FARM INCOMES: A LOOK AT LEVELS, ORIGINS, DISTRIBUTIONS AND FARM / NON-FARM COMPARISONS

By

R. Paul Shaw
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AND FARM:NON-FARM COMPARISONS

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1. Introduction.

This paper is part of a project aimed at making rigorous intersectoral comparisons of the level and nature of incomes received by farmers and non-farmers. It preceeds development of a conceptual framework on complexities of making intersectoral income comparisons (currently underway), in that it summarizes the most up-to-date information on farm versus non-farm incomes, distributional aspects of total farm income by source, and conditioners of differential farm family income. As such, the analysis herein is but a beginning; it seeks to lay the empirical groundwork to a full inquiry into the monetary well-being of farm families.

The paper is organized into six sections. Section 2 briefly summarizes major limitations of intersectoral income comparisons which draw on presently available data from census or survey sources. In effect, section 2 serves warning that findings
deriving from our analysis of farm:non-farm income data presented in section 3 are subject to a number of methodological disclaimers. Section 4 focuses solely on distributional aspects of total income and self-employment farm income of farm families according to select farm characteristics. Section 5 summarizes results of a study which seeks to account for areal variations in total farm family incomes using 1971 census data, and section 6 sums up.

2. Interpreting Farm Incomes: Disclaimers and Methodological Notes.

When comparing incomes between sectors, it is important to keep the following in mind;

1) Income is a flow concept. It measures a return to factor endowments hired for a period of time (i.e., a person with certain skills earning a wage or salary), or a return to ownership or rental of factors of production (a farmer operating his own or rented land and machinery). Thus, income flows may be interrupted at any time due to health problems, unemployment (in cases of wages and salaries), harvest disasters in farming etc. This means that income received over a particular time interval may not necessarily represent either potential or usual income.

This point is particularly relevant when farm:non-farm comparisons rely on census or survey data. For example, the census of Canada uses the snap-shot principle; that is, income reported is assumed to represent the average income situation of the "average" person.
reporting income (see, census of population income questions, Appendix I). Yet, we know very well that fluctuations in incomes of self-employed farmers between years $t - 1$, $t$, and $t + 1$, will be more than, say, for wage and salary workers. In particular, variations in weather cause major fluctuations in net self-employment farm income and, depending on the timing of a particular census or survey, resulting data may be highly unrepresentative of the long term situation (e.g., untypical of average income over a decade).

2) Whenever income questions are enumerated by a census, truthfulness of replies, accuracy of recall, etc., will be in some doubt.

3) Though the census of Canada seeks to enumerate incomes before deductions, self-employment earnings do not always represent total "earned income before deductions". For example, self-employed farmers are permitted to report income after operating costs. Such costs may be exaggerated (i.e., covering capital deepening as well as legitimate depreciation and operating costs). Further, if self-employed farmers also earn off-farm wage and salary income, we can imagine overstatement of operation costs toward reducing total taxable income. If such manipulations have been carried out by farm operators, is it not reasonable to assume that the resulting figures would also be reported to the census towards insuring consistency with Canada tax forms (i.e., 1971 census enumerated
in June with income questions pertaining to 1970 for which income tax returns would have just been filed previous to the census)?

4) Income may also take the form of *income in kind*. Some occupations simply have greater opportunities to produce and consume their own output without having to go through the largely monetary market place. Thus, for those who earn largely wage and salary income, their production is compensated for by cash income with which they then purchase goods and services. For those in the self-employment labour force, their production is not only compensated by cash income but, to a considerably greater extent, they produce and consume goods without monetary transactions. Farm populations are most prone to receive income as *income in kind*, and increasingly so the less developed the monetary system and market economy.

5) Income does not adequately represent *levels of socio-economic well-being* as it does not take into account differentials in wealth (i.e., a stock concept). Thus, for two persons with different wealth levels, interpretation of income flows means different things. One of the most difficult questions to answer, concerns the extent to which overall well-being of farmers would increase or decrease relative to well-being of non-farm persons if capital stock of each population subgroup could be translated into income flows. With rising land prices and inflation, there can be little doubt that ownership of land is taking on increasing
importance in farmer well-being.

6) Income tells us nothing about levels of living as reflected in publically provided amenities and facilities or those indigenous to the area. Thus, persons with a high level of income but no access to running water, public transportation etc., will have a lower level of living than others with the same income but access to such facilities (all else held constant).

7) Income tells us nothing about relative costs of food, clothing, taxes, housing - all of which have differential impact on consumption power of the dollar.

8) Income levels tell us nothing about relative income (an economic concept) or relative deprivation (a sociological concept), unless we know something about (i) the distribution of incomes within and between areas, and (ii) relative deprivation deriving from perception of income inequalities within areas.

Without doubt, each problem noted about (and the list could easily be extended), serves to place into question the validity and utility of (i) estimating intersectoral income comparisons, and (ii) judging the absolute adequacy of average incomes. At the same time, however, we must acknowledge the persistent call for ball-park estimates of how incomes in Canada's farm sector measure up. Thus, keeping the disclaimers noted above strongly in mind, let us turn to some crude intersectoral
income comparisons.

3. Intersectoral Income Comparisons.

Previous to the 1971 Census of Canada, prospects for analyzing data on farm incomes have been virtually non-existent. This is evident in the 1969 report of the Federal Task Force on Agriculture which sought to profile low income farm households using extremely crude indices of returns to farming such as farm sales, farm capital value etc. With the 1971 Ag.-Pop. Linkage, however, prospects for evaluating levels and sources of income earned by farmers have been greatly enhanced. Accordingly, this study draws heavily on the 1971 Ag.-Pop. data base and to a lesser extent on such sources as the 1941 Census of Agriculture and the 1958 Sample Farm Survey for purposes of crude historical comparisons.

3.1. Per Capita Comparisons.

Our first intersectoral income comparison relates to per capita income differentials. These are graphed in Figure I for all Canadians, urban persons, and census farm persons (with and without a crude adjustment for income in kind). The referent year for the 1971 census is 1970, (see Appendix I). Emphasis is, of course, on relative differentials, not on absolute differentials or levels, as misreporting of absolutes has probably confounded the validity of census income figures to some extent. About all
Figure I: Intersectoral Per Capita Incomes of *All Canadians*, Urban Persons and Census Farm Persons, Canada and Provinces, 1971.

Source: 1971 Ag.-Pop. Linkage
we can do is assume that such misreporting is more or less equally distributed in both the farm and non-farm sector (meaning that truthfulness of income levels will be biased downward or upward to a similar extent in both sectors).

Figure I conveys the following:

1) Per capita cash incomes in Canada's farm sector are about one-half those of Canada's urban sector (i.e., a ratio of about $1,500/3,000). With an adjustment for income in kind the per capita farm:non-farm ratio increases to about .62 (i.e., a ratio of about $1,875/3,000).

2) Provincial economies obviously bear on differentials in level of farm versus non-farm per capita incomes. For example, in Ontario and British Columbia, we observe higher per capita incomes than in any other province, and this applies to both the urban and farm sector.

3) Level of farm versus non-farm per capita income appears to be more sensitive to regional economies (as represented by province of residence), than does the size of the relative differential between farm:non-farm per capita incomes.

Now, it is important to mention that 1970 (the referent year for the 1971 Census of Agriculture), was not a particularly good year for wheat farming. This means that the intersectoral gap between per capita incomes is probably slightly wider than
it would normally be for Canada as a whole and, especially for the prairie provinces. To give an idea of the magnitude of the "wheat problem" we have incorporated a crude adjustment at the Canada level. Our adjustment results in a narrowing of the relative intersectoral per capita income differential from .62 to about .7.7

3.2. Comparisons of Income Recipients.

Just as it is important to evaluate incomes of all persons among whom income (earned and otherwise) is distributed, it is important to compare levels and differentials of income recipients themselves. Comparisons among all Canadians, urban persons and census farm persons aged 15+ with income are presented in Table I, columns 1-3; they indicate the following;

1) Considering average cash incomes only, the previously observed census farm to urban per capita ratio of .50 climbs to about .68 for income recipients (column 3 divided by column 2, Table I).

2) Level and size of the relative differential between average incomes of farm versus non-farm income recipients appears to follow the same pattern between provinces as was noted in Figure I.
Table I: Average and Median Income of ALL Canadians, Urban Persons and Census Farm Persons Aged 15+ with Income, Canada and Provinces, 1971.

