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The phrases "family farming" and "the family farm" rank among the most powerful in the agricultural literature. This arises from their capacity to evoke images of a structure of agriculture that combine both economic and social dimensions. One consequence is an ambiguity in the use of the concepts that fosters confusion. This is unfortunate, and avoidable. The definition of a family farm can be stated quite explicitly, and in a form that permits quantitative as well as qualitative analysis.

Consider first the composition of inputs into the farm production process: Land, labor, equipment, and financial capital. One of the most useful definitions uses the term "a family farm" to describe an enterprise in which the major fraction of control over the most durable of these inputs, land and labor, is exercised or contributed by a family unit. A conventional estimate in the agricultural economics literature is that a farming family will contribute annually approximately 1.6 man-year equivalents of labor. Using this base, a farming unit could be classified as a family farm if total annual labor use did not greatly exceed 3 man-years. Note that this definition does not preclude use of a significant quantity of hired labor.

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It is also conventional to define a family farm as one in which control, though not necessarily ownership, of the land used in production rests with the farming family. Note that this does not preclude control through renting or leasing, nor does it exclude a corporate form of farm business organization, if the majority of the corporate equity is controlled by the farm family.

Using these definitions, a family farm could be incorporated, operate entirely on rented land, and hire up to roughly 1.5 man-years of non-family labor. It could also operate entirely with some combination of rented machinery and equipment coupled with contracts for the performance of specific farm operations (most frequently, combine harvesting).

The current farm financial crisis has generated additional definitions, based on the control of financial capital. Chapter 12 of the recently amended Federal Bankruptcy Law, for example, defines a family farm as one in which 80 percent of the debt must arise out of farming operations, and more than 50 percent of the gross income must come from farming.

The emphasis in these definitions rests on control. One measure of the growing complexity of farming operations is the fact that control by a farm family does not necessarily imply ownership. In an older generation, in which the institutional forms of farm business organization were limited, this control was achieved through outright ownership. This is still a prominent feature of many types of farming, especially field crop production, but the separation of control through ownership and control through contractual arrangements is rapidly expanding.

The most emphatic evidence of this shift from ownership to contractual control can be seen in the expansion of farm units classified by the U.S. Census of Agriculture as "part-owner" farms. From 1950 to 1986 the average size of farm in the United States more than doubled, from 215 acres to 455 acres. Most of this increase was accomplished by farm land owners who expanded their size of operation by adding rented land to land already owned.

While there has been a sharp increase in the proportion of farm land operated under lease or rental arrangements by part-owners, there has at the same time been remarkable stability in the proportion of total acres of rented land to the acres of land in farms. U.S. Census of Agriculture data for 1945 reported 37.8 percent of all acres in farms as tenant operated (either by full tenants or part-owners). The figure was 37.3 percent in 1969, 39.6 percent in 1978 and 38.9 percent in 1982. The major shift that occurred was a drop in the percentage operated by full tenants, from 22.1 percent in 1945 to 11.5 percent in 1982. Rented land operated by part owners increased from 15.7 percent in 1945 to 24.4 percent in 1969 and to 27.4 percent in 1982 (DeBraal and Wunderlich, 1983, p. 49).

These changes have resulted in a massive restructuring of farm equity but with little change in the proportion of farm land rented. The typical U.S. farmer in 1982 was a part-owner. Part-owners in 1982 owned 26.4 percent of all farm land and rented an additional 27.4 percent, for a total of 53.8 percent of all land in farms. When combined with the 34.7 percent of farm land held by full owners, the result was that 88.5 percent of all land in farms in 1982 was in the hands of operators who owned some

or all of the land they farmed. This is the highest proportion in this century.

The rental market emerges as the major instrument by which farm size expansion and equity sharing are being accomplished in U.S. agriculture. Heirs leaving the farm have typically retained ownership of their fraction of the land, and rented it to neighbors or to siblings. This is one of the major ways in which farm size expansion has been achieved.

The term "family farm" was once interpreted to imply ownership of all the land farmed. This is no longer a tenable definition. But farming families still retain control over the majority of the land in agricultural use in the United States, although the nature of that control has changed. It is instructive to examine the possible reasons why family units have proved to be a durable form of business organization in farming.

