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SUSTAINABLE AGRICULTURAL DEVELOPMENT: THE ROLE OF INTERNATIONAL COOPERATION

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*Family Farms, Cooperatives and Collectives*¹

THE FAMILY FARM

What is more natural than to expect modern agriculture to be organized in large-scale food factories? Such expectations notwithstanding, a large part of agricultural production – though not all of it – is still done on family farms. Evidently, economies of scale in production, to the extent that they exist, are outweighed by countervailing forces.

Transaction costs and control

Family organization of production minimizes transaction costs through ‘specialization by identity’ and the harmony and trust that comes with it (Ben Porath 1980).² In agriculture, this advantage is augmented by the specific nature of control as discussed already by Brewster (1950) who observed that (a) the biological production process in agriculture is time-dependent: food and fibres cannot be produced in an establishment in which different stages of the product are manufactured simultaneously; and (b) the farm product cannot be moved along a production line: rather the worker has to go to the field to perform the necessary tasks. Both these characteristics make control of labour in agriculture difficult relative to manufacturing and increase the comparative advantage of the family farm versus large units relying mostly on hired hands.

Labour according to Brewster, is a fixed factor on the family farm. The farmer strives, therefore, for a balanced product mix with stable labour requirements throughout the year. As a result, the advantage of the family farm is visible in areas suitable for diversified farming, while large farms dominate the regions of monocultural agriculture. Brewster’s analysis can be augmented with modern theoretical insight and historical experience. Where land ownership is highly unequal, the problem of control can be solved by sharecropping (Otsuka and Hayami, 1988). That this is only a partial solution can be seen from the fact that even livestock production is still mostly a family enterprise. The staged production nature of the biological processes, with waiting periods in between seasonal tasks which prevents factory-like organization of production in agriculture, enables farm operators and other family members to seek part-time, off-farm employment. Monoculture is no more an obstacle; it is an

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advantage. Professional career, farm size, product mix and employment are now determined simultaneously – affected by considerations of income and risk.

The above arguments are analytical and hypothetical, but would not size-associated efficiency gains on large farms compensate for the loss of the aforementioned advantages? To answer this question, we have to examine the empirical evidence.

Economies of scale and farm growth

In an often quoted paper, Griliches (1963) found the sum of the coefficients in a Cobb-Douglas production function for the American farm sector to be 1.28; others report a similar value. Consequently, growth of farm size has been attributed to economies of scale. Hence we now face two questions: should these high-scale estimates be taken at face value and, if not, how can farm growth be explained?

I wish to argue that the evidence does not support unequivocally the existence of economies of scale in agriculture. Because of data shortcomings, every measurement and method of estimation can and should be questioned. When this is done, the case for economies of scale is weakened significantly. The argument is detailed in Kislev and Peterson (forthcoming). Only the main points are repeated here. Conventional production function estimates, Griliches' included, do not allow for differences in ability and local conditions on farms. Indeed, virtually all reported estimates of covariance analysis – taking care of the unobserved specific factors (Mundlak, 1968) – fail to find economies of scale in agriculture. The alternative method of synthetic firm analysis, which has also produced large estimates of economies of scale, assumes away the crucial issue of control.

For further examination, consider expected consequences. If scale economies exist in a competitive industry, they must be a disequilibrium phenomenon and growth should bring farms down the average cost curve towards its minimum. Yet re-estimates of the Cobb-Douglas production function for American agriculture with data spanning the period 1949–87 repeatedly came up with sums of coefficients of 1.3. No convergence to constant cost is discerned in the data with this method of analysis.

Between 1929 and 1987, output per farm in constant dollars grew in the USA by some 6.4 times. If economies of scale are not important, what can explain such fast growth? Changing prices appear to be the answer (Kislev and Peterson, 1982): between 1929 and 1969, machine rental declined relative to alternative labour cost in agriculture by 3 per cent per year. Farmers reacted by increasing the machine–labour ratio. An operator with more machines cultivated a larger area, and farms grew in size. The trend changed when the cost of operating machines increased during the 1970s and, indeed, farm growth was then halted. Farm size seems to have resumed its upward trend in the 1980s, when increases in real wages again overtook growth in machine rentals.

