period. Real estate per farm increased by 63 percent by 1958, while the increase for all farms was only 12 percent.[2] As an average, per farm use of production items such as fertilizer, machinery, feed, and livestock services increased twice as much as on all farms. Between the periods 1930–39 and 1950–58, per farm use of purchased production items increased by 138 percent. The comparable figure for the total farm industry was only 60 percent. The index of nonpurchased production items, mainly labor, declined by 31 percent for the farm industry but by only 5 percent for the average farm.

[2] These figures are magnified somewhat by the fact that farms which have "disappeared" or declined in number have been especially those with few resources.

TABLE 3.7

RESOURCES USED BY TOTAL U.S. FARM INDUSTRY PER FARM FOR SELECTED PERIODS

Item	Total U.S. (millions)				Average per farm			
	1930–39	*1940–49*	*1950–58*	*1959*	*1930–39*	*1940–49*	*1950–58*	*1959*
Cropland (acre)	477	470	472	470	71.2	78.2	92.6	102.2
All land in farms (acre)	919	1,005	1,042	1,045	137.2	167.5	204.3	227.2
Workers (number)	12.3	10.4	8.5	7.4	1.8	1.7	1.7	1.6
Man-hours used (hr.)*	21.7	18.9	13.0	11.1	3,239	3,150	2,549	2,413
Total inputs‡	100	109	111	110†	100	122	146	160†
Farm real estate‡	100	103	112	112†	100	115	147	163†
Machinery & equipment‡	100	156	266	274†	100	174	376	399†
Fertilizer & lime‡	100	248	474	536†	100	278	624	780†
Feed, seed & livestock services‡	100	205	313	381†	100	229	412	555†
Purchased items‡	100	133	160	167†	100	149	238	243†
Non-purchased items‡	100	86	71	65†	100	96	94	95†

* Billions for U.S.
† 1958.
‡ Index.
Source: Economic Report of the President. Washington, 1960. pp. 104–5.

The trends pointed out above for the past two decades will continue for the next, and perhaps at an increased rate, if relatively full employment and ample employment opportunities are maintained in the national economy. Continuance of these conditions and increased communication between farm and urban communities will speed up the tempo at which changes in occupation and location will take place. This provides the opportunity for the remaining farms to expand in land and total capital assets. Forthcoming technology for farming will certainly encourage this. But even in the absence of new technology, the full adjustment potential growing out of currently known technology and existing prices of production items will bring about further changes in the direction emphasized by Table 3.7.

RANGE IN FARM INCOME IS LARGE

The farming industry is not, of course, homogeneous. It has two major income problems: (1) that of commercial farming wherein production outpaced demand and therefore incomes have been low accordingly and (2) that of chronically low income farms, with farm families owning so few production resources that meager incomes would be forthcoming under any level of prices. The latter farms are concentrated in the South, although all regions have a few of them.

Change is taking place in the proportion of farms at different income levels. As Table 3.8 indicates, the number of commercial farms with sales of less than $5,000 has declined continuously over the past 30 years, while farms with sales greater than this amount have increased in number.

A farm with gross sales amounting to less than $5,000 cannot provide a return to farm labor comparable with other industries where the wage to skilled labor approximates this amount. Nearly a million farms still fall in this category.

TABLE 3.8

NUMBER OF FARMS BY ECONOMIC CLASS, UNITED STATES, SPECIFIED YEARS, 1929–54

Economic class	Value of sales (1954 prices)	Number of farms					Percent of U.S. farm sales in 1954
		1929	*1939*	*1944*	*1949*	*1954*	
	(*dollars*)	(*1,000*)	(*1,000*)	(*1,000*)	(*1,000*)	(*1,000*)	
Commercial farms:							
Class I	25,000 and over	47	60	91	103	134	31.3
Class II	10,000–24,999	205	252	347	381	449	26.9
Class III	5,000– 9,999	560	585	723	712	707	20.5
Class IV	2,500– 4,999	1,078	1,015	976	882	811	12.1
Class V*	1,200– 2,499	1.274	1,070	867	661	536	5.7
Class VI*	250– 1,199	1,559	1,283	937	717	463	1.4
TOTAL		4,723	4,265	3,941	3,465	3,100	
Noncommercial farms:							
Part-time and residential†	Under 2,500	924	1,181	1,345	1,670	1,507	2.0‡
Subsistence*	Under 250	556	504	393	247	175	
TOTAL		1,480	1,685	1,738	1,917	1,682	

* With operator not working off the farm as much as 100 days and farm sales greater than income of family members from off-farm sources.

