This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: An Appraisal of the 1950 Census Income Data

Volume Author/Editor: Conference on Research in Income and Wealth

Volume Publisher: Princeton University Press

Volume ISBN: 0-691-04102-4

Volume URL: http://www.nber.org/books/unkn58-2

Publication Date: 1958

Chapter Title: An Appraisal of the Data for Farm Families

Chapter Author: D. Gale Johnson

Chapter URL: http://www.nber.org/chapters/c1056

Chapter pages in book: (p. 287 - 308)

PART III

Examples of Uses of Census Income Data

An Appraisal of the Data for
Farm Families

D. GALE JOHNSON, UNIVERSITY OF CHICAGO

Compared with any of its predecessors, the 1950 census is a land-mark in the search for more adequate data on the income and other characteristics of farm families. The people who are the Bureau of the Census can be justly proud of what their labors accomplished, recognizing as they do that a better job can be done next time, Con-gress and money permitting. It is the purpose of this paper to con-tribute a few small suggestions that might lead to improvement and to make a few comments about the accuracy of the data.

Anyone who uses or appraises the income data for farm families is greatly indebted to the Departments of Agriculture and Com-merce for their cooperative publication, *Farms and Farm People*.[1] In this pioneering effort, the matching of approximately 11,000 schedules from the censuses of agriculture and population permitted certain interrelations between farms and farm people to be seen. Among several able analyses of the underlying data, Ernest W. Grove's "Income of Farm-Operator Families in 1949" is especially relevant here. In fact, I have taken this chapter as part of my text for this essay—one way to put one's discussant on the defensive from the very start.

Some Basic Features of the Data

Some special problems arise from three characteristics of the in-come data: (1) the significant income-receiving unit is the family and not the individual, (2) the income data collected relate only to money income, and (3) incomes of individual farm receiving units vary much more from year to year than do the incomes of nonfarm income-receiving units.

FARM FAMILIES AS INCOME UNITS

Taking the family as the income-receiving unit has peculiar sig-nificance for procedures and findings. Its basis is a fundamental characteristic of the farm population.

The 1950 census enumerated a total of 6,834,000 workers in

[1] *Farms and Farm People: Population, Income, and Housing Characteristics by Economic Class of Farm*, Bureau of the Census, 1953.

farm occupations; of these 919,000 were unpaid family workers. The unpaid family workers on farms constituted 83 per cent of all unpaid family workers enumerated by the census. A little more than 13 per cent of the farm labor force fell in this category. The income representing the productivity of their labor on a farm was undoubtedly attributed to the head of the family, who would normally be classified as a farm operator. Most of the unpaid family workers received no money income from any source.[2]

The problem arising here is that, for rural farm people, the distributions of income for persons and cross tabulations between income and other characteristics for persons are subject to serious limitations and distortions. For example, a cross-classification of income by age will be distorted; while farm operators tend to be older than unpaid family workers, some of the latter will report income and so be included in such distributions.

Also distributions of income of persons living on farms will appear more unequal than they are. Many unpaid family workers who have some money income will be included at low income levels while farm operators will be credited income that is used to increase the level of consumption of the unpaid family workers.

In general, it is usually better to work with distributions of family income data than with individual data. This means, of course, that certain kinds of analyses are not appropriate. Thus interrelations between income and age or education can be discovered only for farm operators, and these relationships may be affected by age or education selectivity among farm operators. Only the most capable young persons or those with the best access to capital can be farm operators, resulting in an overestimate of the "true" income for the younger groups.

EXCLUSION OF NONMONEY INCOME

The exclusion of nonmoney income has two important consequences. First, farm incomes are seriously underestimated relative to nonfarm incomes. For 1949, the Agricultural Marketing Service estimates that the net money income of the farm population was $16,408 million; if changes in the value of farm inventories are excluded, $17,215 million. The nonmoney income (other than change in inventories) was $3,443 million, or 21 per cent of the

[2] There were 892 thousand unpaid family workers living in rural farm areas; of these 324 thousand reported the receipt of money income and 41 thousand fell in the category "income not reported" leaving 527 thousand without money income (*1950 Census of Population,* Vol. II, *Characteristics of the Population,* Part I, Table 142). It may also be noted that there were 979 thousand persons without income who reported work in 1949. Of these farm persons more than half (494 thousand) reported fifty to fifty-two weeks of work and another 156 thousand reported twenty-seven to forty-nine weeks of work (*ibid.,* Table 141).

net money income, including inventory change in total net income. Of course, nonfarm persons have some nonmoney income, particularly from the value of owned housing, but the relative amount is much less important.

