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IMPACTS OF VERTICAL INTEGRATION BY CONTRACT IN AGRICULTURE

R. L. KOHLS

Purdue University, U.S.A.

THERE must be effective co-ordination among the basic production, marketing and consumption activities of an economic system. Such a system must direct the production activities, allocate the products of these activities, and also furnish the mechanism for bringing about desired changes. The simplest example of such a system is a production unit which consumes all that it produces. Once this simplicity is passed, however, and various units specializing in different phases of the process develop, then ways of co-ordinating the producing, allocating, and adapting activities must be achieved. Several alternatives for accomplishing this are possible. One is the use of separate enterprises co-ordinated by a market system of prices. Another is to re-wed some of these separate functional units under centralized management. This process of combining an array of previously independent firms involved in interrelated activities under a single management is usually called vertical integration. Most modern market societies have become acquainted with this process as business firms attempt to achieve the optimum relationship between the benefits of specialization in the productive process and the costs of co-ordination among the interdependent parts. However, it has been more common than not to exclude the processes of agricultural production units from this integrating process.

Two changes in this organizational behaviour have become of interest to agricultural economists: (1) the increasing tendency to include parts of the activities of farm firms under the management control of vertically integrated complexes, and (2) the use of contracts, instead of complete ownership, to secure the co-ordination of centralized management between the farm and non-farm operations. Though such contractual arrangements have existed in some scattered instances in the United States of America for a long time, it is only in the last ten or fifteen years that the nature, extent, and impacts of farm-non-farm integration by contract has become of major interest and concern. The rapid integration of the post-war United States broiler industry dramatically focused our attention on the process and

its possible implications. In the United States, it is estimated that 95 per cent. of the broilers, 50 per cent. of the turkeys, 25 per cent. of the eggs, 70 per cent. of vegetables for processing, 75 per cent. of the hybrid seed corn, 75 per cent. of the sugar crops, 15 per cent. of the fed cattle, and less than 10 per cent. of the hogs are currently produced under some form of vertically integrated arrangements.

Though our interest and concern with this development is great, and although there are many individual studies of it in the United States, our ability to theorize and generalize concerning its growth and impact is limited. The most recent and complete attempt at abstract generalization has been by Mighell and Jones.¹ Probably the most complete attempt to describe the details of the United States development has been done recently by Roy.²

I shall not review the theory of the integration process nor the details of its development. Rather, I shall attempt to present what I interpret to be some of the generalizing propositions concerning the mechanics and operations of contract integration and their impact on agriculture as it is developing in the United States.

*Observations concerning the Nature and
Method of Contract Integration*

The existence of contractual arrangements between farmers and non-farm firms in itself does not indicate the nature and extent of the effective integration which exists. The types of contract differ widely both among different commodities and within the marketing organization of a single commodity. There are three broad classifications of contracts which represent varying degrees of effective integration. These can be broadly described as follows:

Market-specification contracts. These contracts simply specify some of the product characteristics which will be acceptable to the integrator and usually establish some of the basis of payment to the producer. Few or none of the producer's management decisions are transferred. The producer receives little or no financial or technical help. Little or none of the producer's price or income risk is assumed by the integrator, as returns are still fundamentally tied to the open market. These contracts are an effort on the part of the integrator to improve the effectiveness of grades and standards and market information. From the viewpoint of the producer, they guarantee a buyer if the specifications are met. Such contracts obtain very little

¹ Ronald L. Mighell and Lawrence A. Jones, *Vertical Coordination in Agriculture*, Agricultural Economics Report 19, U.S. Department of Agriculture, Feb. 1963.

² E. P. Roy, *Contract Farming U.S.A.*, Interstate Publishers, Danville, Illinois, 1963.

integration of the two parties in the sense of any centralized management control.

Resource-providing contracts. These contracts often specify the kind of certain production resources to be used and the place of their purchase. The integrator usually provides the producer with finance, ranging from operational to fixed investment financing, and a degree of managerial help and supervision. Product prices are usually based upon the open market and income guarantees to the producer are minimal. In such contracts, the integrator influences the technology and size of operations of the producer in order to increase and stabilize the market for his own products.

Management and income-guaranteeing contracts. These contracts often include the marketing and production ingredients of the above two types. In addition, they provide for the transferring of part or all of the price and income risks from the producer to the integrator. This is usually done by paying the producer a pre-arranged sum. In these contracts the integrator assumes a substantial part of the managerial responsibility of the producer. These contracts come closest to obtaining the managerial and financial control and risk which occurs when the integration is effected through complete ownership.

