FARM NUMBERS AND THEIR IMPLICATIONS FOR ECONOMIC ANALYSIS

B. F. Stanton

INTRODUCTION

Data on farm numbers are widely discussed and frequently misinterpreted. These numbers comprise one of the nation's oldest and most basic statistical series. As such they are a fundamental part of our agricultural data system. This paper argues that American farms should be classified into three separate categories for both descriptive and analytical purposes. Such divisions will allow us to understand more fully the changes in farming which have occurred and the implications of changes now in progress. Rates of change in size distributions, productivity and net income may be examined in perspective. Public understanding of the policy issues involved will be enhanced.

These suggestions are made in setting of budget constraints at every level of government. Our national agricultural data system is being asked to establish priorities and reduce expenditures. The Statistical Reporting Service has recently announced that 26 of its reports will be eliminated in 1982; reductions in the number of individual state estimates included in continuing reports will be instituted; the frequency of some reports will be cut.

Analytical work in agricultural economics relies on continuing data series of dependable quality and accuracy. The Economic Statistics Committee of our national association has been active in reviewing components of our national system and making positive suggestions for some improvements (AAEA; Carlin and Handy; Gardner; Upchurch; Weeks, Schluter and Southard). Important changes in the measurement of productivity and agricultural income resulted in part from their efforts (USDA Stat. Bull. 674). This productive interchange continues. Both the regional associations and AAEA, as well as individual economists, must continue to ask questions and invest time in helping to improve our data system.

Just 10 years ago AAEA's Economic Statistics Committee argued that "...the farm or firm as the basic unit of observation from which all food and fiber statistics are constructed is conceptually obsolete" (p. 868). That view has not been generally accepted. To the contrary, farms are still the basic production units of the world's agriculture. Land, labor, capital, and management are combined in producing units called farms, out of which crop and livestock products result. While the ownership and control of some of the resources like land and capital has become more complex, and the identity of the true decision makers with respect to production is sometimes difficult to establish, farms as the basic producing units are almost universally recognized in every language and political system.

CENSUS DEFINITIONS AND NUMBERS

Ever since the national census included comprehensive data on farming for the first time in 1840, almost every unit that produced agricultural products beyond a family garden has been counted as a farm. The definition in 1850 essentially set the pattern to the present time:

> The returns of all farms and plantations, the produce of which amounts to $100 in value, are to be included in this schedule; but it is not intended to include the returns of small lots, owned or worked by persons following mechanical or other pursuits, where the productions are not $100 in value.

Apparently, our national policy over the years has been to make the count of farms as large as possible. Almost any residential unit with some livestock or a crop of some kind has been counted as a farm. As the nation expanded its boundaries, so did the land devoted to agriculture and the number of producing farms. The details of definitions changed nine times from 1850 to 1978, but the underlying concept did not. Currently any producing unit from which $1,000 or more of agricultural products were sold or normally would have been sold qualifies as a farm.

Farm numbers reached a peak in the United States in the 1930's. After World War II numbers decreased rapidly and average farm size measured in acres increased accordingly. Essentially from 1900 to 1945 farm numbers were stable enough in total so that decreases in one section of the United States were balanced by new farms in another region. Many significant changes in farming occurred between 1910 and 1940 as tractor and machine power replaced horses and hand labor, but the stability in numbers tended to mask the dimensions of change until off-farm jobs, farm consolidation and new technology reduced the numbers after World War II (Figure 1).

FURTHER CLASSIFICATION

In my view it is not the underlying concept of a farm as a producing unit which is obsolete. Rather it is the desire to include every business unit which produces some saleable farm products in one general classification that is a problem. Two steers on a five acre parcel have little in common with a 500,000 acre cattle ranch. Perhaps both units can be broadly described as farms. But for any kind of analysis or for historical description as well, further division is necessary.

It is important to separate the primary producing units or full-time, commercial farms from other units, both for description and analysis. Part-time farms include a wide range of situa-

---

B. F. Stanton is a professor of agricultural economics in the Department of Agricultural Economics, Cornell University, Ithaca, New York.

The review and comments of N. L. Bills, J. R. Brake, O. D. Forker, R. B. How and W. G. Tomek are gratefully acknowledged.

