



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

APPLICATION OF THE
STRUCTURE, CONDUCT, PERFORMANCE
PARADIGM TO SUBSECTOR ANALYSIS

by

Bruce W. Marion

WP-7

November 1976

The author is Professor of Agricultural Economics, The Ohio State University. He is currently Visiting Professor, University of Wisconsin and Executive Director of NC 117. The original version of this paper was presented at a meeting of the NC 117 Beef Task Force, March 11-12, 1976

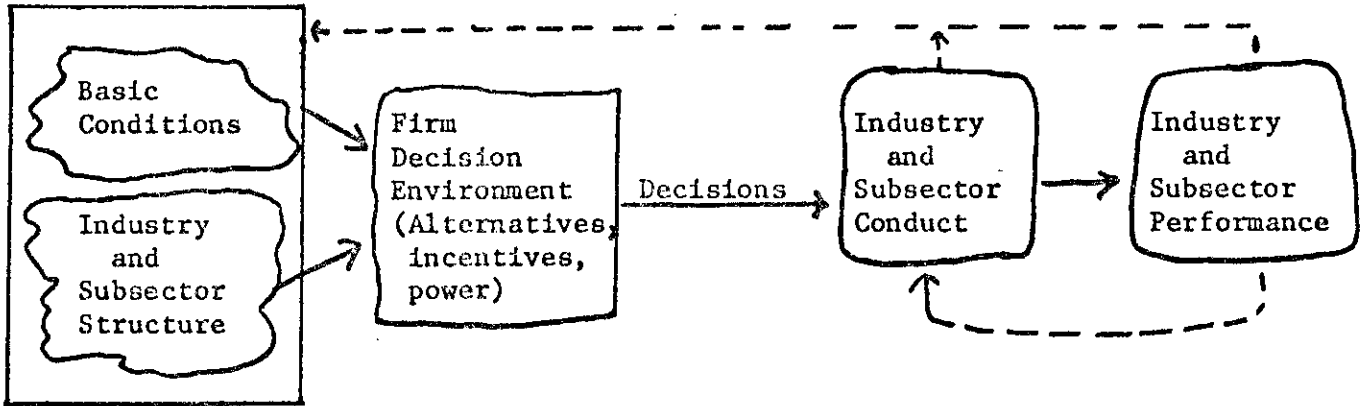
This paper attempts to extend the contents of earlier papers by Henderson [1] and by myself [3, 4]. The objective is to take one step further in developing a logical and operational conceptual framework for subsector analysis.

Although there are many possible reasons for studying subsectors, those concerned about the organization and performance of subsectors are particularly concerned with:

1. The control of subsectors--regardless of its observable impact on performance, we are interested in who has control over strategic aspects of a subsector and the degree, if any, that control is shifting.
2. The effects of alternative patterns of control on subsector performance, and particularly:
 - a. The extent to which supply offerings match demand preferences re: quantity, quality, timing and location, i.e., the extent to which coordination is achieved.
 - b. Technical and operational efficiency of entire subsector.
 - c. Equity of distribution of returns, rights, risks, information, and responsibilities.
 - d. Access to subsector, including the widening or narrowing of markets, market foreclosure, vertical "squeezing" opportunities and the conditions of entry.
 - e. The reliability and stability of subsector performance.

Henderson has suggested adapting the structure, conduct, performance framework of industrial organization theory to subsector analysis. I believe this has potential if we can adequately specify analogous subsector dimensions.

In subsector analysis, we are attempting to meld together the horizontal (industry) and vertical dimensions of a subsector. I would suggest the following general paradigm:



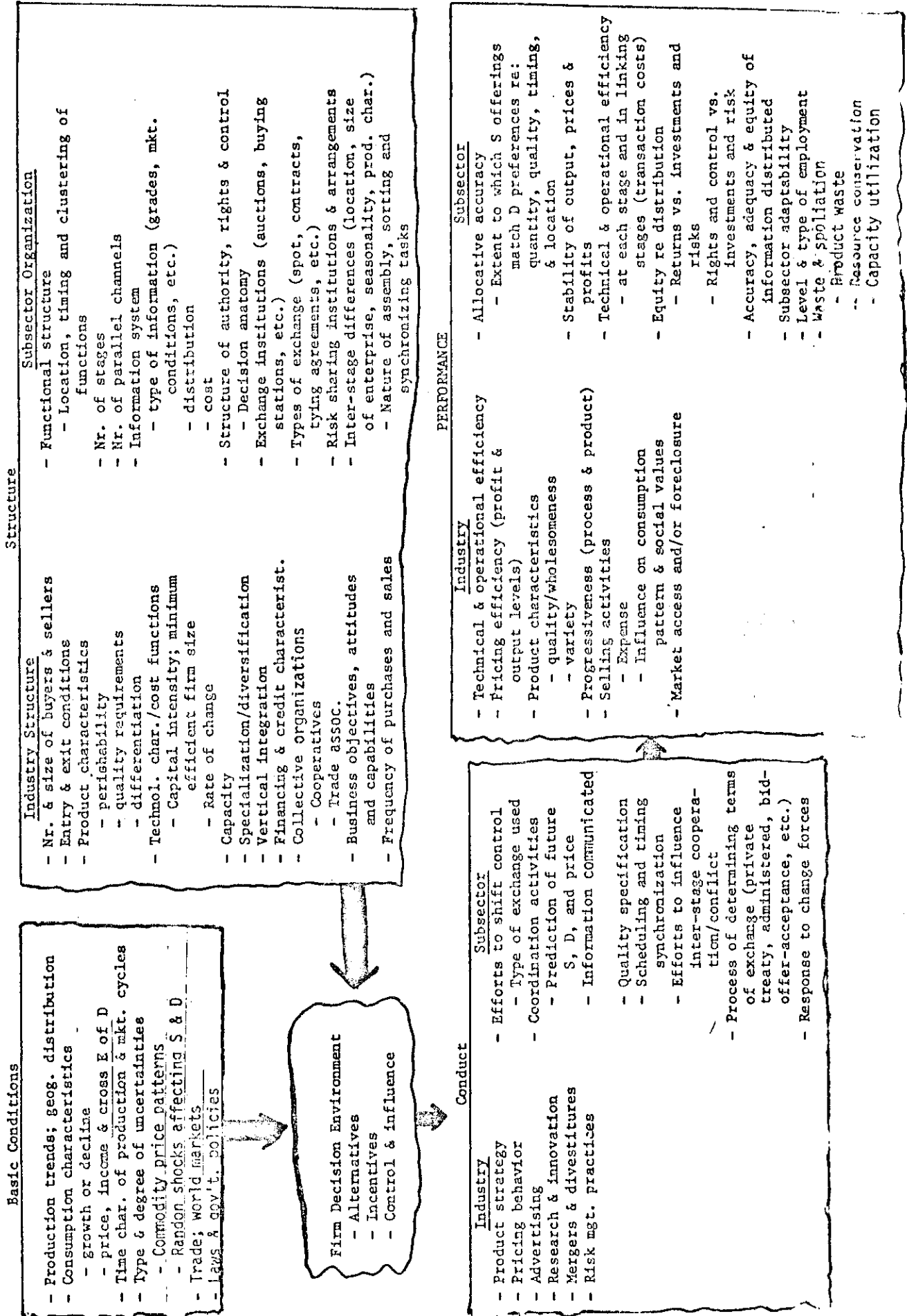
In industrial organization theory, we rarely consider explicitly the firm decision environment -- perhaps because most analyses by-pass conduct and examine the relationships between structure and performance. In subsector analysis, we may find it expedient to do likewise. However, since one of the dimensions we are particularly interested in examining is a conduct dimension--coordination--it seems useful to specify the paradigm as completely as possible at the outset.

The dimensions hypothesized to be important in each of these categories are shown in Figure 1. Considerable work is still needed to define these dimensions, develop ways of measuring them, and to develop hypotheses concerning their inter-relationships. However, these appear to be "doable".