<table>
<thead>
<tr>
<th>Area</th>
<th>All Persons* (1)</th>
<th>Urban Persons (2)</th>
<th>Census Farm Persons (3)</th>
<th>All Persons* (4)</th>
<th>Urban Persons* (5)</th>
<th>Census Farm Persons (6)</th>
<th>Ratio Median to Average Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>$5033</td>
<td>5317</td>
<td>3633</td>
<td>3943</td>
<td>4288</td>
<td>2389</td>
<td>.81</td>
</tr>
<tr>
<td>NFL</td>
<td>3816</td>
<td>4382</td>
<td>3216</td>
<td>2727</td>
<td>3309</td>
<td>2057</td>
<td>.76</td>
</tr>
<tr>
<td>PEI</td>
<td>3416</td>
<td>4109</td>
<td>2734</td>
<td>2368</td>
<td>2920</td>
<td>1856</td>
<td>.71</td>
</tr>
<tr>
<td>NS</td>
<td>4210</td>
<td>4704</td>
<td>3164</td>
<td>3181</td>
<td>3645</td>
<td>2183</td>
<td>.77</td>
</tr>
<tr>
<td>NB</td>
<td>3946</td>
<td>4408</td>
<td>3004</td>
<td>2965</td>
<td>3417</td>
<td>2019</td>
<td>.78</td>
</tr>
<tr>
<td>QUE</td>
<td>4969</td>
<td>5199</td>
<td>3585</td>
<td>4048</td>
<td>4303</td>
<td>2724</td>
<td>.83</td>
</tr>
<tr>
<td>ONT</td>
<td>5459</td>
<td>5634</td>
<td>4208</td>
<td>4426</td>
<td>4625</td>
<td>2715</td>
<td>.82</td>
</tr>
<tr>
<td>MAN</td>
<td>4452</td>
<td>4842</td>
<td>3097</td>
<td>3320</td>
<td>3761</td>
<td>1910</td>
<td>.78</td>
</tr>
<tr>
<td>SAS</td>
<td>3926</td>
<td>4497</td>
<td>3097</td>
<td>3368</td>
<td>2725</td>
<td>1914</td>
<td>.61</td>
</tr>
<tr>
<td>ALT</td>
<td>4978</td>
<td>5321</td>
<td>3664</td>
<td>3746</td>
<td>4175</td>
<td>2251</td>
<td>.78</td>
</tr>
<tr>
<td>BC</td>
<td>5255</td>
<td>5329</td>
<td>4624</td>
<td>4093</td>
<td>4179</td>
<td>3023</td>
<td>.78</td>
</tr>
</tbody>
</table>

Source: 1971 Ag.-Pop. Linkage
Of course, a danger in comparing average incomes, especially between aggregated subgroups, is that disparities between average and median income may be larger among one subgroup than another. This is observed to be the case in Table I, columns 7 and 8 where the disparity in the urban versus farm ratio of "median to average income" is about 10-20% (excluding Manitoba). In effect, this means that the distribution of incomes of income recipients is more unequal in rural farm areas than in urban areas. At the same time, however, the values of provincial ratios are more even in the farm sector than in the urban sector (Ontario being the exception). For purposes of drawing relative comparisons, this implies that we are safer comparing average incomes among provincial populations in Canada's farm sector than we are in comparing average income among provincial populations in Canada's urban sector. This serves as partial justification for our focus on average versus median farm income data in later sections.

3.3. Family Comparisons.

In drawing income comparisons among families, we would only expect the farm:non-farm income gap to narrow further if (i) family size were larger in rural-agricultural areas, and (ii) larger family size resulted in a larger number of income earners per family unit. While it is usually true that farm families are larger than urban families, the Canadian farm:non-farm family size differential is relatively small. One reason
is that Canada's rural-farm sector is populated by a large proportion of "empty-nest" families. Another reason is that a large proportion of young childbearing couples typically migrate out of rural-agricultural areas. Furthermore, slightly larger farm family size does not necessarily imply more potential income earners per family unit given the tendency of farm family members (other than the operator head) to work as unpaid family labour.

In fact, productivity of unpaid family workers is usually reflected in income reported by the farm operator family head (i.e., income that represents a return on his labour and that of his dependents rather than a return on his labour minus a paid wage for hired labour).

Provincial comparisons of farm:non-farm family incomes are graphed in Figure II and indicate the following;

1) When the family is the unit of comparison, the ratio of census farm to urban family income is slightly lower. The ratio is about .67.

2) Again, Figure II attests to provincial peaks and dips in average family income that are similar to those noted in Figure I and Table I.
Figure II: Comparison of Average Total Family, Urban Family, CMA Family and Census Farm Family Income, Canada and Provinces, 1971.

Source: 1971 Ag.-Pop. Linkage
Definition: CMA = Census Metropolitan Area
In the writer's view, a more realistic intersectoral income comparison would take into consideration some estimate of *income in kind* enjoyed by farm families (see point (4) in section 2). To this end, we have applied the same method that was used to adjust per capita incomes (see footnote 5 pertaining to Figure I). The only difference is that we use estimates of *income in kind per family member* and data on average provincial farm family size to derive additions to average total family *cash* incomes. Results are graphed in Figure III. For Canada, they indicate that the aforementioned intersectoral family *cash* income ratio of .67 rises to about .84 after an adjustment for *income in kind*. Indeed, for the provinces of Newfoundland and British Columbia, the ratio exceeds 1.0 and for Nova Scotia, Prince Edward Island and Ontario it is over the .95 mark. In contrast, for Manitoba a large gap is evident.

3.4 Estimates of Differentials in Low Income Families.

Towards gauging poverty in Canada's farm and non-farm sector, Figure IV, Part A, charts proportions of urban and census farm families with relatively low income levels. Interpretation of Figure IV rests on the assumption that $5,000 *total* family
Figure III: Ratios of Total Farm Family Income to Total Income of Urban Families, Canada and Provinces, 1971*

Source: 1971 Ag.-Pop. Linkage.
Figure IV: Comparison of Proportions of Total Families, Urban Families and Census Farm Families with Less Than $5,000 Total Income and Greater Than $15,000 Total Income, Canada and Provinces, 1971.

PART A

% Families with Less than $5,000 Total Income

- Census Farm Families
- Rural Families*
- Total Families*
- Urban Families*

PART B

% Families with Greater than $15,000 Total Income

- Urban Families*
- Total Families*
- Census Farm Families
- Rural Families*

Source: 1971 Ag.-Pop. Linkage
income per year (before tax deductions) is a reasonable low level income cut-off line for gauging poverty in both rural farm and urban areas. In defense of this assumption, consider the following:

a) Canada has no official poverty lines but Statistics Canada initially developed and updated 1961 low level income cut-off lines which have been used by the Economic Council of Canada in its 5th and 6th annual reviews. 9

b) The revised low level income cut-off lines (based on expenditure data from the 1969 family expenditure survey), are (i) approximately $5,000 for an "average" urban family of 3.5-4.0 persons (2 adults, 2 children), for 1970 (the census referent year for reported income), and (ii) approximately $4,500 for an "average" rural farm family of 4.0-5.0 (2 adults, 2-3 children) in 1970. At first impression, the rural farm family size of 4-5 may seem small; however, high out-migration of young census farm males and females, and prevalence of older family heads, underscores the fact that a large proportion of census farm families are "empty-nest" families.

Of course, in using the $5,000 figure as a cut-off, we have no illusions that this is little more than a statistical device which helps us monitor the general situation thereby permitting some analysis of size and characteristics of the low-income population.
With the above in mind, Table II and Figure IV reveal that approximately 46% of Canada census farm families fall below this line versus approximately 18% of urban Canada families, or about 2.6 times as many.

Now, with respect to the high end of the scale, Table II and Figure IV, Part B reveal that the gap between proportions with higher levels of family income is of a similar order of magnitude; about 8.4% of census farm families attain $15,000 or more total income per year as against about 16.0% of Canada urban families, or a little more than half as many. Not only are low and high level income gaps relatively constant between provinces, but we observe all family subgroups (i.e., rural, urban etc.), covarying similarly between provinces. This is an additional reminder that provincial economies operate as a major conditioner of levels of cash incomes regardless of the unit of analysis (e.g., income recipients, families).

3.5. Inequalities in Distribution of Incomes.

Toward gauging income inequality; Lorenze curves for Canada and Gini coefficients for provinces are presented in Figure V and Table III. Our concern here is less with parity of farm: non-farm incomes than with inequalities within each sector, and the extent to which relative deprivation, as represented by the distribution of cash incomes, is greater in the farm sector.
Table II: Distribution of Families by Total Family Income, Canada, 1971

<table>
<thead>
<tr>
<th>Distribution of Income</th>
<th>% Total</th>
<th>% Urban</th>
<th>% Rural</th>
<th>% Census Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ &lt; 2,000</td>
<td>5.5</td>
<td>3.9</td>
<td>10.7</td>
<td>15.2</td>
</tr>
<tr>
<td>2,000-4,999</td>
<td>17.2</td>
<td>13.8</td>
<td>29.0</td>
<td>30.9</td>
</tr>
<tr>
<td>5,000-9,999</td>
<td>38.4</td>
<td>38.6</td>
<td>37.5</td>
<td>32.2</td>
</tr>
<tr>
<td>10,000-14,999</td>
<td>24.8</td>
<td>27.6</td>
<td>15.4</td>
<td>12.8</td>
</tr>
<tr>
<td>15,000-19,999</td>
<td>8.3</td>
<td>9.5</td>
<td>4.3</td>
<td>4.5</td>
</tr>
<tr>
<td>20,000+</td>
<td>5.5</td>
<td>6.3</td>
<td>2.8</td>
<td>4.2</td>
</tr>
<tr>
<td>No Income Reported</td>
<td>.3</td>
<td>.3</td>
<td>.3</td>
<td>.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Number
- 5,076,085
- 3,929,410
- 1,146,345
- 304,450

Average Family Income
- $9,600
- 10,298
- 7,209
- 6,939

**1971 Ag.-Pop. Linkage.
Figure V: Lorenze Curves for Urban Family, Rural Family and Census Farm Family Income, Canada, 1971.

\[ G = \text{Gini Coefficient of Concentration} \]

- Urban Family: \( G = 0.295 \)
- Rural Family: \( G = 0.350 \)
- Census Farm Family: \( G = 0.470 \)
Table III: Gini Coefficients: Census Farm Families and Urban Families, Canada and Provinces, 1971.