† With operator working off the farm 100 or more days, or other income of family members exceeding sales from the farm.

‡ Combined figure for part-time, residential, and subsistence farms.

Source: "Family Farms in a Changing Economy." USDA Agr. Info. Bul. No. 171, 1957.

Families on these farms have too few production resources to gain incomes in farming consistent with incomes which now characterize the U.S. economy and the growth associated with it. This was true even at the higher level of prices earlier in the decade.

Families on these farm units face the need for either shifting to other occupations where labor returns are higher or expanding their operations so that the amount of capital employed allows increased returns to their labor. Childen on these farms will have to make much of this adjustment. An important proportion of farmers are at advanced age levels and lack the training for migration to other industries. Their values and customs frequently tie them to communities where industrial employment opportunities are limited. Age also prevents many from borrowing more capital and extending scale of operations to levels apparently necessary for favorable incomes in the decades ahead.

Opportunity does exist, however, for those in favorable locations to engage in part-time farming and supplement incomes accordingly. Part-time farming serves also as a means of adding income for beginners. Income to farm people from nonfarm sources increased from a fifth of total income in 1945 to a third in 1959. This opportunity is greatest in states with dense populations and greater concentration of other industry. It is generally lacking, however, in areas where adjustment needs are large, such as much of the area in the western half of the nation.

CHANGES IN LARGE-SCALE AND FAMILY FARMS

As illustrated in Table 3.8, most of the change in farm numbers has taken place in farms with gross sales per annum of less than $2,500. The number of farms with sales smaller than this amount declined from 2.4 million in 1939 to one million in 1954. The number of farms with sales greater than $2,500 has remained nearly constant. The

number of these farms increased from 1.9 million in 1939 to 2.1 million in 1944 and remained at the latter level in both 1949 and 1954.

The reduction in farm labor force came almost entirely on farms with annual sales of less than $2,500. These farms produce so little that even as their labor and other resources are withdrawn from farming, production is affected only slightly. In 1954, for example, commercial farms with annual sales exceeding $2,500 provided over 90 percent of all market sales.

The bulk of the farm income pressure still falls on family farms. The proportion of large-scale farms, those with a size of farm business greater than ordinarily handled by a farm operator and his family, has not increased in the last 30 years. In fact, the absolute number of such farms has declined almost steadily at 4,000 per year over the past 30 years. The proportion of family-scale farms has scarcely changed in the past 20 years and still constitutes about two-thirds of all farms (Table 3.9). Similarly, the proportion of small-scale family farms has held remarkably constant over the same period.

Farms with sales of over $2,500 per year have changed, however, as a result of the technological revolution, changes in prices, and in the quantities and kinds of resources used in production. For example, the family-scale or typical farms indicated in Table 3.9 increased farm size from 200 acres in 1940 to 318 acres in 1954, an increase of more than 50 percent. Small-scale family farms increased size from 95 acres in 1940 to 116 acres in 1954. Despite these increases in land and in other capital resources, incomes of these family farms have not kept pace with incomes in other major sectors of the national economy in the last decade. In fact, the net income of family farms has declined over the past five years, though scale of operations and production increased. The decline in net income came about because of lower prices for products sold and higher

production costs. Evidently the farm income problem is not readily solved simply by an increase in scale of operations and greater production per farm.

TABLE 3.9

PERCENTAGE OF FARMS AND SALES REPRESENTED BY LARGE-SCALE AND FAMILY FARMS, 1929–54

Size of operations	1929	1939	1944	1949	1954
	(Percentage of commercial farms in group)				
Large-scale farms*	4.3	4.6	4.4	4.5	4.3
Family farms:					
Family scale or typical	66.0	62.8	63.9	62.9	63.5
Small scale	29.7	32.6	31.7	32.6	32.2
All commercial farms	100.0	100.0	100.0	100.0	100.0
	(Percentage of sales from group)				
Large-scale farms	30	35	34	33	31
Family farms:					
Family scale or typical	64	59	60	61	63
Small scale	6	6	6	6	6
All commercial farms	100	100	100	100	100

* Large-scale farms are those with size of output exceeding that normally handled by operator and family labor; family-scale farms are those which productively employ at least the operator; small-scale family farms are those with sales over $2500 but too small to productively employ full-time, able-bodied operator. The classifications in each year consider the prevailing technology and labor requirements under it.

Source: McElveen, J. V., "Family Farms in a Changing Economy," Agr. Info. Bul. No. 171, USDA, Washington, 1957.