Many contract variations exist in an industry in the early phases of development of contractual integration. Initial contracts often are of market-specification and resource-providing types. However, as the successful potential of contract integration in the industry becomes established, there appears to be a tendency to move to the tighter and more complete arrangements of the management- and income-guaranteeing type. In fact, recent developments in the United States broiler industry indicate a tendency to move from this tighter type of contracting to situations in which the integrator completely owns and operates the farm production operations. Certainly, the hypothesis should not be discarded that for those industries in which the ingredients for successful integration of farm and non-farm operations exist, contractual integration may be an evolutionary phase toward the more conventional fully owned integration structure. It must be noted, however, that while experimental contractual integration is occurring in practically all commodities, such ventures are not equally successful. One of the necessary ingredients for success seems to be related to the farm production process itself. Full integration assumes the centralization of decision-making. For such centralization to be economically successful for the integrator, farm production decisions and supervision must be amenable to standardization and routinization. Full and effective contract integration into

farming operations, therefore, is fundamentally a partner to the development of scientific methods of farm production, and the speed of its development will be limited by the progress of such science.

There seems to be no shortage of firms that are interested in and willing to experiment with contractual arrangements with agriculture. Similarly, though considerable public clamour concerning the disappearance of the independent farmer is heard, farmers who have participated in contractual arrangements appear to be generally satisfied with their experiences. The pressures of modern industry servicing agriculture for assured and predictable volumes of business as well as for rather specific and uniform products puts a premium on effective co-ordination between buyers and sellers. On the farm side, increasing costs of production make many farmers willing to exchange complete managerial freedom for some guarantee against the high income risks of the open market. The most active integrators on the American scene have been those firms primarily interested in selling production inputs, such as firms manufacturing or selling commercial feeds. Their motive is to establish an expanded and assured market for their products. Firms processing and marketing farm products have also been involved to a lesser extent. Some of the oldest examples of contract integration are in the vegetable-processing industry. Here processors have been anxious to assure themselves of the necessary amount and desired type of production. Marketing firms buying and assembling farm products are also becoming involved in an attempt to maintain or expand their business. Retail food firms generally have not been active integrators. However, the increasingly definitive product specification of large-scale super-market retailers has been a motivating force in the integration interest of the food processing industry.

Farmer co-operatives operating in their traditional ways are not a substitute for the process and results of vertical integration by contract. Farm supply or marketing co-operatives are often looked upon as the vertical extension of the farm into other activities related to farming. Here, however, the similarity to contract integration ceases. Most co-operatives in the United States depend upon persuasion and salesmanship to maintain the participation of their patrons. Though co-operative management ideally acts from the viewpoint of the welfare of its farmer patrons, it often does not have centralized control to secure the effective integration of the farm and non-farm parts. Co-operatives, in general, have not been a leader in the contract integration developments of the United States. In some instances, in order to maintain their business position, farmers' co-operatives have

offered contracts to their members similar to those of non-co-operative integrators. However, how to handle the income guarantees and the hard-headed management control necessary for successful operation is one of the critical problems now facing the traditional co-operative.

*Observations concerning the Operation
of the Integrated Systems*

There are indications that the managerial and organizational ability of the integrator is a key to the profitability and success of an integration venture. One study analysed the economic results of integrators that had different types of contract and were involved in different kinds of livestock and poultry.¹ Profitable and unprofitable ventures were found operating under all kinds of contracts in all enterprises. The operational and organizational ability of the integrator was apparently the major factor influencing profitability of the venture. Contract integration, then, has often been looked upon as a way to raise the level of managerial ability of farm producers. This means, however, that the integrator must supply this management from his own organization. To run successfully an integrated operation of any size probably requires a higher degree of managerial skill than would be necessary to operate each of the separate parts. Such managerial talent is in short supply at the operating levels of our elevators, feed mills, hatcheries, market buyers, &c. This resource limitation probably explains the two situations which seem to exist: (1) Many of our integrated set-ups are quite small, often involving only a very few farm producers, and (2) considerable managerial help is often directly or indirectly supplied to the local integrator by larger processors or manufacturers who are his major suppliers.

Integration contracts must provide incentive payments for superior performance if efficiency is to be maintained. Though contracts may protect the farmer from market risks, they should not protect him from the risks of inadequate performance of his responsibilities. Contracts in the broiler industry initially provided for a flat-fee payment to producers. Generally increased mortality and lower feed conversions were the result. Most contracts now provide for variable returns depending upon the production results which the grower achieves. Similarly, contractual production has not provided a haven for the

¹ Richard Philips, *Analysis of Costs and Benefits to Feed Manufacturers from Financing and Contract Programs in the Midwest*. Special Report 30, Iowa Experiment Station, Ames, Iowa, U.S.A., Oct. 1962.

basically inept, lazy, or unco-operative producer. Integrators, faced with poor performance and an available source of new farm producers, have not been hesitant to drop poor contract performers. Though I know of no empirical studies which supply directly applicable supporting evidence, it seems highly probable that the range of producer efficiencies will be less in industries made up of integrated complexes than in those composed of independent producers.