Second, the farm income distribution is made to appear more unequal than it in fact is. As Margaret G. Reid has shown,[3] nonmoney income of farm families is much more equally distributed than is the money income. This is true not only for persons or families within a region but also from one region to another.

I shall here consider only the implications of the underestimation of the real income of farm people. In general, distributions of income combining farm and nonfarm personal incomes should not be presented, certainly not without indicating their serious limitations.

One limitation appears in attempts to correlate education with income. This point can be illustrated by reference to an exceptionally detailed presentation of data relating income to age, education, sex, color, and region.[4] As indicated in Table 11 of the same publication, farm people of any age have less education than do nonfarm people of the same age. For example, the median number of years' schooling for male farm operators thirty-five to forty-four years old is 8.4; for the nonfarm male population of this age group, 10.1. Farm persons thus tend to be concentrated in the lower education levels for any age group. Since the real earnings of farm people are understimated, if farm and nonfarm incomes are combined, the slope of the regression of income on education is steeper than its true value. Since there is little information on the relation between income and education for farm people, one cannot estimate the true value of the regression coefficient.

Even if estimates of the money value of the nonmoney income of the farm population were obtainable, the usual procedure of valuing such items as home-produced food at farm sales prices will still result in too low an estimate of the real value of the nonmoney income to farm families. And economists do not agree on how to correct for this underestimation. Thus it seems appropriate that, regardless of the income concept used, farm and nonfarm income distributions should be kept separate.

VARIABILITY OF FARM INCOME

The third of the basic features of farm income, the year-to-year variability, is something a decennial census can do little or nothing

[3] Margaret G. Reid, "Distribution of Nonmoney Income," in *Volume Thirteen* (1951) of Studies in Income and Wealth, pp. 124–179.
[4] *1950 Census of Population*, Vol. IV, *Special Reports*, Part 1, Chap. C, Table 12.

about in the collection of data. It is possible to obtain data for one year and one year only. However, to compensate for this variability, I have a suggestion about the presentation of income data for farm persons. Income should never be shown as the independent or the classificatory variable; that is, the mean or median of other variables should not be presented for a given income level or a series of income levels without a distribution of the second variable also.

I have not found a presentation of income data in the census of population where this rule is not followed. However, in *Farms and Farm People,* an otherwise admirable study, there are several. For example, median age of farm operator, average size of family, and number of persons per room are calculated by net income level. Such material tells us little because for most farm families any one year's income varies so from their average or normal income.

The data on the average age of farm operators may be used as an example. For the North and West the following results were obtained: [5]

Net Income	Median Age
Under $1,000	56.8
$1,000– 1,999	47.1
2,000– 2,999	44.3
3,000– 3,999	44.8
4,000– 4,999	45.6
5,000– 9,999	46.9

It is hard to say what this tabulation tells us about the interrelation between age of farm operator and income. Age declines as income increases from less than $1,000 to the $2,000–2,999 bracket; then as income increases so does age, at least slightly. But except for the lowest income group, the income-age relationship seems flat, and the regression of age on income would probably have a regression coefficient around zero.

The relationship between age and income for rural farm males is exhibited better in the *1950 Census of Population:* [6]

Age	Median Net Income
14–19	$ 356
20–24	1,090
25–34	1,719
35–44	1,850
45–54	1,697
55–64	1,354
65 and over	789

The age-income relationship for rural farm persons is difficult to estimate accurately because of the importance of unpaid family

[5] *Farms and Farm People,* Chap. 5, Table 4.
[6] Vol. II, *Characteristics of the Population,* Part 1, Table 139.

workers in the lower age groups, yet when income is classified by age rather than vice versa, a more meaningful relationship emerges. The reason is obvious; while income is subject to errors of misreporting and other large random components, the age variable is subject only to errors of misreporting.

Though the following tabulation does not refer to net income, it is a striking illustration of the problem. In the first part of Table 1, the ratio of value of farm products to the value of land and build-

TABLE 1

Value of Farm Products and Value of Land and Buildings for Iowa, 1945, and Effect of Criteria of Classification Upon Ratio Between These Values

Value of Products (1)	Value of Land and Buildings (2)	Ratio of (1) to (2) (3)
Farms Classified by Value of Products		
$ 147	$ 6,088	0.02
316	4,372	0.07
495	4,585	0.10
783	5,615	0.14
1,251	7,780	0.16
2,014	9,492	0.21
3,251	12,927	0.25
4,975	17,465	0.28
7,673	22,903	0.34
15,435	34,313	0.44
70,514	61,777	1.44
Farms Classified by Value of Land and Buildings		
$ 535	$ 750	0.71
1,357	1,500	0.90
1,689	2,500	0.68
1,905	4,000	0.48
2,499	6,250	0.40
3,492	8,500	0.41
4,321	12,500	0.35
6,706	20,000	0.34
10,350	35,000	0.29
18,497	70,000	0.26