<table>
<thead>
<tr>
<th>Area</th>
<th>Census Farm Families (1)</th>
<th>Urban Families (2)</th>
<th>Ratio (1)/(2) (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>.45</td>
<td>.29</td>
<td>1.55</td>
</tr>
<tr>
<td>NFL</td>
<td>.41</td>
<td>.31</td>
<td>1.32</td>
</tr>
<tr>
<td>PEI</td>
<td>.42</td>
<td>.32</td>
<td>1.31</td>
</tr>
<tr>
<td>NS</td>
<td>.41</td>
<td>.30</td>
<td>1.37</td>
</tr>
<tr>
<td>NB</td>
<td>.43</td>
<td>.31</td>
<td>1.39</td>
</tr>
<tr>
<td>QUE</td>
<td>.43</td>
<td>.31</td>
<td>1.39</td>
</tr>
<tr>
<td>ONT</td>
<td>.42</td>
<td>.26</td>
<td>1.61</td>
</tr>
<tr>
<td>MAN</td>
<td>.46</td>
<td>.31</td>
<td>1.48</td>
</tr>
<tr>
<td>SAS</td>
<td>.47</td>
<td>.31</td>
<td>1.52</td>
</tr>
<tr>
<td>ALT</td>
<td>.48</td>
<td>.30</td>
<td>1.60</td>
</tr>
<tr>
<td>BC</td>
<td>.40</td>
<td>.25</td>
<td>1.60</td>
</tr>
</tbody>
</table>
According to the Lorenze curves in Figure V, the distribution of incomes among census farm families is about 1.55 times more unequal than among urban families. This implies that Canada census farm families are not only worse off than their urban counterparts in terms of the level of their cash incomes but are confronted by a greater range of inequality of incomes within their own sector. According to Table III, the provincial ratios of farm family to urban family Gini indices lie in a similar range between 1.3 to 1.6.\textsuperscript{12}

3.6. Intersectoral Comparisons Over Time.

Is the relative situation of Canada's census farm population improving over time? As noted previously, answers to this question are extremely elusive given the paucity of historical data on farm incomes. One clue derives from analysis of crudely estimated ratios of net farm income per farm population\textsuperscript{13} to disposable income per total population\textsuperscript{14} over the period 1941-1971. Results are graphed in Figure VI. At the very least, the time trends in Figure VI indicate notable recoveries in returns to farming per se among the prairie provinces after World War II. The data further underscore the seemingly lower returns to farming enjoyed by the Maritime provinces and Quebec, versus the high returns in Ontario and British Columbia.

A second clue that the gap is narrowing derives from
Figure VI: Ratio of Net Farm Income per Farm Population to Disposable Income per Total Population, Canada and Provinces, 1941-1971*.

<table>
<thead>
<tr>
<th>Province</th>
<th>1941</th>
<th>1961</th>
<th>1966</th>
<th>1971</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saskatchewan</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alberta</td>
<td></td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manitoba</td>
<td></td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>Ontario</td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>British Columbia</td>
<td></td>
<td></td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>Quebec</td>
<td></td>
<td></td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>New Brunswick</td>
<td></td>
<td></td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td></td>
<td></td>
<td></td>
<td>0.1</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

farm:non-farm comparisons of total family income which makes use of farm family data from the 1941 Census of Agriculture, the 1958 Sample Farm Survey and the 1971 Ag.-Pop. linkage. In 1941, the ratio of total farm family income to that of urban families was approximately .40 (a ratio of $760/1,800). By 1958, the ratio was about .58 ($3,600/5,800), and by 1970 it had climbed to approximately .67 ($6,900/10,200). If we were to adjust the 1970 ratio upwards to compensate for poor returns to wheat farmers, the 1970 ratio would probably lie somewhere around .70 (i.e., footnote 7 implies an upward adjustment of 14% to that share of 1971 farm family income that derives from farming).

The figures above imply that the cash income gap between farm and non-farm families has closed by about 30 points over the 30 year period between 1941-1971. Had the 1958 Sample Farm Survey not used the 1951 Census of Agriculture definition of a census farm (which tends to exclude small-scale, less well-to-do farms), we would probably observe (i) a lower 1958 ratio of farm:non-farm incomes and, therefore, (ii) a similar rate in the closing of the gap between 1941-1958 and 1958-1971.16

What of the post-1971 period? Again we are in the position of having to produce ball-park estimates using barely adequate data. To this end, we use (i) the 1971 Ag.-Pop. data on total farm family income, (ii) disaggregate total farm family income into shares from farm and non-farm sources, and (iii) grow
each share according to overall economic performance of Canada's farm and non-farm sector over the years 1972 and 1973 (years for which data were available). Results of this exercise are summarized in Table IV for Canada and are graphed in Figure VII for provinces; the formula used in our calculations is presented elsewhere. (Unlike our previous intersectoral comparisons, the denominator of the ratios in Figure VII is the total income of all Canada families, not urban families.)

With respect to both cash incomes and incomes adjusted for income in kind, Table IV and Figure VII indicate a further narrowing of the income gap between farm and non-farm families. By 1974 (a good year for farmers), there was an improvement of about six points over the 1970 ratio.

To some extent, a steady growth in off-farm employment income, and, to a large extent, recovery among the prairie provinces in net self-employment farm income combined to reduce the income gap by another 10-15% (relative to the level in 1970). Further, according to Figure VII, an adjustment for income in kind elevates census farm families almost to parity with all families in most provinces by 1973. (Note, in Table IV, that the ratio is considerably lower and moves from about .80-.85 when average total incomes of metropolitan families is used as the denominator.)
Figure VII: Ratio of Farm Family Total Cash Income to Total Cash Income of All Canadian Families: Provinces, 1971*.

Source: *Ratios Calculated using:
- 1971 Ag.-Pop. Data Base,
Table IV: Ratios of Census Farm Family Income to Urban Family Income, Canada, Select Years*.

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Cash Income</th>
<th>Cash Income Adjusted for Income in Kind</th>
<th>Non-Farm Family Unit Used as Denominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1941</td>
<td>(Census of Agriculture)</td>
<td>.40</td>
<td>.57</td>
<td>-Urban Families Headed by Wage Earners</td>
</tr>
<tr>
<td>1958</td>
<td>(Sample Farm Survey)</td>
<td>.58 (.54)</td>
<td>.70 (.62)</td>
<td>-Urban Families</td>
</tr>
<tr>
<td>1970</td>
<td>(Ag.-Pop. Linkage)</td>
<td>.67 (.72)</td>
<td>.80 (.85)</td>
<td>-Urban Families (All Families)</td>
</tr>
<tr>
<td>1971</td>
<td>Estimate</td>
<td>.65 (.72)</td>
<td>.80 (.85)</td>
<td>-Metropolitan Families (All Families)</td>
</tr>
<tr>
<td>1972</td>
<td>Estimate</td>
<td>.69 (.76)</td>
<td>.83 (.91)</td>
<td>-Metropolitan Families (All Families)</td>
</tr>
<tr>
<td>1973</td>
<td>Estimate</td>
<td>.72 (.79)</td>
<td>.86 (.95)</td>
<td>-Metropolitan Families (All Families)</td>
</tr>
<tr>
<td>1974</td>
<td>Estimate</td>
<td>.73 (.80)</td>
<td>.89 (.98)</td>
<td>-Metropolitan Families (All Families)</td>
</tr>
</tbody>
</table>

*Source: See Footnote 15.
As observed in previous comparisons, Figure VII reveals that Manitoba lags considerably behind. Manitoba also experiences the smallest yearly improvements. In contrast, the Maritime provinces seem to have surged ahead; this may be a welcome reflection of the heavy federal programming aimed at relocating underemployed farmers to more viable jobs and consolidating "abandoned" farms into more economically viable enterprises.

This concludes our highly aggregated farm:non-farm intersectoral income comparisons. Admittedly, many of the calculations presented in this section are open to question. Refinements are definitely needed. Nevertheless, indications are that the income gap between the farm and the non-farm sector is closing. This is not to say, however, that Canada's farm sector is not beset by large pockets of low income persons or greater inequality of incomes than we might find in Canada's urban sector. It is the task of further research to indicate who and where the afflicted are. As noted in section 2, it is also the task of further research to adjust cash incomes according to differentials in ownership of farm capital versus ownership of urban residential properties, indebtedness, etc., toward estimating just how far our cash income comparisons are amiss of the "true" relative economic well-being of Canadian farm families.
4. Disaggregating Incomes by Source and Select Farm Characteristics.

4.1. Introduction.

In section 3, incomes of *census-classified* farm families have been aggregated, averaged and compared with incomes of urban families without regard to (i) the fact that some farm families are much more reliant on farming as a source of livelihood than others, and (ii) the strong possibility that largely farm-reliant families have lower incomes than those with off-farm sources of income. The implication of (ii) for our intersectoral income comparisons is that aggregation of incomes of all census farm families may have biased the relative income situation of Canada's largely *farm-dependent* population upwards. This section seeks to clarify income and farm characteristics of *census-classified* farm families according to select indices of farm involvement. Again, we rely, almost exclusively on the 1971 Ag.-Pop. linkage as our data source.

