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The Evolving Farm Structure in
Eastern Germany

by

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THE EVOLVING FARM STRUCTURE IN EASTERN GERMANY

Introduction

The existing collective farms (LPG's) and state farms (VEG's) left at the end of the German Democratic Republic were known to be competitively weak compared to western farms. These enterprises were characterized by several problems, including worn-out capital stocks, old technology, and use of excessive amounts of labor which was specialized and inflexible with little motivation. The enterprises themselves were of excessive size and output was overly specialized. Factor productivity was low for both labor and capital (Agra-Europe, 30/91, Länderberichte p. 11; Heller, pp. 29-31). Only 10-20 percent of these enterprises were expected to be profitable in an EC market (Schmidt, p. 3). Thus, a major issue during the process of introducing market forces into eastern Germany has been the type of future farms that will emerge.

The law governing the shift from collective to private agriculture -- the Landwirtschaftsanpassungsgesetz -- formally calls for all business forms to be given an equal chance to survive. Yet if the organizational problems experienced in East German enterprises were not unique to their situation, but rather were a result of generic problems of size and cooperative organization, then the issue arises of whether public assistance should be extended to successor cooperative forms. A related issue is whether agricultural policy should steer the structural development of the sector. Some expect a multi-structured sector with privately owned hybrids of personal and capital corporations (Agra-Europe, 30/91, Länderberichte p. 10). Others, including the German Minister of Agriculture, see a private agriculture emerging that will be similar to the western family farm structure (Agra-Europe, 27/91, Länderberichte p.46).

The debate over what farm structure will arise, what farm structure should arise, and the extent to which the structural development should be guided has been a favorite of German agricultural writers. A second issue which is intertwined is that of optimal farm size. This paper examines the emerging eastern German farm structure. It does not fully develop the debate over the advantages of various organizational forms as numerous papers have already done so. The first part of the paper summarizes the conflicting views over the "best" organization of farms by considering the advantages and disadvantages mentioned for the family farm organization. The second part of the paper then reviews the related issue of farm size. The third section considers the trends already underway in eastern Germany. The various types of organizations are defined, and thereafter, the trends in number and area share are reviewed. Finally, given the developments in farm types and size the paper speculates over the future structure of eastern German agriculture.

"Family" Agriculture: Advantages and Disadvantages as an Organization Form

Regardless of country few issues have had the high profile of the "family" farm issue. The opening lines of every U.S. farm bill pay homage to the family farm, as do the Basic Agricultural Law of the Federal Republic of Germany and EC agricultural policy. Yet the

concept of what is a family farm remains vague. For this section a broad definition is used where a family farm is a farm where the bulk of the labor and/or the assets are controlled by a single family.

A central issue in the development of eastern Germany is whether the family farm is a superior form of business organization to other forms, and hence, should be favored in the measures to assist the sector. This issue can be posed in two distinct manners. The first is whether the family farm is a superior organization form in the context of the often cited unique characteristics of agricultural production. A second, and broader context, is whether the family farm organization is superior without regard to these special characteristics.

Agricultural production is often viewed as having "unique" features. One feature is the role of land in production (Langbehn, p. 2). Crops and many types of livestock are land intensive relative to the outputs of other sectors. Land is a resource with an asset value, its mobility among sectors is limited, and is often specific to only certain types of activities. Land ownership is a major source of the net worth of the sector. Indeed, commodity policies which are frequently couched in terms of income equalization among sectors may be more properly viewed as land value preservation or enhancement policies. A second unique feature is the time dependent concentration of labor due to the biological processes of agricultural production. Labor in the sector must perform sequenced tasks at certain time periods which cannot be repeated if improperly or incompletely executed (Langbehn, p. 2). For example, corn planting in the United States can be delayed at the cost of yield losses, but at a point the crop must be planted or foregone. Third, compared to other sectors the returns to labor specialization are low (Langbehn, p. 2). Also there are several positive external effects for labor in agriculture. A major feature of agricultural production is that it occurs under uncontrolled conditions which require great flexibility in planning, execution, and a loss of control over the output (Langbehn, p. 2). An unusually wet spring may require shifts in the timing of field operations, in the crop mix, and in the input use, yet leave the crop vulnerable to subsequent adverse weather. Agricultural markets also tend to be price and income inelastic which means that technical change creates strong downward pressure on prices. Farmers have the incentive to adopt technical change, but the benefits largely accrue to early adopters and in the longer run to consumers of the product.

In such an environment supporters of a family farm based agriculture see several advantages for that organization form over all others. In a stochastic environment decision making flexibility is seen as critical. In a family farm decisions are vested in a single individual or a small group which gives the process much flexibility. Other organization forms -- corporations or cooperatives -- have hierarchial structures with channels for decision making which can be overtaxed by rapidly changing conditions (Langbehn, p. 4). Larger organizations also must pay higher costs for larger administrative staffs and coordination of communication becomes complex as changes in instructions occur. A related issue is flexibility in labor allocation among tasks which is seen to be higher in smaller units (Leiber, p. 2).

Under a cooperative structure as size rises there is an increased separation between the ownership of factors and their allocation decisions. The family farm retains the sovereignty of the factor owner for allocation decisions, including the right to determine the division of returns between current consumption and investment for the future. In a cooperative form members'

interests and those of the organization can easily diverge (Langbehn, pp. 4-5). Under socialism the state took over much of this responsibility in East Germany, but with privatization this issue reemerges (Schmitt, 1990, p. 10). The effect of this division between member interest and organizational interests can be seen in the large number of disputes now arising in eastern Germany over division of the value of the collective farms and the debt responsibilities of members, particularly by those wanting to leave the collective (Steffen, pp. 165-166).