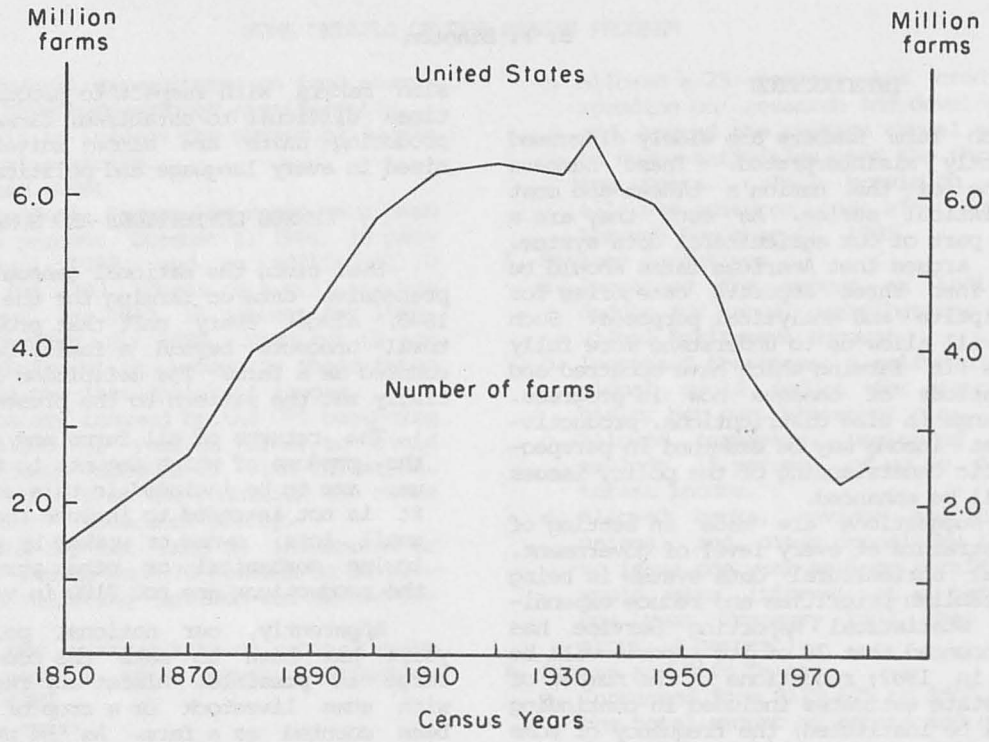

Figure 1. Numbers of farms, United States, Census data, 1850-1978

tions from those getting started in farming at one end of the spectrum to those who have retired on a small farm at the other. Careful classification of our part-time farms into meaningful groups is necessary as well. The emphasis throughout these comments remains on the producing unit or farm, not on the operator, the business arrangement, or the form of ownership. Output from the producing unit and the nature of resources employed are much more central to classification.

The United States, so often a leader in agricultural statistics, has been a laggard in developing consistent definitions and data sets for full-time and part-time farms. During the last 30 years the most common classification of farms has been into size groups based either on acres of land or the value of agricultural products sold. Comparing farms on the basis of land area works well when the resource base and type of farming is similar. But for a very large and diverse country, grouping farms on the basis of acreage has little meaning. A cattle ranch of 3,000 acres may barely support one family, while an intensive fruit farm of 50 acres may support two.

Classifications based on agricultural sales have two major problems. Comparisons through time are confounded when inflation or changes in price level become important. Moreover, changes in technology bring with them increased dependence on purchased inputs and increasing productivity. Output per worker and per acre increase accordingly. Meaningful comparisons of changes in American agriculture since 1950 are made difficult by both of these problems.

SOME ALTERNATIVE DEFINITIONS

It is easier to identify problems than to provide widely accepted answers. One approach is to look at what has been done in the past to classify farms into meaningful groups. These procedures can then be adapted to available data for the United States for the years after World War II when farm numbers declined, commercial farming was consolidated into larger units, and technology and prices changed rapidly. The economic classes developed for the agricultural censuses between 1950 and 1969 are one such approach. Japanese classifications of full-time and part-time farms are another (Kada).

Census definitions - In the two decades between 1950 and 1969 the census divided farms into economic classes. In 1950 the two general categories were commercial farms and other. The primary basis for classification was value of farm products sold. Further subdivision of the noncommercial group was made on days of work off the farm by the operator and the importance of off-farm income sources (Table 1).

By 1969 the general classification, commercial, was dropped. The range of sales for each of the six classes had been increased. Age as well as days worked off-farm had been included as part of the classification system for part-time farms (Table 2). A general division between farms with sales over $2,500 and less than $2,500

Table 1. Distribution of Farms by Economic Class - U.S., 1950

Class	Criteria used: Value of farm products sold	Other	Number of farms
Commercial:			
I	$25,000 and over	None	103,231
II	10,000 - 24,999	None	381,151
III	5,000 - 9,999	None	721,211
IV	2,500 - 4,999	None	882,302
V	1,200 - 2,499	None	901,316
VI	250 - 1,199	Less than 100 days of work off-farm by operator; income of family members from off-farm sources less than value of farm products sold.	717,201
			3,706,412
Other:			
Part-time	$250 -1,199	100 days or more of off-farm work by operator; income of family members from off-farm sources greater than value of farm products sold.	639,230
Residential	Less than $250	None	1,029,392
Abnormal	Not a criterion	institutional farms, experimental farms, grazing associations, etc.	4,215
			1,672,838
Total number			5,379,250

Source: U.S. Census of Agriculture, Volume II, 1950, pp. 1109-10.

Table 2. Distribution of Farms by Economic Class - U.S., 1969

Class	Criteria used: Value of farm products sold	Other	Number of farms
1	$40,000 and over	None	221,690
2	20,000 - 39,999	None	330,992
3	10,000 - 19,999	None	395,472
4	5,000 - 9,999	None	390,425
5	2,500 - 4,999	Less than $2,500 sales if normally would have had sales in excess of $2,500 (crop failure, new farms, large inventories).	395,104
6	50 - 2,499	Operator under 65 years of age and did not work off farm more than 100 days.	192,564
Part time	50 - 2,499	Operator under 65 years, worked off farm more than 100 days.	574,546
Part retirement	50 - 2,499	Operator who is over 65 years old.	227,346
Abnormal	Not a criterion	Institutional, experimental and research farms, and Indian reservations.	2,111
Total number			2,730,250

Source: U.S. Census of Agriculture, 1969, Volume II, Chapter 7, pp. 7.

was followed in many sections of the summary report. This same practice was continued in the 1974 and 1978 census. Economic classes as such were dropped in these reports.

