

SOME FINANCIAL ASPECTS OF A CHANGING AGRICULTURE

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It's good to have this opportunity to discuss with you some financial aspects of an emerging agriculture. The fact that a group of business financial specialists is taking a look at developments in farm finance is sufficient evidence that the financial structure of the industry is changing. Historically, agriculture has supplied the bulk of its capital requirements from retained earnings. This source is no longer adequate. Consequently, an increasing proportion of farm capital needs must come from outside sources. Furthermore, I doubt that the large amounts of outside capital required by most efficient farmers of the future can be supplied entirely through the credit route. The size of loan requirements relative to owner equities already presents a real problem to most financial agencies. It is in this area of new equity capital needs that you financial analysts may play a major role in agricultural progress.

In this discussion I shall attempt to outline some changes in agriculture that have contributed to its capitalization problems. I propose to review: (1) The historical movement of agriculture

from subsistence to commercial farming; (2) the stepped-up revolution in agriculture in recent years; and (3) the impact of these technological advances on changes in farm capital.

Agricultural Developments - A Brief Review

During the first half of the twentieth century, agriculture gradually moved from subsistence to commercial farming. Home-grown products used in the household declined from about one-fourth of total farm income in 1900 to only 7 per cent in 1950. Purchased inputs rose from about one-third of total operating expenses in 1900 to more than half of such expenses in 1950. Horsepower constituted essentially the only source of farm power in 1900; by 1950 only 50 per cent of the nation's farms used horses as their main source of power. Home produced, open pollinated seed was replaced by improved purchased seed inputs, and in the case of seed corn, by hybrid seed inputs. Home produced fertilizer was supplemented by purchased commercial fertilizer nutrients.

Beginning about 1950 the pace of this revolution in agriculture was stepped up. This faster pace of the farm revolution was the result of new market forces in our free enterprise economy. Freed from the necessity of manufacturing military hardware and other defense goods, our industrial machine turned to producing machinery, equipment, and supplies for our domestic economy, of which the agribusiness complex is a major segment. Large supplies

of pent-up technology, not used in the depression years due to lack of capital and purchasing power and not used in agriculture during the war because of the diversion of the nation's resources to winning the conflict, became available for peacetime uses. The flow of these technological gains into agriculture came in numerous forms. Better and more efficient farm machinery replaced the earlier types, which in the prewar years were only slightly better than the horse-drawn equipment. Larger multiple-row equipment pulled by more powerful tractors replaced the single and two-row types. Machines such as the mechanical cotton picker were developed for performing new jobs which heretofore could be performed only by hand labor. Chemicals were developed for weed control, replacing a large part of the labor. Low cost, high nutrient fertilizers came on the market. Losses from disease, insects, etc. were reduced by new chemicals. All these flows of technology into our agricultural plant contributed to a rising efficiency in the industry.

The increasing output per man in agriculture can be demonstrated by comparison both with prior years and with output in the nonagricultural sector of the economy. Real output (output at constant prices) rose at the relatively slow rate of about 2 per cent per year in both the agricultural and nonagricultural sectors of the economy from 1920 to 1935, at

the somewhat higher rate of 3 per cent per year from 1935 to 1950, and output per man hour in the nonagricultural sector has continued up since 1950 at about the same rate as in the 1935-50 period. The rate of growth in agriculture, however, has stepped up to 5.5 per cent per year since 1950. For example, real output per man hour has more than doubled in the last 15 years. In contrast, output per man hour rose only about 90 per cent in the prior 30 years, 1920 to 1950.

Progress Necessitates Change

The rapid rate of progress in agriculture caused major dislocations in resource use, especially labor. With the increasing productivity of land and labor, the flow of farm products to market was magnified in the early 1950's. Since the domestic demand for such products is relatively inelastic and world demand for U. S. output is dampened by trade barriers, the rising output was accompanied by a general decline in farm commodity prices.

After rising sharply from 1950 to 1952 as a result of the Korean War, farm commodity prices began to drop in 1953 and by 1955 had declined to about 10 per cent below their 1950 level. Farm prices were stabilized in 1955, reflecting both market forces and to some extent changes in Government price support and production control restrictions.

The price declines in the early 1950's were sufficient to put great pressure on farm incomes and farm resource adjustments. Net income for all farms declined about 10 per cent from 1950 to 1955. It remained below the 1950 level throughout the rest of the 1950's, except in 1958 when simultaneous troughs in the beef and pork cycles pushed farm product prices up to unexpected levels. Following a sharp decline in net income in 1959, with a return to more normal supply conditions, it began to slowly increase. Soon after the turn of the 1960 decade net farm income surpassed its 1950 level and has continued generally up.

