THE PERSISTENCE OF FAMILY FARMS IN UNITED STATES AGRICULTURE

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Researchers from both neo-classical and Marxist perspectives have predicted the demise of the family farm from competition with more efficient large-scale production (Buttel 1980; de Janvry 1981; Carter & Johnston 1978; Tweeten and Huffman 1980)[1]. In this paper, we draw on a number of themes in the literature on US agriculture, industrial structure, household economics, economic anthropology and agricultural economics to suggest that the family farm persists in many instances due to economic competitiveness. This competitiveness derives from the technical aspects of agricultural production and its compatibility with certain organizational and operational aspects of the family farm. Our analysis contrasts these features of agricultural production with features of industrial production as we seek to understand, in essence, why agriculture has not gone the way of the automobile.

Family farm persistence is linked to the biological, seasonal and spatial characteristics of agriculture and their implications for capital accumulation, task and farm specialization, mechanization and managerial issues such as information flow and distortion, timing and the supervision of labour. Organizational and operational features of the family farm include the complexity of operators' goals, cost accounting methods and family labour relations. This economic competitiveness may, however, be eroded by technological change or by state policies, as it already has been in some sectors of US agriculture.

Some recent studies of farming scale argue that the survival of a particular form of production is historically determined by complex political and economic relations between classes and their manifestation in state policy (Bonanno 1987, Buttel & Newby 1980, Mooney 1988, Servolin 1972). From this point of view, the characteristics of the production system itself have less to do with its persistence or demise than historical alignments of classes, manipulations of the political arena, or the interests of powerful elites. While this political reality is paramount in many instances, within a market-based capitalist system the economic performance of a particular

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organizational form of production nevertheless plays an important role in its survival.

DEBATE OVER THE NATURE OF FAMILY FARMS

The precise nature of the family farm has troubled researchers around the world: is the family farm a non-capitalist unit bound to be eliminated under capitalism, a non-capitalist unit whose distinctive features enable it to persist under capitalism, an efficient capitalist unit, or an inefficient capitalist unit that will eventually disappear? Chayanov, the Russian economist whose theories of the family farm cost him his life, argued that it is an efficient, competitive agricultural production unit based on a distinctive behavioural logic (Chayanov 1966). The goal of production is determined by the consumption needs of household (dependent on its demographic structure) rather than by the desire for profit. The willingness of the family farm unit to forego profit, and even to accept a return on labour lower than the market wage in crisis periods, enables the family farm to compete with large-scale capitalist units.

Chayanov's view runs directly counter to the views of the leading Marxist theoreticians on this question: Marx himself, Lenin and Kautsky. Marx's contempt for the backwardness of the peasantry and his belief in the technologically 'progressive' nature of capitalism are well known (Marx 1977). Lenin's *The Development of Capitalism in Russia* (1920) elaborates this view of peasant agriculture as doomed to extinction under capitalism, citing capitalism's more efficient scale and use of more advanced technology. Lenin sees the peasantry as a social class specific to feudalism, rather than as a production unit with a different logic that might enable it to compete under capitalism. Kautsky, in *The Agrarian Question* (Banaji, 1980) emphasizes the tendency of family farmers to become proletarianized and their farms to be absorbed by more efficient larger production units. His analysis sees a complex transformation of peasant agriculture, including situations in which small farms can survive as sources of labour for capitalist farms.

Neo-classical economic theory also assumes the family farm will be eliminated because of its weaker position with regard to 'economies of scale', a postulate based on the classic work of Adam Smith (1937). In this view, large units of production are generally expected to be more efficient than small units because of the possibilities for task specialization, the ability to use large-scale equipment and managerial talent more efficiently, and the ability to utilize by-products of the principal production activity. This analysis is applied equally to industrial and agricultural production and presupposes that both large and small units are following the same behavioural logic: the goal of profit maximization.

Some neo-classical economists have questioned the applicability of this

analysis to agricultural production. John Stuart Mill argues that agriculture "is not susceptible of so great a division of occupations as many branches of manufactures, because its different occupations cannot possibly be simultaneous" (Mill 1848:131). This view was elaborated in the 1950s by the US agricultural economist John Brewster (1950). In the international arena as well, neo-classical agricultural economists have provided empirical and theoretical support for the view that small-scale production can be economically competitive (Dorner & Kanel 1971). This work rarely addresses the nature of the family farm unit, however, assuming that family farms are identifiable by their small-scale and labour-intensive technology.

Much of the recent literature on the question of the persistence of peasant or family farm production draws on the various perspectives outlined above. Patnaik (1979), de Janvry (1981), Buttel (1980, 1982), and Buttel and Newby (1980) are among the analysts whose arguments reflect the expectation that family farms are unable to compete under capitalism. De Janvry, following Lenin, points out that this demise can be masked by the tendency of the peasantry to become 'semi-proletarianized', retaining small plots of land for household consumption in order to supplement their main source of livelihood, wage labour. Thus, de Janvry points to the increasingly multi-income character of the family farm as evidence of its disintegration.