Source: Based on 1945 Census of Agriculture, *Farms and Farm Characteristics by Value of Products,* Tables 2 and 17.

ings is shown for farms when the value of land and buildings is classified by the value of products. Here there seems to be a definite implication that, as the value of farm products increases, output per unit of this one input increases, and quite dramatically. In the second part of the table, the value of land and buildings has been used as the independent variable. The result as indicated by the ratio of value of products to value of land and buildings is the

opposite of the first result. Since land and buildings constitute only one of several inputs, and other inputs, especially labor, do not increase proportionally as land and buildings increase, the results in the second part of the table are consistent with the observed phenomenon that medium-size farms do compete successfully with large-size farms.

Since estimates of the value of land and buildings are subject to error and some year-to-year variation, and since adjustments to changes in size are not completed at once, the estimate of the regression between the two variables is biased even when the value of land and buildings is used as the independent variable. However, the bias is much smaller than when value of products is used as the independent variable.

Income Aggregates Derived from Census Data

Few economists can resist the urge to try to determine the total of the incomes determined by a sample study, even though the aggregate income derived from such an exercise will always be less than some national income estimator's estimate of what the total income really is. I believe that there are three justifications for the attempt, the wish:

1. To determine the relative underestimation of various income components or of various income groups as a guide for income comparisons of the groups (such as farm and nonfarm residents).

2. To determine if the absolute amount of underestimation is large enough to lead to a suspicion of differential underestimation at the various income levels.

3. To provide an independent estimate of the allocation of certain income components to particular residence groups (such as the allocation of nonagricultural income to farm residents).

Sample surveys are known to suffer from two afflictions, other than sampling problems, both resulting in underestimates of income. People forget income items. Or perhaps they do not answer the income question, or the interviewer forgets to ask it, especially if it is part of a long schedule. In the 1950 census, income was not reported for 4.46 per cent of farm families compared to 4.88 per cent of all families.

In the matched sample reported on in *Farms and Farm People*, the nonreporting problem turned out to be somewhat more serious with approximately 10 per cent of the families not reporting total family incomes. Furthermore, many farm operator households who

did report, did not separate the farm income from other income. Data on nonreporting are given in Table 2 for family income and for income from farming.

TABLE 2

Commercial Farm Operator Families Not Reporting Total Family Income and Not Reporting Income from Farming, by Value of Farm Products, 1949

(*per cent*)

Value of Farm Products	*Class*	*Not Reporting Total Family Income*	*Not Reporting Income from Farming*
All commercial farms		10.2	20.4
$10,000 and over	I and II ·	9.2	17.0
5,000–$9,999	III ·	8.0	15.4
2,500– 4,999	IV	9.4	18.2
1,200– 2,499	V	9.9	23.8
250– 1,199	VI	14.0	26.6

Source: *Farms and Farm People: Population, Income, and Housing Characteristics by Economic Class of Farm,* Bureau of the Census, 1953, pp. 27 and 33.

The importance of the matched sample lies partly in what it tells us about the characteristics of the nonreporting cases. Except for farms with sales between $250 and $1,199, the proportions not reporting family income are about the same for the various classes of commercial farms. There is somewhat greater variation in the proportions reporting income from farming, but for the classes with products valued over $1,200, which included 86 per cent of the farms, the differences are quite small.

DESCRIPTION OF SERIES

Before turning to the estimates of the aggregates of the income of farm people that can be derived from the 1950 census, some description of the available series seems desirable. The following estimates or sets of estimates are available:

1. Incomes of farm operator families resulting from the matched sample of the agriculture and population census schedules (including estimates of family incomes as a total, and estimates of income by sources for the farm operator and members of his family).

2. Family incomes of rural farm families and for unrelated individuals.[7]

3. Individual incomes or incomes of persons, available for the United States as a whole; one group is for rural farm people, the other for persons who have a farm occupation.[8]

Only the incomes for rural farm families and unrelated individuals and the individual income data for rural farm persons relate

[7] *Ibid.,* Table 57.   [8] *Ibid.,* Chap. C.

to the same populations. The following are the total numbers of individuals who had an income or for whom the income was not reported (in thousands):

Rural farm residents	9,207
Experienced civilian labor force in agriculture	6,009
Experienced civilian labor force with farm type jobs	5,856

The difference between the last two consists of persons who work for firms or farms classified as in agriculture but whose jobs (such as typing or bookkeeping) are not called farm jobs. The difference between the first and the other two results from two partially offsetting factors: many rural farm residents have nonfarm jobs, and some of the experienced agricultural or farm labor force live in nonfarm communities.