There appears to be a tendency for contractual arrangements to expand to include additional firms and activities as the use of contracting matures in a particular industry. Integrators who sell feed or other inputs move to include buyers and processors. Integrators who are buyers and processors move to include sellers of important production inputs. Especially when the integration is of the resource-providing type, the output of the farmer-producers often expands dramatically. This increases the need for the integrated unit to have an assured market for its production. Many integrators initially contract for farm production with the limited motive of expanding the size of operations of their primary activities. However, there is increasing evidence of substantial cost-reducing efficiencies which stem not only from size, but from the close co-ordination of the related parts of input-selling, farm production, and output-buying complexes. The efficiency of the total complex may be greater than its individual parts considered separately. This may explain why economic analysis, focused narrowly upon the farm production process, has rarely indicated the potential gains from integration, and farm management economists have been relatively poor predictors of the direction and extent of contractual integration activities.

*Observations concerning the Impact
of Vertical Integration on Agriculture*

The wide-spread use of contractual integration in a particular industry has resulted in substantial expansion of farm output. As previously mentioned, the most active integrators have been those providing resources to the farm firm. This includes both capital and financial resources to expand the scale of the farm enterprise and also the quality of technology and management to lower unit costs. It is generally accepted that a substantial gap exists between known technologies and actual farm practice. One of the effects of the centralized management control of integrated units is to reduce the time lag between technological discovery and its wide-spread adaptation by

contract producers. The impact of contractual integration upon the rapidity of adjustment of farm output to changing market conditions is not clear. Theoretically, the management of integrated complexes could have more complete information both about the potential market and their costs of production. Then, with fewer more centralized decision centres, more accurate and rapid adjustment decisions could be made. This may occur in some of the older integrated enterprises such as in the vegetable-processing industries. However, in many others where the process is relatively new, the issue is obscured by the output expansion which comes as the supply curve continually shifts to the right. This tendency on the part of an industry to expand autonomously furnishes one of the potential restraints on the development of contract integration. If the demand for the product is not an expanding one, or if the demand function is highly inelastic, then the increased production will result very quickly in reduced income to the industry. Any innovational returns to the integrator may be short-lived and limited. These market conditions, are important factors in explaining the rapid growth of integrated systems in some industries, such as broilers, and the slower development in others, such as eggs.

Integration contracts seem to be a very effective way to establish an agricultural enterprise in a new area. In an established industry, it is sometimes very difficult for a new area to begin its existence facing the competition of the older areas. The new producers may be inexperienced. Capital and technical know-how may be lacking. The marketing facilities may be inadequate. And especially if the production process depends on specialized purchased inputs, these supplying industries may also be inadequate. This problem is one that the co-ordinated integrated complex is well equipped to handle. Capital financing, technological know-how, and both supply and marketing services, can be introduced simultaneously at a competitive scale and level of efficiency. In fact, several studies indicate that potential integrators often prefer to work with farm producers who have had little previous experience with the product. This seems especially true when the integrator is attempting to introduce substantial changes in technology or organization. One of the results of contract integration has been to increase greatly the interregional competition in the United States market. New production areas have come quickly into existence and have offered severe competition to older areas.

The impact of contractual integration on the market structure and performance of an agricultural industry is not clear. Where terminal

markets had been organized and functioning, the establishment of contractually integrated units tends to hasten the breakdown of these organizations and to establish a greater dispersion of the title exchanging and price-making points. The effective functioning of market news and standardized grading procedures is impeded. It is also true, however, that integration has taken place in industries where the previously existing market and pricing facilities were functioning poorly. Here effective market news facilities and organized grading procedures were never adequately developed and contractual integration is a force in more effectively organizing these markets. It is widely accepted that integration contracts can, and do, protect producers from some of the risk associated with short-time price changes. What happens, however, to the longer-run general level of the terms of trade between farmers and their suppliers and buyers is less clear. Some long-run data on costs and returns for Georgia contract broiler growers are available. During the period from 1950 to 1962, the average yearly variation in contract returns per pound was 5.5 per cent., while the average yearly variation in broiler prices per pound was 9.9 per cent. During this period, however, the general level of contract returns per pound followed the level of broiler prices downward, but with some time lag.