Shanin (1974), Amin and Vergopoulos (1974) and Bernstein (1977, 1979) are among those who draw on the Chayanovian view that the peasant or family farm has a distinct behavioural logic that explains its persistence under capitalism. Studies showing this persistence around the world emphasize the non-capitalist nature of the production unit: Roseberry (1983) on Venezuela, C. Smith (1984) on Guatemala, Reinhardt (1988) on Colombia, Vergopoulos (1975) on Greece, Figueroa (1984) on Peru, Goodman and Redclift (1982) on Mexico and Brazil, Barlett (1982) on Costa Rica, and Wells (1989), Mooney (1988) and Salamon (1985, 1989) on the US. From this perspective, some researchers argue that the multi-income character of the household economy is not evidence for its disintegration but, rather, part of survival strategies that serve to sustain the unique organization of the family farm (Deere 1989, Reinhardt 1988, C. Smith 1984).

Chayanov (1966) believed that the family farm could be adversely affected by its integration into the broader economy, not through competition with larger farms, but through 'vertical concentration' of agricultural production. Amin (1974), Vergopoulos (1975), Bernstein (1977), Vogeler (1981) and Mooney (1988) are among those who have elaborated on the mechanisms of vertical concentration under capitalism, pointing to tenancy, debt, wage labour and contract farming as some of the means by which capital extracts surplus value from the family farm. Thus the family

farm persists but is effectively proletarianized and perhaps impoverished.

Mooney (building on Weber) argues that in its internal organization the farm family is under pressure to be increasingly 'rationalized', conforming to the maximizing dictates of a capitalist entrepreneurial mentality. He concludes that family farmers may persist by retaining their specific 'substantive' (non-capitalist) rationality, but family farming in the US is in the process of transformation away from such a distinct internal logic.

In contrast, Friedmann (1978, 1980; Winter 1984) argues that where the family labour farm persists it does so because it adopts the logic of 'simple commodity production'. Through specialization of production for the market and the combination of both household and wage labour, the peasant production unit is transmuted into a farm that is fully integrated into a market economy. Family farmers, in her view, are not peasant producers who are exploitatively integrated into the capitalist economy, but rather they represent a viable adaptation to the new economic environment of capitalism. Lehmann (1982) has criticized Friedmann's classification of the US family farm as simple commodity production. He argues that the modern family farm is really a capitalist unit, which he defines as using inputs acquired through the market and therefore adopting market-determined opportunity costs for household decision-making and accounting purposes.

Each of these points of view stresses a different combination of features of the family farm (and of capitalism) as critical to understanding current trends in agricultural history. We see the family farm as distinct from capitalist production, though we share Friedmann's belief that it has adapted in various ways to a new economic environment.

We distinguish the family farm from capitalist organizational forms primarily by two criteria: the objectives of the operating unit and the organization of the work process. Capitalist or 'industrial' agriculture is undertaken as an investment, and the unit will generally survive only if it can earn the average ('normal') rate of profit, taking into account the market value of all resources used. The kinds of goals pursued by family farmers are more complex. While they may well be interested in maximizing net revenue, they may also consider non-pecuniary aspects of farming and the rural lifestyle in making their long-run production decisions. These different objectives are not completely dichotomized between the two farm types, and there may be some overlap in specific cases. The emphasis in decision-making, however, will vary. For example, a willingness to defer income for asset appreciation may characterize both groups, but family farms may be in a position to allow this goal a larger role in decision-making.

The organization of production is also distinct. The capitalist or 'industrial' farm is characterized by the separation of ownership, management

and labour. Day-to-day operations are overseen by a manager and carried out by hired workers, all of whom must receive the going agricultural wage for their particular labour category. The owners are not involved in these day-to-day labour tasks and will withdraw their funds if they perceive more profitable investment opportunities elsewhere. In the family farm, the labour process may bear some similarity to that of the capitalist farm – for example, there may be a division of labour based on age and gender, with the male head of household carrying out the functions of the farm 'manager' – but the centrality of kinship relations and the direct involvement of the farm owner in day-to-day operations are distinctive features of the family farm.

We draw, in our explanation of US family farm persistence, on these behavioural and organizational aspects of the household production unit, but we also emphasize the importance of the specific technical characteristics of agricultural production. These features apply to multiple-income (part-time) family farms and to tenant farms, as well as to full-time family farms[2]. Our argument outlines some of the advantages experienced by the household unit in agriculture that reinforce its ability to resist rationalization and the penetration of various forms of capital.

We note, however, that these inherent conditions can be altered by social and institutional factors external to the production unit such as location and character of markets, government tax and subsidy policy, land policy, labour policy, credit and technical assistance policies, research and development, educational opportunities and off-farm employment opportunities. Such conditions can swing the balance in favour of one or another organizational form. The interaction of these factors can generate a complex pattern of agrarian structure, with family farms successfully competing in some spheres of agricultural production and capitalist units predominating in others. Our focus here on the production process itself sets aside important dimensions of class structure and political struggle surrounding agriculture, in order to elucidate some dimensions of family farming that have not been addressed in the above debate.

THE MEASUREMENT OF FAMILY FARM PERSISTENCE IN THE US

Much of the current debate over the status of the family farm hinges on the definition of types of agrarian units. In the United States, the debate has recently centred around the question of whether or not the 'middle' sector of farm units, which is presumed to be the family farm sector, is disappearing. We feel the 'family farm' should not be as narrowly defined as this debate assumes. Rather, the crucial distinction is between agricultural production based on the use of household labour for the purpose of household livelihood, and agricultural production undertaken as an in-

vestment and characterized by the separation of ownership, management, and labour.

