EFFECTS OF INDUSTRIALIZATION ON CAPITAL REQUIREMENTS FOR SOUTHERN AGRICULTURE

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INTRODUCTION

Industrialization is a synonym for the industry-wide adoption of the systems approach to production. Agriculture in the South will approach the highly organized state currently exhibited by broiler and hog producers, and perhaps pulp and sugar and some cattle feeding operations. I shall define the two terms "industrialization" and "capital" quite briefly, and proceed to a discussion of effects such a development might have on capital requirements.

In general, industrialization means an increase in the degree of organization, the coherence and internal dependence between separable parts of a production process. Generally, industrialization has meant the elimination of large areas of random behavior, or of default decisions, as well as a concentration of effective decision power. Along with the concentration and sophistication of decision processes comes a concentration of control over production resources, and an increasing dependence on cash or credit with which to control these production resources.

Sophistication in the use of increased amounts of production capital generally is concomitant with industrialization. We have observed the increasing substitution of machine work for human labor, and, in agriculture, the substitution of hired labor for unpaid family labor. These do not appear to be logical necessities, but historically they have occurred during the industrialization process. Machinery becomes more sophisticated and more expensive; labor becomes more skilled, more scarce, and more expensive.

Manufactured fertilizers replace "natural" ones, and require money or credit rather than animals and a shovel. The manager of an industrialized farming system cannot afford to guess at the quantity or quality of the plant food elements he applies. At the same time, the storage, handling, and application of standardized manufactured fertilizers are easier, cleaner, and more susceptible to control than are the "natural" products. Hybrid seeds and crossbred breeds require a cash outlay. The user no longer is able to save part of his product for seed or breeding stock.

In all probability, the industrialization of agriculture in the South will lead to an increased flow of money and other capital through the economic system. The interesting questions cluster around the possible modifications in present systems, or the evolution of new ones, that this industrialization process will call forth.

CAPITAL QUANTITIES

To those of us with a farm management bias, the term "capital" can easily be construed to include the gamut of things required in agricultural production. In classical theory, capital was everything other than land, labor and management. But, nowadays, we apply a value transform to these production inputs, and include everything as capital. As the process of industrialization of our agricultural industry progresses, this transform is fast becoming the reasonable common denominator as inputs are more universally hired or borrowed.

In this article, I have not analyzed the physical dimensions of Southern agriculture as it moves into the industrialization processes in 1970's, nor estimated the numbers of cows, pine trees, cotton plants, etc., that Southern agriculture will reasonably add to its

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production, but will discuss capital requirements in terms of money, and of the money-equivalents of resources and products. Altogether, these constitute the capital requirements in and for Southern agriculture.

A few aggregate statistics are presented as a prologue to the more serious discussion that follows. The data summarized in Figure 1 were aggregated from the various Statistical Supplements of the Agricultural Finance Review, and include the 14 Southern States. One must use caution in any interpretation of these credit data, since they are cross-sectional samples of a flow phenomena. Figure 1 does indicate several things about trends that are interesting, if not absolutely reliable in a statistical sense. For one thing, cash receipts from farm marketings and Government payments in the South are increasing at a much slower rate than are the trends for both mortgage and non-real estate credit. This suggests that there will be a continuation in the already apparent squeeze on agricultural profit margins, or that other, more profitable, uses will be found for agricultural production resources.

There is also an indication that land values are rising at a slower rate than is farm mortgage debt. This suggests that there is a trend toward higher leverage positions on real estate holdings - perhaps that there is more involved in the land price structure than just the agricultural productivity value in present uses. Non-real estate debt outstanding grew about 470 percent over the 20 years from 1949 to 1968 in the South. If this trend continues to 1980, the South might be using two and a third times more production credit than it does now. The figure for non-real estate debt outstanding in the 1981 Agricultural Finance Review might be 8.3 compared to the 3.5 recorded in 1968.

Extrapolations from a historical base, as in Figure 1, may be too modest an estimate of the change that will occur this next decade. As a higher proportion of the production resources are bought, one might expect even greater proportions to be financed, and, therefore, even greater amounts of short and intermediate-term production credit to be used. Likewise, with respect to the purchase price of an average acre of land, the increasing scale required by industrialized producers might drive the price beyond the $480 per acre given by this extrapolation for 1980. One can hardly expect a continuation of present land control patterns, much less of present financing arrangements.