ESTIMATES OF TOTAL FARM INCOMES

Two national-income-type aggregates prepared by the Department of Agriculture can be compared to data derived from the census. One, called the net income of the farm population, should be comparable to an aggregate derived from either the family and unrelated individuals income or the persons income in the census, assuming approximately the same definition of the rural farm population in both sources. The other national series is the estimate of the net farm income of farm operators. The only direct counterpart to this in the census is the estimate of income from farm, business, or profession that resulted from matching the agriculture and population schedules.

Miller's Estimate

An obvious difficulty of using sample survey data with open-end intervals and also relatively wide class intervals, particularly at the higher income levels, is that alternative procedures for estimating aggregate income do not give the same results. Differences of 3, 4, or 5 per cent are not unusual.

One attempt to expand the census data on farm incomes was made by Herman P. Miller.[9] He compared his estimate of farm self-employment income of $7.4 billion with the Department of Commerce's national income estimate of $9.9 billion. The difference implies an underestimate for the farm group of about 25 per cent and an underestimate for all United States income receivers of slightly less than 9 per cent, suggesting that underestimation of at

[9] Herman P. Miller, "An Appraisal of the 1950 Census Income Data," *Journal of the American Statistical Association,* March 1953, p. 34.

least the self-employment component of farm family income is greater than it is of the national income as a whole.

But one cannot be certain that the 25 per cent underestimate applies to what the farmers had in mind when they answered the question: "Last year, how much money did he earn working in his own business, professional practice, or farm?" Many farmers still operating on a cash basis may have deducted capital expenditures rather than depreciation charges, and the former exceeded the latter by $2,104 million for all farming in 1949 according to calculations of the Department of Agriculture. On the other hand, farmers who reported income on an accrual basis may have deducted inventory losses (net inventory losses were $807 million in 1949). Both of these actions would have been inconsistent with the instructions, and misunderstandings in both cases would operate in the same direction. Though no single respondent should have erred on both scores, many may have erred because of one or the other.

Grove's Estimate

Grove (in *Farms and Farm People*) attempted to adjust for the "no report" cases in two ways. (1) He adjusted the data for the failure to report income from self-employment when family income was reported by assuming that such income was equal to the average self-employment income for operators in Classes I through IV (see my Table 2) and was zero for the two smaller classes of commercial farms and for the noncommercial farms. (2) He assumed that the average income of the farm operator families who did not report income was equal to the average for the farm class in which each fell.

On the whole the adjustments seem reasonable, though one could argue that the assumption of zero self-employment income for those not reporting such income in Classes V and VI is somewhat arbitrary. However the effect of this assumption would not have been significant, involving an increase of $320 million or about 4 per cent of self-employment income and slightly more than 2 per cent of total income.

Grove's estimate of the total income of farm operator families ($14,252 million) cannot be compared directly with estimates derived from the population census data for rural farm residents. The census data include hired workers who live on farms, and Grove's data include farm operator families who live in urban areas. About 5 per cent of all farm operators do not live on the farms they operate, and some farms are actually in urban areas. In 1950, 2.8 per cent of employed farm managers and farm operators resided in

urban areas, and 5.6 per cent in rural nonfarm areas.[10] However, the persons living in rural nonfarm areas who live on farms are included in the census farm population and present no problem.

Nor can Grove's estimates be compared directly with those of the Department of Agriculture for the net income of the farm population, which include the income of hired farm workers who reside on farms but are not in farm operator households. However, despite these inconsistencies, some comparisons are attempted below.

Comparability of Estimates

By the use of quite unrefined techniques I estimated the aggregate incomes from the census individual income data and from the family and unrelated income data.[11] Without any adjustment for no reporting, the individual income data imply a total of $13,970 million,[12] while the family and unrelated individual data give a total of $12,824 million.[13] The reason for the smaller estimate from the latter source has been adequately explained, at least to my satisfaction, by Miller.[14]

It is not evident how an adjustment for the no-report group in the individual income data should be made. Of a total of 15,817,315 persons fourteen years old and over, 6,609,410 were without income, 8,360,380 reported income, and 847,525 were in the income-not-reported category. Over half of the no-report group were not in the experienced labor force and possibly had zero income. However I made the assumption that this no-report group that was not shown in the experienced labor force in the census could be distributed into classes of work according to the percentages of no-report cases in the experienced labor force shown in the census in the various classes. I then attributed to the resulting no-report cases in each class of work the average income shown for that class by those reporting income. The results indicate that the total income of individuals should be increased by about 5 per cent or to approximately $14,670 million.