Summary of census statistics 1950-1978 - If a summary of the census data on number of farms by economic class is made between 1950 and 1978 important adjustments are required. While the basis for such adjustments may be challenged, the resulting comparisons provide additional insights into the kinds of change which have occurred over the past 30 years. The census itself made one such set of adjustments relating value of sales to economic class between 1950 and 1959. Prices almost doubled between 1969 and 1978. The Producer Price Index for Industrial Commodities was 106 in 1969 and 209.4 in 1978. Each of the 1969 sales classes were advanced one category for comparability with 1978 (Table 3).

One can get further perspective on the changing importance of different classes of farms by studying the proportion of the nations's agricultural sales contributed by each group in each of the census years. Clearly the largest commercial or full-time farms have provided an increasing proportion of agricultural output. Part-time farms produce a shrinking share of total sales (Table 4).

The three general headings in Table 4 reflect the biases and knowledge of the author from a perspective of the 1980s. Study of the table and the changing proportions must recognize that the definitions of economic classes changed between 1954 and 1959 and again between 1969 and 1978. One such adjustment was made by the Bureau of the Census, the other by the author.

Only the first three economic classes could possibly qualify as full-time farms in 1978 or 1969. To generate a minimum of $10,000 of agricultural sales in 1969 would have required from 10 to 15 average dairy cows and associated cropping activities. The same number of cows would have generated $20,000 in 1978. From 50 to 100 acres of field crops would have provided enough sales to make the minimum of a class 3 farm both years. By the technology standards of these years such a unit was most likely to be a part-time farm because it provided much less than full-time work for one individual. In contrast, levels of mechanization and labor productivity in 1950 were quite different. To have agricultural sales of $5,000 would have required 10 to 15 cows depending on production levels. Without a milking machine and using horse drawn field equipment, this provided almost a full-time job for a modest farm operator. But there were quite a few individuals and families who fitted this description. By 1959 most dairy farms of this size had been mechanized or were on their way out of business. But nationally crop farms with gross sales of $10,000 from 100 acres of field crops or its equivalent were still fairly common.

A summary of the number of farms in each of the census years divided into three general categories as described in Tables 3 and 4 is presented in Figure 2. The most substantial decrease in numbers between 1950 and 1978 was in part-time, residential farms. The total value of agricultural sales in each of these years was less than the wages of a farm worker and certainly not enough to provide more than a small portion of the living requirements for a farm family. Over the three decades the number of these farms dropped from about 2.4 million in 1950 to less than 1.0 million in 1978.

In contrast the number of full-time, commercial farms (classes 1-3) were much more stable, moving from 1.2 million in 1949 down to 0,9 mil-

Table 3. Criteria for Economic Classes of Farm Comparable Sales Categories, United States, 1950-78

Economic class	Census years 1950* 1954	1959 1964 1969	1978
	Value of agricultural products sold		
1	$25,000 and over	$40,000 and over	$100,000 and over
2	10,000 - 24,999	20,000 - 39,999	40,000 - 99,999
3	5,000 - 9,999	10,000 - 19,999	20,000 - 39,999
4	2,500 - 4,999	5,000 - 9,999	10,000 - 19,999
5	1,200 - 2,499	2,500 - 4,999	5,000 - 9,999
6	250 - 1,199	50 - 2,499	2,500 - 4,999
"Other"	250 - 1,199 and days of off-farm work, value of off-farm income.	50 - 2,499 and age, days of work off farm.	1,000 - 2,499

* The 1950 Census refers to the year 1949.

Sources: Census of Agriculture, 1950-1978.

Table 4. Proportion of Total Sales by Class of Farm Census Data, United States, 1950-1978

Classification of farms*	Year			
	1950	1959	1969	1978
	percent of total agricultural sales			
Full time, commercial				
1	26.0	31.5	55.7	62.3
2	24.8	18.4	20.3	21.3
3	22.7	21.9	12.5	8.1
subtotal	73.5	71.8	88.5	91.7
Part-time, commercial enterprises				
4	14.4	15.4	6.2	4.1
5	7.3	7.4	3.0	2.2
subtotal	21.7	22.8	9.2	6.3
Part-time, residential				
6	2.3	1.5	0.4	1.1
Other	2.5	3.8	2.0	0.9
subtotal	4.8	5.3	2.4	2.0
Total	100	100	100	100

* Classification using criteria in Table 3.

Source: Census of Agriculture.

lion in 1978. For those who consider class 4 farms as part of the commercial group the equivalent numbers would then be 2.1 million in 1949 and 1.2 million in 1978. Class 4 and 5 farms in 1969 or 1978 did not produce enough value added regardless of the type of farming to provide an acceptable living for a farm family. In this sense they are truly part-time farms. These families are either dependent on off-farm earnings for an important part of their livelihood or else they are retired couples living on their savings and social security supplemented with some farm income.

