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Staff Paper 15

November 1974

FUTURE ORGANIZATIONAL
STRUCTURE OF U.S. AGRICULTURE

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This paper is prepared for possible further revision and for use by Agricultural Economics Staff and College of Agriculture Administration.

Staff papers are published without formal internal review by the Department of Agricultural Economics.

FUTURE ORGANIZATIONAL STRUCTURE OF U.S. AGRICULTURE

BY

G.L. Bradford and D.L. Debertin

Even as recent as the 1950's it was acceptable and probably valid to discuss U.S. agriculture and its control by focusing primarily on farm firm units. The U.S. Census of Agriculture, published twice each decade, provided data on numbers of farm units, size of units, tenure status, descriptions of farm owners and operators, etc. Using these data and similar "facts" from other sources, researchers were able to obtain a reasonable grasp on the nature of control of (1) resources devoted to agriculture and (2) the structure of agricultural resource and product markets--two essential dimensions for defining and describing control.

During the decade following World War II and even up to 1960, agricultural journals, other periodicals and publications contained a great deal of materials (articles) which dealt with the issue of control. Then, even as contract agriculture and vertical integration were accelerating as structural forces and the possibility of unionization of certain "islands" of the agricultural labor force and corporation farming all seemed to be rapidly emerging as key elements of control, it seemed that the issue diminished in importance in the journals and other publications. Perhaps it was due to the increasing difficulty of obtaining hard data on what was happening and what would be likely to happen; data on farm firms were still available, but by this time this obviously was not sufficient.

Or, perhaps it was due to the fact that many agricultural economists found it more rewarding (in various ways) to devote attention to problems which lent themselves to using quantitative models, i.e., tool orientation rather than problem orientation.

What now matters is that problems which center around the words structure or control may be starting to re-emerge into professional focus. If they are not, at least it is the consensus of many agricultural policy leaders that it is timely to address some of the topics, determine if certain of these kinds of problems deserve in-depth research attention by farm management types. The North Central Regional Public Policy Education Committee addressed this topic earlier in 1972 (*Who Will Control U.S. Agriculture?*); their publication is cited and used in some parts of this paper.

OBJECTIVES AND PROCEDURES

The purpose of this paper is to provide a conceptual framework for analyzing the future organizational structure of U.S. Agriculture. We contend that it is naïve and fruitless to attempt to unconditionally predict values of parameters which bound (describe) this problem. Rather, the legitimate role of the economist is to map what is likely to happen (outcomes) and the consequences (impacts) of these outcomes given alternative organizational structural organizations of agriculture.

The paper is organized into four subsequent sections: (1) A delineation of alternative organizational structures, (2) defining certain economic variables which comprise a portion of the entire outcome set,

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i.e., insofar as future organization of U.S. Agriculture is viewed, (3) provide an initial, conceptual mapping of effects of the alternative structures (set A) into the outcome set (B), and (4) some concluding remarks, mostly caveats.

DELINEATION OF ORGANIZATIONAL STRUCTURES

A great deal of the present research work on structure devoted to a description of the current organization structure of U.S. farm firms and how this structure has evolved since World War II. Certainly, this is one type of work that is needed. Yet, two essential ingredients need to be added to make the research of greater and more-enduring value to policy makers and others concerned with the future organization of U.S. Agriculture. First, agriculture must be treated in its entirety for individual foods and fibers and for a composite of products, i.e., in addition to data and "results" for suppliers of productive resources and for food and fiber processors, distributors and retailers. The problem is not merely one of production, nor of marketing; neither does it lend itself to analyses by any one group of micro economists. The problem in reality is a set of problems, all of which need to be clearly defined in relation to one another. Second, as implied above, the work needs to be predictive in nature; forecasts of what is likely to happen and probable consequences of each outcome (however hazardous) are needed.

As an initial thrust toward satisfying the above ideals, four alternative organizational structures are outlined and briefly described. The description is in terms of the probable nature of markets, number

and size of firms, source(s) and flow of capital, sources and flow of technical and market information.