Special tabulations indicate that urban farms number about 96,000 or 1.78 of all farms.[15] The difference from the previously noted 2.8 per cent of employed farm managers and operators re-

[10] *1950 Census of Population*, Vol. II, *Characteristics of the Population*, Part 1, Table 126.

[11] The estimates were made by assuming the average income in each income interval was equal to the midpoint of that interval and $15,000 as the average income of the open-end income class.

[12] *Ibid.*, Table 142.　　　　[13] *Ibid.*, Table 57.　　　　[14] *Op. cit.*

[15] *Farms and Farm People*, p. 67.

siding in urban areas may be accounted for by the number of farm operators not residing on the farms operated but living in urban areas, or in part by differences between the various censuses. However, on the assumption that the individual income data for rural persons do not include that for the 2.8 per cent of operators and managers living in urban areas, and that such operators have an income from agriculture equal to the average for all farm operators as estimated by Grove, or $1,575, an increase of $239 million is implied in the estimate of individual incomes.

To achieve a further degree of comparability, it is necessary to add the income of the farm population not residing in farm operator households to Grove's estimate, or to subtract it from the individual income estimate. This is a difficult task since so little is known about the hired farm labor force and particularly about the proportion living in farm operator households. (The 1950 census definition of the rural farm population, counting hired workers living on farms and paying rent in the rural nonfarm population, is ignored here.)

The only hint of the proportion of those living in farm operator households is from the 1940 Census of Population, which listed 567,940 rural farm households with employed heads classified as farm workers, about 750,000 employed workers in these households, and 1,429,000 hired workers living on rural farms. If it is assumed that employed workers living in households headed by a farm laborer were employed as farm wage workers, these workers would account for 53 per cent of all hired farm workers living in rural farm areas.[16] A less extreme assumption would be that no more than 50 per cent of these workers come from such households.

The aggregate income of all individuals who reported hired farm work as their major occupation in 1950 was $1,713 million, after adjustments for no-report cases (5 per cent) and for underreporting.[17] The Department of Agriculture assumes that 59 per cent of the total cash wages paid by farm operators goes to farm resident workers.[18] If we assume that 50 per cent of this amount goes to members of farm operator families, then 30 per cent of the above total ($514 million) should be added to Grove's total (or, alternatively, subtracted from the total income of the farm population) in

[16] *1940 Census of Population and Housing, Characteristics of Rural-Farm Families,* Table 7, and *1940 Census of Population,* Vol. III, *The Labor Force,* Part I, Table 59.

[17] The adjustment for underreporting assumes that all income was wages and salaries (see below for the adjustment for underreporting).

[18] *The Farm Income Situation,* Dept. of Agriculture, October 31, 1955.

order to make the two series comparable. If this is added to Grove's estimate, the total for the farm population becomes $14,766 million; if $239 million is added to the total of individual incomes to account for self-employment incomes on urban farms, that total is $14,909 million. The astonishing agreement indicates to me that the adjustments made in the data from *Farms and Farm People* were quite reasonable.

However, the closeness of these two semi-independently derived estimates of the income of the farm population says nothing about underestimation of income by the respondents who supplied information. The Department of Agriculture's estimate of money income of the farm population, on a basis of inclusiveness quite comparable to the above two estimates is $17,215 million or about 15 per cent more than the highest of the two estimates (see Table 3).

Can anything further be said about the sources of the underestimate, at least by types of income? According to the distributions of

TABLE 3

Net Money and Total Income of Farm Operators and Farm Population Based on Department of Agriculture Estimates, 1949

(*millions of dollars*)

A. Net Money Income of Farm Operators from Farm Operations

1. Total net income of farm operators	12,866
2. Realized nonmoney income	3,085
3. Value of inventory change	−807
4. Rent to farm landlords	531
5. Total [1 − (2 + 3 + 4)]	10,057

B. Net Money Income of Farm Population

1. Net money income of farm operators from farm operations (A5)	10,057
2. Money wages of farm resident hired workers	1,427
3. Rent to farm landlords (A4)	531
4. Income from nonfarm sources	5,200
5. Total (1 + 2 + 3 + 4)	17,215

C. Total Net Income of Farm Population

1. Total net money income (B5)	17,215
2. Realized nonmoney income	3,443
3. Value of inventory change (A3)	−807
4. Total (1 + 2 + 3)	19,851

Source: *Farm Income Situation,* Dept. of Agriculture, October 31, 1955 for: A1 (Table 2, includes government payments as do all other estimates); A2 (Tables 11 and 17); A3 (Table 14); B2 (Table 17); B4 (Table 3); and C2 (Tables 11 and 17). *Agricultural Statistics,* Dept. of Agriculture, 1953, p. 617 for A4, adjusted by subtracting $17 million of interest payments that had been counted as an expense of farm opertors.

