TOWARD A MORE COMPLETE COMPARISON OF FARM AND NONFARM PROPRIETORSHIP INCOME

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Several methods are available to agricultural economists for appraising the income position of farm proprietors. However, most analyses concentrate on a single measure and give little attention to alternative techniques. We suggest that a better understanding of the income situation of a group can be gained by using a combination of techniques.

Income of farm proprietors is often compared with that of other broad industrial groups. Such a procedure can partly mask differences and similarities that exist between the farm sector and other businesses. In this paper we compare farm proprietor incomes with those of nonfarm proprietors.[1]

INCOME MEASURES

Share Ratio

The share ratio which is a gross measure of the relative income position of an occupational group is calculated as follows:

$$\text{Share ratio} = \frac{\text{Percent of aggregate proprietorship income received by group.}}{\text{Percent group is of all proprietors}}$$

A share ratio of 1.0 indicates that aggregate income of the group is proportional to its size. A group with a share ratio of more than 1.0 receives more than its relative share of income; if the share ratio is less than 1.0, the group receives less than its relative share. For example, the share ratio of .79 for farm proprietors means that they receive only 79 percent of what they might be expected to receive if aggregate income were divided in relation to numbers (Table 1). However, using the share ratio as a guide, farm proprietors as a group are relatively better-off than several nonfarm subindustry groups such as taxi drivers and proprietors of eating places (Table 2).

As a relative measure of the income situation of industry groups, the share ratio does not provide information on absolute income levels or on how income is distributed within a group.

Central Tendency

Central tendency is perhaps the best understood and most widely used concept in income analysis. The arithmetic mean and the median are most commonly presented.[2] Because income distributions are almost always skewed to the right, the median income is typically less than the arithmetic mean. Stated differently, a few individuals with relatively large incomes "pull" the mean above the income level of most of the group.

The mean and median are useful in comparing two or more individuals or groups within a sector or for comparing sectors. For example, the mean income

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[1] The data are from [4, Table 2.9, pp. 98-123]. Nontaxable returns were distributed based on [5, Table 1.7, pp. 22-25 and Table 1.24, pp. 49-52]. Income includes net profit from farm or business, wages and salaries, and other income. Problems arise in using tax data for welfare implications. Among the most important, individuals tend to minimize reported income to limit their tax liability and individuals with incomes of less than taxable minimum often do not file. A small number of individuals have income from more than one type of business and thus will be counted more than once. Because these problems are common among all proprietors, we feel that the use of tax data does not greatly affect relationships among groups. Differences between farm and nonfarm business income may be overstated due to special tax treatment given to farmers. For a discussion of the problems in the use of tax data for such purposes, see [2].

[2] We neglect the mode. It is well understood but less commonly used.

for legal services was $23,000 in 1968, about 3 times that of farm proprietors.[3] One may conclude that members of this group had larger incomes than farm proprietors. However, additional information is needed concerning dispersion or variation about the measure of central tendency for a more complete picture.

The Distribution of Income and the Gini Ratio

The range provides some information and can be useful in showing dispersion, however, more complete income distribution data are preferred.[4] Such data are also more useful in diagnosing income problems. For example, a problem may be deemed to exist when a "high" proportion of proprietors have incomes below some "acceptable" level. Thus, we might find a situation in which 40 percent of farm proprietors in a given region had less than poverty incomes to be unacceptable–even though the mean income compared favorably with that in other regions or with other industry groups.

Closely related to the distribution of income is the Gini ratio. The Gini ratio is essentially a single figure summary of how evenly income is distributed among recipients within a group. The ratio is a relative measure; it has meaning only when two or more groups are compared. In this paper we use the Gini ratio to compare how income is distributed for farm and other proprietors.

The Gini ratio is the ratio of the area between the diagonal and the Lorenz curve to the total area under the diagonal (Figure 1).[5] As ordinarily used the theoretical value of the Gini ratio ranges from 0 to 1. A ratio near zero means that income was nearly equally distributed among proprietors. A value near 1 suggests that most of the income is received by a few proprietors.

Gini ratios computed for this paper indicate that the incomes of small manufacturers and farm proprietors are distributed similarly about their respective means despite large differences in mean income (Table 1). In fact, some farm proprietors do as well as their counterparts in manufacturing. Some measure of the degree of overlap of the two distributions is needed to reflect this aspect of income.

The Index of Integration

A measure that helps identify overlap of income distributions is the index of integration. If one distribution were superimposed on another the index of integration would measure the area in common to the two distributions (Figure 2).[6]

Table 1. SOLE PROPRIETORS REPORTING FOR FEDERAL INCOME TAX PURPOSES DISTRIBUTED BY AMOUNT OF INCOME AND MAJOR INDUSTRIAL CLASS, 1968.