A similar summary of changes in farm numbers between 1949 and 1978 for the 12 northeastern states is presented in Figure 3. About 10 percent of the nation's farms were located in this region in 1949 and a little less than 8 percent in 1978. The relative changes over the past 30 years are quite similar to those nationally. Full-time, commercial farms have been more stable in numbers than other groups. Very substantial reductions in numbers have occurred for the smaller, part-time and residential farms. Stability in numbers for all groups has been achieved during the last decade. Specific information for each of the Northeastern States from the census in 1978 is summarized in Table 5.

The foregoing examination of farm numbers and census statistics for 1949-78 has been developed to support classifying farms nationally into two major categories: (1) part-time and (2) full-time, commercial enterprises. Further, because part-time farms make up so large a proportion of the total and encompass such a wide range of situations, further division is necessary both for description and analysis. The part-time residential units where agricultural sales are relatively unimportant to the family are differentiated from the part-time farms where income from farm operations is more important.

WORKER EQUIVALENTS IN FARMING

One approach to classifying farms into meaningful categories and differentiating part-time from full-time farms is to determine the worker equivalents used in farm operations. The concept of man equivalents or worker equivalents to measure size of business has been used in farm management from the beginnings of our discipline (Dadisman, Arnold and Branch). It has been common to describe farms as one man or two man businesses (Lin, Coffman and Penn). Estimating worker equivalents used in farm operations is not difficult for either farmers or enumerators. Current reporting requirements for hired labor on commercial farms indicate that such estimates could be readily obtained on a regular basis from large businesses as well as smaller ones.

One approach to obtaining consistent data over time on two different groups of part-time farms and a size classification of full-time commercial farms is presented in Table 6. Initially some combination of gross farm sales and worker equivalents used in farm operations would be necessary for the two categories of part-time farms. Particularly for individuals who are in ill health, partially disabled, or in their retirement years, farming activities may be the

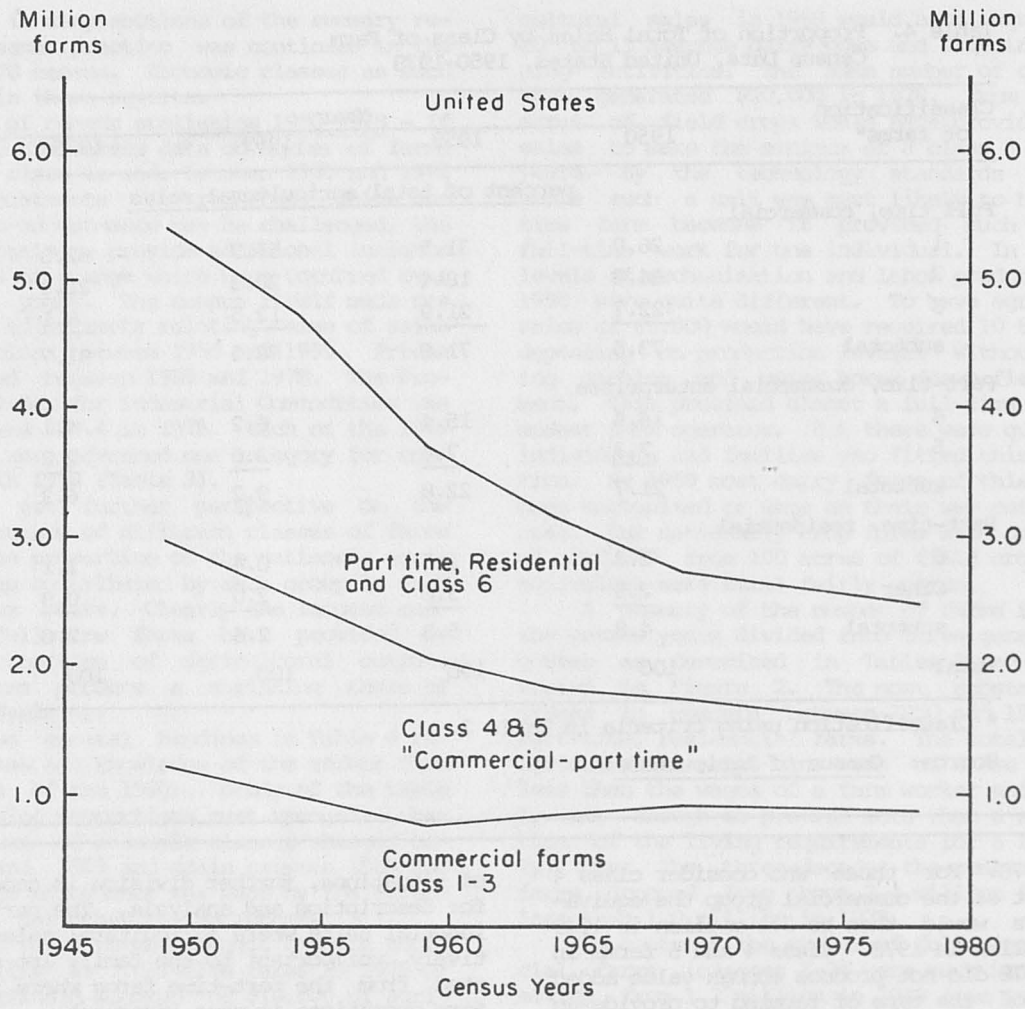

Figure 2. Decreases in farm numbers by Economic Class of Farm, United States, 1949 - 1978

only things they do. But if the output that results is very small, say under $5,000 of agricultural sales, then the worker equivalent expended in "standardized" terms would also be small.