A family farm is seen as an organizational structure which generates a high labor motivation (Leiber, p. 2). This flows from the linkage between risks and rewards because the factors are owned by the entrepreneur (Langbehn, p. 5). Cooperative structures tend to suffer lower labor motivation (Warnemünde, p. 616). Costs are carried by members, but the return accrues to the cooperative -- especially true for the leadership (Langbehn, p. 5). This problem can manifest itself in increased shirking which requires increased supervisory and administrative personnel which generally have high wage costs (Schmitt, 1990, p. 7 and 11).

The advantages of a family farm agriculture noted above are not universally shared. In some cases objections are raised on conceptual grounds. In other instances it is argued that the reestablishment a family farm structure in eastern Germany is not feasible given the developments of the past decades.

Much of the support for family farms arises from the view that the transaction costs of other organizational forms are high. Thus, it is hardly surprising that critics of that support argue that the transaction costs are not so high (Harsche, 22/90, Markt + Meinung p. 15). They argue that the emergence of large firms in market economies which have come to dominate their sectors shows that the organizational problems are solvable with the proper system of contracts (Harsche, 22/90, Markt + Meinung p. 14). One advantage for cooperative ownership forms is their ability to generate larger sums of capital at more favorable terms (Langbehn, p. 5). This allows them to expand size and to thereby reap economies of scale, size, and scope. Organizational forms such as stock companies also serve to limit the exposure to risk whereas with a family farm the owner must bear the full risk personally. Among the various possible forms some, such as cooperatives, are granted comparatively favorable tax treatment (Warnemünde, p. 618). Additional capital formation allows expanded access to new technology and the opportunity for horizontal and vertical integration. Thus, a policy of forcing a family farm structure sacrifices cost advantages (Kallfass, pp. 305-313).

In the eastern German context the argument is also made that returning to a family farm structure is not possible and that structural change in the agricultural sector must proceed from the region's historical experience (Harsche, 19/90, Markt + Meinung pp. 3-6). Western Germany retained its tradition of family farms with the necessary requirements of knowledge, entrepreneurialship, capital, and risk acceptance (Kallfass, p. 310). These are missing in the east under conditions where labor is specialized, capital formation insufficient, property rights unclear, risks great, and rewards uncertain (Kallfass, p. 311). Surveys show few eastern Germans willing to strike out alone in a market economy, rather most prefer to continue to work in a cooperative form. Agriculture in eastern Germany is based on large units of a size to capture scale economies and a policy of forcing a family farm structure risks creating an inefficient structure and lengthening the crisis (Kallfass, p. 311).

Farm Size: The Mysterious Optimal Size

Hidden within the discussion of organizational structure for agriculture in eastern Germany is the issue of farm size and its interaction with per unit production and transaction costs. Implicitly assumed is that family farms are small. Thus, the issue emerges of what size captures economies of scale in agriculture and how this is related to organizational form. Transaction costs for cooperative types of farms could exceed those for family farms, yet if cooperative forms can more than compensate through scale effects in production they would have a competitive advantage. Thus, the issue is the location and shape of the average cost curves for the different enterprise forms.

In a simple theoretical microeconomic framework as found in a textbook this size and organizational issue is straightforward. Average cost curves for a firm illustrate a "U" shaped pattern. As per unit total cost falls economies of scale are reaped and size grows. When average cost is rising diseconomies of scale are obtained and size shrinks. Between these regions lies the minimum average cost where firm size is optimal. The organizational form whose average unit cost -- for all factors -- is lower has the advantage. Determining the location and shape of the average cost curves for the various enterprise forms gives the answer. Unfortunately the actual process is not simple and the answers from such studies have been criticized on theoretical, methodological, and empirical grounds. For example, Schmitt (1992) argues that the traditional microeconomic framework presented above is inappropriate for this organizational and size issue in the case of agriculture. He suggests a different approach where the farm is viewed as a household rather than as a firm.

Most studies of farms find the existence of economies of scale, and they suggest that the range of outputs over which average cost declines is quickly exhausted. Once the average cost stops falling there is a large range of output over which costs are relatively constant. Farms have the incentive to grow along this range to increase total income but not to reduce per units costs (Schmitt, 1990, p. 4). This means that based on average cost the idea of an optimal farm size is very elusive. Studies show that in western Germany family farms of 70 plus milk cows or 250 hectares have very low costs. Family crop farms in the United States of 600 to 700 or more hectares are not unusual. Farms of these sizes appear to have exhausted economies of scale in production (Leiber, p. 2).

Conceptually all costs should be included in the analysis. Because some costs are difficult or impossible to measure they are excluded from the analyses. Transaction costs fall into that category, thus, can be added only in a subjective manner. Schmitt (1990) argues that for agriculture the transaction costs of cooperative organizations quickly exceed any advantage obtained in production costs, and hence, these organizational forms are not capable of surviving (p.6). This conclusion is derived from the observation of existing organizational forms in market oriented agricultures around the world. Producer cooperatives are extremely rare. Corporate forms exist, mostly family corporations, but are not a major share of farm types. Rather family farms of various sizes dominate the agricultural landscape. This suggests that scale economies including all factors can be obtained at sizes within the reach of family based units and that family farms have an advantage over other organizational forms.

Trends in Eastern German Farm Structure during 1990 and 1991

While the above discussion argues that previous studies suggest no apparent cost disadvantage for family farms due to organizational structure or size, that alone is not sufficient to conclude that a family farm agriculture will arise in eastern Germany. That region has operated under central planning since 1933 and with collective and state farms since the collectivization process began in the 1950's. After 1960, there were few private farms so that many of the preconditions for a private, family based farming structure are missing.

This section examines the farm structure developments which occurred during 1990 and 1991. The process is in an early stage and there is no guarantee that the patterns observed to this point will persist. They could be reflective of the future or they could merely be a transition phase to an entirely different structure. That is, this section takes a peek at a short time interval in a dynamic process.