income by source in *Farms and Farm People,* $1,506 million of the underestimate is due to the difference in the estimates of farm operator income, leaving $943 million to be attributed to the other sources of income. Miller estimates that census figures for salaries and wages for the nation as a whole were low by the reciprocal of 1.028, while other sources of income were low by the reciprocal of 1.855 if the individual income data are compared with the National Income Division estimates.[19] The estimates in *Farms and Farm People* for other sources of income and for wages and salaries have apparently been adjusted somewhat: for other sources the aggregate estimate is $1,568 million, and my estimate from the published distribution is $1,462 million; the estimate of wages and salaries is $4,133 million against my estimate of $3,792 million. My adjustments, noted above, were use of $15,000 instead of $14,000 as the value for the open-end class, of the middle value of each income interval to estimate aggregate income in that interval; and the addition of $514 million to cover the incomes of hired workers who are farm residents but not members of farm operator families (see Table 4).

If Miller's estimates of underreporting are applied to the income distributions (not Grove's estimates) given in *Farms and Farm People* for salaries and wages and for other income (assuming that all the income of hired farm workers who are not members of farm operator households is wage and salary income), the total for wages and salaries is $4,412 million and for other income is $2,712 million.[20] Adding this to the net farm income of farm operators as estimated by the Department of Agriculture, after adjustment for comparability, gives a total net money income of the farm population of $17,181 million. This is nearly equal to the $17,215 million adjusted estimate of the Department of Agriculture.

A rough check made by subtracting rent paid to farm landlords and wages paid to farm residents, as estimated by the Department of Agriculture from the excess of the total income of the farm population over the net operator income, gives an estimate of income from nonfarm sources of $5,166 million or nearly the same as that given in *The Farm Income Situation* for 1949 (B4 of Table 3).

I will conclude this rough survey of the income aggregates with the statement that, if one uses the individual earner data and adjusts for the no-report cases, the income data for the farm population

[19] *Op. cit.,* pp. 34–35.
[20] It should be noted that the estimate of income for farm residents who are not members of farm households has also been included.

TABLE 4

Total Money Income of Farm Operators and Farm Population Based on Estimates in *Farms and Farm People*, 1949

(*millions of dollars*)

A. Estimates of Income of Farm Operator Families

As adjusted by Grove: [a]		
From farm operations		8,551
Wages and salaries		4,133
Operators	2,850	
Other family members	1,283	
Other income		1,568
Operators	998	
Other family members	570	
Total		14,252
Derived from income distributions: [b]		
Wages and salaries		3,792
Operators	2,679	
Other family members	1,113	
Other income		1,462
Operators	951	
Other family members	511	
Derived from income distributions and adjusted for underreporting: [c]		
Wages and salaries (1.028)		3,898
Other income (1.855)		2,712
Total		6,610

B. Estimate of Income of Farm Resident Hired Farm Workers Not Members of Farm Operator Families

As adjusted for underreporting [d]	514

C. Estimate of Income of Farm Population

As adjusted for underreporting and a further adjustment to raise income from farm operations to Dept. of Agriculture estimate:	
Income from farm operations	10,057
Wages and salaries and other income:	
Farm operator families	6,610
Farm resident hired workers not members of farm operator families	514
Total	17,181

[a] *Farms and Farm People: Population, Income, and Housing Characteristics by Economic Class of Farm*, Bureau of the Census, 1953, pp. 27–30.

[b] *Ibid.*, pp. 31–34. Midpoint of each income range assumed to equal average income. Open-end class estimated at $15,000.

[c] Adjustments made on basis of results derived from Herman P. Miller, "An Appraisal of the 1950 Census Income Data," *Journal of the American Statistical Association*, March 1953, p. 34.

[d] See text, pp. 292–299.

is underestimated by something of the order of 15 per cent. If the same adjustments are made in data for the rest of the population the underestimate is probably of the order of 5 per cent.

For many purposes of analysis family income data are more useful than individual data, especially for rural farm areas. For the United States as a whole, Miller found that, when the same value was used for the open-end class of individual and family data, the family data aggregate was 5.4 per cent smaller than the individual earner aggregate.[21] For the rural farm families the difference is larger—8.2 per cent. Thus use of the family income data may result in underestimation of rural farm family incomes, after adjustment for the no-report cases, by about 22 per cent compared with an underestimation for the rest of the population of a probable 10 per cent.