One advantage of classifying farms on the basis of worker equivalents used in farm operations is the stability of this definition through time. Comparisons can be made between years. Inflation or a change in price level is not a problem as it has been with gross farm sales. The idea of describing commercial farm businesses as one worker or two worker farms is old and familiar. Establishing appropriate ranges of gross farm sales that are roughly equivalent to the number of workers per farm will be an important component of such a shift in emphasis, at least initially. One of the surprises in studying available, historical data on farm size in the United States is the absence of data on labor units employed in farming either in the census or USDA series. Substantial efforts have been made to record information on hired labor. Consistent estimates of all labor used on individual farms, including family labor and the farm operator, are largely confined to farm management studies or farm record summaries in the various states.

AN INTERNATIONAL COMPARISON

Part-time farming is an important component of rural living and agriculture in the United States as it is in most industrialized countries in the western world. In both Europe and Japan, part-time farms have been identified statistically and have been an important concern for public policy activity during the last two decades. The formal definitions for full-time and part-time farms are of some interest from a conceptual point of view and for purposes of international comparisons. Consider the Japanese definitions:

> A full-time farm is defined as one in which no family member is engaged in any off-farm work for more than 30 days in the census year. If any family member, including the operator, himself, does off-farm work (30 days or more of employed work, or self employed business work of 50,000 yen or more annual income by the family), the household

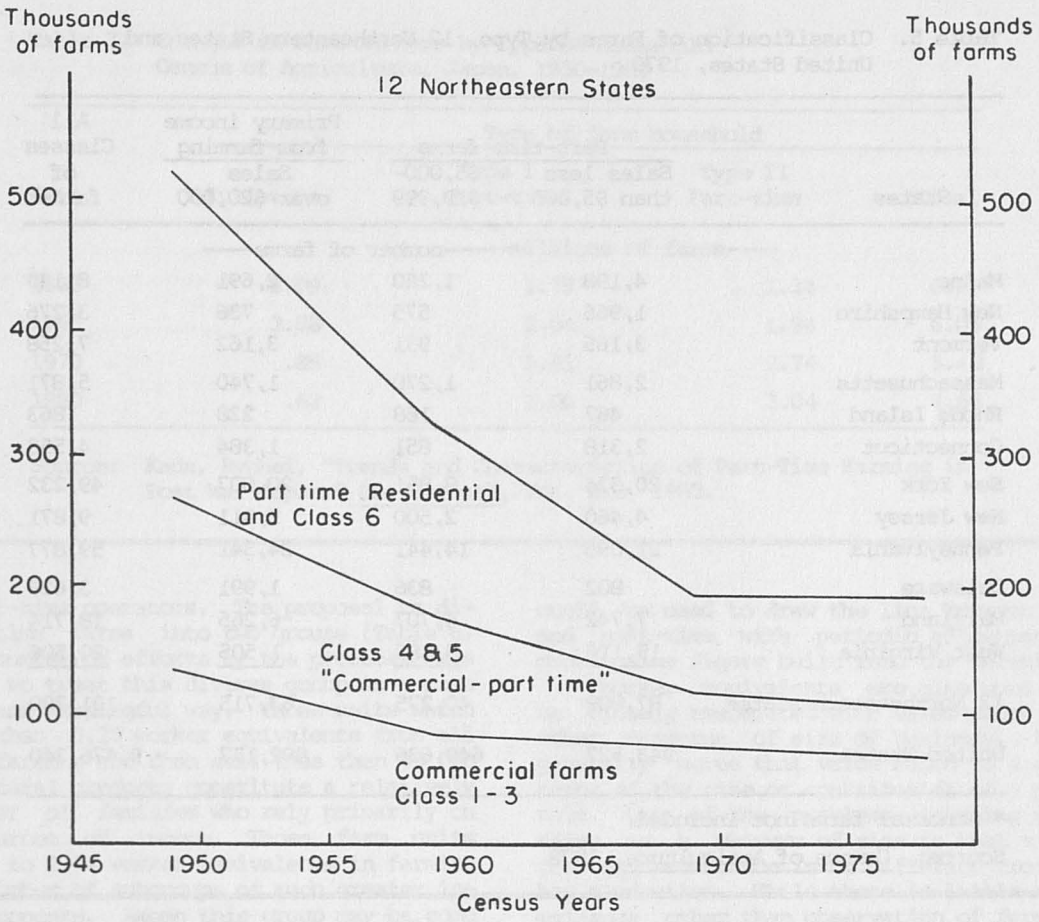

Figure 3. Decreases in farm numbers by Economic Class of Farm, 12 Northeastern States, 1949-1978

is classified as a part-time farm household. ...Part-time farm households are then divided by Japanese census statistics into two categories: Type I, households in which net farm income equals or exceeds off-farm earnings; Type II, households in which total off-farm earnings exceed net farm income. This subdivision is made on the basis of income dependency of the household, irrespective of the number of days worked off-farm or who was engaged in off-farm employment. (Kada)

While these definitions may not be directly applicable to American conditions, they do indicate how Japan has chosen to delineate different types of farms. Sources of income and family commitment to farming are of central importance. The need to differentiate part-time farms into two groups is also of interest. The magnitude of changes in numbers for the three classes between 1950 and 1980 is shown in Table 7.