4.2. A Look at Farm:Non-Farm Involvement of Census Farm Population.

Without doubt, one of the most interesting characteristics of Canada's 1971 economically active farm population is the large share of *total* farm family income that derives from off-farm sources. According to the 1971 Ag.-Pop. linkage, about 25% of the 645,000 economically active, resident, census farm pop-
ulation (of a total 1,496,000 residents, and 1,672,000 in all), were classified as non-farm operators working as wage and salary earners, 50% were classified as census farm operators with varying degrees of involvement in off-farm jobs, and 25% were classified as unpaid farm family workers.

The growing importance of off-farm income to Canada census farm families is revealed in Figure VIII where we observe a declining share of total family income originating from net self-employment farming between 1941 and 1971. Compared with 1941, the absolute level of 1971 net self-employment farm income of farm families increased only about threefold for Canada as a whole. In contrast, the increase in off-farm employment income has been about fivefold; the ratio of off-farm employment income to net self-employment income for Canadian resident census farm families in 1941 was about 1/6 compared with about 2.0 in 1971. Similar orders of magnitude are observed for the provinces.

Table V gives an idea of just how large a proportion of all Canada's census farm operators receive employment income (column 3) and were involved in non-farm occupations during census week (the inverse of figures in column 2). That is, about 35% of Canada's 1971 census farm operators reported other than a farm occupation during census week, about 38% received wage and salary income during 1970, and about 46% received employment income during 1970. These proportions are as high as 65%, 56% and 71%,
Figure VIII: Farm Family Income from Farming, Off-Farm Sources and Off-Farm Employment, Regions, 1941, 1958, 1971.

Legend:
- Net Self-Employment Farm Income
- Off-Farm Employment Income
- Total Off-Farm Income from All Sources

Source: 1941 Canada Census of Agriculture
1958 Farm Survey, Report, No. 2, DBS., 1958, CAT. NO. 21-509
1971 Canada Census of Agriculture, Unpublished Data

Note: Unlike the 1941 and 1971 Census Farm Definition (farm = 1 acre + $50 sales as minimum), the 1958 survey uses the 1951 Census Farm Definition (farm = 1 acre + $250 sales as a minimum).
Table V: Involvement of Census Farm Operators in Off-Farm Occupations and Work, Canada and Provinces, 1971*.

<table>
<thead>
<tr>
<th>Area</th>
<th>% Census Farm Operators Classified as Self-Employed Agricultural Workers during Census Week</th>
<th>% Census Farm Operators Reporting Farm Occupation during Census Week</th>
<th>% Census Farm Operators Reporting Off-Farm Employment Income</th>
<th>% Farm Operators Reporting Wage and Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>55.7</td>
<td>64.9</td>
<td>46.3</td>
<td>37.8</td>
</tr>
<tr>
<td>NFL</td>
<td>26.0</td>
<td>34.4</td>
<td>71.3</td>
<td>55.7</td>
</tr>
<tr>
<td>PEI</td>
<td>54.0</td>
<td>60.6</td>
<td>47.7</td>
<td>37.0</td>
</tr>
<tr>
<td>NS</td>
<td>38.2</td>
<td>46.0</td>
<td>63.9</td>
<td>52.5</td>
</tr>
<tr>
<td>NB</td>
<td>40.5</td>
<td>47.3</td>
<td>60.6</td>
<td>50.5</td>
</tr>
<tr>
<td>QUE</td>
<td>51.3</td>
<td>59.9</td>
<td>47.6</td>
<td>38.7</td>
</tr>
<tr>
<td>NT</td>
<td>49.2</td>
<td>57.2</td>
<td>53.0</td>
<td>45.0</td>
</tr>
<tr>
<td>MAN</td>
<td>63.3</td>
<td>73.3</td>
<td>40.3</td>
<td>32.0</td>
</tr>
<tr>
<td>AS</td>
<td>69.1</td>
<td>79.3</td>
<td>34.0</td>
<td>26.2</td>
</tr>
<tr>
<td>ALT</td>
<td>60.2</td>
<td>70.9</td>
<td>43.7</td>
<td>35.3</td>
</tr>
<tr>
<td>BC</td>
<td>31.4</td>
<td>39.0</td>
<td>67.6</td>
<td>58.2</td>
</tr>
</tbody>
</table>

Source: *1971 Ag.-Pop. Linkage.
respectively, in Newfoundland, and between 20-30%, 25-35%, and 34-44%, respectively, in the prairie provinces.

Another gauge of economic dependency on farming is major source of income. Use of this variable compliments data in Table V as it pertains to the relative importance of the magnitude of income earned from farm versus non-farm sources over an entire work year. Table VI indicates that even larger proportions of resident census farm family heads report wages and salaries as their major source (41.2% for Canada), whereas only 43.9% report self-employment farming as a major source. (About 7% of these farm family heads report no income.)

Again, census farm family heads (about 96% males) in Newfoundland appear considerably less dependent on self-employment farming as a source of livelihood (17%, see column 2), whereas prairie farmers are most dependent (50-60%). Yet, even in the case of Manitoba and Alberta, almost one-half of resident census farm operators do not appear to be reliant on farming as a major source of income.

Data in Table VII, rows 1-4, come almost as a shock. They indicate that only 43.5% of Canada's census farm operators derive more than 50% of their total income from farming (columns 3 and 4 combined). This proportion is as low as 18% for Newfoundland; only in the case of Saskatchewan does it exceed 50%. Row 5 reveals that only 21.3% of all Canada census farm families...
Table VI: Percentage Distribution of Family Heads Aged 15+ With Income by Major Source of Income, Canada and Provinces, 1971.*

Major Source of Income of Family Heads

<table>
<thead>
<tr>
<th>Area</th>
<th>% Total With Income (1)</th>
<th>% Wages and Salaries (2)</th>
<th>% Self Employment Farming (3)</th>
<th>% Self Employment Non-Farming (4)</th>
<th>% Government Transfers (5)</th>
<th>% Pensions et al. (6)</th>
<th>Total no. with Income (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>100.0</td>
<td>41.2</td>
<td>43.9</td>
<td>5.0</td>
<td>6.4</td>
<td>3.5</td>
<td>300,095</td>
</tr>
<tr>
<td>NFL</td>
<td>100.0</td>
<td>54.2</td>
<td>16.8</td>
<td>7.4</td>
<td>20.0</td>
<td>1.6</td>
<td>950</td>
</tr>
<tr>
<td>PEI</td>
<td>100.0</td>
<td>42.6</td>
<td>37.8</td>
<td>5.4</td>
<td>12.6</td>
<td>1.6</td>
<td>4,080</td>
</tr>
<tr>
<td>NS</td>
<td>100.0</td>
<td>57.7</td>
<td>21.7</td>
<td>6.2</td>
<td>10.8</td>
<td>3.6</td>
<td>5,330</td>
</tr>
<tr>
<td>NB</td>
<td>100.0</td>
<td>54.7</td>
<td>24.9</td>
<td>6.5</td>
<td>11.2</td>
<td>2.7</td>
<td>4,850</td>
</tr>
<tr>
<td>QUE</td>
<td>100.0</td>
<td>44.1</td>
<td>40.7</td>
<td>5.5</td>
<td>7.5</td>
<td>2.2</td>
<td>55,650</td>
</tr>
<tr>
<td>QNT</td>
<td>100.0</td>
<td>49.8</td>
<td>36.0</td>
<td>4.7</td>
<td>4.7</td>
<td>4.8</td>
<td>81,175</td>
</tr>
<tr>
<td>MAN</td>
<td>100.0</td>
<td>36.0</td>
<td>49.7</td>
<td>4.5</td>
<td>7.2</td>
<td>3.1</td>
<td>28,600</td>
</tr>
<tr>
<td>SAS</td>
<td>100.0</td>
<td>24.5</td>
<td>62.0</td>
<td>4.3</td>
<td>6.0</td>
<td>3.2</td>
<td>53,855</td>
</tr>
<tr>
<td>ALT</td>
<td>100.0</td>
<td>36.1</td>
<td>49.2</td>
<td>5.4</td>
<td>6.3</td>
<td>3.0</td>
<td>50,235</td>
</tr>
<tr>
<td>BC</td>
<td>100.0</td>
<td>61.1</td>
<td>22.7</td>
<td>5.4</td>
<td>5.3</td>
<td>5.5</td>
<td>15,370</td>
</tr>
</tbody>
</table>

Source: *1971 Ag.-Pop. Linkage.
Table VII: Distribution of Census Farm Operators and Farm Families by Proportion of Total Income from Farming, Canada and Provinces, 1971*.