In most of the situations in which the use of integration contracts is in its experimental stages, the number of alternatives available to the farmer is still substantial. Several integrators are competing for the business of capable farmer-producers. In addition, the farmer still has the alternative of returning to independent production and the open market. However, it is true that in the United States, there is a great deal of uneasiness that widespread use of integration contracts may reduce the competitive strength of the farmer-producers. One Congressional investigation of the broiler industry has recommended that the use of integration contracts be outlawed as violating our anti-trust laws. Most of our farm organizations recently have become concerned about the bargaining powers of farmers. There seems to be enough evidence to warrant watching at least two apparent trends: (1) As the use of the contract arrangement becomes a major part of the market structure of a commodity in a given area, it may be increasingly difficult to maintain enough business firms to operate effective open-market systems for those who do not wish to accept contracts, and (2) When contract integration becomes the method under which the greater part of a commodity is produced, the number of integrators becomes smaller as the stronger firms absorb the weak.

Some Concluding Observations

The preceding points are tentative conclusions concerning this agricultural development. Professor Paarlberg has classified the recent revolution in United States agriculture into four different categories: (1) the mechanical revolution of substituting mechanical power for animal power, (2) the biological revolution of new knowledge in genetics, nutrition, &c., (3) the chemical revolution in fertilizers, pesticides, &c., and (4) the organizational revolution of the agricultural system.¹ The development we have been discussing is certainly a part of this latter development.

Increasingly we must recognize that the invention of new ways to handle, organize, and guide the human managerial element is as truly a new technology as new fertilizers, feeds, and equipment. In the United States prophets of neither extreme have been correct. Contract integration is not a fad that is quickly dying out, nor has it run rampant in all areas of agriculture. It is rather one of the experimental frontiers for which all the evidence is not yet available. It has been conclusively demonstrated that, in the right circumstances, contractual integration may aid in greatly increasing production. However, whether its results are desirable when all the aspects, such as its effects on our competitive system and rural welfare are considered, will be a major issue of policy debate during the coming years in the United States. One of the major impacts of the organizational device of contract integration is that it destroys the validity of treating the farm firm as an entity separate from its related supplying and marketing activities in either theory or practice. It is a package approach. Some countries that are striving to increase their agricultural output rapidly should evaluate it carefully as a useful tool of development.

M. POHORILLE, *Warsaw, Poland*

The subject on which Professor Kohls has spoken is of great interest not only for the West, but also for Poland. Any comparison of the way in which similar economic functions occur in various institutions and social and economic systems, are of definite scientific interest, and they provide a good starting-point for discussion. The problem of the contract system has many different aspects, technical, economic, and social. Production under a contract system doubtless facilitates technical progress, lowers expenses, and improves the marketing of agricultural products. On the other hand, the farmer who was previously independent becomes,

¹ Don Paarlberg, *American Farm Policy*, John Wiley & Sons, New York, 1964.

in fact, a kind of piece-worker taking orders from an integrated enterprise. It is not surprising that in many countries farmers and their professional organizations are against the contract system. Some people look for the origin of this opposition in the farmer's traditionalism, or, simply, in emotionalism; others think it is a result of the natural inclination of human beings towards freedom and independence. In my opinion, it is not a question of philosophical or psychological problems, or questions of freedom and obligation, or of traditionalism or attachment to enterprises. It is the material interests which constitute the real cause of this problem. The question is who will perform this integration, and whether the present system really is in the interests of farmers. It is important to know who is the partner in this contractual system. Does the farmer make contracts with huge industrial corporations, or with agricultural co-operatives or, as in socialist countries, with semi-co-operative purchasing centres, partly belonging to the State. The form of the contract, by itself, does not determine anything. What is important is to discover what is the dominant factor. Is it in the general interest of society, or in the interest of the various farming groups, or in the interest of these large economic units which have secured a monopolistic position in the market?

A second problem of great importance is that concerned with the possibility of adapting, by the mean of the contractual system, the supply of agricultural products to correspond with effective demand, and to free the farmers from risks connected with changes in demand and in prices. The contractual system presents a number of incontrovertible advantages, namely: (1) the contracting partner has a better knowledge of the market than the farmers, (2) the contract makes it possible to influence the structure of agricultural production towards greater efficiency, (3) the quality of commodities covered by the contracts is better suited to consumer needs and changing industries, (4) supply is spread more evenly over a given period, (5) farmers have a guaranteed market for their products on terms which have been previously fixed.

May we, therefore, affirm that the contractual system provides a suitable development in the supply of and demand for agricultural products? Such a conclusion would be too optimistic. A system of contract is not an independent factor and it cannot be studied separately from the whole economic situation. It cannot by itself solve the problem of market equilibrium in any economic system.