Perhaps the most important fact is that decisions involving a trade-off between consumption and investment are internalized within the farm firm. A decision to raise wages or increase family expenditure on consumption is immediately confronted with the fact that less will be available for investment. A decision to restrict consumption, i.e. to accept a lower wage, in order to increase investment occurs in a framework that unifies decisions affecting both income and wealth. The possibility of future returns from slow pay-out investments can be valued more highly by the work-force if it is also the direct beneficiary of future capital gains. The family unit in farming can make a direct trade-off that translates lower labor income into prospects for a higher net worth. When wage recipients are not also capital providers this trade-off cannot be

made. This is especially important in agriculture, dealing as it does with biological processes and climatic cycles in which time is the critical variable. The family farming unit can place a higher value on the future.

A second reason is that the reward and penalty structure affecting managerial decisions is symmetrical. Those accepting risk are the ones who will benefit or suffer, depending on the outcome. This feature is especially important in those types of enterprises in which conventional economic risks associated with prices and markets are combined with climatic risk. The riskiness of farming sets it apart from most other types of business. This has discouraged cumbersome forms of business organization that rely on repetitive processes and institutionalized behavior rules. Together with forestry and fishing, farming is almost the only type of business in which the operator must decide anew each morning what work to attempt in that day. This puts a premium on the ability to make quick and risky decisions.

This attribute of a risk-accepting family managerial unit in farming is closely related to a third characteristic, in that the information feed-back loop in day-to-day operations is unbroken. When something goes wrong, the individual who detects it is also the one who must correct it. There need be no delay in reporting the malfunction to a supervisor, with an accompanying wait for authority to take remedial action. On-site decisions are frequently required that cannot easily be centralized, or accommodated in an operating manual. The potential advantages of job specialization in farming are in many cases outweighed by diseconomies of size in decision making. Coping with the unexpected is achieved most

efficiently when the functions of worker, manager, and capital provider are combined in the same individual or family.

The embodiment of the functions of worker, manager, and capitalist in a family unit also creates a fourth advantage of a family-type business unit, in that the family in control can place a higher value on non-monetary rewards than is possible when these functions are separated. These rewards include independence of decision-making, a relative freedom from supervisory control, social status in the community, a self-image that is rooted in a sense of self-mastery, and a freedom to determine the pace of work. Although these characteristics of a job are not priced directly in a market place, it is clear that they have monetary value. Other things being equal, workers will accept lower monetary wages when the conditions of work include the above features. This option is available to the family unit in farming, and is a major explanation for the fact that labor income in farming has persistently stayed below nominal wage levels in comparable non-farm jobs. The farming family can convert what would in a non-farm job be considered leisure time into low-wage employment, and is perfectly rational in so doing.

A feature of family-scale firms in farming that has grown in significance in recent decades is their ability to fail at a relatively low social cost. The characteristic of large business firms in non-farm production that has emerged most dramatically since the second World War is their ability to postpone change until it is forced upon them. When change does come, it tends to be catastrophic, and to involve very high social costs, including sudden and massive unemployment, community disruption, and the traumatic write-down of capital values, private,

corporate, and public. In some well-publicized cases (Lockheed, Chrysler) the costs of failure threatened to be so large that the firms were not permitted to fail. Change has not been incremental.

The sorting-out process in business management that enables failure to be a part of learning has been a major characteristic of family-type farming in the United States. This is its most prominent dimension, in the financial crisis that is currently dominating American agriculture. Reductions in the number of farm firms and the consequent collapse of many rural communities threaten to create farming ghost towns of a type once thought to be found only in mining regions. There have been disruptions in rural community cohesion and wipe-outs of capital values on an unprecedented scale. The social cost of this change is enormous, and often unnecessarily high. But we should be clear about its significance in a larger setting.

Technological change in agriculture has not been inhibited by farms so large that they could avoid it. Wage costs in farming have not been elevated by firms with the market power to pass on a higher wage bill to consumers through higher prices. More than all of the increase in the real cost of food in the United States in the past half-century is explained by the addition of processing, packaging, and distribution services. The real cost of food products at the farmgate has steadily declined. The structure of relatively small to medium-sized farms under predominantly family control has enabled incremental change in agriculture to occur at a pace unmatched in other industries.

This is demonstrated in Table 1, which shows an annual rate of labor productivity growth in farming which, at 6 percent per year, is more than twice as high as the growth rates achieved in manufacturing or in service-producing sectors, for the period from 1948 to 1981. For the past half-century, farming in the United States has been in the forefront of technological change.