Hence structural characteristics of production and control make the family farm the dominant form of organization (though not the only one, as should be emphasized) and price ratios affect optimal size of operation. The amounts of land, capital and labour on the farm are determined simultaneously with lines of production and non-farm employment.³

Decision making

The economic decisions of the farm household in a market economy are guided by prices and optimization can often be done recursively. In the first stage, income is maximized by deciding on allocation in the production 'department' of the family farm; in the second stage, income is distributed between consumption items and saving (Singh, Squire and Strauss, 1986).

However, the recursive nature of decisions is not always maintained. Examples to the contrary arise when household members draw different utility from working on or off the farm (Lopez, 1986) and when uncertainty affects the price of a product that is both produced and consumed on the farm (Finkelshtain and Chalfant, 1991). Though recursiveness and relying on market signals simplify decision making, with experience and necessity even traditionally bounded peasants allocate optimally the resources at their command (Schultz, 1964).

COOPERATIVES AND COLLECTIVES

The advantage of the family organization is usually presented in comparison with commercial farms relying on hired labour. Cooperation facilitates the realization of scale economies in services and trade, overcoming local monopolies (Sexton, 1990), risk sharing and credit enhancement. The problem of control can be much reduced in cooperatives and collectives (voluntary, not forced cooperation of course), but it cannot be eliminated completely, as evidenced by the Israeli experience which culminated in a severe financial crisis in the mid-1980s. I draw on that experience and base my discussion to a large extent on Zusman (1988). For an analysis of the economy of the kibbutz, see Barkai (1977).

Four types

The major types of cooperatives in Israel are moshavim, kibbutzim, regional cooperative enterprises, and supply cooperatives. They are now undergoing revolutionary changes and their description is somewhat outdated. The recent changes will be discussed towards the end of the paper.

A moshav (moshavim is plural) is a farming community in which all farms are family-operated, and all farmers are members in the multi-purpose, democratically run, village cooperative. In principle (practice varies) the coopera-

tive association in the moshav purchases all farm supplies for its members and markets their farm products. A kibbutz is a commune. Members work together and receive from the kibbutz all their needs. Again in principle, a member in the kibbutz owns his or her personal belongings but no other property. Moshavim and kibbutzim are members in two types of second-order cooperatives: regional service enterprises (such as feed mills, slaughter houses and transport services) and supply cooperatives set up to purchase farm requisites for their members the moshavim and the kibbutzim. Owing to space limitations, the supply cooperatives will be considered only to the extent necessary to explain developments in the first-order cooperatives – moshavim and kibbutzim – and the regional enterprises will not be dealt with at all.

Starting with the transfer of suppliers' credit to their members, the village associations of the moshavim and the supply cooperatives expanded into full-scale financial intermediation and the domineering position that financial activities occupied among their functions greatly affected both their well-being and their structure. It is useful to commence the discussion with a review of balance sheets.

Structure and accounting

Differences in their organizational forms are reflected in the accounting practices and balance sheet composition of the cooperatives (Jensen, 1983). Three randomly chosen cases are presented in Table 1.

TABLE 1 *Balance sheet composition (percentages, September 1984)*

	Moshav	Kibbutz	Supply coop
Fixed and financial assets	2.8	62.4	8.3
Loans to members	75.7	0.1	77.8
Other current assets	21.5	37.5	13.9
Total assets	100.0	100.0	100.0
Equity	2.9	33.7	0.4
Outside debt (including suppliers)	51.7	54.7	84.1
Loans from members	5.4	0.1	15.5
Loans from supply coops	40.0	11.5	—
Total liabilities	100.0	100.0	100.0

Source: Lerman (1989)

The accounting framework of the moshav and its balance sheet are for the cooperative association of the village; the economic activities of the family farms are not covered. In this way, the privacy of the members is respected, but the practice also limits the moshav's monitoring ability, representing a

weakness which contributed to the financial crisis. The importance of credit intermediation can be seen from the share of loans to members in its balance sheet, estimated at 75.7 per cent of the assets. The moshav raises credit from outside sources, almost a half of it from the supply cooperative, and distributes it to its members. To a lesser extent, the moshav also functions as a clearing house, receiving deposits from members with surpluses for others in need (5.4 per cent of the liabilities). Like the association in the moshav, the supply cooperative is also mainly a provider of services, including financial intermediation. The functional resemblance is reflected in the similarity of the balance sheet composition.