Alternative (A) -- Dispersed, Open Markets

1. Open factor and product markets--free access to trading for all parties.
2. Large number of farms and agri-business firms, each of modest size with substantial portion of the firms' owners (landholders in the case of farmers) also being the firm's operator(s)
3. Minimum "control-strings" on externally furnished investment capital.
4. "Open flow" of technical and market information from public sources, and broad-based public support for access to necessary public services (utilities, schools, health, etc.)

Alternative (A₂) -- Contract Production, Vertical Integration, Cooperatives

1. Factor supply functions similar to Alternative (A₁), but factor demand functions more inelastic -- reflecting fewer firms and more specialized production. Raw product markets similar to that now found in poultry, seed crops and processed vegetables with more likelihood for pockets of agricultural laborers becoming unionized.
2. Number of producing firms gradually decreasing. Owner, operator and labor functions tend to be carried out by different people.
3. Increasing reliance on equity capital. Large amounts of debt capital per producing firm to be obtained on national money markets in competition with non-agr. firms, implies less need for government sponsored agricultural financial intermediaries.
4. Technical and market information increasingly generated internally (by each firm). Demand for public services oriented to the firm (e.g., utilities) but pressures for community and state government agencies to provide educational and health services left to firm's employees.

Alternative (A₃) -- Corporate Agriculture

1. Imperfect competition in factor and product markets, especially in livestock agriculture; Competition mostly on a nonprice basis -- price discrimination employed to the extent that markets

are separable. Considerable pressure for labor unions.

2. Few firms, especially for livestock agriculture; Owner, management, and labor functions separated.
3. Investment capital secured through stocks and bonds much like many present industrial corporations.
4. Numerous impediments to inter-firm flows of technical and market information.
Public services differentiated into those demanded by firms (e.g., utilities) and those services demanded by households (e.g., schools, doctors, hospitals.)

Alternative (A₄) -- Government Administered Agriculture

(Assumes the present structure of Government, i.e., a Federal Republic etc.)

We will see traditional agr. policies that are designed to affect product supplies and prices plus government regulations designed to (1) ensure environmental quality needs (demands) of voters, (2) foster "improved" land use policies, (3) provide "adequate" credit for certain economic sectors, (4) protect well-being and income of agricultural laborers.
Could be superimposed upon Alternative (A₁) and/or Alternative (A₂).

DELINEATION AND DEFINITIONS OF ECONOMIC VARIABLES (SET B)

Note that this set of three economic variables (columns of Table 1) is "selected", for illustrative purposes, from a near-infinite outcome set. The economists's role is legitimate only when he estimates (or predicts) values for outcome variables "selected" by decision makers. A simple example of a appropriate effort on the part of an agricultural economist to impose values and weights can be shown in regard to the net farm income variable.

Net farm income (NFI) reflects in reality several elements: Net farm income each year (N₁, distribution of this net income among farmers (N₂), yearly stability of such income (N₃).

In this notion, the economist must obtain values, weights and a functional form from all farmers--a difficult task! Can one, for example, hypothesize that the three components of this notion are equally valued and weighted by all farmers? Does one assume

$$NFI = N_1 + N_2 + N_3 \quad ?$$

Or, does one assume (for example) that $NFI = 2N_1 + 3N_2 + 4N_3$?

It is more legitimate or appropriate when researchers have almost no information about decision markets' values and weights, for NFI to be defined more precisely. To wit,

Net farm income--aggregate annual net farm income or

(NFI*) = residual gross farm income after subtracting
annual cash operating expenses

Consistent with this approach, illustrative definitions for the other two outcome (set B) variables shown in Table 1 are:

Retail food prices--Monthly index value of "market food basket" compiled by USDA researchers.

Total farm productivity (output)--total real dollar value
of all farm production.

ECONOMIC RATIONALE FOR ESTIMATED OUTCOMES (MAPPINGS)

Retail food prices

The no. 1 rating is assigned to the alternative organization which will likely (is estimated to) result in the highest total food bill for all U.S. consumers. One could argue for several rankings. However, let us employ axioms of economic theory (& logic) along with available empirical research knowledge to assign ratings.