The Farm Structure of East Germany

Before describing the farm structure that is emerging it is necessary to review the structure of agriculture in East Germany during the communist period. That structure was overwhelmingly dominated by the collective farm (LPG). As of September 30, 1988 there were a total of 3855 collective farms of which 1159 were specialized in crop production and 2696 were specialized in livestock production (Kurjo, pp. 13 - 14). The collective crop farms operated 85.1 percent of agricultural area for an average size of 4500 hectares using over 200 labor units. Collective livestock farms were extremely concentrated production units. They accounted for only 1.3 percent of area or roughly 31 hectares per farm. On that small area around 4500 large animal units were held with an average labor use of over 100 labor units.

In collective farms contributors of land retained nominal ownership of that land but the land was jointly operated by the collective members. The organization of the farm was along industrial lines. The superstructure consisted of a membership assembly, with in principle all decision power, and a directorate elected by the assembly which had the day to day operating responsibility. Underneath this structure the collective was organized by function with brigades assigned to specific tasks.

An important feature of a collective farm was that it was more than just a production unit, rather it was more like a community. Many of the activities normally associated with a rural community were undertaken by the collective, including child care, machinery repair, cultural activities, and maintenance of village infrastructure.

A second type of major agricultural organization in East Germany was the state farm (VEG). These farms were largely formed in the initial post-war land reform from expropriated private farms. All land and inventory was state-owned and operation was again organized along industrial lines under a state appointed director. State farms were also specialized. On September 30, 1988 there were in total 390 state farms of which 79 were specialized in crop production and 311 in livestock production. The crop specialized state farms operated 6.4

percent of area and the livestock farms 0.8 percent of area. Because these farm tended to concentrate on critical activities like seed production or in breeding animals their importance based on numbers or on area is underestimated.

With the specialization of farms the interaction between livestock feed needs and feed supplies was critical. Commodities delivered to the state via quotas could be allocated by decree. Excess supplies required another mechanism which was satisfied by combining 2 - 4 livestock farms with a crop farm underneath a cooperative council (KOR). In 1988 there were roughly 1200 of these.

Despite the pressure to collectivize agriculture a small private farm structure endured. There were roughly 3000 private farms and in conjunction with church farms operated 5.5 percent of the area.

Legal Forms for Farms

Interpreting the data on the emergence of new farm structures in eastern Germany requires some basic information about the major legal forms permitted. There are two critical categories for farm organizations -- those of natural persons and those of legal persons. Within these categories there are various alternatives which individuals may select based on experience, risk considerations, capital contribution and formation purposes, tax considerations, and firm objectives. This discussion will not cover the details of the differences, rather is designed to give an overview of these forms.

Among the natural person legal forms a major type is the individual family farm (Einzelbetrieb-Familienbetrieb). The farm leadership and the labor are supplied by the occupant of the farm, by the farm couple, or their family (Der Bundesminister, p. 58). The leadership of the farm has free and independent decision authority and carries the risk with unlimited liability. Earnings from the farm cover family labor, owned capital, and risk with the imputed allocation a responsibility of the family.

Another business form centered on natural persons is a small partnership (Kleinere Personengesellschaft). This form is a small partnership among two or more farmers, for example, between a father and son (Der Bundesminister, p. 58). The objectives of this form include a division of risk, improved liquidity, enhanced ability to finance operations, strengthened ability to purchase inputs and sell outputs, and intergenerational transfer of the farm.

A partnership under civil law (Gesellschaft bürgerlichen Rechts - GbR) is also considered a form of personal partnership (Der Bundesminister, p. 59). Its characteristics include a formal treaty governing the farm leadership as well as profit and loss division with great flexibility in form and simple procedures for establishment. Tax treatment is equivalent to the family farm and this farm is eligible for all agricultural aids.

Another form of personal partnership with more members is a limited partnership (Kommanditgesellschaft - KG). Within the partnership members differ in responsibility and risk,

with some active in the farm's operation and bearing full personal risk for all liabilities, and others whose responsibility is limited by agreement to information and examination and whose risk is limited to their capital contribution -- outside partners. This form combines the responsibility and leadership of the other partnership forms with a limit on the individual's risk as found in a corporation.

There were five types of legal person organizations found in eastern German agriculture during 1990 and 1991. One was the collective farm (Landwirtschaftliche Produktionsgenossenschaften - LPG) remaining from the communist period. This organization form was not permissible under West German law transferred to eastern Germany. Under the agricultural adjustment law -- Landwirtschaftsanpassungsgesetz -- this form was permitted to continue in existence until January 1, 1992 for the purpose of reforming into other legal forms. Collectives that failed to do so by that date were legally dissolved.

Another form remaining from the Democratic Republic years was the state farm (Volkseigene Güter - VEG). The goal was to privatize these farms and for that purpose their administration was transferred to the privatization agency -- the Treuhandanstalt. Privatization proved to be a complicated and time consuming process due to unclear ownership claims and old debt burdens so that in 1990 and 1991 VEG's continued to be operated under Treuhand administration or through leasing agreements between the agency and other types of farms.

A form of legal person under West German law is the limited liability company (Gesellschaft mit beschränkter Haftung - GmbH). This form requires one or more founders, and a notarized charter which must be registered (Der Bundesminister, p. 60). The company is permitted to be operated by a persons not holding a share in the business. Its advantages lie in limited financial liability for the value of the business and considerable entrepreneurial flexibility.

Another option for a legal person organization is the joint stock company (Aktiengesellschaft - AG). Ownership tends to be spread among many individuals in the form of stock certificates. The individual's risk then depends on the value and number of certificates held. Ownership and operating decisions are often in the hands of very separate groups. As in other legal persons, the decision structure is hierarchial.