Measurement criteria reflect the aims of the analysis, and both the purposes of study and the definition of the family farm have varied considerably through history (Brewster 1979). In the US, the early Jeffersonian vision was that the family farmer owned his land, relied on family labour, made all management decisions and was as self-sufficient as possible. By the end of the nineteenth century, this vision had changed markedly. Increased market orientation had reduced the importance of self-sufficiency, the growing labour market had increased the importance of hired labour and the closing of the frontier lent support to the idea that tenant farmers could be considered family farmers. In the post-World War II period, all that remained of the earlier vision was that the farm family should control the operation and be able to earn a livelihood from it. This perspective was modified even further by the early 1970s, and the US Department of Agriculture (USDA) defined the family farm as "a primary agricultural business in which the operator is a risk-taking manager, who with his family does most of the farmwork and performs most of the managerial activities" (Nikolitch 1972). Gone was the notion that the farm should provide a livelihood. This new definition responded to the fact that the population of small part-time farms in the US was increasing at the same time as the overall number of farms was decreasing. By this definition, family farms have declined in number but continue as a dominant form of production in the US.

Researchers have countered this rosy view of family farm persistence with studies of farm sales by farm size, which show increasing concentration in the post-World War II period. For example, the largest 25% of US farms contributed 77% of gross farm sales in 1960 and 85% of gross farm sales in 1977 (Schertz *et al.* 1979:18). In 1981, 60.1% of farms had gross sales under $ 20 000, 27.7% had gross sales between $ 20 000 and $ 100 000, and 12.2% had gross sales over $ 100 000 (USDA 1982:1). However, sales statistics do not tell us anything about the nature of the farms in different size categories and so do not provide clear evidence for the demise of the family farm. Wells (1989) demonstrates that commodity systems vary greatly in their costs per acre and the value of their product. Strawberry farms in California average only 34 acres in size but gross over $ 850 000 in annual sales, and many are family owned and operated. Barlett (1984) shows that the $ 40 000 - $ 100 000 gross sales category, often used to describe mediumsized full-time family farms, can include a wide variety of types of farm sizes and operational structures. Obviously, then, size alone is not an adequate proxy for farm organization and structure. The spectacular growth in average farm size in the US is not necessarily an indication of the demise of the family farm. Mechanization in the post-World War II period has enabled households to farm a much

greater acreage, resulting in fewer, larger family farms.

Some analysts have focused on the increased number of agricultural corporations as an indication of the replacement of family farming at the upper end of the farm spectrum (Vogeler 1981). However, a number of authors have pointed out that the majority of corporations are in actuality family farms that were incorporated for tax purposes. In 1982, 88,1% of farm corporations were family held, and non-family corporations accounted for only 6.5% of total US farm sales (US Bureau of the Census 1982: 4,37)[3].

Many agricultural economists argue that the criterion of adequate income is important to understand the structure of agriculture, and that at least 50% of family income should come from the farm in order to classify the unit as a family farm. In 1978, over 70% of farm units provided less than 50% of household income (USDA 1979b). Most of these were 'sub-family farms', too small to employ family labour fully or to provide a livelihood for the family. This definition results in a greatly diminished number of family farms surviving at present but does not prove that this form of production is less competitive or that the remaining larger family farms cannot persist. For the purposes of analyzing the persistence of household production of marketed products in agriculture, part-time operators are as relevant as full-time operators.

Two studies use definitions similar to the one advocated here. Nikolitch (1972) uses the family labour criterion to define a family farm as any agricultural unit that uses less than 1.5 man-years of hired labour per year. He found that 95% of US farms were family farms in 1964. Rodefeld (1978) uses both the family labour criterion and a land ownership criterion. Family labour farms depending primarily on rented land were found in this analysis to be 17% of all farm units, and what he calls 'family-type' farms, which combine family land ownership with family management and labour are 79% of all farms. Thus, by these definitions, the family labour farm persists as a central feature of US agriculture.

BASES FOR PERSISTENCE OF THE US FAMILY FARM

Classic Marxist analysis suggests that household agricultural production can survive in an industrial society only where family farmers withdraw from market relations and produce for home consumption (Patnaik 1979: 420, fn. 34). However, all but the smallest of family labour farms in the US do produce for the market. Another possible explanation for their persistence is that these households are engaging in agricultural production despite the fact that they are not competitive. This perspective argues that many such households persist because they are 'gardeners' or 'hobby farmers' who support themselves from non-farm income, farm for the

lifestyle, and that find the non-pecuniary advantages of farming compensate for pecuniary losses (Barlett 1986, 1990). Though these characteristics are true for a sector of part-time farmers, the continuing importance of family labour farms in full-time rowcrop and livestock production cannot be accounted for in this way.