There are other attributes of a structure of family type firms in agriculture that are less easily quantified. The growth of large agribusiness firms in some sectors of agriculture has introduced rural communities to labor problems that exceed any previous experience. Strikes, boycotts, and tension between labor and management have not historically been a part of the farming scene. They are today, in some sectors of vegetable, horticultural, and tree-crop production. The rise of contract production in poultry and eggs introduces the prospect of labor strife in this sector, and this possibility is more distant but visible in some types of hog and beef cattle feeding.

This throws in sharp relief the fact that farm structures dominated by family-type units have been remarkably free of internal conflict arising out of labor relations. There have been few instances of jurisdictional strikes in agriculture. Crafts and skills have rarely been a basis for labor specialization. Conflict between younger and older workers has been resolved within families. There has been little evidence of forced retirement to make way for younger and cheaper workers.

One of the most important of the intangible attributes of family farms is the combination of job-related learning experiences with training in management and risk-taking. The worker-managed firm has been a

Table 1
Estimated Trend Labor Productivity Growth By
Sectors in the United States
1948-1981[a/]

Private Business Sectors	Average Annual Trend Productivity Growth[b/]	
	1948-68	1968-81
	(% per year)	
Service Producing	3.0	1.5
Goods Producing	3.0	2.1
Manufacturing	2.9	2.8
Farming	6.0	6.3
Private Business Sector as a Whole	3.3	1.8

a/ Charles S. Morris, "The Productivity 'Slowdown': A Sectoral Analyses", Economic Review, Federal Reserve Bank of Kansas City, April 1984, p. 13.

b/ Trend productivity growth is defined as the growth in output per manhour worked if all resources in the economy were fully employed at desired levels (Morris, p. 4).

reality, not a slogan, in family farming. Where the size of farm has been big enough to permit experimentation, with its attendant risks, an optimum business climate has been created for the rapid adoption of new technology. A structure of medium-sized and larger family farms has been associated with a record-breaking pace of technological change. Something must have been working right.

If these have been the strong points of a family-farm structure, what are the handicaps? Is this system threatened? The first point to make is that there are no simple answers to the questions. In a broad sense, the very strengths of the system have also contained seeds of decay. The most prominent example from the past two decades has been the susceptibility of land owners to the lure of capital gains. Growing publicity given to world population growth and food shortages in the 1960's exploded in the early 1970's into a belief that the world was running out of ability to feed itself. American farmers were told repeatedly that they possessed the world's largest reserve of food-producing capacity. It was an easy step to the conclusion that farm land values could only rise, and this was borne out by four decades of almost continuously rising land values, from 1935 to 1981.

Those who owned farm land were transformed from profit-seekers into rent-seekers. Appreciation in land values overrode mistakes in farm management. After the mid-1970's income stagnated in real terms, while land values continued to rise. The credit base created by higher land values encouraged borrowing on a scale that was not supported by cash flow. Farmers in general, and above all family farmers who owned land, proved to be exceptionally exposed to the lures of inflation.

The cultural values of family farmers increased the danger of this exposure. An almost universal goal of family farmers has been to pass the farm on within the family. Helping a son get started in farming has been the highest expression of this goal. In this context, demographic trends created a trap.

For the U.S. as a whole, the foundation for the baby boom was laid in the 12 years from 1945 to 1957. In that period annual births increased from 2.85 million to over 4.3 million, and remained above 4.0 million from 1954 to 1964. As a result, the population of young adults reaching age 21 reached its maximum in 1978, which can also be taken as the mid-point of the euphoria that fueled the boom in land prices after 1972-73.

The land boom of the 1970's was thus perfectly synchronized with the baby boom that maximized the number of young people reaching an age when they were ready to make career choices. In retrospect, the results were predictable. With rising land prices and a peak in the youth population, families were presented with an irresistible temptation to use their expanded credit base to help establish their young people in farming. The most vulnerable families were those who had inherited land, or purchased it at the relatively low prices that prevailed from the mid-1930's through the 1960's. In short, the families with the largest credit base with which to help their youth make a start in farming were those that represented a tradition of family farming, often extending back over several generations.

There was a high degree of interaction among these variables. Families with a strong credit base could make the highest bids for farm land that came onto the market, thus fueling the inflation in land prices.

When land prices collapsed after 1981-82, these families were the ones most affected. This explains the frequency with which farming failures and bankruptcies in the 1980s have seemed to involve an unusual number of farms that had been held by the same families for generations. They were often the ones whose transient credit base lured them into highly unwise land purchase decisions.