A form of legal person appearing in eastern German agriculture is the registered cooperative (eingetragene Genossenschaft - eG). Members share the operation of the business with their vote determined by their share of the cooperative's value. Members buy into the cooperative and provision of in-kind land, labor, and inventory are regulated by contracts (Warnemünde, p. 617). The cooperative must be formally registered and requires at least seven founding members. The decision hierarchy of the cooperative consists of a directorate -- minimum of two members -- and a supervisory council -- at least three members. Because every member has a vote some decision making flexibility is lost (Agra-Europe, 34/91, Markt + Meinung p. 19). The cooperative form offers members the chance to create a larger unit and to obtain more capital with a relatively favorable tax treatment. Yet risk may be more than in corporate forms. Under certain conditions liability beyond the value of the cooperative is possible (Der Bundesminister, p. 60).

Trends Underway

Agriculture in the Democratic Republic was dominated by the collective farm (LPG). During 1990 and 1991 restructuring in eastern Germany largely meant replacing this collective agriculture with new legal forms. The extent of this process is shown in table 1. By April 1991, the number of LPG's had fallen from 3,855 in September 1988 to 2,287. From April to August another 863 LPG's disappeared, yet 1,424 remained despite the January 1, 1992 deadline for reorganization.

The instrument to recreate a private market based agriculture from the collective farms is the *Landwirtschaftsanpassungsgesetz* passed by the East German Volkskammer shortly before economic union with West Germany. This law contains several critical features and continues - with modifications -- to be in effect after German reunification.

The original law calls for all ownership and business forms to receive equal competitive opportunities. That includes family farms as well as cooperative organizations voluntarily formed by farmers. In regard to restructuring LPG's, the law contains rules over the transfer of assets to other business forms. Exiting members are entitled to their land and inventory contributed to the collective. If a return is not possible on economic or legal grounds, exiting members can claim compensation of equivalent lands in terms of quantity, value, and quality. Departing members can also claim compensation for land rent not received in the past and for their share of past profits. The law also regulates the manner in which the collective dissolves. For both restructuring and liquidation the collective must present and have approved a detailed plan for division of its value. The law declares that collectives not restructured by January 1, 1992 are dissolved (*Agra-Europe*, 29/90, Dokumentation pp. 1 - 14).

The law was amended in June 1991 to clarify the rules over value with an emphasis on outstanding debt responsibility, value claims by departing members, and production quota claims. A responsibility for old debts incurred by the collective directorate was introduced. The rules over claims by exiting members were clarified whereby the return of contributed inventory as well as the division of production quotas were given priority. Additionally, voting rules for restructuring and dissolution were amended to give asset owners a stronger voice (*Agra-Europe*, 24/91, *Länderberichte* pp 49 - 52).

The restructuring LPG's face enormous obstacles which have slowed or in some cases halted the process. Decapitalization of an LPG involves assigning property rights to and valuation of the contribution for hundreds of individuals who often had joined the collective at differing dates in the absence of functioning factor markets. The task facing the LPG is to determine who owns which assets, the value of those assets, and the payment for labor contributed. Individuals tend to form into broad groups with greatly different interests. There are owners of land and inventory who desire a high share of returns allocated to assets and a quick resolution of property rights so that the land can be leased or sold. Another group consists of LPG members who contributed labor but not assets. These individuals can constitute a substantial share of the membership and have the incentive to secure as high as possible imputed value for labor from the LPG value. Thus, they are in direct conflict with the first group. The third group consists of future operators who desire to secure the best possible starting conditions for their subsequent operations (Heller, pp. 29-30). The third group is defined by a completely

different criterion than the other groups and can be comprised of members of both groups one and two.

Due to old debts, unclear ownership claims, and the various interpretations of the law requiring reformation the restructuring LPG's find themselves facing legal actions in court and an uncertain future. Thus, most every decision regarding restructuring is subject to a potential challenge and uncertainty over the outcome clouds the future.

Restructuring of LPG's has also been slow due to a lack of entrepreneurial education and willingness of members. Information on alternative organizational forms, on legal requirements and procedures, on tax and policy issues is missing (Henrichsmeyer, p.66). Knowledge and farming experience as well as the willingness to take risks had been lost under the socialist system (Heller, p. 30). Rebuilding these traits requires time. With restructuring requiring complicated legal and economic decisions in an uncertain and rapidly changing environment many LPG's have been reluctant to press forward (Agra-Europe, 45/91, Länderberichte p. 54).

While precise data is hard to obtain there are indications that the restructuring process accelerated after August 1991. Initial estimates were that 500 - 800 LPG's might dissolve without a successor when the January 1, 1992 deadline arrived (Agra-Europe, 45/91, Länderberichte p. 54). This fear caused the state of Brandenburg to request an extension of the deadline with the argument that there were still many unresolved issues and that the deadline would result in the dissolution of many LPG's through no fault of their own. There had not been sufficient time given for such radical changes (Agra-Europe, 48/91, Länderberichte pp. 2-3). The counter argument was that sufficient time had been given to meet the rather modest registration requirements for a new organization form as in the Anpassungsgesetz. The compromise decided was that the deadline was not extended, but LPG's which had reported to officials on their intentions to reform but which had not received approval of all paperwork obtained a grace period. The final estimates of the number of LPG's which dissolved varied but were under 100 (Scholz).