Limitations to economies of scale in agriculture

Economic theory suggests that a basic determinant of industrial structure is the extent of economies and diseconomies of scale. Industries in which scale economies are rapidly exhausted and diseconomies quickly encountered will consist of small, competitive units. Industries in which scale economies are soon exhausted but diseconomies do not appear over a wide range of plant size may be characterized by the co-existence of large and small units. Industries in which economies of scale continue to be present as firms become progressively larger will tend to consist of large firms, the number of which is determined by the size of the market. Once certain social and institutional preconditions are met (for example, the development of product, capital and labour markets), the development of scale economies and the postponement of diseconomies are key factors enabling the transformation of some economic activities from small-scale cottage industry based primarily on household labour to large-scale production based on hired labour.

Technical economies of scale, such as task specialization and capital-intensive mechanization, are important in generating large-scale units in industry, but the biological conditions of agricultural production limit the ability of capitalist agriculture to develop and capture these sources of scale economies (Reinhart 1988). Task specialization, for example, is limited by the biological and therefore sequential nature of agricultural production. Though workers can be trained in specialized planting, weeding and other tasks, they cannot carry them out simultaneously. The dependence of agriculture on biological cycles poses an obstacle to the development of capitalist agriculture. Because agriculture is dependent on the seasons and on plant and animal growth, production time (the total period necessary to complete the production cycle) is considerably greater than the time when human labour is being applied (Mann & Dickinson 1978, 1980). More efficient completion of specific tasks thus does not automatically translate in agriculture to higher production or higher profits.

The temporally uneven character of most agricultural production creates marked seasonality of labour requirements to which the family labour farm often can respond more easily. The family farm can diversify crop and livestock mixes and can allocate household labour during slack periods to other household reproduction tasks, to handicrafts, to farm

maintenance, or to human capital formation (Buttel & Gillespie 1984: 185, Friedmann 1980). Though large farms can also adopt these solutions to labour seasonality and in additon have the option of simply laying off workers, capitalist production tends to approach this problem through technological development. The mechanization of the most labour-intensive and time-constrained tasks such as soil preparation, planting and harvesting is common.

Mechanization is generally considered to be a principal factor that gives capitalist production an advantage over household production. Several aspects of mechanization are cited in this regard. In industry, mechanization reorganizes the work process on a continuous flow basis and thereby allows for the deskilling of labour, the separation of management and labour and an increase in task specialization. In agriculture, too, mechanization allows for labour deskilling and the separation of management and labour. However, Brewster has argued that mechanization does not give large units any significant advantage over family farm units, since farm activities "are as widely seperated by time intervals after mechanization as before" (Brewster 1950: 72). Again, the biological character of agriculture impedes the development of the type of continous flow assembly-line operation that is the hallmark of capitalist production. Although individual operations can be mechanized, maturation periods and thus seasonality of labour requirements are not eliminated. Labour seasonality may even be increased by the specialization that tends to accompany mechanization.

Mechanization does put pressure on farm operations to increase scale in order to spread high fixed costs over larger productive acreages. Since most agricultural machinery can only be operated during short periods of the natural agricultural cycle, adopters want to use the machinery to its maximum potential during these periods. This efficient use can be accomplished by increased commodity specialization and by expansion of the overall scale of operations. Kramer (1987) shows that dairy farmers as well as crop producers have felt this imperative. These are important factors in the growth in farm size in the US over the last thirty years.

The farm commodity specialization that accompanies mechanization creates several difficulties, however. In addition to increased labour seasonality, the specialized unit foregoes benefits from the use of by-products, such as the feeding of crop residues to livestock or the application of livestock manure to crops. The specialized farm is also exposed to greater risks from crop failure due to pests, disease or bad weather and faces greater risk from price fluctuations in the market for its crop. The current farm crisis shows that high-cost mechanization and farm specialization are linked to high rates of farm loss (Mooney 1988, Salamon & Davis-Brown, 1986, Salant & Saupe, 1986).

The limited economies of scale in agriculture are illustrated by numerous studies. Although there is some debate over this issue, the United States Department of Agriculture has concluded that most technical economies of scale can be captured by a moderate-sized family farm operation in most branches of US agriculture (Table 1). Beyond that farm size there is a wide range over which variation in farm costs is unrelated to farm size (Miller 1979: 111; Miller, Rodewald & McElroy 1981). Table 1 shows the farm sizes that capture 90 per cent of economies of scale in a range of US commodities and farming regions. The mean of the seven farm types shows that most advantages of large size are obtained on farms of slightly over 300 acres with farm sales under $ 50 000. This farm size would be considered moderate, neither large nor small, among full-time farms in most regions of rowcropping in the country. It is a size easily handled, in these commodities, by one farm family, and often by a single operator with a modest amount of family help. Other studies have found that technical diseconomies of scale reduce efficiency in many commodities beyond the farm size that can be handled by one family with minimal hired help (Tweeten 1984: 23; Tweeten & Huffman 1980).

Table 1. *Economies of Scale in United State Agriculture, 1979*

Region and Farm Type	Size at which 90 per cent of economies are obtained	
	Gross Farm Sales in Dollars	*Acres*
Northern Plains/wheat-barley farm	13 000	175
Pacific North-west/wheat-barley farm	54 000	450
Corn Belt/corn-soybean farm	60 000	300
Southern Plains/wheat-sorghum farm	28 000	400
Delta/cotton-soybean farm	47 000	335
Southern High Plains/cotton-sorghum farm	58 000	395
South-east/peanut-soybean-corn farm	55 000	143
Average (arithmetic) of seven farms	45 000	314

Source: USDA 1981:58.