In general the Type I part-time and the full-time farms are similar in the size of average land holdings (1.9 ha) and in net farm income. The Type II part-time farms have about 40 percent as much land in crops as the other two groups and the productivity per hectare is less than 50 percent of that on Type I part-time or full-time farms. These differences are a major subject of public policy debate in Japan with respect to the efficiency of resource use, including land, family labor and capital.

POLICY AND ANALYSIS

One reason for emphasizing the concept and definition of a farm producing unit and the need to differentiate part-time farms from those in the primary producing sector is to strengthen discussions of public policy and to provide a stronger basis for informed analysis. During the years since World War II more than 85 percent of saleable agricultural produciton has been produced by 2 million farms at maximum and less than 1 million in the 1970's, not the 5 million of the full census count in 1950 or 2.4 million recently. When the media give the headlines to farming as many did in the spring of 1982, it is less likely that Time will write, "Millions of farmers are operating at severe losses" (April 12, 1982), especially if they recognize there are less than one million farm operations where operators depend on farming for their primary income.

A clear demarcation of part-time from full-time farms will allow more careful consideration of public policy issues, or the lack of them, for the large number of families and the substantial amount of capital and natural resources control-

Table 5. Classification of Farms by Type, 12 Northeastern States and United States, 1978

States	Part-time farms: Sales less than $5,000	Part-time farms: $5,000–$19,999	Primary income from farming: Sales over $20,000	All Classes of farms*
	----number of farms----			
Maine	4,198	1,260	2,691	8,149
New Hampshire	1,965	575	736	3,276
Vermont	3,165	931	3,162	7,258
Massachusetts	2,861	1,270	1,740	5,871
Rhode Island	467	168	228	863
Connecticut	2,318	851	1,384	4,553
New York	20,374	8,851	20,007	49,232
New Jersey	4,460	2,500	2,911	9,871
Pennsylvania	21,095	14,441	24,341	59,877
Delaware	802	836	1,991	3,629
Maryland	7,742	4,707	6,265	18,714
West Virginia	15,116	3,885	1,505	20,506
12 Northeastern states	87,809	40,275	63,715	191,799
United States	943,527	640,636	892,177	2,476,340

* Abnormal farms not included.

Source: Census of Agriculture, 1978

Table 6. Labor Based Size Distribution of Farms Potential Definitions and Comparisons, United States

Annual worker equivalent used in farm operations	Description of farm type	Rough equivalent 1980 gross farm sales
PART-TIME		
0.00 - 0.24	Part-time, residential	Under $5,000
0.25 - 0.74	Part-time, with commercial enterprises	$5,000 - 19,999
FULL TIME, COMMERCIAL		
0.75 - 1.49	Commercial, one worker	$20,000 - 49,999
1.50 - 2.49	Commercial, two worker	$50,000 - 99,999
2.50 - 3.49	Commercial, three worker	$100,000 - 199,999
3.50 - 4.49	Commercial, four worker	$200,000 - 299,999
4.50 - 10.49	Commercial, 5-10 worker	$300,000 - 749,999
10.50 and up	Commercial, very large	$750,000 and over

Table 7. Changes in Farm Numbers by Type of Household
Census of Agriculture, Japan, 1950-1980

Year	Type of farm household			
	Full-time	Type I Part-time	Type II Part-time	Total
	----millions of farms----			
1950	3.09	1.75	1.34	6.18
1960	2.08	2.04	1.94	6.06
1970	.85	1.81	2.74	5.40
1980	.62	1.00	3.04	4.66

Source: Kada, Ryohei, "Trends and Characteristics of Part-Time Farming in Post War Japan," Geo Journal, Vol. 6:2, 1982.

led by part-time operators. The proposal to divide part-time farms into two groups (Table 6) follows a number of efforts by the professionals in Census to treat this diverse group in a more consistent and meaningful way. Those units which use less than 0.25 worker equivalents from all sources in farming and then sell less than $5,000 of agricultural products constitute a relatively large number of families who rely primarily on nonfarm sources of income. Those farm units using 0.25 to 0.74 worker equivalents in farming include a number of subgroups of much greater interest and concern. Among this group may be some of the truly disadvantaged, where no member of the family has access to a good off-farm job. The farm resources available are not sufficient either in size or in quality to allow a decent living. Some of the most pressing rural poverty is likely to exist in this group. It is also likely to include a number of older farmers in some stage of retirement as well as all sorts of part-time commercial operations.