<table>
<thead>
<tr>
<th>Area</th>
<th>Less Than 10%</th>
<th>10-49%</th>
<th>50-89%</th>
<th>90%+</th>
<th>% of Census Farm Families with &gt;75% of Total Family Income from Farming</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>42.1%</td>
<td>24.4%</td>
<td>19.3%</td>
<td>24.2%</td>
<td>21.3%</td>
</tr>
<tr>
<td>NFL</td>
<td>65.8</td>
<td>15.8</td>
<td>7.9</td>
<td>10.4</td>
<td>8.9</td>
</tr>
<tr>
<td>PEI</td>
<td>38.7</td>
<td>16.8</td>
<td>20.8</td>
<td>23.5</td>
<td>19.8</td>
</tr>
<tr>
<td>NS</td>
<td>55.9</td>
<td>18.1</td>
<td>12.4</td>
<td>13.7</td>
<td>11.2</td>
</tr>
<tr>
<td>NB</td>
<td>57.2</td>
<td>13.8</td>
<td>12.2</td>
<td>16.9</td>
<td>14.6</td>
</tr>
<tr>
<td>QUE</td>
<td>36.7</td>
<td>16.3</td>
<td>24.2</td>
<td>22.8</td>
<td>23.8</td>
</tr>
<tr>
<td>ONT</td>
<td>48.0</td>
<td>14.7</td>
<td>15.6</td>
<td>21.7</td>
<td>18.6</td>
</tr>
<tr>
<td>MAN</td>
<td>38.8</td>
<td>13.4</td>
<td>21.6</td>
<td>26.2</td>
<td>26.5</td>
</tr>
<tr>
<td>SAS</td>
<td>33.7</td>
<td>13.5</td>
<td>23.3</td>
<td>30.0</td>
<td>31.2</td>
</tr>
<tr>
<td>ALT</td>
<td>41.6</td>
<td>13.7</td>
<td>17.8</td>
<td>26.9</td>
<td>26.3</td>
</tr>
<tr>
<td>BC</td>
<td>63.8</td>
<td>14.2</td>
<td>10.3</td>
<td>11.7</td>
<td>10.8</td>
</tr>
</tbody>
</table>

Source: *1971 Ag.-Pop. Linkage.
derive more than 75% of their total income from farming (8.9% for Newfoundland, 31.2% for Saskatchewan)! To this reviewer, it seems truly amazing that such small proportions of census farm families, particularly those residing in the prairie provinces, derive 75%+ of their total income from self-employment farming.

Clearly, it is important to question, "How is it possible that 35% of Canada's census farm operators are employed in non-farm occupations during census week (a busy time for farmers given that census week falls in June)?". Further, how does this 35% figure "translate" into a seemingly low 44% of Canada's census farm operators deriving 50%+ of their total income from farming, or a meagre 21.3% of census farm families deriving 75%+ of their total farm income from farming? Certainly, the trend toward part-time farming has not been all that prevalent.

It is the writer's view that answers to the questions above lie in one or a combination of the following considerations;

1) The high proportion of those with non-farm occupations is partly attributable to the Census of Agriculture's definition of a census farm. The Census of Agriculture classifies any "holding" as a census farm as long as it is "at least one acre in size and has $50+ sales per year". Obviously, there is much room for including hobby and marginal farms here. This would explain the high proportion of census classified farm operators that are
actually much more involved in non-farm occupations during any given year.

2) The seemingly high reliance of Canada's census farm operators on wage and salary, pension or other income, as a major source of income may be attributable to farmers ploughing net self-employment farm income back into their capital stock. If this were the case, returns to farming during any given year would tend to be understated with the implication that if operators earn off-farm income as well, the role of off-farm earnings, etc., as a contributor to total income would be overstated.

3) Census farm operators earning wage and salary income (i.e., income that is typically highly monitored by employers for tax purposes) may understate their self-employment farm income (i.e., income that is self-monitored for tax purposes), towards reducing their total reported taxable income. Again, such behavior would tend to overstate the role of farm operator reliance on off-farm employment income.

4) 1970 was not a particularly good year for wheat farmers which may underlie (i) a seemingly high incidence of zero or negative farm income (particularly in the prairie provinces), and (ii) a tendency to work more at off-farm jobs during 1970 which would again tend to inflate the usual contribution of off-farm income to total farm family income. Again, both of
these considerations would work independently and in conjunction towards understating farm family reliance on net self-employment farm income.

Now, the first point raised above implies that there may be a significant census-classified farm operator or farm family subgroup that is involved in farming only marginally. As noted previously, the rigor of our intersectoral income comparisons would be enhanced by examining income characteristics of marginal versus full-time farm operators. The second and third points above imply that off-farm earnings will be associated with underreporting of self-employment farm income. Again, rigor of our intersectoral income comparisons would be enhanced by disaggregating farm families according to farm characteristics indicative of greater farm magnitude, farm involvement and therefore, greater farm dependency.

Of course, consideration of 1-3 above does not deny that increasing reliance on off-farm employment as a means of supplementing farm incomes represents an important structural feature of Canada's 1971 farm population. Indeed, there is good reason to believe that prevalence of part-time or marginal farms is no longer an adequate index of stage mobility out of farming; rather, it may be more indicative of a swing towards a more optimal employment combination that permits farm families to enjoy advantages of both farm and non-farm work.
4.3. Incomes by Farm Sales.

Farm sales is one of the most commonly used surrogates of farm magnitude, profitability etc., and there is every reason to expect that sales and net farm income will be positively related. On the other hand, whether a relationship of similar elasticity exists between farm sales and total farm family incomes is less well known. Figure IX addresses this question and permits the following generalizations:

1) While an upturn in total farm family and farm operator income is positively associated with an upturn in net self-employment farm income (which is, in itself, positively associated with larger farm sales), there are discrepancies in the relationship.

2) In the lowest sales categories (<$2,500), total farm operator and farm family income are higher, on average, than for members of the next highest category. This can be explained by the generally higher prevalence of off-farm work among operators of these farms. To illustrate, the ratio of "% of all days worked off-farm" to "% of farms in each sales group" is about 1.8 for farms with sales <$2,500 (53.9%/29.3%), in contrast to about 1.1 for farms with sales $2,500-$4,999 (19.2%/17.2%) and about 0.7 for farms with sales $5,000-$9,999 (15.2%/22.5%). If the lowest sales group did not also have a disproportionately higher incidence of operators aged 65+ (implying retirement, fewer dependents etc.),
Figure IX: Average Farm Family Income and Farm Operator Income, and Farm Operator Income from Farming, and Average Non-Employment Farm Operator Income by Economic Class of Farm, Canada, 1971.*
the average income of this group would be even higher.

3) For Canada's census farms that have sales between $30,000-50,000+ (about 5.4%), the relationship between higher sales and net self-employment farm income is almost negligible. Does this mean that depreciation and operating costs take such a toll among farms able to generate $30,000+ sales that they are barely economically viable? Could these operators be rolling back profits into building up their farm capital stock? While there may be some truth to both of these questions, it is more likely that the explanation for the relatively inelastic sales: net farm income relationship lies in (i) production cutbacks among Canada's large wheat farms which would tend, on average, to reduce profit margins among farms in the larger sales groups, and, (ii) underreporting of net farm income in face of relatively high off-farm income from government transfers or returns to off-farm employment (see point (3), section 2).

4) The absolute share of total farm family income contributed by family members other than the farm operator is almost constant across all sales categories. This is observed to be the case in all subsequent income disaggregations and is also characteristic of the income data produced by the 1958 Sample Farm Survey.

5) It would appear that parity of farm family and non-farm family cash incomes occurs, on average, only among 4-5% of
Canada's census farms with sales exceeding $35,000. That is, average total farm family income of operators of these farms is slightly in excess of $10,000 compared with average urban total family income of about $10,350.

6) If farm families with $5,000+ agricultural sales can be assumed to be indicative of Canada's most farm dependent population (representing 53.8% of all census farms, 91.5% of total products sold, and 26.5% of total days worked off-farms), then the previously observed 1971 farm:non-farm cash income ratio of .67 for all farms climbs to about .74 for farms with sales of $5,000+ ($7,550/10,250).

7) If (i) it is fair to assume that, on average, farm families described by (6) were those most heavily hit by the 1970 production cutbacks etc., and (ii) it is reasonable to adjust net farm incomes of these farm families upward accordingly, then their farm:non-farm ratio climbs from .74 to about .80. Admittedly, this kind of adjustment is extremely crude and is provided here merely to give an idea of the range that the income ratio would likely fall.

4.4. Incomes by Farm Capital Value.

As average gross farm sales and average farm capital value are usually highly and positively correlated, we might expect trends between farm capital value and incomes to be
similar to those observed in Figure IX. According to Figure X, such is the case but with a few important variations;

1) Absolute net self-employment farm income does not level off with higher farm capital value as with higher farm sales. Even though farm capital-value includes value of residence, it may be that its representation of fixed and variable capital serves as a better index of returns to farming than does gross farm sales.

2) Even among members of the highest farm capital value group, a large share of total farm operator and family income derives, on average, from off-farm sources.

3) Again, parity of farm family and non-farm family cash incomes occurs, on average, only among about 7.2% of Canada's census farm families with farm capital value in excess of $150,000.

4) If farm families with farm capital value in excess of, say, $74,950 can be assumed to be indicative of Canada's most farm dependent population (representing 27.3% of all farms, 63.6% of all products sold and 14.1% of all days worked off-farms), the 1970 farm:non-farm income ratio is about .80. If we add members of the next sales category ($19,950-74,949, with a relatively high representation among days worked off-farms), this ratio drops to .69.
Figure X: Average Total Farm Family and Farm Operator Income, and Average Farm Operator Income from Farming, by Capital Value of Farm, Canada, 1971.*

Source: *1971 Ag.-Pop. Linkage.
4.5. Incomes by Farm Size.