These data suggest that in terms of technical, on-farm production, household production is competitive with industrial agriculture in many regions of the US. In the input and market sectors, however, pecuniary economies of scale may exist (Smith, Knutson & Richardson 1986). For instance, in the delivery of farm inputs or the marketing of farm products, large farms may share in the reduced costs that suppliers or distributors may obtain when dealing with a few larger producers. This potential advantage of scale varies by local input and market conditions. In addition, it can be (and has been in the US and other countries) captured by co-operative organizations of small-scale agricultural producers. The fact

that the numbers of small part-time farms in the US have been growing, even during the current prolonged slump, suggests that these pecuniary economies of scale have not been a major deterrent to survival of household units.

Diseconomies of scale

Relatively little attention has been given to the issue of diseconomies of scale in agriculture. Diseconomies of scale in industry derive principally from rising per-unit managerial costs as operations become more complex. These managerial diseconomies are frequently encountered in agriculture at a comparatively low level of gross sales because of the specific ecological conditions of agricultural production. Such disadvantages to large industrial farm units stem from the complexity of ecological information that must be processed, the rapid pace of biological processes and the need for timely decisions to respond to these complex processes. Problems with supervision of labour, difficulties in innovation and information loss and distortion, also militate against unchecked expansion of farm size and bureaucratization of the labour process. These diseconomies of scale are part of the reason why mechanized family labour farms continue to predominate in many sectors.

Much of the information necessary for good management of complex agro-ecosystems comes only through long-term observation of those micro-environments under different circumstances. Unlike the situation of chain drugstores or supermarkets, where general rules for selling aspirin or bananas can be developed and will increase profits, growing corn is not uniform. Agricultural production is unpredictable because of the uncontrolled nature of the climatic and biological processes. More so than with industrial machinery, crops and livestock require constant attention. Biological processes cannot be shut off during evenings and weekends, and disease can strike at any time and spread quickly. Further, the growth of crops and livestock varies from microclimatic influences, making attention to details of soil, slope, animal physiology and such factors necessary to maximize production. Particularly as heavy use of agricultural insecticides and antibiotics has been challenged by ecological concerns, it has become imperative to pay careful attention to these biological processes and to develop remedies more refined in their effects.

The larger the farm, the less likely that attention to microclimatic variation and changing biological processes is possible. Financially pressed Georgia farmers who have expanded farm size in an attempt to repay debts commonly complain that they cannot attend to all the necessary farm tasks 'in a timely manner' (Barlett 1987). Late application of chemicals or delay in carrying out specific farm tasks is known to lower production. Agricultural experts warn against 'windshield farming' (that

is, farm observation and management decisions carried out from the driver's seat of a vehicle), but large scale and the separation of management and labour make observation of crops throughout the fields virtually impossible. Information flow from labourers thus becomes a key component of farm operation.

Experience reveals substantial diseconomies from information loss and distortion, and response lags due to the bureaucratic division of labour on large farms. Kramer describes a large industrial farm in California where he observed a cotton field flooded by a malfunctioning irrigation system. "The foreman reported the situation over his two-way radio. Someone in the irrigation departement responded, 'Thanks, we'll get to it tomorrow. It's late in the day now' " (Kramer 1987: 247). Family farms benefit from the opportunity for the operator to see the results of production decisions. Tailoring of farming methods to micro-environmental variations in fields can be evaluated when the same person observes all aspects of planting, care and harvest. Even when these feedbacks are shared with other family members, the internal relations of the farm household create the 'shadow of the farmer on the land' and give the household production unit an advantage in managing continuously-changing natural processes.

The bureaucratic nature of the large farm also hampers innovation. Raup argues that "the ability to retain the rewards of innovation must be shared with others, and the time required to secure agreement to changes in traditional modes of technological behavior become excessive" (Raup 1978: 305). This generalization is illustrated by one large-scale Georgia peach grower who complained that he might try to adopt new recommendations in pruning trees but that did not mean his workers would comply. "They have their own ideas about how it should be done", he laughed (Barlett, personal communication). Innovations on many large farms must be discussed and approved by a series of managers and foremen, each with different access to necessary information and with different overall responsibilities. Kramer documents this sluggishness in innovation for one of the largest US corporate farms, Tejon Ranch Corporation (1987: 229-31). Raup concludes that the general public interest is better served by small and medium-sized family farms because they are more innovative and incur fewer social costs (1978).

Hired labour efficiency can also suffer from farm size expansion. Uneven topography, the height and density of a crop, or the dispersed nature of farm plots over a wide area, all render labour supervision more difficult. Increased transportation time, wear and tear on machines that must move miles from field to field, and delays in co-ordinating specialized workers in the enterprise are also part of labour inefficiencies.

The extent of scale diseconomies varies among agricultural activities, and some commodities are more amenable to large-scale production than others. Nikolitch (1969), however, argues that with the development of

agricultural technology there is a general trend toward increasing the number of management decisions involved in any agricultural activity, contributing to the persistence of the family farm in the United States. Raup, in a similar vein, found that a principal factor in the "flight out of agriculture" by corporations in the US was "miscalculation of management problems in agriculture" (Raup 1973: 290).