In a capitalist market economy, the development of contractual systems is not the same as planning. It simply indicates the change

from free competition towards monopolistic competition. It is necessary to point out some of the more important factors. First, apart from competition between the contracting firms themselves, there is another kind of competition which is determined by existing substitutes. Regarding food products, the substitution problem becomes very important as the demand for food products is fairly inelastic. Secondly, as Professor Kohls has shown, integration processes do not occur equally in all parts of agricultural production. This inequality is the origin of a lot of contradictions. Corporations which integrate a definite part of production, not only control it, but try to modify its relation to the whole of agriculture, so as to correspond to their interests. And they exert influence on government agricultural policy and on institutions operating in the agricultural sector. Thirdly, it is true that the contract system reduces the risks the farmers may encounter, but only for a short period while the contract is valid. When it ends, the people concerned with the integration can modify the contract. It is possible then to reduce the quantity of the products which were the subject of the contract, and to lower prices. In a recession, this will be done in order to try to restore market equilibrium. Very advanced specialization of production, added to the fact that the farmer is isolated from the market, prevent him from fighting against a recession by an internal reorganization of the farm. In a period of recession, a decrease in the supply of agricultural products in fact prevents the heavy fall in price, but does not solve the farmer's income problem. And there is still another doubt. Is it desirable to harmonize the changes in agricultural production with the general rhythm of changes in the market situation? At one time, T. W. Schultz spoke about this problem and indicated that maintaining agricultural production at a high level during periods of recession alleviated the general slackening of economic activity. This problem is worth studying comprehensively.

In planned economies, the question is quite different. There, obligations under contract systems are more simple and easy. They are not hampered by private interests of various integrating firms, and are one of the factors in a developed planning system covering the whole social production. However, this does not mean that the role allotted to the contractual system, to adapt the supply of agricultural products to the demand, does not cause any difficulty or present any complication. I will only mention some of the problems. One of the more important is the co-ordination of the activities of the numerous contracting institutions. In 1961, there were fifteen organizations of this kind in Poland, institutions which act, it is true,

in a single national plan, but which each employs its own network of agents and services. Dispersion of organizational efforts through various channels reduces the efficiency of the contract system in so far as the improvement of agriculture is concerned. It increases the commercial expenses which arise from making the contracts, from inspections, crop controls, &c. In Poland, we recently tried to include the contract system in plans for communal agricultural development, and entrusted the co-ordination functions to the national advisers. In the contract system, the main problem is to arrive at the best policy for agricultural product prices, and other methods of agricultural supports such as credits, better supply of improved seeds, progress in cattle breeding, and price premiums.

The opinions of some economists about planned economies affirm that the contractual system and price fixing by the State are an arbitrary method for solving agricultural production problems. Such opinions do not correspond with reality. Without establishing a fair price level, it is impossible to determine the required production structure. And if the rapid increase of demand requires an acceleration in the rhythm of supply of agricultural products, we must use a wider spectrum of means to influence agriculture, such as investment incentives, wider diffusion of technical knowledge, and special steps to promote technical progress. So, we can see that in a planned centralized economy, the contract system is not able by itself to solve the problem of equating the supply and demand of agricultural products. There is, too, an essential contradiction in the contract system. When agricultural marketing difficulties appear, the contract system cannot reveal its main advantage which is, of course, to stimulate agricultural production. In the contract system, agriculture receives help from other sectors as, for instance, credits, raw material, and agro-technical services, which certainly encourage the acceleration of the production rhythm. Any attempt to change the contract system into a method of resisting over-production, contains an internal contradiction. Besides, when the agricultural market is wide open, the contract system loses most of its attraction. In effect, the farmer is no longer afraid of a fall in prices, or of difficulties in disposing of his produce. There is also no doubt that the contract system does not suffice as a means of accelerating an increase in the rhythm of agricultural production.

It seems to me, then, that there is as little justification for regarding the contract system as a panacea for all the ills that result from disequilibrium in agricultural markets, as to hope that it is capable of replacing intervention by the State.

J. S. MARSH, *University of Reading, U.K.*

In bringing together such a wide range of issues and concepts Professor Kohls has performed a most useful integrating function. Inevitably, when so wide a field is covered in such small compass, it is impossible to comment upon all the matters raised. I will concentrate, therefore, on four points. First, it seems to me that it would be confusing and rather inconvenient if we were to develop in agricultural economics a usage of the term vertical integration different from that in general economics, where it implies complete control of one firm by another—control so complete that, in most cases, it can be secured only by outright ownership. A manufacturer who contracts to supply ink to a printer does not thereby consider himself to be controlled by the printer, though in fact the contract may specify, for a particular batch of production, the colour, density, packaging, &c., of the ink concerned. Many farm contracts involve no more sacrifice of control. Contracts to produce seed, sugar, eggs, &c., may well be simply an agreement to do a certain job in a certain way at a certain time. The conditions are agreed in advance by the farmer and, at the end of the period of production, he may seek to renew the arrangements, to find some alternative outlet for his crop, or to grow some other crop. In no significant sense can he be said to have lost control of the farm business. However, although most farming contracts may lead to nothing approaching vertical integration, there are some situations in which it seems that, as a result of contracts, control of a farm business may pass effectively to some agency outside the farm. This is a fairly restricted category of contracts. To lose control, a farmer must be unable to find any other productive outlet for his resources. In the existing state of trade in the United Kingdom and, I suspect, in the United States, there are still many competitors for a farmer's custom and for most of the products which he wishes to sell. The only situations in which freedom may be seriously impaired are where a farmer, as a result of a resource-providing contract, is in debt to a contractor or where a contractor holds a monopoly of all possible products of a farm. In the first case, it is the debt rather than the contract which is the integrating force, and in the second, the monopoly position of the contractor.