Table 1 also shows the types of organizational forms which arose as the restructuring of the LPG's proceeded. One popular new form is the cooperative (eG) which in many cases is a simple change in the LPG's legal form combined with a relinking of livestock and crop operations along with downsizing (Henrichsmeyer, p. 66). For the formerly specialized livestock units acquiring land for manure disposal is critical under EC rules. Downsizing reflects both economic pressure and the separation of community responsibilities. Decision making has improved over the LPG by vesting more responsibility in the directorate. Managers are allowed full freedom of decision making within broad limits. The supervisory council bares a controlling responsibility. The membership assembly involvement in decision making is limited. By April 1991, 477 such cooperatives had arisen and in August the number stood at 830. One motive for this type of organization is that LPG members had experience working in cooperative forms and thus there is much popularity for continuing to do so. A March 1991 survey by the University of Frankfurt of 113 LPG leaders showed a preference for restructuring into a cooperative form (Ernährungsdienst, June 13, 1991). At that time 16.5 percent had already adopted the cooperative form (eG) versus 4.3 percent for the limited liability corporation (GmbH). Future plans were to continue that pattern as 62.5 percent would chose an eG versus 20.5 percent for the GmbH. Another motive for the cooperative form as well as the corporate

forms is that in most cases the value share obtained by an individual from the LPG is insufficient to create an economically competitive farm given the capital required. Indeed lack of collateral is a critical problem for eastern German farmers trying to take advantage of official investment assistance programs. A cooperative form is seen as pooling enough capital to enable the unit to achieve minimum costs while not subject to tax discrimination. Advocates of cooperatives see gains due to the ability to exploit monopsony power in input purchases as well as the possibility of gaining through vertical integration. Many cooperatives are trying to control livestock from the feeding, to slaughter, to direct consumer marketing. Some cooperatives are developing retail outlets both on farm and in nearby communities.

The movement to cooperatives is seen as having both positive and negative effects. Many observers question the long-run ability of these enterprises to survive in competition with other forms even if there are short-term benefits. One view is that a cooperative form offers a reasonable temporary organization for LPG's in transition to a market economy (Agra-Europe, 48/91, Kurzmeldungen p. 6). It is relatively easily accomplished under the majority decision rules of the Anpassungsgesetz. It retains the value of the collective farm's assets while giving time for new farms and farmers to emerge. That is, the missing experience can be created. Yet, a danger is seen in that the process of using cooperatives might slow the transition to an entrepreneurial based agriculture with individual ownership (Steffen, p. 165). The policy environment created by the EC and the German government disadvantages this form through either outright exclusion from some programs or via size limits applied to programs. Another problem with cooperatives is that the interest of private investors in working with this type of organization is limited, hence, hinders the ability of the enterprise to raise outside capital (Isermeyer, p. 299). Despite reforms to improve the decision making process and to improve labor incentives, problems are still encountered. A study of LPG's that restructured into cooperatives by the University of Halle finds similar problems as before with a lack of motivation and inefficiency (Agra-Europe, 49/91, Länderberichte p. 23). Thus, the early experience with cooperatives arising from collective farms is not encouraging.

Another form of legal person emerging from the reorganization of LPG's are the corporate organizations -- the GmbH's and AG's. By April 1991 there were 459 of these and by August 744 (table 1). While initially cooperatives (eG) were more popular in the second one-half of 1991, corporate forms, notably the GmbH gained acceptance (Peters). The corporate forms retain the size advantages of the cooperatives. In concept it has a superior decision framework as the number of leadership voices is reduced, but as many cooperatives vest considerable responsibility in the directorate the practical advantage is less clear. Also as some of the late restructuring LPG's are burdened by old debt, the risk limitations of the corporate form have advantages over the cooperative organization. Another advantage of the corporation is that it allowed asset owners from the LPG to retain value without requiring their direct participation in agriculture. There is also the belief that outside investors are more comfortable with this form and that collateral for loans can be more easily secured. A disadvantage is that tax law and aid measures are not neutral, but rather are biased against this form. Investors in corporations have to assume that other forms will receive favorable policy treatment (Isermeyer, p. 301). Another disadvantage for weak corporate organizations is the obligation to pay members cashing their stocks. If a farm is weak, members can quickly cash their stock certificates. This cuts liquidity and further weakens the enterprise. If the prospect is bankruptcy, it is better to take the money early rather than being left holding stocks of little

value at the end. While concern over possible runs on enterprise liquidity are expressed there is little evidence of such behavior by members.

In terms of farm numbers natural persons dominate the eastern German landscape. In 1988 there were 4,625 legal persons -- collective and state farms -- and 3,000 natural persons -- private and church lands (table 1). By April 1991 there were 9,215 natural person farms and in August 12,637. The bulk of these enterprises were family farms -- in August 1991 12,106 family farms versus 531 partnerships. This group of farms is a very heterogeneous one. There are a large number of small farms where agriculture is a secondary activity along side of larger more growth oriented family farms which focus on agriculture (Isermeyer, p. 296). Many of these farms involve returning land owners from the west or farmers from the west who lease land from former LPG members. Although the aids programs and tax policies favor the reestablishment of family farms, units emerging under former LPG members are often burdened by weak management experience, limited area, and insufficient capital (Steffen, p. 165). Liquidity is a major problem as is a lack of collateral to qualify for loans. As they are economically vulnerable future directions in EC farm policy and the trade liberalization negotiations in GATT are seen as critical to their survival. To avoid some of these pitfalls partnerships have been formed to gain size advantages and some labor specialization (Kallfass, p. 311). While that organization form creates a more flexible decision process than a cooperative structure, it also requires a close and trusting working relationship among the partners.