The basic structure-conduct-performance paradigm seems to lend itself rather well to the conceptual schools I identified in an earlier paper [3] and which, at least implicitly, suggest certain hypotheses. With some modifications of my earlier classification, the schools are as follows:

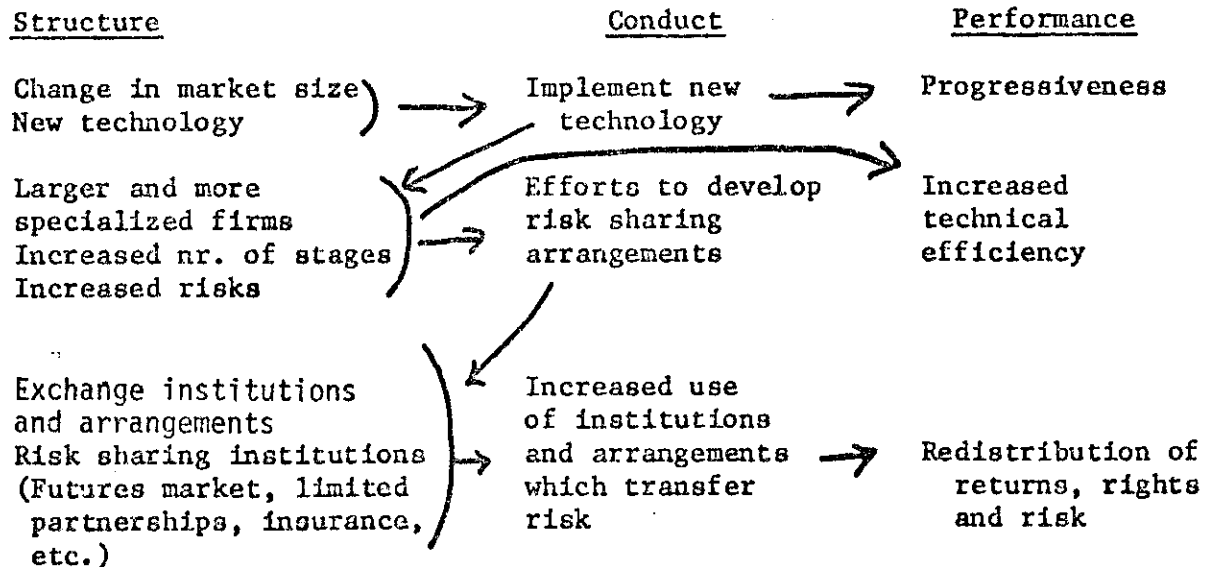
1. Technological determinism -- concentrates on the design of systems from a logistics-production economics point of view. Tends to focus on the reasons for changes in subsector structure, particularly integration and

Figure 3. SUBSECTOR STRUCTURE, CONDUCT, PERFORMANCE PARADIGM



disintegration. Structural changes are attributed largely to technical efficiency and/or risk sharing incentives.

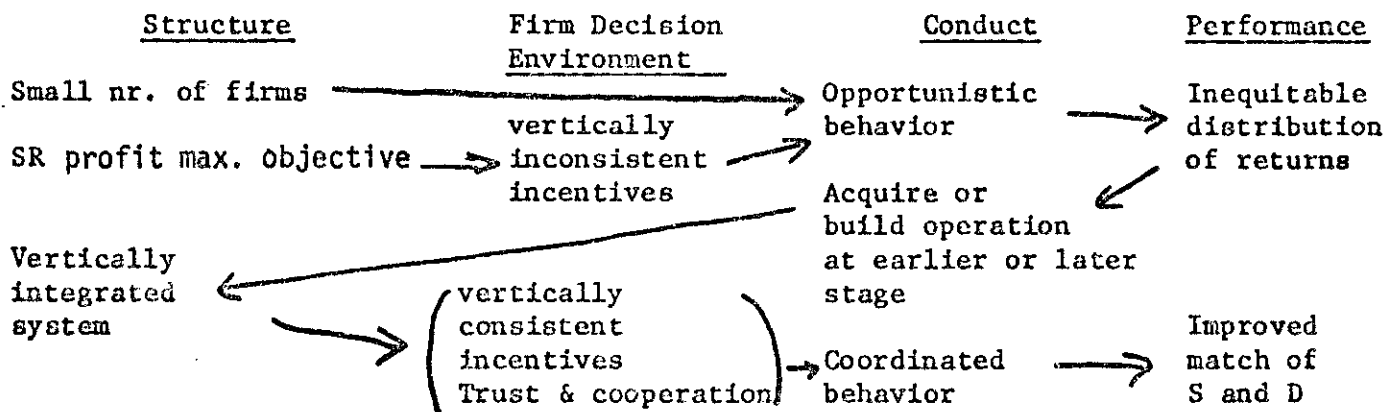
An example of the rationale of this group can be cast in the structure-conduct-performance framework as follows:



2. Behavioral -- focuses on how system functions with strong emphasis on conduct affecting inter-firm vertical relationships. Positivistic approach with human element considered.
 - a. Cybernetic feedback-control approach -- micro dynamic general systems simulation models which examine decision rules, delays, and decision points. Emphasis is on relationship between these coordinating activities and performance in matching S and D.
 - b. Conflict-cooperation approach -- emphasis on behavioral analysis of conflict, cooperation and power in vertical channels, their effects on the coordination process, and on matching S and D. Changes in linkages are viewed as ways of altering the levels of cooperation, conflict and control -- and in turn altering the degree of coordination achieved (match of S and D).

- c. Market failure approach -- focuses on the causes of subsector structural change, particularly vertical integration. Williamson, one of the leading proponents of the approach, suggests that both structural and conduct factors are involved in leading to market failures which may cause vertical integration (i.e., small numbers plus opportunistic behavior). Conduct is viewed as more independent of structure than in many approaches. [5]

An attempt to adapt the structure-conduct-performance paradigm to Williamson's approach is as follows:



3. Institutional -- tends to concentrate on structure-performance relationships.

- a. Market structure approach -- focuses on the effects of vertical structure on industry structure, conduct and performance. For example, vertical integration, tying agreements and long term contracts are examined to determine their effects on conditions of entry into an industry, market foreclosure, and vertical squeezing opportunities as well as on such factors as technical efficiency and pricing efficiency.
- b. Coordination-adaptation approach -- emphasizes the institutional structure of systems, the structural evolution of the system, and the coordination and adaptation of the system. Attempts to consider entire subsector. Technical efficiency, adaptability, allocative

accuracy, and distribution of rights, returns, and risk are performance dimensions emphasized.

- c. Legal-institutional -- focuses on the role of laws and institutional arrangements. Particularly concerned with distribution of rights, risks, and returns relative to investments and control of various participants.

The structure-conduct-performance paradigm can be similarly adapted to these approaches. At this point, however, I suspect that this is unnecessary.

A vertical S-C-P framework is appealing from several standpoints. First, since it is analogous to the S-C-P approach of industrial organization economists, it does not face the problems of a new and different concept. It has the advantages and perhaps the dangers of familiarity. On balance, however, this should enhance understanding and acceptance.

Second, it provides a useful classification scheme for the various writings on vertical organization, vertical coordination and subsector analysis. Until one has a total framework, it is often difficult to define what part of the framework is being addressed and what is ignored. Most of the relevant literature provides only a partial conceptual framework or analysis of vertical systems.

Third, the S-C-P paradigm provides the base for defining hypothesized relationships for examination. The dimensions included in Figure 1 may be both incomplete and excessive. After a variety of subsectors have been examined, some of these dimensions may "float out" as more important than others. Perhaps, in time, we will be able to reduce these down to a select few as industrial organization theorists have done.