The key decision in defining farms is the breaking point between part-time and full-time or the separation of the primary producing sector from the rest. The suggestion of a lower limit of 0.75 worker equivalents may not be low enough. Perhaps the lower limit for the primary producing units should be closer to 6 months of labor or 0.5 worker equivalents.

The line between primary production units, regardless of who owns the resources or makes the key decisions, and the part-time sector is important. Conceptually a labor based measure has appeal because it is a physical measure and one which farmers can estimate with reasonable knowledge and accuracy. Moreover, it makes farm units in this country much more comparable with others throughout both the developed and less developed world. It is my general observation that family farm businesses are the norm in most countries. Land resources and capital are combined with labor in very different proportions in different societies. But one, two, three and four worker farms predominate. Initially some combination of gross farm sales and worker equivalents could be used to draw the line between full-time and part-time with periodic adjustments in the gross sales figure built into the definition.

Worker equivalents are also more likely to be closely associated with value-added than most other measures of size of business. Economists generally agree that value added is a good indicator of the size or contribution of a production unit. One of the problems in using gross farm sales as a measure of size is that value added for egg production is so different from wheat or hay production. While there is little scientific evidence other than observation of farms to support this generalization, worker equivalents and value added are quite closely related in American agriculture.

NET FARM INCOME

One of the most important agricultural statistics calculated nationally is net farm income. This is an aggregate figure representing returns to all farm resources. Estimates are also made for different sizes of farms based on agricultural sales. The economic status and well being of farm families is considered by combining off-farm sources of income with net income from farming. New procedures for calculating net farm income were instituted by the Economic Research Service in 1980. These procedures follow the general methodology used in other sectors of the economy, where the operator's dwelling and household accounts are separated from business activities (ERS Statistical Bulletin 674).[1]

A summary of these annual estimates for the period 1960-1980 is presented in Table 8. Before 1960 estimates of off-farm income for farm families were not made. The series has been deflated by the CPI to allow comparisons in terms of the purchasing power of family income. The aggregate

[1] A discussion of procedures used and important definitions comparing the old and new accounting methods are presented on pages 1-9 in ERS Statistical Bulletin 674.

Table 8. INCOME OF FARM OPERATOR FAMILIES
Constant 1967 Dollars, United States, 1960-80

Year	Net income from farming	Off-farm income	Total family income	Total family income per farm
		1967=100		
	millions	millions	millions	
1960	$12,985	$ 9,563	$22,548	$ 5,690
1961	13,345	10,227	23,571	6,163
1962	13,316	10,932	24,247	6,567
1963	12,835	12,017	24,853	6,957
1964	11,294	12,526	23,820	6,890
1965	13,650	13,468	27,118	8,080
1966	14,362	14,282	28,644	8,794
1967	12,339	14,495	26,834	8,486
1968	11,825	14,843	26,668	8,684
1969	13,017	15,129	28,147	9,382
1970	12,168	14,959	27,126	9,199
1971	12,063	15,522	27,585	9,505
1972	14,896	16,453	31,350	10,962
1973	25,056	17,850	42,906	15,199
1974	17,691	17,953	35,644	12,617
1975	15,183	17,030	32,213	11,642
1976	10,957	17,758	28,716	10,488
1977*	10,133	13,955	24,088	9,808
1978	13,540	14,378	27,919	11,461
1979	15,040	15,276	30,316	12,476
1980	8,047	14,579	22,626	9,319

* Definition of farm changed to include only operations with sales of $1,000 or more.

Source: USDA, ERS Statistical Bulletin 674, September 1981, pp. 111.

net income from farming shows no clear trend over the 20 year span, when price level is taken into account. Clearly net income has been much more volatile in the 1970's than in the 1960's, but this is mostly variation around a flat trend line rather than a clear downturn as some have suggested.

In contrast, off-farm income sources have become a more important component of total family income in each 5 year period. Off-farm income is more stable and there is a measurable trend component. The data base for the two series is quite different. Net income from farming is monitored in detail with estimates constructed for individual states. Cash receipts and cash expenses are calculated using alternate sources of information. Substantial effort is put into developing careful and accurate data sets. Off-farm income estimates receive much less attention and are based on a very limited data base.

The final column in Table 8 presents real family income per farm, an important measure of average levels of income for farm families. Even though net income from farming has not increased in the aggregate, farm numbers have declined and net farm income per farm has increased. This rather straight-forward idea is often lost when comparisons are made between aggregate net income in 1980 and earlier years.

FAMILY INCOME BY SIZE CLASS

One of the ways of examining the relative position of farm families compared to other groups in society is to compare per capita personal and disposable incomes for farm and nonfarm populations. Such series have been calculated since 1934 (ERS Statistical Bulletin 674). In the 1950's farm income as a percentage of nonfarm income per capita ranged between 47 and 64 percent. By the 1960's the range was 53 to 73 percent. In the 1970's the range was from 73 to 109 percent. Over the three decades the trend has been clearly upward and some approximation of greater parity has been achieved. But every average is based on a distribution of incomes that lies behind it. Serious analysis and understanding of what has been happening requires study of these distributions.