The second matter I would raise concerns the reasons why firms outside farming prefer contracts with farmers to outright ownership of farms. This is important in understanding the probable growth of contract farming. Firms seek contracts with farmers for one of two main reasons. Firms who sell to farmers may be anxious to assure

themselves of a regular and large volume of sales of farm inputs. Firms who buy from farmers may wish to ensure a predictable supply of farm products of a known type and quality. Contract farming may help to achieve these ends, but it does not secure them completely. Contracts are necessarily for limited periods. At the end of each period, the contracting firm faces competition from outside competitors. If a farmer's experience under the terms of the contract has been adverse, he may well be reluctant to renew the arrangement. He may either succumb to the blandishments of a competitive contractor or he may revert to open market selling. The improved skill and efficiency of the farmer, which may have resulted from capital or advice made available by the contractor, are often non-recoverable when the contract is over. In these circumstances, the contractor has to write his contract in such a way that the profits from a more predictable level of through-put are shared with the farmer. Integration in the sense of ownership of farms by the companies who contract with farmers would avoid these disadvantages. The whole benefit of stability and the application of advanced management techniques could be ploughed back into the parent company. Despite this, company ownership is not generally found in Western developed countries. I think we can see three sorts of reason for this. First, to do so would involve most supplying or purchasing companies in a very large outlay of capital. Under the contract system, marginal expenditures of capital on existing farms ensures the steady volume of trade desired, at least for a time. Full ownership would involve the provision of all the capital needed. Considering the ratio of processing or manufacturing capacity to the overall output of farms, it is clear that this would demand an enormous volume of capital. Second, such farm ownership would mean that the company would have to undertake the whole range of farm activities, including products in which they had no direct interest. Only for a limited number of specialist intensive holdings, such as broilers or eggs, would such other activities be unimportant. Thus, company farms might find managerial effort and capital dissipated over a wide field where it was of little or no benefit to the parent company. Third, contract farming takes advantage of the managerial skill of the existing farming community. Despite obvious deficiencies, this represents an invaluable body of know-how in all developed countries. In a plantation type of economy on the other hand, each of these conditions may be reversed. Thus local capital availabilities may make only a very small contribution to total capital requirements; the typical output is heavily concentrated on one crop and the management skills

of indigenous farmers may be of little value for the enterprise concerned. In these circumstances company ownership rather than contract production is the normal form of organization. Often this may form part of a vertically integrated chain having its outlet in developed countries.

Professor Kohls spoke of several systems of market co-ordination, one of which is the use of separate enterprises co-ordinated by market prices. It is vital to remember that contract production, or vertical integration for that matter, does not lessen the importance of market prices. To do away with the price mechanism completely would involve the centralized planning of all production and all consumption decisions. Even the most ardent planners have found this difficult! The function of contracts, and to some extent of vertical integration, is to lessen market uncertainty, to reduce risks and so improve the working of the system. By improving knowledge of the intentions and requirements of consumers and producers, waste may be avoided. However, if the full benefit of this improved information is to be reaped it must be reflected, in practice, in the price structures used. Thus, Professor Kohls emphasizes the need to provide incentive payments if the efficiency of an integrated enterprise is to be maintained.

My last point concerns the need to avoid exaggeration of the extent or significance of contract production. Professor Kohls's figures at the beginning of his paper are impressive but they cover a very limited range of farm output. My own inquiries in the United Kingdom suggest that, apart from seeds, processed vegetables, bacon pigs, and broilers, production contracts are still very unusual. Much concern has been expressed by farmers' organizations that such contracts involve the loss of independence by farmers. I believe that this trend towards outside control is not wholly to be related to the institution of contracts but can be traced to more fundamental causes. Any examination of the agricultural industry reveals that managerial skills vary widely amongst all participants both on the farm and in ancillary businesses. Again, modern technical changes have altered the stage in the production process at which some managerial decisions can best be taken. Thus, overall efficiency and competitiveness can be enhanced by the wider dissemination of the best managerial practice at any level of the industry and some decisions (for example those affecting the volume of production or the quality of the product) can best be taken at a level other than that of the individual farm business.