The major farm price and income declines of the 1950's provided sufficient pressure, however, to hasten the reorganization of American agriculture into a truly commercial industry. In view of the generally prosperous nonfarm economy, all prospective farmers who were lacking in farm know-how and financial resources could earn more by applying themselves to nonfarm pursuits where their labor was needed. There was a great exodus of farm boys to nonfarm pursuits. New entrants to farming, where labor was still in excess, thus declined rapidly.

The number of farms dropped at a faster rate following 1950 with the increased pressure on farm incomes than in earlier years. Farm numbers declined at the annual rate of 1.2 per cent from 1935 to 1950. From 1950 to 1955, however, when

pressure was greatest on farm incomes, the number of farms declined at the annual rate of 3.8 per cent. Since 1955 the number has declined at a rate of 3.1 per cent. Increases in farm size have corresponded closely with the decline in farm numbers, as total land in farms has not changed significantly in the last two decades.

Along with the major decline in farm prices and incomes in the mid-1950's occurred a decline in income per farm worker. During this period of rapid gains in new technology the farm work force could not be reduced as fast as new work-reducing methods were being adopted in the industry. The result was lower returns per worker. More recently, however, the situation has changed. Beginning in 1955, income per farm worker began to increase, and with the exception of 1959 which followed the unusual gain in 1958, farm income per farm worker has increased in each successive year.

This upturn in farm income in 1955 was primarily the result of two basic economic forces rather than special programs or other temporary palliatives. As indicated earlier, the great backlog of farm technology moving into agriculture in the early postwar years resulted in a flood of farm commodities to the market. This occurred despite a decline in the farm labor force. By the mid-1950's the flow of technology into farming may have begun to

decline as the pent-up supply of technology was worked off in the late forties and early fifties. In addition, the number of farm workers began to decline more rapidly about this time. The number of farm workers declined at the annual rate of 2 per cent from 1935 to 1950 and 2.2 per cent from 1950 to 1955. The rate of decline accelerated to 3.2 per cent from 1955 to 1960 and further accelerated to 5.1 per cent from 1960 to 1966.

It is my belief that this very rapid decline in the farm work force, coupled with the reduced technology flows, is beginning to have a sizable impact on the volume of farm output.

These market forces, coupled with a constant rate of increase in demand for farm products, were apparently sufficient to halt the downtrend in farm commodity prices in the mid-fifties and turn farm prices upward in the sixties. While over-all farm incomes have been rising slowly, per capita, disposable income per farm worker has been rising rapidly. During the past 10 years, income per capita of the farm population rose at the annual rate of 6.2 per cent, while that of the nonfarm population rose only at the rate of 3.4 per cent.

In my opinion, the strong market forces which have pushed farm incomes up during the past 10 years are continuing to exert upward pressure on farm commodity prices and incomes. Farm labor resources are becoming more sensitive to nonfarm employment opportunities. Better educational opportunities in rural

areas equip rural labor for all types of jobs. Thus, agriculture is becoming fully integrated with other sectors of the economy in contrast to its former insular position where it suffered greatly from its excesses. This move of agriculture into a fully market oriented industry is indeed a new horizon to those who have chosen farming and agribusiness as an occupation. A look back on the mid-fifties and earlier prewar years points to conditions in agriculture to which the industry is not likely to return. Conversely, the future in agriculture can be viewed with great optimism.

Agriculture in a Commercial Setting

As indicated earlier, in my judgment agriculture finally reached full commercial status in the 1950's, as opposed to "subsistence" or "way of life" farming. We turned the corner when labor began to leave agriculture in sufficient numbers for returns to labor to turn up. Resources in agriculture became fully sensitive to the market forces in other sectors of the economy. Labor began to move readily to occupations where returns were greater. Although most farm labor still consisted of the farm operator and his family help, if nonfarm opportunities were more attractive, he simply sold his farming interests to a neighbor and started anew in nonfarm pursuits. Improved educational

opportunities in rural areas were a major factor in this greater mobility of farm labor. As more farm production inputs were purchased, the returns to inputs had to be weighted closely against costs. Investments in farming had to be weighted against returns to investments in other areas.

These self-adjustments in labor which are necessary to provide maximum efficiency in supplying goods and services to the community are unique to the free enterprise system. Other systems must move labor and other resources from one occupation to another by arbitrary means if a high standard of living is to be achieved, and such movements allow much less freedom of choice than in our own system.

The enlarged flows of technology into agriculture and of labor to other industries have also dictated major changes in farm capital. Agriculture in its commercial setting has become highly capitalized. Total assets in the industry rose from about \$126 billion in 1940 to about \$200 billion in 1965. With the rapid increase in size of farms, however, capital per farm more than tripled, rising from \$18,000 to \$62,000 during the period. Furthermore, these averages include a large number of subsistence or semi-retired farmers. It is nothing unusual to find commercial farms today that are capitalized in excess of \$400,000. I might also add that capital per farm is increasing at a high rate and is likely to continue to grow for several years hence. My reasons for this conclusion are drawn from studies of returns to scale in agriculture.