Table 1. Ratings matrix: mappings of alternative organizations into expected outcomes for selected economic variables*

Alternative organizational structure for agriculture	Estimated outcome for		
	Retail food prices	Net farm income	Total farm productivity (output)
(A ₁) Dispersed, open markets	3	4	2
(A ₂) Contract production Vertical Integration, Cooperatives	4	3	1
(A ₃) Corporate	1	1	3
(A ₄) Government administered	2	2	4

*Rating scheme: 1 = highest average aggregate value (absolute) of the variable

2 = next largest value of the variable

3 = third largest value

4 = smallest value

Alternative A₂ is assigned the no. 4 rating (the lowest total food-bill for U.S. consumers) because this organization (of the four being compared) best lends itself (1) to attainment of substantial scale economies by production and processing firms, (2) to passing benefits from such scale economies to consumers since a rather healthy

degree of price competition can be maintained in the factor product markets at various stages in production and marketing phases. Witness for example, the trends toward lowering of broiler prices throughout the 1950's & 1960's as this industry gradually transformed from an Alternative (A_1) situation to an Alternative (A_2) situation.

Alternative (A_3) (corporate agriculture) is assigned the #1 rating--highest food bill of the four alternatives--because one must doubt even if substantial cost economies of scale could be achieved by agricultural corporations, that the competitive structure of a corporate agriculture would allow the transfer of benefits to consumers. There are, of course, yet no sectors of the US agricultural economy where a corporate structure directly prevails. However, one can discern clues as to what could happen by studying the transformation since 1950 of certain farm input supply industries -- from Alternative (A_1) to something approaching (A_3), e.g., seed corn, raw materials for inorganic fertilizers.

Net farm income

Rating criterion--Real present value of aggregate net farm income above cash operating expenses for a 10 year planning horizon (say, 1975-1984).

Alternative (A_3) is given the nod--#1 rating--because in an imperfect market few firms, vertically integrated from present corporations or new farm corporations, could capture practically all added net revenues resulting from size economies. This assumes that tax laws would not be altered too drastically from present (e.g., repeal of all capital gains and cash accounting regulation), and that other government regulations on deleterious environmental effects of large-scale farm production

operations would be limited and/or could be largely avoided.

Alternative (A_1) is given the #4 rating because, as in the past, practically all intra-or external economies emerging from this type of organization are reaped not by producers but by middlemen or consumers. Thus, even though total production can be very efficient under a dispersed, open-markets structure, net farm income tends to be lower than for the other three alternatives.

CONCLUDING REMARKS

The thrust of the presentation has not been to unconditionally predict (forecast) the future organization of U.S. Agriculture. Rather, it is argued that a more fruitful and legitimate role of the economist is to map what is likely to happen and consequences of such results given alternative organizational structures, i.e., if organizational structure (A_1) emerges then it is likely that the outcome(s) will be

The predictive power of such an approach depends greatly upon how accurately one delineates the action and outcome sets. For the problem of future organization of US Agriculture there are certain key elements which should be considered in delineating such sets. Let us conclude by posing certain questions along this line.

- (1) How should we define agriculture when studying structure?

For a start, read Breimyer's article in the August 1962 JFE entitled "The Three Economies of Agriculture."

- (2) What is the fundamental nature of the machine process in agriculture and how does it differ from industry?

For a start on this question, read John Brewster's article in the

February 1950 JFE.

- (3) How does one measure economies of size, and to what extent can economies be achieved for various sectors of agriculture?

See Madden's Booklet entitled "Economies of Size in Farming," Agriculture Economics Dept. 107, ERS, USDA, February 1967.

- (4) How can we model the firm growth process for farms and other Agricultural firms?

See George Irwin's article, "A Comparative Review of Some Firm Growth Models" in Agr. Econ. Res., Aug. 1968.

- (5) What sort of theory "should" economists use to model capital investment decisions?

See J. Hirschleifer's article, "On the Theory of the Optimal Investment Decision" in Journal of Political Economy, August 1958.

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