As size of farm is also positively correlated with gross farm sales and capital value, the relationship between farm size and self-employment farm income should be somewhat similar to the trends observed in Figures IX and X. Figure XI reveals this to be the case for net self-employment farm income but not for total incomes. For example, observe the dip in total farm family and farm operator income between farms sized 10-69 acres and 1,600+ acres, and the similar levels of total income attained by farm families among both the smallest and largest size farms. There can be little doubt, of course, that farm operators with farms 1-9 acres are predominantly involved in non-farm occupations (i.e., they represent 3.9% of Canada census farms and 7.9% of days worked off-farms).

At the same time, however, it would not be correct to hypothesize that, on average, size economies require 1,600 acres or more in order for farm families relying largely on farming to attain incomes equal to farm families reliant largely on non-farm occupations (i.e., operators of tiny farms). That is, large farm sizes are typically found in the prairie wheat belt which experienced a particularly bad year. Thus, during a "normal year" we would expect (i) total family and net self-employment farm incomes to be much higher for farms on the higher end of the size scale, and (ii) possibly, lower levels of off-farm income if
Figure XI: Average Total Farm Family Income and Farm Operator Income, and Farm Operator Income from Farming, by Size of Farm, Canada, 1971.

Source: *1971 Ag.-Pop. Linkage.
off-farm employment represents only a temporary adjustment towards
offsetting production cut-backs during 1970-1971 (i.e., a temporary
reallocation of farm family labour to its best earning advantage).

4.6. Incomes by Farm Type.

Differentials in farm income by type of farm may or may
not be expected, depending on trends or fluctuations in export
demand for various farm products, availability of government
programs to aid in sale of surpluses or income supports during
times of poor productivity, knowledge of imperfections in the
market mechanism viz. allocation of resources to their best long-
run advantage etc.. Even if returns to one type of farming were
progressively higher than another, it is seldom an easy process
to transfer farm resources and farmer knowhow from one type of
farming to another. It is well known that neither factors of
production for different types of farming nor skills required
for their operation are perfectly transferrable. This is one
reason government price and income supports play such an impor-
tant role in Canadian agriculture.

According to Figure XII, fruit and vegetable, poultry
and dairy farms seem to be in the most favorable income situation.
These farms represent about 23.3% of all census farms and attain
a 1970 farm:non-farm family income ratio of about .74 (i.e.,
$7,600/10,250). In contrast, the income ratio for cattle, hogs
Figure XII: Average Total Farm Family and Farm Operator Income and Average Farm Operator Income from Farming, by Type of Farm, Canada, 1971.*

Source: *1971 Ag.-Pop. Linkage.
and sheep, and wheat farms (i.e., 46.5% of all farms) is .64.

Of course, there are vast differences in parity of incomes across provinces. According to Table VIII, parity of incomes is attained in Newfoundland for poultry farms but the family income ratio is lowest for fruit and vegetable farms. In British Columbia, parity is attained for dairy farms but the income ratio for fruit and vegetables is also low (relative to other types in British Columbia, that is). The utility of Table VIII is that it indicates which types of farming in each province are, on average, less in need of price and income supports towards raising their farm:non-farm income ratio. For example, data in Table VIII lend themselves to the following kind of generalization: "Not only do Ontario and British Columbia enjoy the highest average total farm family incomes but their inter-sectoral income ratios are highest when disaggregated by select farm types". Does the double-barreled nature of this generalization marry well with the "direction" and "size of flow" of federal-provincial agricultural price and income supports?

One reason for higher incomes among fruit and vegetable, dairy and poultry farms may be that a large share of these farms are located in high income provinces (e.g., about 70% of Canada's dairy production is located in Ontario and Quebec, whereas fruit and vegetable farming is concentrated in British Columbia). As noted previously, the economic prosperity of a provincial
Table VIII: Ratio of Average Total Provincial Farm Family Income to Average Total Provincial Urban Family Income by Type of Farm, 1971*.

<table>
<thead>
<tr>
<th>Area</th>
<th>Fruit and Vegetables (1)</th>
<th>Poultry (2)</th>
<th>Dairy (3)</th>
<th>Other Field Crops(4)</th>
<th>Cattle, Hogs, Sheep (5)</th>
<th>Wheat (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>.85</td>
<td>.78</td>
<td>.71</td>
<td>.69</td>
<td>.65</td>
<td>.54</td>
</tr>
<tr>
<td>NFL</td>
<td>.62</td>
<td>1.01</td>
<td>.82</td>
<td>.62</td>
<td>.71</td>
<td>--</td>
</tr>
<tr>
<td>PEI</td>
<td>.79</td>
<td>.57</td>
<td>.59</td>
<td>.67</td>
<td>.65</td>
<td>--</td>
</tr>
<tr>
<td>NS</td>
<td>.64</td>
<td>.74</td>
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<td>.67</td>
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</tr>
<tr>
<td>NB</td>
<td>.60</td>
<td>.63</td>
<td>.74</td>
<td>.56</td>
<td>.72</td>
<td>--</td>
</tr>
<tr>
<td>QUE</td>
<td>.82</td>
<td>.74</td>
<td>.69</td>
<td>.74</td>
<td>.69</td>
<td>.68</td>
</tr>
<tr>
<td>ONT</td>
<td>.80</td>
<td>.74</td>
<td>.61</td>
<td>.86</td>
<td>.65</td>
<td>.84</td>
</tr>
<tr>
<td>MAN</td>
<td>.78</td>
<td>.59</td>
<td>.59</td>
<td>.54</td>
<td>.53</td>
<td>.53</td>
</tr>
<tr>
<td>SAS</td>
<td>.60</td>
<td>.76</td>
<td>.85</td>
<td>.60</td>
<td>.57</td>
<td>.54</td>
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<tr>
<td>ALT</td>
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<td>.74</td>
<td>.76</td>
<td>.69</td>
<td>.59</td>
<td>.66</td>
</tr>
<tr>
<td>BC</td>
<td>.83</td>
<td>.91</td>
<td>1.10</td>
<td>.78</td>
<td>.84</td>
<td>.79</td>
</tr>
</tbody>
</table>

*Source: 1971 Ag.-Pop. Linkage.
economy (as reflected in total incomes of urban, rural and census farm families), seems to be an important conditioner of level of net self-employment farm income also. Figure XIII brings this point home as we observe significant provincial differentials in total farm family incomes even when families are disaggregated according to type of farm. Again, there are obvious implications of these trends for evaluating the "direction" and "size of flow" of provincial price and income supports?

In one respect, the disaggregation of incomes by farm type in Figure XII is not as informative as previous disaggregations, as it does not differentiate families according to farm dependency. One way of controlling for farm dependency is to look at income characteristics of only those farms with sales exceeding $2,500; such farms are called commercial farms in census terminology and are expected to be more representative of full-time concerns. However, this kind of disaggregation (i.e., removal of about 30% of all farms), resulted in little change; fruit and vegetable farms were still the leaders with respect to parity of incomes, poultry farms were second, dairy farms third, other field crops fourth, cattle, sheep and hog farms fifth and wheat farms last. Parity of farm:non-farm family incomes dropped slightly for Canada, as a whole, from .67 to about .65. This drop accords with data presented in Figure IX, which indicates higher average family incomes among the <$2,500 sales group due to greater involvement
Figure XIII: Farm Family Total Incomes for Select Types of Farm, 1971*

Source: *1971 Ag.-Pop. Linkage.
in off-farm work.

4.7. Further Refinements.

To some extent, disaggregating incomes by variables reflecting farm magnitude has clarified the income situation of those likely to be most dependent on farming as a source of livelihood. Yet, even among operators of relatively large scale farm enterprises, we still observe off-farm employment income playing a major role, on average, in total farm operator and farm family income. This implies a need to disaggregate census classified farm operators according to occupation reported by the operator himself towards (i) better understanding of the monetary situation of those most likely to be year-round farmers and (ii) the relative income and farm situation of their census classified farm operator counterparts who are engaged largely in non-farm jobs. To this end, all census classified farm operators have been disaggregated into three occupational subgroups; farm managers (FM = 16,200), farmers (F = 222,145) and those reporting non-farm jobs (Non-F = 98,500). (Those reporting no occupation (about 30,000) have not been considered as their age and education profile indicates they are close to or past retirement ages.)

With respect to average total incomes of each of the three subgroups, we expect the following;

1) On average, operators reporting non-farm occupations during census week will have highest total incomes as (i) they are
likely to be working in a non-farm labour market where (as we have already established) incomes are, on average, typically higher than in the farm sector, (ii) as they report non-farm occupations during a most demanding farm time there is every reason to assume they are involved in non-farm occupations on a full-time basis, and (iii) the flow of income to full-time off-farm employment is typically much more stable than are returns to self-employment farming (i.e., greater probability of harvest disasters etc., in the latter case).

2) On average, income of farm managers will be close to those with non-farm occupations because managers usually operate large scale, highly productive farms, draw wages and salaries, and are likely to be endowed with managerial skills for which a more highly competitive wage and salary market exists.

3) Incomes of the farmer group will rank last.