The demographic trap was only one of the roots of the farm financial crisis of the 1980's. The nature of technological change in agriculture since 1950 has involved the use of credit on a scale that makes farming exceptionally sensitive to interest rates.

At the end of the Second World War labor was just under one half of the total cost of farm inputs in U.S. agriculture. Land accounted for 16 percent, all purchased inputs (machinery, agricultural chemicals, feeds, seeds, and purchased livestock) for 26 percent, and interest and taxes 7 percent. By 1985 the cost of labor inputs had fallen to 19 percent of total costs, land had risen to 23 percent, and the total of all purchased inputs involved 52 percent of total input cost (USDA, 1986).

In this 40-year period the fraction of total costs represented by purchased inputs doubled. This has more than doubled the exposure of agriculture to the costs of production credit. An older generation could absorb economic shock by suppressing family levels of living, i.e. by accepting a lower wage. When labor costs were half of total costs, this represented a major shock-absorbing capacity. Today, with labor costs under 20 percent and purchased inputs over 50 percent of total input cost, this shock-absorbing capacity has been undermined. At the same time, the rise in purchased inputs has greatly increased the exposure of farmers to

interest rate fluctuations. Since 1945 the capacity of the financial system to generate interest-rate shock in the farming sector has been more than doubled, and the capacity of farm families to absorb it has been more than cut in half.

The consequent financial stress on the farming sector has assumed unexpected proportions in the 1980's. A decision to accelerate military expenditures after 1980 has lifted them to levels of GNP previously unknown except in wartime. No comparable offsetting cuts in federal non-military expenditures proved to be possible. A large and growing federal budget deficit resulted, and this had to be covered by borrowing. High real interest rates have been necessary to attract the needed funds. This led to a demand for dollars by foreign investors anxious to benefit from the higher interest rates, and thus to a sharp increase in the exchange rate of the dollar.

In this way U.S. exports were made increasingly high priced to foreign buyers and imports were progressively cheaper. Agricultural exports after 1981 were prominent victims of the resulting drop in U.S. export trade, caused primarily by defective federal fiscal and financial policies.

Both the trade deficit and high interest rates can be viewed as the effects of a policy of financing a federal budget deficit by borrowing. This has thrown the burden disproportionately on those sectors of the economy that depend heavily on credit. Farming has emerged as a high credit-using sector, without the ability to pass on credit costs to consumers in the form of higher prices. The transition to a high dependence on purchased inputs, and thus on production credit, has been

especially traumatic for family farms. Since 1980 they have been increasingly at the mercy of national and international trends in financial markets, and have lost much of their capacity to respond by cutting back on family consumption. A family farm structure dependent on purchased inputs is highly vulnerable in the economic world of today.

The effects of structural change that were primarily internal to agriculture were accelerated in the inflation of the 1970's. Repeated efforts at the national level had been made to help farmers by preferential treatment under the income tax. Costs of land clearing and conservation practices could be "expensed", within limits, i.e. could be deducted as annual operating costs. Cash-basis rather than accrual accounting had long been authorized for farmers, even for those whose scale of operation would have required accrual accounting for income tax purposes if they had been in any business other than farming. Tax rulings in the 1970's permitted farmers to treat single-purpose buildings used in livestock and poultry or horticultural production as if they were machinery or equipment, with consequent reductions in the length of time over which they could be depreciated. This greatly reduced the cost of the investment to high-income tax-payers.

Other investment incentives built into the tax code were not designed explicitly with farmers in mind, but had a significant effect on the competitive status of farmers in different income size classes. The most pervasive was the investment tax credit, originally 7 percent and later raised to 10 percent. This was a straightforward reduction in the price of machinery, equipment, and some types of buildings for those taxpayers who had a tax obligation large enough to absorb the credit.

A similar effect resulted from accelerated depreciation schedules, permitting a more rapid write-off of depreciable property. In the land boom of the 1970's, one of the most damaging concessions was the preferential taxation of capital gains. The higher the income tax class in which a taxpayer fell, the greater the value of these tax-code rules. The effect was to reduce the cost of capital relative to labor, to reduce the real cost of investments in farm operations by high income taxpayers, and to increase the after-tax value of any profit derived from the sale of land. A tremendous incentive was created for farm size enlargement and for the substitution of capital for labor, in order to reach income tax brackets at which the value of tax rules could be maximized.