Thus, the advantages which commonly accrue to capitalist industrial firms from mechanization do not generally accrue to capitalist farms. Land, weather and biological processes pose obstacles to the development of controlled, continuous production processes characterized by stable labour requirements, finely developed task specialization and highly refined mechanisms for labour supervision and control. These arguments help to explain the empirical findings that household production is technically competitive with larger units that rely on hired labour.

Goals, accounting methods, opportunity costs and lifecycle stages

As well as the foregoing technical aspects of family farm competitiveness in US agriculture, there are a series of organizational characteristics of the household-based farm unit that give it an advantage over the capitalist farm. Because the family labour farm is oriented toward a range of goals, not simply profit maximization or firm survival, it responds differently to economic conditions, both good and bad. We argue that the family labour farm uses a different accounting method, in which family-owned resources, such as certain categories of family labour, are not always considered to have alternative uses, and their opportunity cost is not subtracted from gross revenues to determine if the operation should continue. In addition, a farm owner-operator is able to capture certain non-financial benefits that are unavailable to workers in other industries, raising the opportunity cost of choosing to leave farming for non-agricultural work. These organizational factors that contribute to the survival of the family farm are thus both objective and subjective, to use Bonanno's terms (1987).

As noted above, numerous other researchers also see the persistence of the family labour farm as linked with the non-capitalist characteristics of the household unit. Mooney (1988) uses Weber's distinction between substantive and formal rationality to argue that commitment to a way of life leads some family farmers to choose different economic paths from farms that are more completely rationalized, seeking primarily to maximize short-term profit. Anthropological research over several decades has found both the supposed non-calculating, tradition-bound behaviour of 'primitive peoples' and the supposed marked rationality of the capitalist to be over-generalized stereotypes (Cancian 1969, Plattner 1989). Diverse considerations enter the decision-making of all capitalist firms and entrepreneurs, not just self-interested profit seeking, and the latter behaviour is

a component in the decision making of non-capitalists as well[4].

A capitalist firm, for example, can simplify its decision-making by excluding long-term concerns for each worker's family welfare or personal aspirations. In a family farm these personal and familial concerns are central, and though trade-offs can and must occur, some goals cannot be summarily laid aside. For example, workers in both types of farm may share a desire to rear children to be hard working and responsible adults. The capitalist farm makes no attempt to incorporate this goal into the farm operation and requires its workers to leave children at home. The farm family, in contrast, is committed to the socialization of children and will accept lower productivity at certain times or in certain enterprises in order to teach children farm skills and the work ethic. In this way, a farm family may sustain, for example, hog production over a low-profit period because it helps to train children. A capitalist farm that must pay workers and managers cannot trade off low returns on profit-seeking goals for high returns on parenting goals.

The distinct calculus of the family farm can enable household agricultural production to persist through periods of market downturn that drive capitalist units out of business. Family farms can more easily substitute labour for capital during downturns, or increase off-farm employment of family members to tide the household over a difficult period. Alternatively, the household may attempt to maintain farm revenues in a period of declining prices by intensifying the family labour input in order to expand farm output. The calculus of the family farm allows it to cut costs, by accepting a lower marginal return to family labour, more effectively than the capitalist unit, which must continue to meet payrolls or lose skilled labour (Buttel & Gillespie 1984: 185). This "self-exploitation" of the farm family (Chayanov 1966) may not be the principal reason for family farm competitiveness, but it does provide an important survival mechanism that enables technically-competitive household production to survive temporary market downturns.

Raup points out that this accounting method is not an error in farmers' calculations nor a failure to recognize market forces or realities. Instead it is "a reflection of the fact that . . . [family farms] . . . have opportunities to value dimensions of intangible wealth that are denied workers in non-proprietary businesses" (Raup 1978: 306). He argues that the increasing interest in farmland investment in the US reflects the appreciation of these aspects of intangible wealth in recent years. These dimensions include pride of ownership, continuity of family, freedom of choice in work time and pace, and the ability to identify effort and reward, all of which are part of the family farmers' calculations about livelihood and profit (Raup 1978; Paarlberg 1980: 194)[5].

Research by Salamon (1985, 1989) in Illinois demonstrates that commitment to the long-term survival of a family farm unit and its successful

transmission to the next generation lead to farm management choices that can out-compete more capitalist farm orientations (see also Strange 1988). Communities of 'yeoman' farms have been expanding in size over the hundred years since settlement, while the communities of 'entrepreneurs' have been stagnant or declining in the total land area they control. In the current crisis, the yeoman farms have also had a competitive edge, because they operate their farms in a more conservative way, avoiding debt and expensive machinery, and maintaining a diversified portfolio of crops and livestock. The entrepreneurial farms that tend to be much larger in size, less diversified and more reliant on capital-intensive equipment, have faced severe debt loads in many cases. A higher proportion of these farms have been forced out of business, suggesting that capitalist cost accounting methods and goal orientations yield higher profits in the average years, but may not sufficiently protect the farm unit from cash flow difficulties in poor years. These processes have also been observed in Georgia (Barlett 1984, forthcoming).