	Amount of income				Number	Median income	Mean income	Gini[a]	Index of integration	Share ratio
	Less than $5,000	$5,000-$9,999	$10,000-$19,000	$20,000 or more						
	Percent				Thous.	Dollars	Dollars			
Farm	46	33	16	5	3,031	5,600	7,600	.509	1.00	.79
Contract construction	36	38	21	5	662	6,800	7,800	.407	.89	.81
Manufacturing	35	28	26	11	172	7,700	10,300	.507	.84	1.07
Transportation, communication, utilities	40	35	21	4	283	6,400	7,600	.438	.93	.79
Wholesale and retail trade	34	34	24	8	1,850	7,300	8,900	.454	.88	.92
Finance, insurance and real estate	21	30	33	16	507	9,900	13,400	.452	.72	1.39
Services	28	29	27	16	2,325	8,700	13,000	.498	.79	1.35

[a]The Gini ratios were calculated using eight income classes rather than the four presented on this table.

[3] Lawyers include all sole proprietorships offering legal advice or service on a contract or fee basis that are headed by members of the bar. Most farm proprietors are operators but some are landlords and others filing farm tax returns. Income includes that reported from all taxable sources.

[4] Other important measures of dispersion are the variance and standard deviation.

[5] A method for computing the Gini Ratio is given in [3]. Also see [1].

[6] The index of integration is calculated as:

$$I_{I,II} = \sum_{i=1}^{n} P_{i_I}, P_{i_I} < P_{i_{II}}, + \sum_{i=1}^{n} P_{i_{II}}, P_{i_{II}} < P_{i_I}$$

where $I_{I,II}$ is the index of integration, P_{i_I} is the percent of group I in income class i, and $P_{i_{II}}$ is the percent of group II in income class i. For a complete development and discussion of the measure see [6].

The index of integration gives a different perspective than either measures of central tendency or the Gini ratio. For example, differences between farm proprietors and legal services suggested by the mean and median are somewhat "toned down" by information gained from the index of integration. This index suggests that nearly half of the distribution for farm proprietors overlaps with that for legal services. The income distribution for legal services lies somewhere to the right of the farm distribution. Of course some distributions, such as for lumber and wood manufacturing, other than furniture, have lower mean incomes than farmers, indicating that the distribution lies to the left of that for farm proprietors.

COMPARISON OF FARM AND NONFARM BUSINESS INCOME

Statistics from tax returns provide some support for the view that farm proprietors generally have lower incomes than proprietors in other industries (Table 1). Among the six major nonagricultural industry groups only one, the transportation, communication and utilities group, reported mean incomes as low as those reported by farm proprietors. However, the farm group had, by far, the lowest median incomes. Farm proprietors also had the highest proportion with relatively low incomes; forty-six percent reported incomes of less than $5,000. This was a somewhat greater percentage than for any other group, including the transportation, communications and utilities group.

Historically, the largest single group of proprietors was those involved in farming. In 1968, they accounted for about one-third of all proprietors filing tax returns. Relatively large numbers and low incomes have caused policymakers to focus on their income problems. Proprietors in nonagricultural industries with low income problems are less numerous and dispersed among several heterogeneous subgroups. For this reason they often receive less attention.

Most comparisons of proprietors' incomes deal with the aggregate income of large groups and fail to show the relative income situation of subgroups. However, differences in income of proprietors can be observed by disaggregating the various industry groups and by using several measures of income.

Proprietors from 35 nonfarm industry subgroups for which reasonably complete data are available were listed in one of three classes based on median income (Table 2). Class I subgroups have median incomes of less than $6,500; these seem to have incomes similar to farm proprietors. Class II includes subgroups with median incomes somewhat larger than those of the farm group–greater than $6,500 but less than $10,000. Class III includes subgroups with median incomes of more than $10,000; these clearly have better incomes than farm proprietors. For convenience, the individual subgroups within each class are listed in order by size of Gini ratio, those with more equally distributed incomes first.

In addition to similar median incomes, there are other common characteristics among Class I firms. The income distributions for subgroups in Class I closely overlap those of the farm group as shown by the index of integration (Figure 3). The share ratios for the firms suggest that, like farm proprietors, these firms receive less than their share of aggregate proprietorship income. Most of the firms have competitive situations similar to those of farm proprietors. They are characterized by easy entry and limited possibility for product differentiation. In most cases, the proprietor would need limited training and relatively little capital. However, the firms come from several major industry groups and are heterogeneous in other respects. Ten of the fifteen subgroups had share ratios smaller than farm proprietors. Two–gasoline service stations and tourist courts and motels–had higher mean incomes than their farm counterparts, although their respective median incomes were slightly less than those for the farm group. Some individual firms in these two subgroups had fairly substantial incomes; many clearly do less well.