This incentive structure was further augmented by tax rules permitting the melding of farm and non-farm income. A high income tax obligation resulting from non-farm income could be reduced by investing in a farm with its many opportunities for expensing capital improvements. Current income could be converted into capital values, and if sold, any capital gain would be taxed at a flat rate that was much lower than the tax rate on earned income. At the time of enactment of the Tax Reform Act of 1986 the maximum tax on capital gains was 20 percent (one-half of 40-percent of the gain) while the top rate on earned income was 50 percent. This created a powerful reward system for high-income taxpayers who invested in farming. Similar attractions prevailed in forestry.

Inflation in the 1970s multiplied the force of these tax-based incentives. One consequence was to put the family type farm at a comparative disadvantage unless the farm was large enough to lift the farmer into high income tax brackets. Using the definitions with which

this paper began (a labor requirement of approximately 3 man-years and half or more of the equity under farm family control), it is clear that most family farms could not achieve the income levels needed to take full advantage of income tax-based incentives. In effect, national income tax policy down-graded all types of proprietary businesses of a family size, and the most numerous business firms in this category were farms. One rule emerges: It has not been possible to help family-type firms by tax concessions within the framework of a progressive income tax as administered to date in the United States.

It is as yet unclear whether or not the Tax Reform Act of 1986 will remove the worst of these structural distortions. The investment tax credit is gone, depreciation schedules have been lengthened, and tax-loss farming has been made less attractive. But many potential sources of distortion still remain. Achieving this level of wisdom in income tax policy has been very expensive for medium sized family farms. If the farm is small enough, family labor can be released for non-farm employment, which can underwrite the survival of the farm unit. If it is at the upper end of the family farm size class, the differential effects of income tax policy that favor taxpayers in higher income brackets can be reduced, if not eliminated. It is the farms in the mid-range of family size that were under greatest financial pressure in the 1970's and that face the most uncertain future in the 1980's.

One shibboleth should be set aside, in appraising the future of family farms. A farm that can gainfully employ 3 man-years of labor is not significantly less efficient than its larger neighbors. There is general agreement in the agricultural economics literature that most

economies of size can be achieved at farm sizes that can be operated by a farm family. Where this is not the case, as in some types of horticultural crop production or livestock and poultry feeding, it reflects a concentration of the production process in both time and space that approaches the characteristics of industrial production in a factory setting. This process has expanded rapidly in the past three decades, in some agricultural sectors.

Size alone is not necessarily an indicator of greater efficiency in resource use. It should be noted that the types of agricultural production that have moved beyond the family size of firm tend to be concentrated in areas that benefit from high levels of price distortion for two of the major production inputs: labor and water. Modal types of the largest farms, dairy herds and livestock feedlots in the U.S. are concentrated in the Southwest, in the southern Great Plains, and in the Gulf and Southern Atlantic coastal areas. They are able to exploit water resources that are flagrantly underpriced (in the California and Arizona case), or not priced at all (as is true of withdrawals from the Ogallala aquifer in the Southern Plains). They have also been the principal beneficiaries of the depressed level of labor wages resulting from a massive in-migration of labor from Mexico, Central America, the Caribbean, and Southeast Asia.

It is not clear that the regions and communities that include the largest types of farms are capable of supporting a level of services and community infrastructure that is necessary for a stable economic environment. Almost universally, they are in low-tax jurisdictions with low levels of local public services. It is not demonstrated that the communities in which they are located can reproduce a labor force that

will continue their present wage-cost advantage. It is equally unclear that the labor force of existing large farms will reproduce a generation of managers and risk-takers.

These reflections point up a dimension of a family-farm structure of agriculture that is difficult to quantify but perhaps of decisive importance. Farms produce many things besides crops and livestock. Above all, they produce people. The ultimate test of a farm structure lies in the quality of the people it produces, and in the stability of the communities they support. Family-type farms, by this test, have proved to be remarkably successful. They are undergoing dramatic change in the United States, increasing in size and decreasing in numbers. Many of the reasons for this decline are a consequence of public policies that were not designed to eliminate family-operated businesses in farming, but they have had that effect. These policies could be changed, especially those that relate to income taxation, interest rates, exchanges rates, and the international competitiveness of U.S. agricultural exports. These appear to be the most promising approaches for public policies that genuinely seek to create an economic climate that is hospitable to family businesses in farming.

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