Modern agriculture is increasingly dependent upon a capital

intensive infrastructure of ancillary industries. For such capital to reap its full reward, it must be used as fully as possible. Hence a greater premium is inevitably placed upon regularity and predictability of throughput. Some risks, such as weather, cannot be eliminated, but many market hazards can be reduced by planned production. Perhaps we should be less worried about such apparent loss of independence as may arise from contract production, and examine each device used to regulate the production of the farm to see, first, whether in the short term the farmer reaps an equitable share of the benefit and, second, whether in the long run it contributes to the most efficient organization of the industry. In the last analysis, it is the relative success of the arrangements used in increasing efficiency which will establish the competitive position and the survival of the farmers concerned.

W. MACKENZIE, *McMaster University College, Hamilton, Ontario, Canada*

I wish to be brief and deliberately controversial. I do not believe that this topic can be discussed without considering price policy towards agriculture. Professor Kohls does not touch on this point. It is a fact that support prices in the United States of America have given stability and high prices to the grain sector, without similar steps being taken directly in the livestock sector. It is my contention that contract farming has arisen in the United States to extend the area of certainty in the processing industry, as well as to offer some minor removal of risk to the farmer. It is interesting to speculate what would have happened if livestock prices had been supported at parity levels like those of grain. I think that contracts would not be the dominant method of integration, but integration would have been completely vertical from the processor back to the farm. The greater the degree of price certainty the more quickly is complete vertical integration likely to appear. Without price supports or price certainty we obtain changes in farm size, and eventually the need to specialize through contract farming. It appears likely that when this process has gone some considerable way, enough uncertainty has been removed to get complete vertical integration. I see this as the end result, and the speed with which it is achieved seems to me to depend on the nature and extent of farm price supports.

G. GIOVANNI, *Faculta di Agraria, Piacenza, Italy*

On the whole I am in agreement with Professor Kohls. My remarks will be limited to drawing attention to particular aspects of the subject.

The big food distribution enterprises, particularly, the chains of shops of the supermarket type, are a factor of the first importance in the determination of the process of vertical integration in agriculture. Indeed, the development of this process is a basic element of the market strategy of these enterprises. To retain and increase their market power they must be able to control the quality of the products, the quantities and dates of delivery, and the prices. This control can be effective only if those responsible for the supermarket chains can co-ordinate (directly or indirectly) all the links in the marketing chain, even to directing the activity of the agricultural producers. Professor Kohls showed clearly that, among the effects of vertical integration, is a substantial expansion of agricultural production. Indeed, vertical integration causes a reduction in the time which elapses between the appearance of an innovation and its general adoption by farmers. But it is useful to draw attention, on one hand, to another cause of this expansion and, on the other, to another effect of vertical integration. The expansion of production depends not only upon the technical development of the process of production, but also, and especially, on the fact that vertical integration represents, practically, a substitute for the diversification of products. In fact, it allows the reduction, even the suppression, of the risk proceeding from the uncertainty of the markets. In this way technical progress in the long term, leads agriculture to a progressive specialization of production. Vertical integration in addition is a very effective means not only of developing production, but also of controlling it and avoiding the building up of production surpluses. Thanks to the elimination of many intermediaries, it permits a reduction of the distance separating supply from demand. It is easy to conclude that it can become a very valuable instrument of agricultural policy. On the other hand it can be the cause of serious damage. For example, it can favour the development of monopolistic forms of market. All this justifies, and demands, the close interest of governmental authorities in these contractual agreements.

Another danger is linked with the consequences which vertical integration can imply for the social structure of the peasant world. The integration contract can oblige a farmer to renounce a substantial part of his activity as an entrepreneur. This is so in certain contracts for the production of broiler chickens. In consequence, the farmer becomes almost a salaried hand, who, nevertheless, must bear the brunt of certain technical production risks. We may say, then, that vertical integration can become the cause of a process which proletarianizes the agricultural entrepreneur.

A. K. IRUMJAN, *Institute of Agricultural Economics, Armenian S.S.R.*

In the report of Professor Kohls a lot of space is devoted to 'contracts' in agricultural production. He gave examples taken from agriculture in the U.S.A. and we will give examples from the U.S.S.R.