Similar results are reported in Mooney's research in Wisconsin (1988). Mooney calls Salamon's entrepreneurial farms more 'rationalized' and finds that these farms are also more vulnerable in economic downturns. Though he points to a variety of economic and political factors external to the farm to explain the persistence of an alternative rationality, he argues that these different decision-making processes internal to the household unit do play a role in the persistence of such units. In addition, he emphasizes that family farms must have access to strategic land, capital, water and other resources ('privileges') to survive, a point with which we agree completely (Reinhardt 1987; Barlett 1980, forthcoming). Mooney's comments about 'craftship' on family farms echoes many of Raup's points about intangible wealth just discussed.

Another characteristic of the family farm that may contribute to its survival is the way in which the enterprise normally follows stages of establishment, development, maintenance and redevelopment within its lifecycle (Bennett & Kohl 1982). After a farm is first established or transmitted to a new generation, there often follows a period of rapid innovation and development of the farm's resources. Family consumption expenses must often be deferred in this stage. Later, as farm development goals have been met and income stabilized, management is focused on maintenance of productivity. As the enterprise approaches the point at which it may be transferred to the succeeding generation, Bennett and Kohl (1982) found it often went through a second development phase, to allow an increasing number of people to be supported. This cyclical process of development and maintenance may aid the survival of the family farm in two ways. First, it creates periodic pressures for innovation, which keeps the enterprise from stagnating. Second, it also creates periods of resistance to innovation, when debts and risk are minimized.

Thus, at no one point is it likely than even the majority of family farms will try some new technique or push ahead with some change in production methods or inputs.

This cyclical conservation may then protect one group of family farms from the impact of inappropriate or disastrous innovations (Salant & Saupe 1986, USDA 1985). During the current US farm crisis, enterprises in a development phase have been severely handicapped by high interest rates, rising costs and low profits. Farms in a maintenance phase, however, seem to be able to sustain the adverse conditions at present without threat of foreclosure or bankruptcy. More than may be true for capitalist farms or industrial firms - though little research has been done and more is needed - family farms may respond to market pressures with more variable management strategies, depending on the phase of the household and enterprise cycle, and this variation in behaviour may confer an advantage under rapidly-changing economic conditions.

EROSION OF FAMILY FARM ADVANTAGES

The competitiveness of household agricultural production in the US today varies by region and activity. While the greater efficiency of capitalist agriculture stems in some cases from favourable natural conditions, in most cases it is the result of deliberate efforts to overcome the natural advantages of the family labour farm. Technological developments that take the 'nature' out of agriculture can favour capitalist production. Mann and Dickinson (1978) emphasize technological innovations that shorten or make continuous the production process. Chicken and egg production provides a good example. As technology of confinement systems shortened the time necessary for broiler or egg production and made the labour requirements of the process more uniform, corporations have penetrated poultry production to the disadvantage of diversified family farms (Fink 1986). A similar example is the technology of controlling disease in order to confine large numbers of animals. Use of antibiotics in feed has changed hog and cattle production and circumvented the disparity of production time and labour time. Capitalist structures have expanded rapidly in large feedlot operations, but range production of livestock does not provide the same advantages, and large capitalist farms in these areas have declined[6].

Continuous crop production is made difficult not only by the biological processes involved but also by climatic variability. It is clear that areas with long, homogeneous growing seasons are particularly receptive to capitalist forms of production. California's "unusually homogeneous and predictable" climate (Friedland & Barton 1975: 52) has provided a favourable environment for the development of capitalist agriculture. Even here, however, federally financed irrigation systems were necessary to give capitalist production an edge over family farms. In areas that are

not so favoured by natural weather conditions, the development of climate and water control technology is necessary to reduce the managerial difficulties that large-scale wage-labour production encounters. It is not surprising that capitalist farms of the future have been envisaged as completely enclosed systems in which temperature and moisture are rigidly controlled (Berry 1977: 67-68). Whether this is possible remains to be seen. Whether it is pursued is a matter of public policy.

The role of the state in helping capitalist agriculture to overcome naturally-occurring obstacles cannot be over-emphasized. Agrarian structure is greatly affected by government policies, particularly in terms of research priorities (Busch & Lacey 1983). Large-scale tomato producers in California, for example, benefited greatly from the development of a mechanical tomato harvester by the University of California Agricultural Experiment Station. Friedland and Barton claim that this invention "saved the tomato industry for California" by keeping tomato processing companies from moving to Mexico (1975: 51). Another effect of this advance in technology was to give an advantage to larger growers who specialized in tomatoes and who could afford the machines. "From 4 000 tomato growers in California in 1962, mechanization reduced that number to 597 in 1973" (Friedland & Barton 1975: 54).

In addition to research and development priorities, the government can affect the relative competitiveness of different organizational forms through land policy, through labour policies and through tax and subsidy policies. Here again, California agriculture provides illustrative examples. Several researchers have documented the special advantages given to large-scale farms in obtaining good land, cheap irrigation water and non-competitive wage labour (Friedland, Barton & Thomas 1981; Busch & Lacy 1983; Thomas 1985). Majka and Majka (1982) have described the character of south-western agriculture as particularly dependent upon the cheap labour of different immigrant groups (Filipinos, Chinese, Japanese, and Mexicans, at different historical points). When labour shortages emerged, the state intervened to provide prisoners of war, Puerto Ricans and others. The state thus created artificial conditions for large-scale south-western agriculture, when compared with the rest of US agriculture that "must function under the stress of intensive labour competition" (Padfield & Martin 1965: 253).