The mean and median can give distinctly different pictures. Only five of the subgroups had lower median incomes than farm proprietors, but ten had lower mean incomes. Further, the mean incomes of local transportation other than taxicabs, trailer parks and camps, and for general merchandise and variety stores were all about $7,600–the same as for farm proprietors. However, of these three only local transportation had a lower median income than the farm group.

Class II also includes a wide range of enterprises; most could be termed better-off, with respect to income, than farm proprietors. Some of the industry subgroups in the class are skilled trades (e.g., electrical work and plumbing, heating, and air conditioning). Others such as educational services, and agents, brokers, and managers probably have more formal education than is required for most Class I subgroups. For the most part, the income distributions for the industry subgroups in Class II lie somewhat to the right of those for the farm group (Figure 3).

Professional subgroups requiring much investment in education fell mainly in Class III. Their incomes, both median and mean, were substantially greater than for farm proprietors. Aside from the type of business organization most of these have little in common with farm proprietors.

Gini ratios, our measure of income inequality, varied greatly within the income classes and among the industry subgroups. Enterprises for which labor serves as the major inputs–such as carpentering, taxi driving, repair services, and engineering services appear to have somewhat lower Gini ratios than capital and land based operations. Among subgroups with larger Gini ratios are: farms, tourist courts and motels, trailer parks and camps, and general merchandise and variety stores.

Because the Gini ratio attempts to measure only relative equality without accounting for the absolute level of income, it would be possible to have more true poverty in a population for which incomes were equally distributed than in one for which incomes were unequal, but much higher. Overemphasis on the Gini Ratio could thus lead to serious misinterpretation.

CONCLUDING REMARKS

Our analysis was based entirely on total income and its distribution. Because it was not possible to account for productivity nor measure resource use, we do not draw implications on why given income patterns exist. The results do show important differences among the various subgroups, however. Each measure used adds a somewhat different dimension to the total picture and we conclude that it is better to use a combination of measures rather than one alone.

When the income situation of farm proprietors is compared with broad industry groups, the farm group appears to have income disadvantages. However, our analysis shows that farm proprietors are not the only proprietors with income problems. It is not clear which industry subgroups are actually worse off than farm proprietors. To a large extent this kind of judgment depends on which measure of income is given greater weight.

The importance of special training and formal education again emerges as an important determinant of income level, a theme we have all heard before. This appears to be one factor which distinguishes Class I from Classes II and III. Incomes in industries, which require considerable capital or land, tend to be less equally distributed than those for which labor is the most important factor. Thus, capital and land seem to be important in explaining income inequality within a subgroup.

After nearly four decades of farm commodity programs almost half of farm proprietors reported incomes of less than $5,000 in 1968. Thus, it seems doubtful that such programs hold the solution to farm income problems, although they benefit the agricultural sector by stabilizing markets and prices.

Arguments for general income maintenance programs are strengthened by continuing problems in the farm sector and by increased awareness of similar income problems in other sectors. A more general program that would help all low income people regardless of where they live or work has broader appeal and is thus likely to have more political support in the future than a narrow sector-by-sector approach.