CAPITAL CONTROL

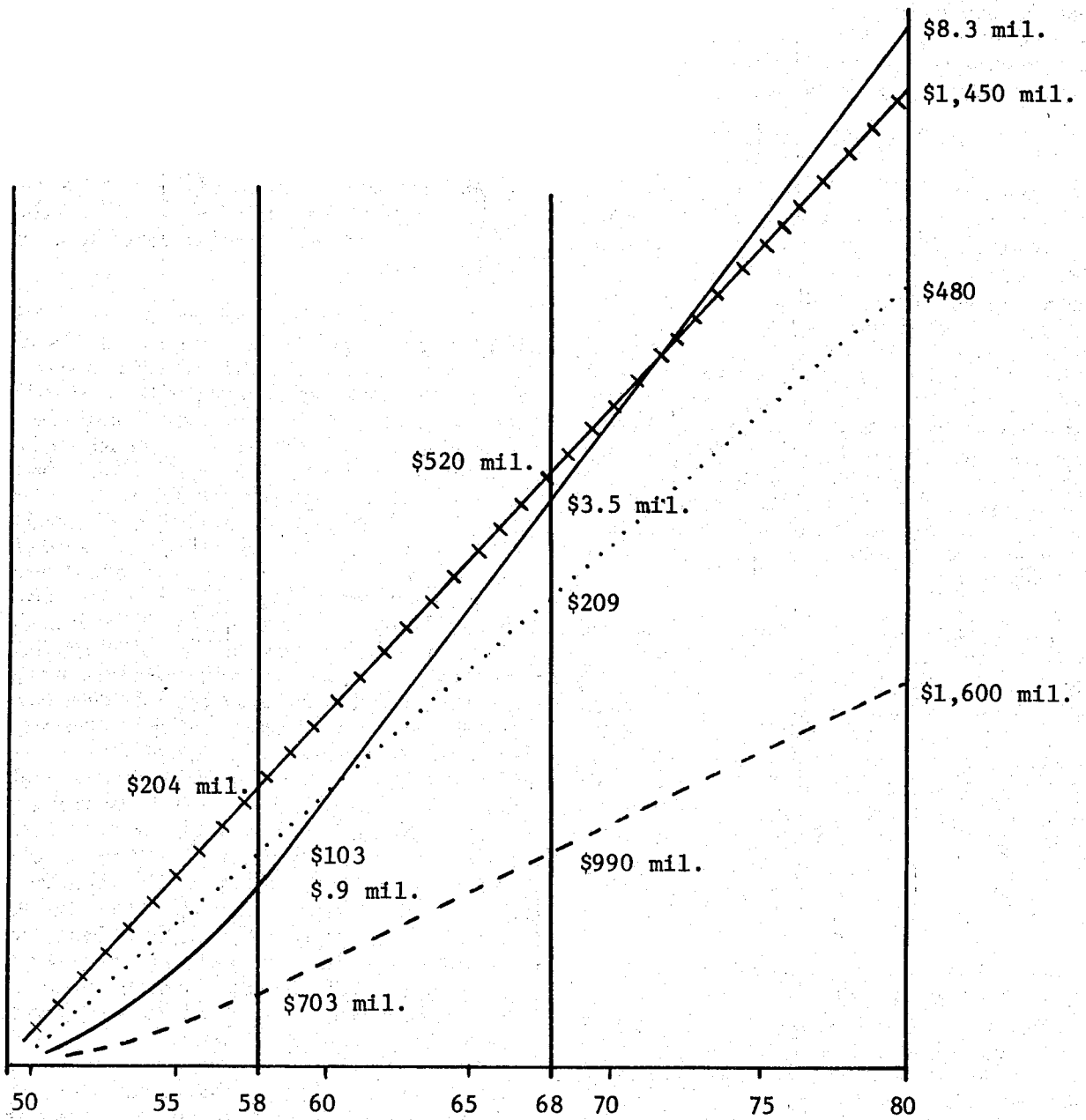
We must become accustomed to the inevitable separation of capital ownership from capital control. One assumes that the required quantities will be supplied at some price, whatever the stage of the economy, but control of resources is the key to industrialization. I refer to the prospect of separating the ownership of land and other productive resources, from the managerial control of those resources in a production process. Industrialization requires both a concentration and a sophistication of the managerial decision power over resource use.