Finally, government subsidies have enhanced the profitability of some sectors of agriculture, providing more benefits to large-scale than to small-scale growers (Congressional Budget Office 1985). Tax policy has encouraged investment in agriculture as a tax shelter and has increased advantages to industrial-type farms (Strange 1988). Some observers have referred to these investments as 'tax-loss farming'. Raup (1973), Cordtz (1972) and Kramer (1987) have documented the importance of tax policies which allowed owners to write off investments in livestock and farm

improvements, and use these losses to reduce their tax liability on income from other sources. Carter and Johnson (1981: 18), examining US Treasury Department tax return data, found that "taxpayers in the highest income categories have an amazing propensity to lost money farming".

At the same time as these and other policies have encouraged the rise of industrial agriculture, the natural advantages of the family farm have also been threatened by the types of practices increasingly adopted by the family farmers themselves. Competitive pressures have led many farmers to purchase machinery that has forced them to expand and/or to increase their specialization. Specialization can increase risk, especially when the market for a particular commodity is fluid and prices erratic. In the recent US farm crisis, specialization has contributed to the vulnerability of midwestern corn and soybean farmers. More dependent now on a few crops, the farmers have given up the livestock and feedgrains that provided a cushion to poor prices in the past.

CONCLUSION

From a postition several hundred years ago in which virtually all human food was produced by family-based units, the family farm has declined in scope. Its range of activities and operations has become reduced through competition with capitalist farming units. Nevertheless, household agricultural production remains viable in many commodities and in many regions. Disaggregation of farming regions, conditions, and production systems is necessary to unravel the current status of family labour farms in the US and their future in competition with capitalist agriculture.

Some observers might wonder at all the ink that has recently been spilled over the US family farm. After all, the rise of the urban-industrial economy has pulled and pushed rural Americans out of farming to the point where less than 4 per cent of the US labour force is involved today in direct agricultural production. The number of farms has declined from its peak of 6.8 million in 1935 to only 2.2 million in 1989. The debate over the nature of the few remaining US farms may seem to some like hair-splitting, since such a small percentage of the population is involved.

Nevertheless, this debate is of crucial significance for a large proportion of the world's people. The image of large-scale US agriculture is frequently held up to the developing nations as a model for their own future. We question the appropriateness of that image. Even in the US, the shape of agrarian structure has owed as much to deliberate government policy and to the socially-constructed notion of progress and the 'good life' as it has to any innate advantage of large-scale over small-scale production. Large-scale production, whether organized as state farms in the Soviet Union, large communes in China or industrial capitalist farms in the United

States, has experienced managerial diseconomies in many spheres of agriculture. The persistence of the family farm, despite the weight of all the policies operating against it, is testimony to the strength of its natural competitive advantages.

NOTES

1. An earlier version of this paper (Reinhardt & Barlett 1989) was presented at the Rural Sociological Society meetings in Madison, Wisconsin, and at the Society for Economic Anthropology meetings in Riverside, California, in 1987. We are grateful to our colleagues in both organizations and to the editorial board of this journal for their comments and criticisms.
2. Tenant farm families often share the objectives and organization of production of owner-operated farms (Wells 1989). Tenants may be displaced, however, for reasons that have nothing to do with their economic competitiveness. For this reason, the fate of tenanted household-labour-based farms requires a separate analysis, and we will focus here on the owner-operated family-labour-based farm unit.
3. In 1974, 71.3% of farm corporations were privately held, primarily farm family operations. Non-family farm corporations accounted for 9.5% of total US farm sales in that year (Reimund 1979: 130; Schertz 1979: 30-31). Using statistics on non-family farm corporations may result in a slight undercounting of the number of capitalist farms because some families owning incorporated farms may be non-farm investors who leave management and labour to others. The fact that they are kin and probably inherited the farm does not change their lack of direct involvement in its operation. Family-owned, primarily farm corporations accounted for 8.7% of total US farm sales in 1974 (calculated from Reimund 1979: 130).
4. This debate over the logic of household production is a complex one, in which economists generally combine the concept of rationality with the particular goals being maximized. In anthropological research, these two issues are separable. Thus, Bennett and Kohl (1982) discuss the family farm as a multi-generational unit in which personal lifetime goals of each member must be combined with the needs of the enterprise (Bennett & Kohl 1982). This in no way implies a qualitatively different decision-making process, only that the criteria for decision making and the assessment of costs and benefts in the family labour farm are different from those of capitalist units.
5. It is certainly true that many US family farmers do indeed have to consider the opportunity cost of purchased inputs, including land itself, as well as the opportunity cost of financial capital (the interest rate on loans). Nevertheless, these farmers differ from capitalists in the fundamental respect that they are producing for household livelihood rather than as an investment of capital. Their objective is to earn a positive contribution to livelihood after all market costs have been paid, not to obtain the highest rate of return on their resources, and they will be maximizing other non-financial goals as well.
6. We thank an anonymous reviewer for making this point.

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