Table 2. SELECTED INCOME MEASURES BY SUBINDUSTRIES AND MEDIAN INCOME, 1968

Industry Subgroups	Share ratio	Median	Mean	Index of integration	Gini ratio
Farm	.79	5,600	7,600	1.00	.51
		Class I -- Similar to farm			
Carpentering and flooring	.66	6,000	6,400	.88	.33
Taxicabs	.64	5,500	6,200	.86	.33
Painting, paperhanging and decorating	.66	5,900	6,300	.92	.36
Gasoline service stations	.81	5,200	7,800	.86	.37
Beauty shops	.72	6,400	7,000	.92	.39
Laundry, drycleaning plants, not coin	.77	5,900	7,400	.95	.42
Local transportation, not taxicabs	.79	5,300	7,600	.91	.42
Local and long distance trucking	.73	6,200	7,000	.94	.43
Drinking places	.68	5,700	6,600	.98	.44
Fisheries	.69	5,700	6,600	.96	.44
Eating places	.73	5,700	7,000	.97	.48
Trailer parks and camps	.79	6,000	7,600	.97	.52
General Merchandising and variety stores	.79	6,300	7,600	.94	.52
Lumber and wood manufacturing, not furniture	.70	3,600	6,700	.90	.58
Tourist courts and motels	.84	5,100	8,100	.88	.59
		Class II -- Greater than farm			
Repair, not automobile	.77	6,900	7,400	.86	.34
Horticultural services	.74	6,600	7,100	.88	.37
Coin laundries and drycleaning	1.02	8,200	9,800	.81	.38
Electrical work	.96	7,900	9,300	.83	.39
Roofing and sheet metal	.82	6,800	7,900	.90	.39
Plumbing, heating, and air conditioning	.97	8,800	9,400	.80	.40
Educational services	1.01	8,500	9,700	.80	.40
Appliance, radio, TV and music stores	.94	7,600	9,000	.84	.42
Agents, brokers, and managers	1.26	9,600	12,200	.94	.43
Home furnishing and equipment stores	.96	7,500	9,300	.86	.44
Printing, publishing, etc.	1.24	8,900	11,900	.77	.44
Liquor stores[a]	1.16	9,100	11,200	.75	.44
Womens dress, accessories and fur shops	1.09	8,000	10,500	.83	.46
Theatrical producers, banks, orchestras and entertainers	1.05	7,700	10,100	.86	.48
		Class III -- Much greater than farm			
Engineering services	1.79	14,300	17,200	.52	.34
Insurance agents, brokers and services	1.37	10,500	13,200	.69	.38
Veterinaries and animal hospitals[a]	1.71	13,700	16,400	.59	.39
Legal services[a]	2.39	17,400	23,000	.45	.40
Advertising	1.33	11,800	12,800	.64	.43
Consulting services	2.11	14,600	20,300	.55	.48

[a]Gini ratios were calculated using seven rather than eight income size classes. The first two classes were combined. Tests by the authors showed Gini ratios to be slightly understated.

Figure 1

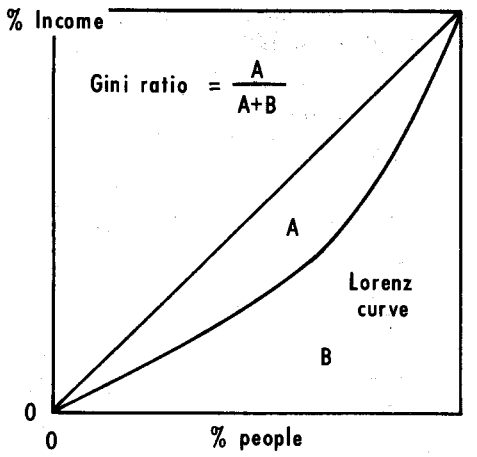


Figure 2

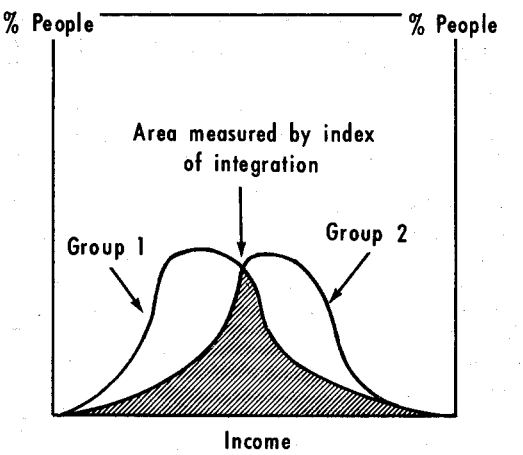
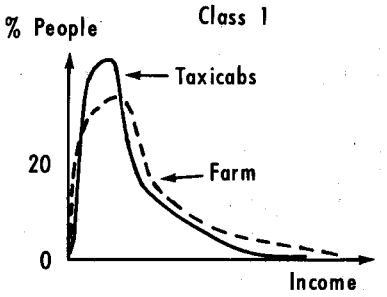
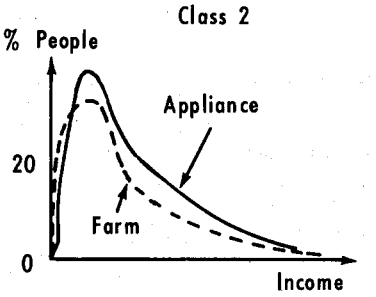
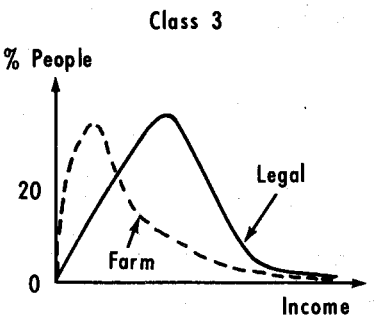


Figure 3







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