In the U.S.S.R., the Government buys the production of sovkhoz and kolkhoz on the basis of a contractual agreement. This system has great advantages. It guarantees kolkhoz and sovkhoz the sale of their marketable production at economically suitable prices and it guarantees for the Government the receipt of the amount of products it needs. Through these contracts, the Government assists in deciding what are the most advantageous cultures for different areas. For example, by studying the natural economic conditions of Armenia, the Government advises the planting of vineyards, and tobacco, the production of wine and brandy, and encourages the canning of fruit and vegetables. The method by which these contracts are arranged is as follows—the Government decides what it needs from each region; the local leaders in each area decide what every kolkhoz must produce. To encourage production, the Government on the basis of contracts, at the beginning of the year gives advances in money without interest up to 40 per cent. of the value of the production which will go to the Government. Part of this is devoted to the payment of kolkhozniks. Prices are guaranteed by the Government in accordance with established contracts. They vary depending on the economic conditions of different areas. Prices are such that they ensure a net benefit to all farms. Thus in the U.S.S.R. the Government buys agricultural products at prices which suit the kolkhoz and also the Government itself.

This system of contractual agreements has justified itself in the U.S.S.R. Nevertheless, there are parts of the system which must be perfected and economists are actively engaged on this task.

Y. KYESIMIRA, *Makerere University College, Kampala, Uganda*

The problem of vertical integration in developing economies, where a large proportion of marketable agricultural production is exported, is much more complicated. It would probably entail inviting foreign firms to set up processing plants, and this would raise questions of political stability, the right to expatriate profits, &c. All the same, there is a strong case for relating industrialization policies in developing economies to the processing of their raw materials. It must be admitted that there are vested interests in developing countries in maintaining the *status quo*, in addition to the more

technical considerations of processing, capital availability, market information, and skilled personnel. Vertical integration may be used to remove the disadvantages of small-scale farming when the processing of agricultural products is capital-intensive and requires much skilled manpower. There is the possibility of making contracts with small farmers to supply a large estate as outgrowers. This is happening in East Africa with sugar, tea, and sisal. Governments in developing countries are committed to raising living standards in various ways, such as by industrialization, involving capital imports and the supply of more food to feed the industrial population and to raise nutritional standards generally. The whole effort of economic planning in these countries seeks to set up consistency between the various sectors in the economy, and its success will depend on whether the right response will be forthcoming from the numerous independent farmers who constitute the majority of producing units. Unless the farmers respond favourably, the implications are serious for democratic régimes, even if the contracts are unwritten.

M. UPTON, *University of Ibadan, Nigeria*

May I ask Professor Kohls about the planning of contract farming in the United States? The contract-making organizations, because of their large scale, would seem to be more suitable than is the ordinary farm for advanced planning methods using operational research. In fact, a large broiler-producing organization in Britain has just started an operational research division. This I believe is an innovation in British agriculture. I would like to ask whether many such organizations in the United States have operational research departments, and to what extent advanced planning techniques are used in vertical integration as defined in his paper.

R. L. KOHLS (*in reply*)

The many and varied comments lead me to agree with some and not with others. The running theme of vertical integration that we have under discussion here will not solve all the problems. Certainly, nothing that has been raised in this conference is going to solve them all. I agree that vertical integration does not lessen the importance of pricing systems. I would not want to be misinterpreted on that point. It changes the level and mechanics of price discovery. But it certainly does not lessen the importance of a pricing system for coordinating and giving the necessary allocative orders. Nor does it protect us from the competition of other products.

I cannot agree with the thread of comment that becomes highly concerned with who is the integrator. I agree that it may be important if you do not maintain effective competition among the units involved. However, if you permit effective competition, I would not be overly concerned with who is the integrator. I am not sure that the consumer can depend on the farmer and his organizations to give a dynamic and efficient system, any more than he can on a large corporation. I am much concerned over the system which is going to direct whatever operational complexes we have. There is a sharp difference between the issue of integrated systems policed by the competitive market and those which become an arm of the state.

The other point that ran through the comments, of course, was the philosophic issue of freedom. I would agree with whoever said that we should not jump on the band wagon of talking about loss of freedom, but should examine the problem and determine specifically what is lost and what is gained. Freedom is such a loose concept. The freedom to starve to death may be a very high price to pay. These issues should receive sound research, not emotional answers.

I would agree with those who argued that we must not assume that the existence of contracts always results in effective integration. I think some of the comments referred to buying contracts. In many cases these offer no effective integration at all. It is true that classical economic theory dealt only with integration through ownership. It is also true that theorists are broadening their framework to include the kind of integration which industrialists achieve through franchises and controlled outlets. What is under discussion is the issue of integration, not the means of its development.

I cannot agree that it is necessary to have a farm price policy or guaranteed prices in order to accomplish integration. The evidence does not support this assumption. There are at least two things that go on in an integrated complex. The returns from the operation must be divided among the participants; the relative terms of trade must be determined. Also the technological job of the production process must be done. There is the possibility of improvement in the technological efficiency of the entire process. I think that our discussions have paid far too little attention to the potentialities of technological improvement through integration and far too much to the issues of price policy and who is to make the terms-of-trade decision. We need to concern ourselves not only with the division of the economic product among participants, but also with the size of the economic product which may be forthcoming.