It is here that some permanent mechanisms to decompose farm numbers into a small number of meaningful groups would be most helpful. Estimates of farm family income from all sources classified by amount of agricultural sales is available for the years 1960-1980. Data for 1980 are presented in Table 9. The size classes have been further aggregated into three groups to approximate roughly the categories proposed earlier. As the averages indicate, off-farm income provides an important component of family living in every size category including the largest commercial farms.

The two lowest averages for farm family income are in the $20,000-39,999 and $10,000-19,999 sales classes. These are likely to be the groups with substantial variability in levels of poverty, family net worth, and reliance on farming for family living. In particular there is need to improve and enlarge the basis for estimating off-farm income for these groups if fur-

Table 9. Farm Family Income by Farm Size, USDA Estimates, United States, 1980

Value of agricultural sales	Average net farm income	Average off-farm income	Average farm family income	Farm Income as a percent of total
Full time, commercial				
$100,000 and over	$33,972	$12,922	$46,894	72
40,000 - 99,999	16,674	7,922	24,596	68
20,000 - 39,999	8,280	9,358	17,678	47
Group average	19,325	9,839	29,164	66
Part-time, commercial enterprises				
$10,000 - 19,999	4,299	12,847	17,146	25
5,000 - 9,999	2,512	16,768	19,280	13
Group average	3,342	14,947	18,289	18
Part-time, residential				
$2,500 - 4,999	1,582	20,156	21,738	7
Under $2,500	1,821	20,242	22,063	8
Group average	1,723	20,207	21,930	8
All farms	9,002	14,820	23,822	38

Source: USDA, ERS Statistical Bulletin 674, September 1981, pp. 106.

ther analysis leading to policy recommendations is to be based on these statistics. This is one area where a re-examination of priorities might well lead to more resources being spent on an existing program at the expense of other data series where pressure for policy related analysis is less strong.

SUMMARY COMMENTS

1. This paper argues that farms as business units should be divided into three basic categories:
   (a) full-time, commercial units (the primary producing sector for agricultural production where 0.75 or more worker equivalents are employed in farming)
   (b) part-time farms with commercial enterprises (where agricultural sales are important but family living comes primarily from off-farm sources and 0.25 to 0.74 worker equivalents are employed in farming)
   (c) part-time, residential farms (where less than 0.25 worker equivalents are employed in farming and agricultural sales are not an important source of family income).
2. The USDA and Bureau of Census, with the advice of representatives from appropriate professional associations, should establish a set of clear definitions for these three categories of farms based on physical criteria which can be continued over a span of years.
3. Substantially less emphasis should be given to describing farms on the basis of gross agricultural sales because inflation makes comparison of such size distributions through time very difficult and because value added for different types of farming activity is so divergent.
4. Estimates of net income from farm and off-farm sources are important data series. This is particularly true for the two categories of part-time farms. Monitoring income from off-farm sources, particularly for the largest farms employing 4 or more worker equivalents, has much lower priority.
5. The concept of a farm as the primary business unit producing crop and livestock products is not obsolete. Definitions must allow for a wide range of organizational forms from individual proprietorships to cooperatives and corporate entities. The challenge is to insure that this dynamic sector is constantly monitored and that our data systems accurately reflect change as it occurs.

REFERENCES

AAEA Committee on Economic Statistics, "Our Obsolete Data Systems: New Directions an Opportunities," Amer. J. Agr. Econ. 54 (1972) 867-880.

Bureau of the Census, Department of Commerce, Census of Agriculture 1950, 1954, 1959, 1964, 1969, 1974, and 1978.

Buttel, Frederick H. and Michael E. Gertler, "Small Farm Businesses: A Typology of Farm, Operator, and Family Characteristics with Implications for Public Research and Extension Policy," J. Northeastern Agr. Econ. Council 9 (1982) 35-44.

Carlin, Thomas A. and Charles R. Handy, "Concepts of the Agricultural Economy and Economic Accounting," Amer. J. Agr. Econ. 56 (1974) 964-976.

Dadisman, A. J., J. H. Arnold and F. H. Branch, "Report of the Committee on Terminology," J. Farm Econ. 1 (1919) 76-77.

Gardner, Bruce, "Strategies for Long Run Investment in Rural, Social, and Economic Statistics," Amer. J. Agr. Econ. 57 (1975) 892-899

Kada, Ryohei, Part-time Family Farming: Off Farm Employment and Farm Adjustments in the United States and Japan, Center for Academic Publications Japan, Tokyo, 1980.

_____, "Trends and Characteristics of Part Time Farming in Post War Japan," Geo Journal 6 (1982).

Lin, William, George Coffman and J. B. Penn, "U.S. Farm Numbers, Sizes, and Related Structural Dimensions: Projections to the Year 2000," USDA, ERS Technical Bulletin 1625, July 1980.

Staff of National Economics Division, ERS, "Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1980," USDA Statistical Bulletin 674, September 1981.

Upchurch, M. L., "Developments in Agricultural Economic Data," A Survey of Agricultural Economics Literature, Volume 2, University of Minnesota Press, 1977, pp. 305-372.

Weeks, Eldon, E., G. E. Schluter and L. W. Southard, "Monitoring the Agricultural Economy: Strains on the Data System," Amer. J. Agr. Econ. 57 (1975) 900-909.