Within these broad patterns there are regional differences (table 2). The number of family farms dominates in all five states but there is a relationship between the family farm share and the structural and natural conditions of the state. Family farms have the greatest relative importance in regions with better natural conditions (Agra-Europe, 45/91, Länderberichte p. 54). This includes areas of Saxony and Saxony-Anhalt. Areas least favorable on the basis of natural conditions -- that is, sandy soils and low moisture -- are Brandenburg and areas of Mecklenburg-Pomerania. These states have fewer family farms and more unrestructured collectives. Access to urban areas also supports family farms which can tap the demand in that market and also develop a heavy reliance on agriculture as a secondary income source. This is reflected in the high shares of family farms in Saxony, Thuringia, and to some extent in the figure for Brandenburg. Another feature reflected in the data is the historical land holding pattern. Pre-war land holding patterns were that farm size rose from south to north. The northern larger farms were the focus of the first land reform efforts under Soviet military occupation. These expropriations were not subject to return with German reunification. The smaller southern holdings were less affected by early land reform and farms expropriated after 1949 are to be returned once the ownership is established. Thus, the two southern most state -- Saxony and Thuringia -- have the largest shares in family farms and the lowest shares remaining in collectives as of April 1991. Mecklenburg-Pomerania has by far the largest share of farms remaining as collectives and the lowest share of farms in the family farm category with Brandenburg and Saxony-Anhalt in between.

The above discussion suggested a pattern of family farms emerging in eastern Germany. The area shares by farm type give a different picture of the structural development (table 3). The initial situation in the Democratic Republic was that LPG's controlled over 86 percent of the area, VEG's over 7 percent, and natural persons just over 5 percent. In April 1991, LPG's

still held 59 percent of the area despite an almost halving of their number. Other forms were increasing their share, but in aggregate legal persons -- LPG's, eG's, and corporations -- held nearly 89 percent of the area. Thus, while natural persons had increased in number from about 3,000 to 9,215, their share of area rose only from 5.5 percent to 11.3 percent. Those 8,952 family farms only held 8.6 percent of the area even though they were nearly 70 percent of farm numbers.

This pattern was also reflected in the August data. Four months before their formal dissolution, the share of area in collectives had fallen but only to around 37 percent. Between April and August 1991 the share of area controlled by cooperatives rose 73 percent and that for corporations by 116 percent. Meanwhile the area controlled by family farms rose 24 percent - numbers increased 35 percent. Partnership numbers rose 102 percent and area controlled rose 148 percent, but was still only 5.2 percent of the area.

German farm leaders could point to a rise of a family farm structure based on numbers (Agra-Europe, 29/91, Kurzmeldungen p. 15). Yet on an area basis, collective agriculture remained dominant through August 1991 and the restructuring which occurred favored cooperatives foremost followed by corporations. Nearly 84 percent of the area was in the hands of legal persons. Eastern German agriculture had more of an appearance of large jointly operated units intermixed with a large number of small family farms.

Not surprisingly this pattern was confirmed in the average size data by enterprise type (table 4). A comparison of average size before and after reunification is difficult. Collective farms in the Democratic Republic were really rural communities with up to 22 percent of the labor devoted to non-farm activities (Grosskopf and Kappelmann, p. 2). The LPG's and the VEG's were also specialized in the areas of crop or livestock production. After reunification many of the non-agricultural functions were detached, and livestock and crop activities were recombined. Between 1988 and August 1991, the average size of the collectives (LPG's) actually rose. Separating the data into crop only LPG's shows that average size shrank from 4,538 to 3,145 hectares in April 1991. That was still an extremely large unit. The emerging forms of legal persons also showed large and rising average size. In April 1991 cooperatives averaged 1,697 hectares and corporate forms 760 hectares. By August the average size of these organizational forms had risen to 1,710 and 1,030 hectares, respectively. In this regard it should be noted that these larger average sizes are misleading for they provided a return to more labor units. A 1700 hectare crop cooperative with 20 labor units would have fewer hectares per labor unit than many private farms. Similarly a cooperative with 400 or 800 cows could easily have a lower cow to labor ratio than a family farm. Furthermore, whereas the cooperatives and corporations usually involve recombining crops and livestock, many of the family farms are moving to a largely crop agriculture.

Among natural persons two opposite trends appeared (table 4). The average size for a family farm fell slightly from 54 hectares in April 1991 to 50 hectares in August. Meanwhile the average size for partnerships rose from 438 to 550 hectares. Over the period as a whole compared to the 3,000 or so private and church farms in East Germany there was a fall in average farm size for natural persons. Nevertheless, these small private farms remained above the average size for western Germany and many treated agriculture as a secondary income source. Removing farms where agriculture was secondary raised the average: Mecklenburg-

Pomerania, 170 hectares; Brandenburg, 125 hectares; Saxony-Anhalt, 165 hectares; Saxony, 60 hectares; and Thuringia, 55 hectares (Isermeyer, p. 296). Considering only family crop farms raised the average size further to 203 hectares, but here as well, the size for this type lay behind other types on average (Agra-Europe, 41/91, Sonderbeilage p. 5). Again it should be emphasized that on a labor unit basis the size advantage for the other forms over the family farm was not clear. Of the farms visited by the author in terms of crop operations, family operations, whether owners or tenants, tended to operate equivalent area with slightly less labor.

Some of the slowness in the rise of commercial family farms is attributed to deficiencies in functioning market institutions and capital for operators, and in unsure sales (Agra-Europe, 30/91, Länderberichte p. 10). Other sources include lack of farming knowledge and risk acceptance (Kallfass, p. 311). Discussions with farmers highlighted a lack of collateral. A former LPG member has few assets for loan collateral and a former VEG member has essentially none. Thus, although official lending programs favor establishing or reestablishing family farms, these farmers find it difficult to access enough of the aids to create a viable unit. There is a decided advantage for former owners who receive their land back as well as western farmers who have collateral from their other operations.