Data in Figure XIV, Part A, support our relatively straightforward income hypothesis. Further, Parts B through G, convey that census-classified farm operators reporting "non-farm occupations" during census week report very little net self-employment farm income (Part B), have less total farm capital to work with (Part C), have considerably lower farm sales (Part D), have smaller farms (Part E), and expend a considerably larger amount of their time at off-farm work (Part F). The income differentials between operators
Figure XIV: Select Characteristics of Census Farm Operators by Occupation Reported During Census Week, Canada and Provinces, 1971.*

Part A

Average Total Income

Part B

Average Net Self-Employment Income

Non-F = Non-Farm Occupation
F.M. = Farm Manager
F. = Farmer

Average Total Income

$7000

$6000

$5000

$4000

$3000

$2000

$1000

0

CAN NFL PEI NS NB QUE ONT MAN SAS ALT BC

Area

$2800

$2600

$2400

$2200

$2000

$1800

$1600

$1400

$1200

$1000

$800

$600

$400

$200

0

CAN NFL PEI NS NB QUE ONT MAN SAS ALT BC

Area

Average Net Self-Employment Income

$2800

$2600

$2400

$2200

$2000

$1800

$1600

$1400

$1200

$1000

$800

$600

$400

$200

0

CAN NFL PEI NS NB QUE ONT MAN SAS ALT BC

Area

Non-F.
Figure XIV: (cont'd)

Part C

Average Capital Value

$180,000
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000

Part D

Average Agricultural Sales

$45,000
$40,000
$35,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
0

Area

CAN NFL PEI NS NB QUE ONT MAN SAS ALT BC

Area

CAN NFL PEI NS NB QUE ONT MAN SAS ALT BC
Figure XIV: (cont'd)

Part E

Average Size of Farm (acres)

![Graph showing average size of farms in different areas.](image)

Source: *1971 Ag.-Pop. Linkage.*

Part F

Average Days Off-Farm Work

![Graph showing average days off-farm work.](image)

Source: *1971 Ag.-Pop. Linkage.*
reporting non-farm and farming occupations (for which managers represent a small share) are a clear indication that off-farm employment income is the major key to understanding the monetary well-being of at least 27% of Canada's census farm operators.

Now, if we relate total incomes of members of the three occupational subgroups to total incomes of urban males aged 15+, we get a somewhat clarified view of the relative income situation of those largely dependent on farming. With respect to cash incomes only, Table IX reports an average farm:non-farm inter-sectoral income ratio for the F group of about .62 for Canada; this represents about two-thirds of Canada's census farm operators. In contrast, the ratio for the NF group is about .89; it is almost parity in Ontario and exceeds parity in British Columbia.

Table VIII also reveals that farmers in Manitoba are least well off, whereas, on the whole, all occupational subgroups are best-off in British Columbia. If we were able to adjust the relative income situation of the Non-F group by taking into consideration income in kind, there would be little doubt that the farm:non-farm income ratio would exceed parity in all provinces but Manitoba.

If there is a lesson to be learned from the data in Table IX, it is that every effort should be made to qualify census-classified farm operators according to occupation towards identifying who, on average, are (i) on the high end of the income
Table IX: Ratio of Total Incomes of Three Operator Subgroups to Total Incomes of Urban Working Males, Canada and Provinces, 1971*.

Income Ratio: Using Total Average Income of Urban Working Males as Denominator

<table>
<thead>
<tr>
<th>Area</th>
<th>(F) Farm Operator (1)</th>
<th>(FM) Farm Manager (2)</th>
<th>(Non-F) Non-Farm Occupation (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
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<td>.77</td>
<td>.89</td>
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<td>.70</td>
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<td>.77</td>
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<td>.73</td>
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<td>.60</td>
<td>.71</td>
<td>.87</td>
</tr>
<tr>
<td>BC</td>
<td>.85</td>
<td>1.07</td>
<td>1.09</td>
</tr>
</tbody>
</table>

Source: *1971 Ag.-Pop. Linkage
scale, and (ii) are probably least in need of farm oriented
government transfer payments, farm tax allowances etc.. In other
terms, it is possible that a large proportion of persons operat-
ing Canada's seemingly most inadequately sized farms (i.e., in
terms of available resources to work with) are those least in need
of farm policy interventions because they actually rely to a very
small extent on their farms as a source of livelihood.

At the very least, it seems safe to approach the problem
above by attempting to exclude those who are doing relatively
well. For example, data in Table X, Parts A and B, suggest that
about one-third of Canada's census farm operators have average
total cash incomes above that of urban male income recipients
(i.e., >$5,300). In contrast, about one-third of Canada's census
farm operators appear very badly off (i.e., average total incomes
of $1,004). However, as noted in section 2, before jumping to
conclusions, we must recognize that these figures are confused
by the myriad of considerations bearing on actual versus reported
income, wealth, income in kind, tax benefits, consistency of
income flows, labour force status etc.. Needless to say, the
directive for further research is obvious; it is time that the
methodological disclaimers noted in section 2 were met head on
unless we are prepared to accept that between one-third to one-
half of Canada's census farm operators are poverty cases.
Table X: Average Total Income and Percentage Distribution of Census Farm Operators by Categories of Farm and Off-Farm Employment Income, Canada, 1971, and Select Income Data for Provinces, 1971*.

Part A

<table>
<thead>
<tr>
<th>Canada</th>
<th>Farm Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Farm Employment Income</td>
<td>$\leq 2,000</td>
</tr>
<tr>
<td>$\leq 2,000</td>
<td>$1,004**</td>
</tr>
<tr>
<td>2,000-4,999</td>
<td>3,805</td>
</tr>
<tr>
<td>5,000-9,999</td>
<td>7,009</td>
</tr>
<tr>
<td>10,000-14,999</td>
<td>11,543</td>
</tr>
<tr>
<td>15,000+</td>
<td>24,269</td>
</tr>
</tbody>
</table>

Part B

<table>
<thead>
<tr>
<th>Canada</th>
<th>Farm Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Farm Employment Income</td>
<td>$\leq 2,000</td>
</tr>
<tr>
<td>$\leq 2,000</td>
<td>36.4%</td>
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<td>2,000-4,999</td>
<td>11.7</td>
</tr>
<tr>
<td>5,000-9,999</td>
<td>12.7</td>
</tr>
<tr>
<td>10,000-14,999</td>
<td>3.0</td>
</tr>
<tr>
<td>15,000+</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Source: *1971 Ag.-Pop Linkage

**Average Total Income from all sources.
5. Correlates of Differential Farm Family Income.

5.1. Introduction.

Having described levels, sources and parity of farm family incomes, we now turn to results of a study of conditioners of differential levels of 1970 total farm family incomes. The study utilizes data from the 1971 Ag.-Pop. linkage and correlation and regression analysis. It is largely exploratory in the sense that (i) it draws on a large number of variables pertaining to Canada's farm sector, but (ii) it does not evaluate a specific model of determinants of farm family income. Rather, variables have been grouped and discussed viz. such general considerations as "human capital endowments" and "farm capital endowments" etc., for which a well-known body of theory has already been developed on the how's and why's of the bearing of such considerations on incomes.

The major asset of our correlation and regression analysis is that it makes use of the extensive 1971 Ag.-Pop. data base and it permits reduction of a wide range of variables to a general few that are consistently correlated with higher farm family incomes. Of course, there are disadvantages to the 1971 Ag.-Pop. data base. The following should be borne especially in mind when interpreting the significance of our results;

a) findings are based on an areal analysis (i.e., characteristics of farms have been aggregated and averaged for 252 census divisions), meaning that our results are most relevant to
understanding general structural correlates of average total farm family incomes,

b) it would be faulty to leap from analysis of general correlates of incomes to policy statements concerning cause and effect, and

c) similar studies are not available for purposes of comparing results. (Although sufficient data was collected by the 1958 Sample Farm Survey to allow correlation and regression analysis of similar scope, such a study was never done. Of course, a number of correlation and regression analyses using data from small-scale:small-area samples are available. However, their narrow sample frames (i.e., limited to certain areas, types of farms etc.), undermine meaningful comparison given that our study is concerned largely with identifying major structural correlates of farm family incomes that are applicable to Canada's farm sector as a whole.)

5.2. Correlation Results.

Initially 53 variables were considered (see Appendix II). Of these, 35 were "disqualified" after a correlation analysis revealed either (i) inconsistency of sign or statistical insignificance among three derived regions, or (ii) that one of two or more variables measuring a similar property was more highly correlated with 1970 total farm family incomes.
Census divisions were grouped towards controlling for the vastly different types of farming between provinces as well as effects of more prosperous regional or provincial economies on levels of family income. The three derived regions are: the Midwest, consisting of 53 census divisions of Manitoba, Saskatchewan and Alberta; the Mideast consisting of the 155 census divisions of Ontario, Quebec and British Columbia (the latter was included here as it is also a high income province and has a farm sector more similar to Ontario than any other province); the East consisting of 44 census divisions of the Maritime provinces.