Average returns on a group (28 farms) of specified types of commercial farms by size as computed by the U. S. Department of Agriculture indicate the greater efficiency of larger farms during the entire postwar period, 1947 to 1964. Excluding real estate appreciation gains, returns varied from 0.7 per cent on the smaller size group with average assets of \$22,000 per farm, to 7.0 per cent for the large farms with average assets of \$129,000. The step-up in rate of returns is continuous as size increases. For example, from a 0.7 per cent rate for the smallest size group, the rate increases to 4.3 per cent for farms in the next larger group, to 6.4 per cent for the second largest, and to 7.0 per cent for the largest size group.

Although returns to scale for the entire period 1947 to 1964 were significant, returns to size have become even more significant since the early postwar years.

During the period 1947 to 1949, all size groups of farms except the smallest earned a return on capital in excess of 10 per cent. Also, there was no significant difference in the rate of return for each of the three larger size groups. Beginning with the 1950-54 period, however, the greater efficiency of the larger farms began to show up at all levels, and for the most recent periods increasing returns to scale have been significant for each larger size group.

In the most recent period 1960-64, the two smaller groups of farms each had returns on capital of less than 4 per cent. The next largest and largest groups, however, had returns of 5.7 per cent and 6.5 per cent, respectively, excluding gains from real estate appreciation. Furthermore, for each step-up in the size of farms, there was also a step-up in rate of return on capital invested throughout all the size groups.

As I analyze the preceding data and contemplate their meaning, I conclude that the forces which have brought farming out of subsistence into commercial status have not run their full course. Further changes are shaping up that are bound to have a major impact on farm cooperatives, as well as on all other types of business organizations related to the agribusiness area.

Farms are moving away from our traditional concept of small family farms. They are moving in the direction of small to medium size commercial business enterprises. The following factors point to this move. The capital required in most commercial farming operations exceeds the amount which most individuals can expect to accumulate in a lifetime. As indicated earlier, a single operator often has under his control assets in excess of \$400,000. The transfer of these assets to the next generation is almost impossible under the existing structure of farm business organization. We need to

look backward only a very few years to see when many nonfarm businesses reached this stage and were forced to transfer control by means other than outright purchase or inheritance. In addition to problems of transferring ownership, credit needs for farm operation may be too large to depend on the life span and qualifications of one man only. New ways will be found to finance commercial farming. I would anticipate that as new financial arrangements appear, they will involve some further separation of the managerial function from ownership.

As farms become more like nonfarm business enterprises, problems of agglomerating the farm products of numerous small producers and of distributing supplies to them will decline in importance. The single farm will be a mass producing unit and will often be able to negotiate sales directly to the major processors who will have full confidence that grade, quality, and time of delivery of such commodities will be satisfactory. In many cases, products will be sold well ahead of the delivery date, and in some cases, sales will be made prior to production. Many of the supplies required by farm producing units will likewise be purchased in large quantities directly from the manufacturer. The wholesaling, jobbing, and commission operations will decline to a minimum and probably go out completely for the mass of farm commodities and the mass of supplies sold to farmers.

A large portion of all farm products will be produced under close ties with processors and mass retailing organizations. We may call it integrated farming, corporate farming, or chain farming. Prices, quantity produced, and output of individual farms will often be determined prior to production. Financing and capitalization problems of the farming portion may be combined with other phases of the operation. Thus, many of the financial problems of farming as we have known them in the past may tend to disappear in the next half-century. We are already able to observe some indications of this trend - namely, the large cattle feeder operations and some broiler producing enterprises. These factors point to greater stability in farm output and prices.

The on-the-farm sector of our agribusiness industry will continue to decline relative to the total. More of the inputs needed for farm production will come from the nonfarm sector, and more of the food processing and preparation chores will be done after commodities leave the farm. Thus, the farm will gradually drift into a specialized plant for processing mass quantities of raw materials into farm products. Such producing units will grow larger in size but will probably produce a smaller variety of commodities. In most cases I would expect no more than one or two commodities to be marketed from an individual farm.

Summary

In view of these massive changes in agriculture and the increasing role of nonfarm capital in the industry, I believe that you people in the field of financial intermediation will play an increasing role in future agricultural developments. I can visualize the time that equity funds will be channeled into farm units just as such funds have heretofore been channeled into nonfarm industries. Efficiency factors and balance sheet items will receive the same consideration as in the nonfarm sector. The movement of large amounts of equity capital into agriculture through the corporate route may not come easy. Agriculture is bound by tradition and protective laws. The laws tend to protect agriculture as a way of life. Yet when practice and tradition limit the efficiency of farming to less than optimum, the barriers usually come tumbling down. It is my belief that we have already reached this stage and that access to equity capital by efficient and economical means has become essential. I am sure that you specialists in the financial counseling business will be able to work out the details as demands for such capital increase.