Table 5 gives a picture of the major production activities by farm type in the spring of 1991. The difference between the importance of family farms in number and their relative economic contribution was clear. Of the farm types shown, family farms had 69.8 percent of the farm numbers but only 9.5 of the area. Collective farms were but 18.9 percent of the farms, yet had 64.8 percent of the area. Among the production activities shown in table 5 family farms had their strongest contributions in the grains-oilseeds-legumes category, 11.4 percent, in perennial pasture, 10.3 percent, and in layers, 8.5 percent. Their contributions in other areas were low, especially in livestock. This reflected a difference in lumpiness in the capital stock and land. Whereas a crop only LPG could relatively easily be divided into various sized units, the large livestock facilities were not -- a 400 cow dairy barn could not be subdivided. Except for layers, collective farms dominated all production categories with shares ranging from 62.5 percent for grains to 72 percent for cattle. The layer category showed a radically different situation compared to the other categories with a much more even distribution across enterprise types. This reflected a lack a concentration of poultry in large collectivized units in the communist period. The largest individual type was the other legal person -- GmbH's and AG's - - with 48 percent. This was followed by collectives with 23.3 percent. In comparison to other commodities cooperatives were not very well represented in layers -- 5.8 percent. The shares of the types of natural persons in layers were in the same range, from a high of 8.5 percent for family farms to a low of 6.7 percent for other natural persons.

Implications of the Developing Farm Structure in Eastern Germany

The transformation of the farm structure from a socialist system to one of private ownership in a market economy is underway. From what has already occurred some thoughts on the future farm structure in eastern Germany can be offered. The ultimate outcome of the farm structure remains uncertain as many factors affecting the process remain unresolved.

In the near term there will be a farm structure of great variety. Farms will be differentiated by size, legal form, in management, and in ownership and operating relationships (Heller, p. 30; Steffen, p. 165). Often farms will have multiple owners contributing land and inventory. Several will have many leaders as in the case of cooperatives. During the past year there has been a strong effort by collective farms to reform themselves as cooperatives and corporations. Yet it is unresolved if such enterprises will survive in a market economy. The theoretical discussion suggests advantages for the family farm organization in terms of transaction costs. Empirical research shows that family farms can obtain the sizes needed to capture economies of scale. Despite attempts to streamline decision making, already cooperatives have exhibited many of the operating and efficiency problems which plagued the collective farms. Existing assistance programs disadvantage legal persons. Farms face liquidity problems and a lack of collateral. Thus, it could be expected that a second wave of restructuring will occur as the cooperatives dissolve. There is a tendency by cooperative members to see their problems as policy related and not a result of organization form. Dissolution of these enterprises may be associated with disillusion and alienation from a market economy.

Toward the end of 1991 there was an increased tendency of collective farms to reform themselves into corporations. This meets the need to restructure as required under law, yet avoids some of the operating problems experienced by cooperatives while allowing owners to retain their capital. A corporate form is also more attractive for outside investors and could thereby attract more of the capital badly needed by the sector. While in concept the larger farm could have a long-run cost advantage there remain uncertainties. One concern is whether the corporate form's organization and decision structure is flexible enough for agricultural production. Another concern is again the discriminatory policy environment. Corporations in agriculture are not accorded the favorable tax treatment given to family farms, cooperatives, and partnerships. Also state aids -- such as investment aids -- are both size limited and often exclude legal persons. Thus, corporations would need to renounce claims to some of the support given to the agricultural sector (Henrichsmeyer, p. 66; Isermeyer, p. 301). The stock certificate value is also a concern. Corporations short on liquidity could be further undermined as stockholders cash their certificates in anticipation of impending financial problems. In the present situation in eastern German agriculture there could be a tendency for corporate farms to self-destruct. Finally it should be noted that outside of poultry corporations are rare in western German agriculture and in the agricultural sectors of other market economies. This suggests difficulties for this organizational form in competition with family farms.

Although the farm numbers are dominated by family farms, their share of economic activity for the time being is relatively low. The present farm structure is one of a modest number of very large enterprises intermixed with a large number of small farms. These dominant enterprises are generally some form of joint operation -- a cooperative, a corporation, or through 1991 a collective. Collective agriculture by law disappeared on January 1, 1992. The remaining cooperatives and corporations are on average quite large and thus, can be expected to have high transaction costs which endanger them.

A related issue is the emerging size of units, both legal and natural persons. This unfolds in many ways. Previous research suggests that economies of scale are exhausted at sizes well within the reach of family farms and that the incentive to grow is related to income generation. While cooperatives and corporations in eastern Germany are large, they are also generating

income for multiple owners and operators. The same situation is true for the partnerships, which although having an average of 500 hectares, are to provide a living for at least two operators. Thus, on a labor unit basis these enterprises may not be larger than the emerging family farms. Size interpretations for family farms must differentiate between those units where agriculture is the primary income source and those where it is secondary. In the northern parts of eastern Germany family farms where agriculture is the primary income source are approaching average sizes that western German research suggest are needed to capture most economies of scale. In southern regions sizes of farms in which agriculture is primary appear small. This suggests future pressures to grow unless incomes of small farms are policy supported and size linked measures are used. It is likely that on average farms in eastern Germany will exceed the size of those in western Germany. But whether farms in the east will be of sufficient size to generate adequate incomes should EC agricultural policy be liberalized is unclear.

Regional differences are also appearing. To some extent these are similar to pre-war patterns with larger units in the north than in the south. Differences also reflect natural conditions with a stronger family agriculture in the better natural areas and more legal persons in the poorer regions. Regional differences are also related to outside activity with family farms in areas of outside employment opportunities relatively strong. Such chances allow the development of secondary farming around industrial areas -- mainly in the south.

Differences in production activities by farm type are also emerging, although legal persons dominate all major commodities except for layers. As the structure has shifted to smaller units livestock operations have tended to remain in the larger legal persons. That is, the smaller family farms have not, thus far, favored cattle and hogs. Rather they have tended towards crops. This reflects the difficulty of dividing the large livestock facilities created under central planning.