The concentration of both ownership and managerial allocation and control was present to a large degree under the plantation system. But in the coming process of industrialization, it will matter little who owns the resources, but very much who exercises allocative control over them. The professionalization of the management function goes along with this separation of ownership and control. The manager treats the payments to resource owners and investors as part of his cash operating costs and economizes with respect to the net returns of these costs.

Procedures for capital control in this decade of the 1970's allow for much interesting speculation. Capital may be controlled through ownership at varying investment equity levels, or through the hiring or leasing of use-rights from the resource owner. The quantities of resources required for a viable agricultural production unit nearly rule out the continuing prospects for our traditional full-owner single proprietorship means of control. Ownership probably will be divided among several real or legal persons, in a partnership, a closely-held, or a public corporation. In any of these cases, a hired manager will be necessary to operate the production business. Certainly, we can expect very few successful attempts to manage farming operations through a group decision process. The alternative prospect is that an entrepreneurial manager will rent the agricultural production resources, and that the owners and investors of them will retain only a loose contractural control over their allocation.

What is likely for management is even more likely for the labor input. Self-employed labor is likely to disappear as a significant cost item in an industrialized agriculture. We may see the development of a pool of laborers who are skilled machine operators, husbandmen, and mechanics. Operators will be less and less inclined to trust to luck as machinery becomes more expensive, production systems more sophisticated, and operating margins narrower. We should expect that the labor employed on industrialized farms will be much more highly paid than at present, and possibly as well unionized as their peers in other sectors of our industrialized economy.

So, we can expect an increase in managerial control over more sophisticated and capital-intensive production systems, and the prospect of a separation of



- - - - - Cash receipts from farm marketings and government payments

..... Average value/acre, land and buildings

———— Non-real estate debts outstanding (commercial lenders)

|—|—|—|—| Farm Mortgage debt outstanding (commercial lenders)

(All curves fitted freehand to data plotted individually on semi-log paper)

FIGURE 1. SELECTED CREDIT AND PRODUCTION TRENDS: 14 SOUTHERN STATES, 1949-1968, AND EXTRAPOLATED TO 1980

managerial control from resource ownership and investment, and from the labor functions. We can expect that these separations will lead to specialization and to increases in production efficiency. We can surmise that it, also, will lead to the development of countervailing powers among various owners, suppliers, and users of production resources.

CAPITAL INSTITUTIONS

Industrialization will certainly work changes in the present agricultural institutions of the South. Concentration of the managerial function certainly will require a concomitant concentration in the control of production resources. It will lead to the demand for capital that can only be met by some sort of vertically integrated credit institutions. We may see an increase of branch banking, and an increased participation of "central" banks in local lending activities, an increase in commercial paper, discounting at the level of "Fed window," or some adaptive form of debentures for agricultural production firms of a large sort. We may also see perpetual debt for selected production firms, or financing from non-traditional channels, e.g., from integrators or contractors, etc.

The direction that these financing activities will take depends in large part on the willingness and ability of Southern financiers to adapt to changing credit requirements. If present suppliers of credit continue to rely on ownership of resources as the primary collateral for their lending activities, then there will not be great industrialization, or it will not be financed from the region. The process of industrialization implies change in whatever sector it occurs. There will be a switch in primary lender concern from ownership-control of resources to loan service-ability and profit generation.

In addition to examining institutions for ways in which they might be made to modify the conditions of successful production, we should examine emerging technology for the ways in which the rules of the game might be modified. The "leading edge" of agricultural producers will continue to find ways in which to use emerging technology to beat the normal system based on natural phenomena, and on the institutions that have evolved to deal with them. Entrepreneurial returns come from finding techniques of organization, production, and resource control that reduce the probabilities of loss irrespective of nature or outside institutional structures. The entrepreneur looks for techniques that are not restrained by extant institutions, and that have a high probability of success regardless of what happens.

Institutions and natural phenomena are both externalities for the "typical" producer. The "atypical" producer finds strategies that exploit permissive chinks in the institutional armor. The "atypical" producer tries to internalize the stochastic elements in both institutions and nature, by means of his strategic arrangements.

It is much easier to find chinks in the institutional constraints than it is to change the institutions themselves, and to convince a tax court to extend a depletion allowance to ground water, than to change the tax laws with respect to depletion allowances. Exploitation of these premissive chinks eventually will be reflected as institutional changes, but not in the same decade.