The kibbutz conducts its accounting like a family farm, combining its business and household books. The assets in the balance sheet are machines, buildings, orchards, livestock, plus the members' dwellings, pension funds and other savings. Consistently consumption, not labour, is considered as part of the cost of running the economic enterprise. Such mixed accounting practices mask the distinction between business and household, and between ownership and management, and are obstacles in the control of the economic affairs of the kibbutz.

Kibbutzim are profit-maximizing entities, engaged mostly in production and aiming to accumulate equity capital—a third of the liabilities in the kibbutz in Table 1. As zero-profit cooperatives, concentrating on financial intermediation, the moshav and the supply cooperative naturally accumulated smaller share of equity.

STRUCTURAL CONSTRAINTS AND ORGANIZATIONAL BEHAVIOUR

The moshav, the kibbutz and the regional cooperative are contractual institutions. Members contract, explicitly or implicitly, with the cooperative association and with each other to perform together certain economic and social activities. In principle, members are bound by the rules and regulations of the cooperative or the collective they joined. Practice is dictated by the democratic governance of the kibbutz and the moshav and by the cooperative ethics of their members.

Conflicts of interest – the moshav

By tradition, cost (of marketing, for example) is allocated in cooperatives according to 'patronage'. This results in average pricing, which may differ from optimal pricing if, in the quantity of services provided, marginal costs differ from their average. In an attempt to improve upon this rule, the moshav may choose a two-part cost allocation rule: each member is charged a given amount α (perhaps to cover part of the fixed cost) and an additional sum β per unit of product marketed through the cooperative. Now there is room for conflicts of interest. Members with a large volume of production will try to allocate most of the cost to the fixed element α , small producers will favour

charging mostly on a per unit basis. If this issue comes to voting and the distribution of members by size of production is not symmetrical, the value of β chosen will reflect the interest of the majority. The minority may find itself shouldering a larger than proportional share in the cost of the marketing service.

Consider now the construction of a feed-processing plant by the moshav for the service of its members. When the investment is financed by the general fund of the moshav, the risk of the venture will be shared by all members. If only livestock farmers participate in the investment, others will avoid the risk, but the moshav will not make use of one of the great advantages of cooperation. The possibility of any degree of risk sharing raises new issues of moral hazard which are nowhere more pronounced than in credit and will be discussed below.

Conflicts of interest – the kibbutz

A major source of structural conflict in the kibbutz is its set of operational constraints: equality, own labour (no exploitation of hired employees) and standard of living in parity with the standard of reference groups outside the kibbutz. These constraints are not always consistent. Own labour implies that unskilled work in agriculture and manufacturing is also done by members. These tasks seldom yield the income needed to support the expected standard of living. During the 1970s and early 1980s, ample supply of credit assisted in maintaining the desired private and social consumption levels, but also created the background for the financial crisis to follow.

By sharing income equally among its members, the kibbutz avoids much of the kind of conflict of interest that plagues the moshav. The outcome of an economic undertaking affects similarly all members and it is generally not in the immediate interest of any one group to tilt decisions in its direction. And if conflicting interests arise, since personal consumption is not affected, the intensity of the conflicts and the social antagonism they may generate are more often than not much weaker than in similar situations in the moshav.

The identity of the society and the community with the economic activities is the source of another kind of conflict. The majority of the members cannot comprehend fully the economic situation of the kibbutz – particularly with accounting practices that do not separate business from the community – but everyone understands social problems. Consequently, unlike the rational traditional peasants whom Schultz (1964) praised, kibbutzim are often subject to the logic of collective action (Olsen, 1965). They tend to have bloated services (particularly in children's care), readily purchase new and convenient machines, continue with failing activities to avoid painful labour re-allocation, and invest in dwellings and community services even if the necessary capital is too costly. They also tend to permit their young members long leave periods to experience outside life. The result is an unequal age distribution of the labour force, which is manifested particularly as the kibbutzim get older.

Recapitulation

As we have just seen, the structure of the kibbutz and the moshav breeds conflicts which may hamper optimal operation. Other difficulties can be regarded as free-riding and moral hazards. They are manifested strongly in the financial activities of the moshavim and the kibbutzim to which we now turn (for details, see Kislev, Lerman and Zusman, forthcoming).