Area Differences in Aggregates Derived from Individual Earner and Family Income Data

As indicated above, the nature of the farm enterprise and the significance of unpaid family labor in agriculture means that family income data are frequently more useful than individual earner data in economic analyses of rural farm income. However, family income data include a smaller fraction of total income than do individual earner data. The relative completeness of the family data, may also vary according to certain conditions that are not randomly distributed among the various states or economic areas. To indicate the general nature of the problem, in Table 5, I show the relative differences in totals derived from family and from individual income data in seven states (selected, I should point out, on the basis of whim, fancy, and scholarly insights).

Total individual income is smaller in proportion to total family income in each of the four southern states than in the three north central states. The extremes are 86.7 per cent in Mississippi to 94.1 per cent in Iowa.

The other data presented in the table represent information on items that I thought might help to explain the observed differences. But there seem to be no systematic differences in these characteristics that are associated with the differences in the two income aggregates. A comparison of Iowa and Mississippi, for example, reveals nothing to me that would explain the relatively large difference in the income estimates. Though it is possible that the individual income responses were more complete in Mississippi than in Iowa, I

[21] *Op. cit.*, p. 40.

TABLE 5

Various Characteristics of Rural Farm Population Income, 1949, and of Rural Farm Labor Force, 1950, Selected States

	Mississippi	South Carolina	Alabama	Arkansas	Ohio	Wisconsin	Iowa
Total income (millions):							
Family	$265	$204	$270	$268	$592	$465	$669
Individual	306	232	304	296	634	497	711
Various characteristics:							
Family income as % of							
individual income	86.7%	87.6%	88.9%	90.7%	93.3%	93.4%	94.1%
No income report:							
Family	3.7	4.8	3.9	4.0	6.1	3.6	4.3
Individual	6.1	9.9	8.6	9.4	13.1	8.1	9.5
Rural farm labor force:							
Engaged in agriculture	81.0	70.3	72.4	77.5	56.8	80.0	87.1
Wage or salary workers	25.4	36.5	31.7	31.5	45.9	29.0	22.0
Unpaid family workers	15.0	19.8	15.6	10.4	7.0	18.0	12.1

Source: *1950 Census of Population,* Vol. II, *Characteristics of the Population,* Chaps. B and C in state volumes.

can think of no reason why this would be so; and on the basis of the evidence at hand, I have been unable to check the relative accuracy of the state estimates of individual earner income data for the rural farm population. In terms of my original expectations, Ohio should have exhibited the largest differences between the two income estimates.[22] However, this exercise leads me to the conclusion that, in the use of the family income data for rural farm areas, some adjustment for interarea comparability may be required.

COMMENT

ERNEST W. GROVE, DEPARTMENT OF AGRICULTURE

Since D. Gale Johnson based part of his paper on my chapter in *Farms and Farm People* and in general treated it with respect, it would be unseemly for me to disagree with this part of his paper. And I do not find fault with the other parts either. On the whole, Johnson has provided us with a reasonable and valuable appraisal of the 1950 census income data for farm families. However, in two places he implies some objection to my methods of estimation.

[22] I had expected that the states with the greatest proportion of nonfarm workers in the rural population would have the largest underestimate of family income. I had assumed that, as the number of income sources and income earners increased, there would be a tendency to forget some of the sources in reporting family income.

UNREPORTED TOTAL INCOME

In section A of his Table 4, Johnson compares estimates derived from my summary tables of the total money income received by farm operator families with estimates of his own derived from the original distributions. Because my totals are higher than his unadjusted totals, he suggests that I must have made some unspecified adjustment to the data.

This is correct, but the adjustment made was a very simple one to allow for the nonreporting of income. No allowance is made for the no-report cases in most of the tables in *Farms and Farm People*. For example, the number of farm operators not reporting any income from wages or salaries includes not only those who reported they received no such income but also those from whom no report on it was obtained. Working more with average incomes for each economic class of farm than with income totals, the only way I could make some allowance for the no-report cases was to divide the income totals in each economic class not by the total number of farms in that class but by the number of farms reporting total family income. For all economic classes combined about 10 per cent of the farms did not report total family income. My procedure, therefore, raised the totals of wages and salaries and other income by about 10 per cent, which accounts for the discrepancies found by Johnson.

UNREPORTED SELF-EMPLOYMENT INCOME

The only other place where Johnson may imply some criticism of my methods is his discussion of the adjustments for farm-operator families who reported total family income but failed to include in it any income from farm, business, or profession. For farms in Classes I through IV (commercial) I assumed the omitted income to be equal to the class average of reported self-employment income; for farms in Classes V and VI (commercial) and all noncommercial farms, to be zero. Johnson apparently disagrees with the assumption of zero unreported farm income for Classes V and VI.