Control and Coordination

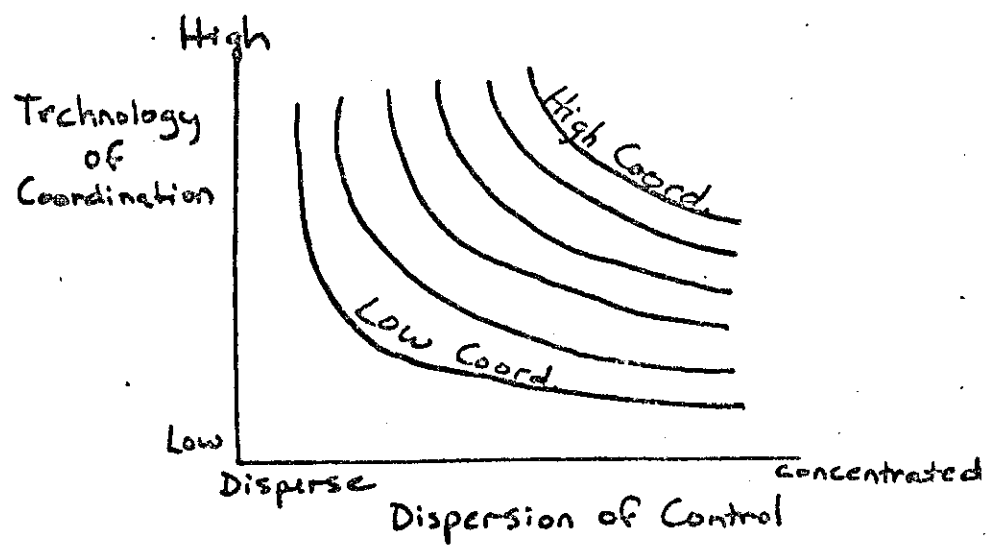
Let me return for a few moments to the concerns defined at the beginning of this paper. "Control" is a term like power that everyone understands--yet would find difficult to define. I see at least two categories of control are of interest in subsector analysis:

1. Vertical control -- closely related to the structure of authority in the subsector, vertical control is primarily concerned with who has the power or right to make strategic decisions, i.e., who decides how much will be produced, how much marketed, of what quality, when, where and how? Who determines the distribution of returns and risks? In trying to understand control, it may be helpful to examine the types of authority involved (ownership, contracted, sovereign, traditional, etc.) and the type of decisions involved (unilateral, bilateral, multi-firm or industry, or institutionally imposed). Except for unilateral (or administered) decisions, authority is often difficult to pin down. In examining bilateral decisions between two vertically adjacent firms, the bargaining balance is also important to understand. Some bilateral decisions are little different from unilateral decisions.
2. Horizontal control -- influenced by government programs, the structure of an industry (the level of interdependence), the existence and power of collective organizations such as unions, trade associations and bargaining associations, and the extent to which the functions of the industry are controllable (i.e., to what extent is the output, quality, price, etc. of an industry controllable), in fact controlled, and by whom?

This leads rather nicely into the topic of coordination. I have used the term here to refer to the process of harmonizing the functions of a subsector,

i.e., as conduct. The result of good coordination is a match between seller offerings and buyer preferences. On the concerns identified at the start of this paper, the two that are likely to be the most difficult to define, measure and evaluate are equity and the extent to which coordination is achieved. Let me offer a few humble thoughts about the latter.

In an earlier paper, I distinguished between the mechanisms of coordination (subsector structure) and coordination as a process (subsector conduct). It has bothered me, however, that even with carefully designed coordinating machinery and control networks, good coordination may not be achieved. Gerry Campbell has suggested the following -- which to some extent gets at the uncontrollable factors that often affect the degree of coordination achieved.



This "iso-coordination" curve is suggesting that the degree of coordination achieved (S-D match) is a function of the technology of coordination (how much can supply be regulated re: quantity, quality, timing and location and how much can demand be influenced) and the dispersion of control. This hypothesis seems to fit some subsectors quite well. Beef, for example, is characterized by low technology of coordination, relatively dispersed control and a rather low level of achieved coordination.

Broilers have high technology of coordination, concentrated vertical control, and high coordination. Although production cycles may be considered signs of poor vertical coordination, I disagree. They say little about vertical coordination but do tell us something about horizontal control.

The important point of the above is the notion of the technology of coordination. How easy or difficult is it to synchronize seller offerings and buyer preferences throughout the subsector? Drawing on a recent paper by Henderson [2], coordination between two stages may be relatively easy if the firms are located in the same areas, are of consistent size (each buyer need deal with only one seller and vice versa), agree on desired product characteristics, and have parallel seasonality patterns. This happens not to be true with the beef subsector.