THE COOPERATIVE AS A FINANCIAL INTERMEDIARY

Moshavim and kibbutzim cultivate national land leased to the farmers on a long-term basis. Farms cannot be used as collateral against loans. The alternative is cooperation in credit. Both the associations in the moshavim and the supply coops of the moshavim and the kibbutzim function as credit intermediaries. To augment monitoring and to facilitate convenient collection, members are required to market farm product through the cooperative.

Advantages

With financial cooperation, members in the moshavim, and moshavim and kibbutzim in the supply cooperatives, enjoy economies of scale in loan processing, professional financial management, and stronger bargaining position in the credit market. However, the greatest advantage of cooperative credit, both in the moshav and in the supply cooperative, lies in risk pooling, the implementation of which is founded on mutual liability and guarantee. Members in the moshav sign mutual guarantee agreements for the moshav association and representatives of moshavim and kibbutzim pledge similarly for loans raised by the supply cooperative. The social pressure to comply with cooperative norms is strengthened under mutual liability arrangements. The probability of default is reduced. Banks evidently recognize the advantage inherent in this arrangement, as credit is often made conditional on renewal of mutual liabilities.

Weaknesses

Several kinds of structural difficulties afflict the moshav and the supply cooperative, particularly (a) moral hazard – members tend to invest on their farms in risky projects knowing that with mutual liability they will be bailed out should the returns on the investment be disappointing; (b) free riders – a member in the moshav, or a moshav and a kibbutz in a supply cooperative, may choose to market farm products privately, thus weakening the association's standing in the credit market; and (c) agency cost – banks and other lenders view the cooperative associations as their agents and expect them to protect their interest (for example, by limiting credit to failing members) but the associations are guided by interests which are not always those of the

lenders. Similarly, officers in the associations may be tempted to expand operations and to assume risks which prudent members would avoid.

Enforcement of the cooperative's norms and rules – in practice, mainly enforcement of the inter-linkage arrangements of product marketing through the moshav and through the supply cooperative – is critical to its continued functioning as a credit cooperative. However, compliance with the behavioural code requires high standards of cooperative ethics and will to enforce. But enforcement is difficult in the internal political environment of the cooperatives.

PUBLIC POLICY

Cooperation in agriculture has always been supported by the government in many ways, but the most profound public involvement was in credit. The government raised capital on the markets in Israel for its budgetary needs, thus crowding out private sources of investment capital. To remedy the shortage of its own creation, the government distributed credit and subsidized it. Farm cooperatives were among the beneficiaries of this policy. The dependency on the government and the expectation that it would bail out moshavim and kibbutzim in trouble created moral hazard problems. Cooperatives at all levels were willing to rely on large amounts of debt, and banks were willing to lend, all trusting the government to save them in case of difficulty. This problem of moral hazard was recognized by the government, but the will to maintain a strict policy could not withstand the flood of credit in the late 1970s, when Israel participated in the global credit expansion. The situation was aggravated as inflation accelerated (to an annual rate of 440 per cent in 1984) while interest rates lagged and real rates were negative on many kinds of loans for most of the 1970s and early 1980s. The combination of ample supply of credit with the weaknesses of cooperative financial intermediation resulted in over-expansion and excessive reliance on debt in moshavim, kibbutzim and regional cooperative enterprises. In July 1985, inflation was abruptly halted by severe measures, including tight monetary policy. Real interest rates rocketed.

Crisis

The financial crisis in agriculture erupted at the end of 1985, when creditors realized that agriculture, particularly cooperative agriculture, could not continue to service its debt in view of the exceedingly high real rates of interest and that the government – bound by a stringent fiscal regime – could not bail the sector out any more. Most regional cooperatives and many of the associations in the moshavim collapsed. Farm production has continued, often with private credit arrangements and the farmers' own resources. But this cannot be a complete solution to the crisis, and banks and other creditors are still demanding repayment of their loans. For most members in the cooperatives, the heavy burden is not their own debt but their share in the mutual liabilities

– their share in covering the debt of several heavy borrowers in the moshav and the debt of the regional enterprises.