In general, the farm structure now arising in eastern Germany appears temporary. There will likely ensue a process in which the present structure of domination by legal person farms gives way to one of natural person farms. The forces creating this adjustment will be problems in decision making and the struggle for liquidity and capital formation. All types face liquidity and collateral problems. Over time stronger management and value creation in natural person units will likely create a situation where these farms survive and present members of legal person enterprises depart to form natural person organizations or exit the sector. That is, the legal person units serve a role as a training ground for future farmers but appear unlikely to be a sustainable form. The average size of the farms emerging in this second transformation will lie above western German averages and will be affected by agricultural policy through discrimination or lack thereof by size. There will likely continue to be a north-south difference with farm size rising moving northward. An additional characteristic may be a greater reliance on land leasing arrangements in eastern Germany as operators create economic units from the lands of the many owners arising from the LPG's. This could serve to make the structural transition easier by adding fluidity to land arrangements.

Table 1: Farm Numbers by Type in Eastern Germany on Selected Dates¹

Type	1988 ²	1991 ³	
		April	August
Legal Persons:			
Collective Agriculture (LPG)	3855	2287	1424
Collective Gardens (GPG)	199	79	50
State (VEG)	390		
Other Collective	181	62	22
Cooperatives (eG)		477	830
Other (GmbH, AG)		459	744
Natural Persons:			
	3000	9215	12637
Family		8952	12106
Agricultural		6878	9918
Garden		2074	2188
Partnerships		263	531
Other		245	99

¹ Based on applications for adjustment assistance.

² Data from Kurjo, p. 14.

³ Data from Agra-Europe, 5/92, Sonderbeilage p. 2.

Table 2: Farm Numbers by Type and States, April 1991¹

Type	Brandenbg	Mecklenbg Pomerania	Saxony	Saxony Anhalt	Thuringia
Legal Persons:	742	769	679	659	515
Collectives	528	517	493	491	399
Cooperatives	119	93	68	111	86
Other	95	159	118	57	30
Natural Persons:	1904	1402	2797	1805	1552
Family	1817	1306	2723	1639	1467
Partnerships	29	59	45	98	32
Other	58	37	29	68	53
Total:	2646	2171	3476	2464	2067

¹ These data were revised and do not match those in Table 1.

Source: Agra-Europe, 41-91, Sonderbeilage p. 2.

Table 3: Shares of Area by Farm Type, 1988, April and August 1991

Type	1988 ¹	1991	
		April ²	August ³
		-- percent --	
Legal Persons:	94.5	88.7	83.9
Collective Agriculture (LPG)	86.4	59.2	36.6
Collective Garden (GPG)	0.2	⁴	⁵
State (VEG)	7.2	8.0 ⁶	8.0 ⁶
Other Collective	0.7	0.6 ⁷	0.6 ⁷
Cooperatives (eG)		14.5	25.1
Other (GmbH, AG)		6.3	13.6
Natural Persons:	5.5	11.3	16.1
Family		8.6	10.7
Partnerships		2.1	5.2
Other		0.6	0.2

¹ Kurjo, p. 14.

² Agra-Europe, 41/91, Sonderbeilage p. 4.

³ Agra-Europe, 5/92, Sonderbeilage p. 2.

⁴ No separate report, probably included in LPG's.

⁵ Insignificant.

⁶ Based on Kurjo's area reported for VEG's and assumed to be in Treuhand administration so overstates share to the extent VEG's were privatized or leased to private individuals.

⁷ Based on data reported by Kurjo.

Table 4: Average Size of Farm Types, 1988 and 1991

Type	1988 ¹	1991	
		April ²	August ³
-- hectares --			
Legal Persons:			
Collective Agriculture (LPG)	1386	1445	1450
Crops only	4538	3145	
Livestock only	31		
Collective Garden (GPG)	75	56	40
State (VEG)	1151		
Crop only	5013		
Livestock only	170		
Other Collective	28	104	
Cooperatives (eG)		1697	1710
Other (GmbH, AG)		760	1030
Natural Persons:			
	113		70
Family		54	50
Agricultural			60
Garden			4
Partnerships		438	550
Other		127	100

¹ Kurjo, p. 14.

² Agra-Europe, 41/91, Sonderbeilage p. 5 and 7.

³ Agra-Europe, 5/92, Sonderbeilage p. 2.

Table 5: Production Activity Shares by Farm Type in Eastern Germany¹

	Legal Persons			Natural Persons		
	Collective	Cooperative	Other	Family	Partner	Other
	-- percent --					
Numbers	18.9	3.7	3.6	69.8	2.0	1.9
Area:						
Total	64.8	15.9	6.9	9.5	2.3	0.6
Grains, Legumes						
Oilcrops	62.5	15.8	6.9	11.4	2.8	0.6
Feedcrops	69.0	17.0	7.0	5.0	1.5	0.5
Pern. Pasture	66.6	14.8	6.1	10.3	1.5	0.7
Cropland	70.8	14.1	6.9	5.9	1.6	0.7
Cattle ²						
Milk	72.0	15.7	6.3	3.4	1.5	1.1
Other ³	72.1	16.4	6.9	2.5	0.9	1.2
Swine ²						
Sows	69.8	15.7	9.0	2.3	0.9	2.4
Other ⁴	67.7	14.8	10.2	1.5	1.4	4.4
Layers ²	23.3	5.8	48.0	8.5	7.7	6.7

¹ Excludes State farms (VEG's)

² Livestock based on numbers.

³ Without calves.

⁴ Without young pigs.

Source: Agra-Europe, 41/91, Sonderbeilage p. 4.

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