For crops, the technology of coordination is affected by the ability to store the product and by non-controllables such as weather as well as some of the factors mentioned above. The endogenous variables involved in the technology of coordination are those under the control of subsector participants and may be subject to modification. The exogenous factors, however, such as weather or a shift in demand may continue to influence the extent to which coordination is achieved. However, the coordination of the subsector can hardly be faulted for failing to predict such factors.

The incentives to improve the process of coordination through improved information, shifts in control (contract or vertical integration) or efforts to develop more inter-stage cooperation would seem to depend upon the technology of coordination, the importance of coordination, and how well it is presently being achieved. In trying to understand past or potential changes in subsector structure or conduct, the incentives in the subsector play an important role. They may not provide a complete picture of the effects on performance, however.

One final thought. I have viewed ideal coordination as the process by which the activities of a subsector are efficiently performed and synchronized so that a match is achieved between supply and demand. If we include the condition that supply and demand are matched at the lowest possible long run price, ideal coordination would result in the optimization of two traditional efficiency dimensions -- allocative and operational efficiency.

Although these are worthwhile theoretical goals, in subsectors in which demand cannot be precisely predicted due to shifts in tastes, changes in the prices of substitutes, shifts in foreign demand, etc., where supply is neither completely controllable nor predictable, and where new technology and entrepreneurial imagination periodically call for reorganization of the way functions are performed, allocative and operational efficiency may be concepts which like perfect competition largely serve as standards for comparison but which may neither be desirable nor possible to achieve.

If this is so -- and I think it is -- then defining an operational goal for coordination is very difficult. How do we know when coordination is good or bad?

Given the dynamic characteristic of agricultural subsectors and the imperfect control and predictability of both supply and demand, we can hardly expect good coordination to eliminate price variations. Prices are expected to ration supplies, alter incentives and distribute returns. In a market economy, if prices are relied upon to provide needed corrections in directions, they can hardly fulfill this role without varying.

It strikes me that a more useful approach to evaluating coordination may be to judge coordination as a process rather than the degree of coordination achieved (performance). As a process, the critical characteristic of

coordination is its correcting and regulating properties. Thus, perhaps the question that should be asked is whether the coordinating institutions and elements in a subsector accurately and promptly shift incentives and provide other signals to alter the quantity, mix, timing and location of products, the technology employed and the functions performed.

In subsectors where functions are performed inefficiently, where desired and economically viable products are not produced, where product wastage is persistent, or where waits or delays are common, coordination is not stimulating the needed shifts in direction. The source of the coordinating deficiencies and opportunities for alleviation can then be examined.

This is more of a diagnostic approach to coordination. Although diagnosis and correction can become the primary end to this approach, it can also be used as an inductive method of developing a broader theory of vertical coordination. In this sense, I believe it is compatible with the structure-conduct-performance paradigm discussed in this paper. By properly blending the deductive and inductive approaches to inquiry, I am optimistic that progress can be made both in developing and testing a theoretical framework and in conducting case studies and diagnosis of individual subsectors.

References:

1. Henderson, Dennis R., "Toward A Theory of Vertical Market Behavior," NC 117 Working Paper No. 2, October 1975.
2. Henderson, Dennis R. and Robert Schwart, Jr., "Vertical Coordination in the Cow/Calf-Feedlot Segment of the Beef Subsector," ESO 329, Dept. of Agricultural Economics and Rural Sociology, Ohio State Univ., March 1976.
3. Marion, B.W., "Vertical Coordination and Exchange Arrangement: Concepts and Hypotheses," in Coordination and Exchange in Agricultural Subsectors, ed. B.W. Marion, NC 117 Monograph No. 2, March 1976.
4. Marion, B.W., "Vertical Systems Analysis and the Organization of Agriculture," paper presented at NCT meeting, Chicago, Nov. 16-17, 1972.
5. Williamson, Oliver E., Markets and Hierarchies: Analysis and Antitrust Implications, the Free Press, 1975