Agriculture could not repay or service its debt in full. Once this was realized, the government moved in, offering support in an effort to reach a debt settlement between the banks, on the one hand, and the moshavim and the kibbutzim on the other. Agreements have been formulated but their implementation has been slow, as many in the sector still hope that they can gather political support for a more favourable settlement.

A major victim of the crisis has been cooperation. Many of the village associations in the moshavim ceased to function as cooperatives and most of the supply cooperatives had to give up financial intermediation. It is practically impossible to get credit guarantees, and banks became suspicious of borrowers. These changes, coming in the wake of the crisis, are affecting different sectors of agriculture in various ways. Wealthier farmers in moshavim can offer collateral in the form of private property and saving. Poorer members have only their farms to offer, but these are not acceptable and such operators are often driven to expand off-farm work.

The crisis also accentuated the differences between moshavim and kibbutzim. A moshav can function as a village even if the farmers desert the cooperative and each fends for himself. Kibbutzim are made up of their membership and, should the members leave, the kibbutz will disappear. Some young members are already leaving (not all for economic reasons, to be sure). The crisis is therefore much more dangerous for the kibbutz. And indeed, many of the kibbutzim reacted by adopting revolutionary structural changes including the division of the kibbutz into several semi-independent economic units, each with its own board of directors and reporting obligations. The kibbutzim are showing here – not for the first time – both their commitment to the collective idea and their practical flexibility. It seems that, economically, most of them may survive the crisis and emerge from it strengthened, provided the younger generations stay and continue in their parents' tradition.

CONCLUSIONS

Cooperation was in the forefront of agricultural development in Israel. Much of the sector's institutional building and technological advancement was achieved through cooperative efforts. For many years, members in moshavim and kibbutzim reached satisfying income levels and maintained stable cooperatives. The late 1970s were particularly favourable for cooperative agriculture: with its access to credit, it succeeded in accumulating large amounts of equity capital, much of it due to inflationary gains resulting from negative real interest rates. With prudent housekeeping, moshavim and kibbutzim could have emerged from the inflationary experience stronger than ever. Instead, driven by weaknesses of cooperative action, combined with irresponsible government policy, they have sunk deeper into debt and prepared the ground for the devastating crisis.

It may well be that, with time and with changing government attitudes and public atmosphere in Israel, cooperation would have lost in the evolutionary

struggle to private modes of organization in agriculture. However, in the intensely unstable economic environment of the last 20 years, the institutional competition has been unfair and cooperation may have retreated too much. Time will tell whether cooperation will return to its pivotal position in Israeli agriculture.

NOTES

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²Schmitt (1990) also attributes particular importance to transaction costs in explaining the survival of the family farm.

³Here I differ with Schmitt (1990) who assumes, perhaps implicitly, that land and capital are given exogenously and farm size is determined (actually, defined) solely by labour allocation.

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DISCUSSION OPENING – LAURENT MARTENS*

It is a common occurrence to accept the role of discussion opener on the basis of nothing but a title. As long as the discussant does not have any other information, he may have rather conflicting expectations concerning the content of the paper on which he will eventually have to comment. On the one hand, he can hope to find a paper with which he substantially agrees, since we all like our biases to be reinforced by others. In such a case the discussant can explain how much he enjoyed reading an excellent paper and he can complement the paper from his personal experience. On the other hand, he may look forward to a paper leaving plenty of opportunities for disagreement with the author, enabling the discussion opener to point out major theoretical or empirical shortcomings and leaving all participants with the impression that the topic still holds scope for further research.

In this particular case it appears that there is ample scope for both approaches. The title alone suggests that the theme is an evergreen one and an old classic as well. It is evergreen because the issues covered remain exceptionally topical in the present debate on structural transformations in agricultural production world-wide, not just in what used to be centrally planned economies in Central Europe, but also in less developed economies and in the European Community. It is an old classic because throughout the 70-year history of IAAE one can hardly find a single conference during which the institutional organization of agricultural production was not on the agenda. Yet the overall scope of the paper has been scaled down considerably from the initial title to the final content. The initial title sounded like ‘Competitive Institutional Arrangements in Farming: Theory and Evidence’, from which one could expect a paper developing a universal theory, based upon empirical evidence, which would cover all aspects of alternative institutional structures. Participants who have chosen to attend this particular session on the basis of such high expectations might feel somewhat misguided or even disappointed by the much narrower scope of the paper which has been presented. Indeed the concept of family farms has been scaled down to that of developed market economies, and even mainly to United States experience, while agricultural cooperatives and collectives are even further reduced to the very specific institutional arrangements of moshavim and kibbutzim in Israel.