What are some of the consequences for capital requirements? History teaches that the institutions of capital supply and management will change, but slowly. Logic suggests that capital supply will alter radically for those innovators who make up the "leading edge" of Southern agricultural producers. Contracts are by now quite traditional, but an entrepreneur will write a contract that does things a lot differently in his particular case. He may not address himself directly to the problem of maximizing the renters share of the take from land. He may not even try to minimize the probability or the amount of an absolute loss. He may write a contract that aims at once at minimizing the maximum probable loss, at maximizing the minimum gain, and most importantly, at ensuring that any gains are capital-gains-sheltered, rather than exposed as ordinary income. The non-owner may economize with respect to the after-tax net entrepreneurial return, rather than some more traditional form of net farm income. The diversity and sophistication of capital control and allocation strategies worked out by our entrepreneurs in this new decade may well amaze if not dismay us. These strategies, blended with emerging technologies, tend not to modify expected payoffs so much as to change the basic rules of the entrepreneurial game. Institutional arrangements modify the rate of payoffs, but entrepreneurs do not have time to wait for institutional changes; they precede them instead.

There no doubt will soon be organized labor to contend with organized managers and resource owners in agriculture. Again, this need not be viewed as the realization of an anathema, but may instead be seen as a natural process of substantive value to producers. Organizations can bring professionalization, increased skills, and a more responsible participation in the production process, as well as situations not so welcome. But labor in an industrialized agriculture might be hired less and less in a direct fashion, and increasingly as a part of a contractural package of goods and services. One might expect that certain managerial information and advice also will be hired on contract, perhaps in connection with borrowed

capital. Credit tied to record processing and tax consultation, as well as to advice on production technology will come partly from the demands of agricultural producers, and partly as a result of competition among lenders for high quality agricultural producer business.

Industrialization in the non-agricultural sectors has been accomplished by innovations in organization, technology, and capital supply. We have seen the epochal invention of the corporate person in business. We have seen the invention of holding companies and of conglomerates. We have seen capital raised through stocks, bonds, debentures, and commercial paper. There is every reason to believe that these and similar phenomena will accompany the industrialization of agriculture in the South as elsewhere.

We might hope for further innovations in the supply of capital. Somewhere there are entrepreneurs who will supply them, or have already, perhaps. Managerial co-ops might spring up - associations of producers who band together to hire and share professional competence in production, financing, and marketing technology, as well as in record keeping and analysis. Agriculture has hardly marred the surface of the shared-time computer systems already used in other industries. This will come for market reports, weather conditions, insect and disease control, and other up-to-the-minute information useful to agricultural production.

Economic theory too often presumes perfect information and instantaneous managerial adjustment. The more successful competitors in an industrialized agriculture will find ways of more closely approximating perfect information, and of making more nearly instantaneous production adjustments to that knowledge. It will be done with leased wires and remote computer terminals. By the time that the postman rings even once, it may already be too late for successful entrepreneurship.

Two things are sufficient conditions for industrialized agriculture. The first is zero-time-lagged information. The second is the ability to rationalize such information into the production process with positive eventual results. Modern communication systems are available, although costly, that fulfill the information condition. The rationalization condition depends in part on our own abilities as researchers. We must look for and find ways of using better information more quickly in agricultural production.

The laurels for research in this decade of the 1970's will go to those who provide systems of resource control and management adapted to the emerging processes of agricultural industrialization. Research further into the systems and part-systems of the 60's may not be good enough. Agriculture in the South is in transition - we do not yet know toward what, or at whose pace. We can only hope that our research helps the "leading edge" agricultural producers[1] - that it at least blazes a few witness trees in the still virgin woods of agricultural industrialization. If it does not, if it plows doggedly into a perfection of the record of the past, then we will lose our leadership to other researchers, either academic or private, for industrialization will come, and intricate production systems will be devised by or for the entrepreneurs. If we do not do it, someone else will, and that will not be a cause for pride.

[1]A reviewer of this article suggests that researchers in publicly supported institutions have responsibilities to the public welfare, as well as to the individual producers. If one accepts this premise, then we are compelled to try to lead or otherwise control the industrialization process in agriculture, such that the public good is served - or at least not dis-served. An interesting point for further speculation, perhaps.