Assuming that unreported farm income was zero in these classes may be open to some question, especially for the lower classes of commercial farms, but it is not entirely unreasonable. Also in defense of my assumption, I did everything I could within reason to hold down the averages of farm income for these classes in an only partly successful attempt to reconcile them with agricultural census data.

RECONCILIATION OF POPULATION
AND AGRICULTURAL CENSUS DATA

The matched sample of schedules from the 1950 Census of Population and Housing and from the 1950 Census of Agriculture combined income data from the population census with data on value of farm products sold and on certain farm production expenditures from the agricultural census. For the higher economic classes of farms, the income data from the population census were low relative to the corresponding information on value of sales and expenditures from the agricultural census. This raised no problem, as substantial understatement of incomes is to be expected in any field survey of income.

But the data for the four lowest economic classes presented a serious problem of reconciliation. Self-employment income for each of the lowest classes calculated from the population census averaged considerably higher than the agricultural census could justify. As the person designated to analyze and report on these matched data, I was in the rather unpleasant position of a referee obliged to render a decision on their comparative accuracy. I had some qualms about the income averages derived from the population census, but all previous experience with income surveys suggested that exaggeration of farm income by the smaller farmers in their reports to the census enumerators did not seem at all likely. Consequently, I argued that the value of farm products sold as reported to the agricultural census must have been greatly understated for the lower economic classes of farms.

This view seemed reasonable enough at the time to all parties concerned—except the Agriculture Division of the Census Bureau, which naturally was reluctant to agree that the results of its census were of such poor quality. A compromise was finally reached which served more or less as a basis for the report. The published report does not state that the value of farm products sold was understated for the lower classes as much as I then thought it *was* understated. Nevertheless, the onus of the discrepancy was left almost entirely on the agricultural census.

I am not so sure now that I was right in this judgment, and some of the papers in this volume provide reasons for my uncertainty. Toward the end of his useful summary of the Census Bureau's experience with income questions, Edwin D. Goldfield admits rather casually that some self-employed persons tend to report their total gross receipts instead of their net income. Presumably this includes farmers, and chiefly the lower-income farmers. Relatively few re-

ports involving such an error would distort both the averages and the distribution of farm income. For example, if a fourth of all Class VI farmers reported their gross value of sales instead of their net income, this alone might account for most of the discrepancy in Class VI between the population and agricultural census data for 1949.[1]

The results of the Post-Enumeration Survey, as reported by Leon Pritzker and Alfred Sands, are not at all reassuring on this point. The PES did not obtain information specifically on farm income, but it modified the census procedure on self-employment income by asking first for gross income and then for net income. This one important change in the questionnaire resulted in lowering the median income from self-employment by $160 for males and $170 for females, and in raising by more than 10 per cent the number reporting self-employment income of less than $500.

Could it be that farm income at the lower levels was seriously exaggerated in the 1950 census? I do not know, and I am more inclined now than I was in 1953 to reserve judgment. The general conclusion then was that the 1950 census income data were more reliable at the lower income levels than the agricultural census data on the value of farm products sold. I still think that the value of farm products sold may be relatively more understated for the lower than for the higher economic classes of farms, but I would no longer put all of the blame for the discrepancy on the agricultural census.

There was also a tendency to assume that the size distribution of farm income obtained from the 1950 census for the year 1949 was more reliable than that obtained by the then Bureau of Agricultural Economics (now the Agricultural Marketing Service) in its survey for the year 1946.[2] I am now inclined to question this view also. In fact, I do not think we know which, if any, survey distribution of farm income is correct.

---

[1] By agricultural census definition, Class VI farms are those with sales varying from $250 to $1,199, and with all other family income less than the value of sales. Adapted from page 33 of *Farms and Farm People* is the distribution of Class VI operators reporting income from farm, business, or profession by size of such income:

Under $ 500	46.5
$ 500– 999	33.6
1,000– 1,499	12.1
1,500 and over	7.8
Total	100.0

[2] Nathan M. Koffsky and Jeanne E. Lear, *The Size Distribution of Farm Operators' Income in 1946*, Dept. of Agriculture, September 1950. A preliminary report appears in Volume Thirteen (1951) of Studies in Income and Wealth.

In this connection, I can heartily agree with Monroe G. Sirken, E. Scott Maynes, and John A. Frechtling, in their comparison of the Survey of Consumer Finances with the Census Quality Check, when they state that "The inconclusive results of our examination of entrepreneurial incomes underlines again the need for the experiments on income reporting by farmers and businessmen." I think this is true, so I find it rather disturbing when they report abandonment of the separate farm schedule previously used in the SCF. The issue admittedly remains unresolved, but those in charge of the SCF have apparently decided to act as though it *had* been resolved.