The section on family farming focuses almost exclusively on economies of scale and is introduced by the question ‘What is more natural than to expect modern agriculture to be organized in large-scale food factories?’ I would rather have expected this question to be phrased in the opposite sense: ‘Is there anything natural about expecting large-scale food factories?’ Indeed, it is soon made clear that the evidence does not support unequivocally the existence of economies of scale in agriculture. Kislev is certainly in good

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company in suggesting that fast growth in farm size and the maintenance of the dominant position of the family farm can be reconciled. In his stimulating paper presented at the 19th IAAE conference, Boussard (1985) concluded that farm size heterogeneity is a consequence of absence of economies of scale, and that farm structure heterogeneity is a result of the interactions between a dynamic process of adjustment towards optimal price-dependent structures and of market constraints which perturb this adjustment. At the same conference, Newby (1985) stated that the tendency towards increased concentration of production has not been accompanied by the disappearance of the family farm or peasantry, and that the emergence of a dual farming economy can be witnessed in many countries.

At the 5th Congress of the European Association of Agricultural Economists, Nielsen (1985) concluded that its ability to adjust to changing external conditions is the main reason for the family farm having been such a persistent institution. Schmitt (1989, and at this Conference), focuses more specifically on the argument that transaction costs related to farming are smaller in family farms, so that economies of scale are insufficient to compensate higher transaction costs in commercial farms. All this points us towards household production theory as an integration of the neo-classical theory of producer and consumer behaviour. However, here too there is hardly anything new. Almost four decades ago Heady (1953) wrote: 'Motivational forces behind the farm producing unit are consumption-inspired as well as profit-inspired ... The optimum use of resources in production or the optimum allocation of income in consumption cannot be defined unless the two basic sets of economic relations are related'.

This approach also clarifies the similarity between the kibbutz and the family farm. Indeed, Kislev points out that in both cases business and household accounts are combined and that the labour of the extended kibbutz family is not recorded as an expense. Some similarities could also appear with farming systems based on extended families throughout the world. Here, too, the unity of the firm and the household can be a source of conflict, either because it can result in the exploitation of family labour or because it leaves ample scope for free-riding.

The institutional framework of the moshavim is clearly that of a cooperative characterized as a voluntary association of people, in which capital subscription does not form the basis of voting power and in which the reward is primarily seen as the patronage rebate or discount based on the value of business done with the society. Kislev points out some conflicts of interest in the management of the moshavim, such as cost allocation according to patronage. Cobia (1989) formulates this problem in more general terms, in relation to the heterogeneity in size and structure of farms mentioned earlier, stating: 'The size disparity among farmers challenges existing cooperatives to serve patrons with very different needs'. Olson (1965) is even more specific: 'Unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational self-interested individuals will not act to achieve their common or group interests'. This phenomenon of conflicting individual and group interests is also experienced in some cases of group farming in Western

Europe (Martens, 1973) and certainly helps us to understand the financial crisis of the kibbutzim to which Kislev is referring.

Somewhat to my surprise, the author states that 'institutional competition has been unfair to cooperatives'. I would like to know how the author arrives at such a conclusion, especially since in the same paper we also read that 'cooperation in agriculture has always been supported by the government in many ways', and that the greatest involvement was in credit, with negative real interest rates. Moreover, kibbutzim cultivate national land leased on a long-term basis. My personal, very subjective, impression is that in Israel institutional competition has been unfair to family farms and to non-family corporate farms. If fair competition prevailed, and considering the unbalanced age distribution of the labour force as well as the fact that some of the initial objectives behind kibbutzim and moshavim are somewhat outdated, I would rather expect that family farms or non-family corporate farms would take over. Of course, the answer could be a matter of definition and it is my impression that many arguments concerning institutional arrangements in farming have to do with a lack of clearly defined concepts.

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