The most significant variables emerging from the areal correlation analysis were:

1) level of farm sales per census division (hereafter CD), (a + effect),
2) level of farm capital value per CD (a + effect),
3) emphasis on production of meat products such as hens, and livestock per CD (a + effect),
4) proportion of farm land rented per CD (a + effect), or proportion of farmers that are outright owners per CD (a - effect),
5) days of off-farm work per CD (a + effect), or proportion of family member farm operators that have off-farm occupations per CD (a + effect),
6) proportion of family member farm operators with less than grade 9 education per CD (a - effect), or pro-
potion of operators with greater than grade 12 education per CD (a + effect),
7) proximity of CD's to urban areas (a + effect). 22

5.3. Regression Results.

The relative importance of the variables mentioned above (as well as others listed in Appendix II) in accounting for areal variations in total farm family income were evaluated using log-transformed multiple stepwise regression techniques. 23 Variables were grouped into three subsets consisting of Farm (F), Farm Operator (FO) and Farm Family (FF).

The influence of the F subset on total farm family incomes (FFY) was represented by three largely independent variables (i.e., insured by low intercorrelation coefficients), with the expected relationships;

1) \( \frac{\partial FFY}{\partial KV}, \frac{\partial FFY}{\partial M} > 0, \frac{\partial FFY}{\partial 0} < 0 \), 24

where; KV = average capital value of farm per CD,
M = % of farms per CD that are predominantly cattle, hen or livestock combination producers,
0 = % of farms per CD that are totally owned.

These variables have been chosen on the following grounds;

a) KV is a good surrogate of farm holdings and magnitude of operation. It is positively correlated with average agricultural sales, farm expenditures, number of tractors and most
other indicators of scale. Thus, the larger KV, the higher we would expect family income from farming to be. As for shortcomings in using KV, there are at least two. First, it includes accumulated wealth which may not be used in the production of agricultural goods and services in any given year. Second, it is a stock concept whereas family income from farming is a flow concept. The most logical alternative to using KV would be "agricultural sales" or "farm expenditures". Although both of these concepts were observed to be somewhat more highly correlated with operator's net self-employment farm income than was KV, neither were observed to be as highly related to total farm family income as was KV. Thus, in the interests of maximizing the predictive capacity of our regressions without seriously misrepresenting the theoretical construct at issue, we choose to use KV. An additional benefit in using KV is that it represents not only means of generating income from production and sale of agricultural goods but means of generating rental income from land and machinery.

b) We would expect that meat producing farm families (M) would be in a more favorable position to earn higher farm incomes than non-meat producing farms given (i) greater internal stability of market prices for meat products (i.e., less susceptibility to fluctuating export demand), and (ii) generally higher income elasticity of demand for meat products with
rising per capita non-farm incomes.

c) Just as share tenancy, rental of land etc., usually connotes motivation to expand farm holdings toward increasing farm revenues, we expect outright ownership (O) to imply inertia, less risk proneness, less motivation to expand typically smaller scale holdings etc., and therefore, smaller returns from farming.

The influence of the farm operator subset (FO) on total farm family incomes was also represented by three largely independent variables with the following expected relationships:

$$2) \left( \frac{\partial \text{FFY}}{\partial D}, \frac{\partial \text{FFY}}{\partial E_{12^+}} \right) > 0, \left( \frac{\partial \text{FFY}}{\partial E_{-9}} \right) < 0,$$

where; $D =$ average days of off-farm work of family member farm operators per CD,

$E_{-9} =$ average % of family member farm operators per CD with less than grade 9 education,

$E_{12^+} =$ average % of family member farm operators per CD with greater than grade 12 education.

Rationale for including these variables are as follows;

a) Days of off-farm work (D) of the operator family member was expected to be strongly and positively correlated with total farm family income given relatively high rates of return to off-farm work, and that the operator contribution to total farm family income usually constitutes a large majority.
b) Proportion of farm operators with greater than grade 12 education (E_{12+}) was expected to be positively related to total farm family income as it implies greater opportunity for relatively high paying non-farm jobs either on a part-time or full-time basis during periods of poor farm productivity.

c) Proportion of farm operators with less than grade 9 education (E_{9}) was used as a surrogate resistance to modern day farm technology, inadequate management skills, etc.

The influence of the FF subset on total farm family income was again represented by three largely independent variables;

3) \( \partial FFY/\partial MS, \partial FFY/\partial UP, \partial FFY/\partial FS > 0, \)

where; \( MS = \) a dummy variable for major source of total family income with 1 = a larger % of farm families in the CD deriving their MS from farming than non-farming; 2 = converse of 1,

\( UP = \) a dummy variable for proximity of the CD to an urban area with 1 = not close, 2 = close,

\( FS = \) average family size of each CD,

In support of our choice of these variables consider the following;

a) Although major source of farm family income (MS) is positively correlated with operator member's "days of off-farm
work", it is included as a means of partitioning farm families into two groups, one which includes about 15% of farm families with government transfers etc., as a major source of income. Also, non-operator members contribute to total family income; thus, in combination with the operator's off-farm earnings, they may render the family less dependent on farming than on non-farm economic activity.

b) Urban proximity (UP) is included for two reasons. First, proximity to an urban area implies less cost of transporting farm produce and greater chances of earning income through sales directly to consumers. Second, proximity implies greater prospects of off-farm work in larger diversified labour markets as a means of supplementing low farm incomes. UP would seem particularly relevant to opportunities for females to secure employment.

c) Family size (FS) was expected to bear positively on total farm family income as (i) farming is relatively labour intensive and (ii) family members, other than the farm operator, often contribute to total family income. However, it does not necessarily follow that larger families will have larger total family incomes than smaller families. Obviously, other productive assets enter the income equation. For example, smaller families are usually characterized by family heads with higher levels of education which, in turn, is often associated with greater income earning capacity and more opportunities for
off-farm employment for wives. This implies that smaller family size will be associated with families that have higher income earning power. Nevertheless, if all else is held constant, total farm family income can be expected to be positively related to number of family members.

The overall equation for estimation is:

1) \[ \text{Log FFY} = a + b_1 \text{logKV} + b_2 \text{logM} - b_3 \text{logO} + b_4 \text{logD} + b_5 \text{logE_{12+}} - b_6 \text{logE_{-9}} + b_7 \text{MS} + b_8 \text{UP} + b_9 \text{logFS}. \]

Results are presented in Table XI for Canada and the three regions. Variables which demonstrated neither consistency of sign nor statistical significance were excluded. In interpreting results of Table XI, it should be kept in mind that significance of each variable in the regression is indicated by size of its standard error and size of the regression coefficient. As a rule of thumb, the regression coefficient should be at least two times its standard error to be statistically significant.

Findings reported in Table XI indicate the following:

a) F ratios for each equation are statistically significant at the .01 level. Statistically, \( R^2 \) values are satisfactory.

b) For Canada as a whole \((N = 252)\) all variables take on the expected sign. For Canada and the three regions, capital value \((KV)\) and days of off-farm work \((D)\) consistently account for the largest share of the variance in farm family income \((FFY)\).
Table XI: Family Income Regressions.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Symbol</th>
<th>Canada</th>
<th>Midwest</th>
<th>Mideast</th>
<th>East</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>RC  SE</td>
<td>RC  SE</td>
<td>RC  SE</td>
<td>RC  SE</td>
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<tr>
<td>Owners</td>
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<td>-.127 .066</td>
<td>-.104 .091</td>
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<td>Off-Farm Work</td>
<td>D</td>
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<td>.203 .072</td>
<td>.119 .033</td>
<td>.265 .119</td>
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<td>&lt; Grade 9 Education</td>
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<td>-.063 .103</td>
<td>.029 .053</td>
<td>-.100 .028</td>
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<td>.008 .042</td>
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<td>Average Family Size</td>
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<td>.201 .216</td>
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<td>.507 .221</td>
</tr>
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<td>% Farm's Meat</td>
<td>M</td>
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<td>.055 .030</td>
<td>-.020 .023</td>
<td>.037 .023</td>
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<td>Intercept</td>
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*For the column headings RC = regression coefficient; SE = standard error of the regression coefficient.
Both variables have a relatively consistent regression coefficient across the derived regions and low standard errors for the midwest and mideast regions, but less for the eastern region.

c) The variables average family size (FS), proportion of farm operators that are owners (O), and urban proximity (UP) consistently demonstrate the expected sign for Canada and the regions.

d) The variables to do with farm operator education ($E_9$) and proportion of farms in the business of producing meat products (M) each take on the expected sign for Canada and two regions. However, standard errors of the regression coefficients are acceptable only for Canada and the eastern region for $E_9$ and only for Canada for M.

e) Judging our findings in terms of (i) the ratio of regression coefficients to their standard errors and (ii) findings among regions, leads to the conclusion that the farm component (F) of equation 1, as represented by capital value (KV), is somewhat more useful in accounting for variations in total farm family income than is the FO component as represented by days of off-farm work (D). In contrast, the farm family component (FF) as represented by average family size and urban proximity is least significant.

On the basis of our regression results and the income disaggregations in section 4, it is certainly safe to generalize
that our understanding of total farm family cash incomes is only partially complete with the understanding of characteristics and performance of family farms *per se*. An implication for federal agricultural policy is that farm programs which are designed to boost family incomes in Canada's farm sector may have a limited impact if they pertain to only one (small?) part of the farm family income equation.

As part of a project aimed at making rigorous farm: non-farm income comparisons, this paper outlines the most up-to-date information on farm versus non-farm incomes, distributional aspects of total family income by source, and conditioners of differential farm family income. By our own admission, this study is but a beginning and results must be interpreted with caution. Methodological disclaimers to be borne in mind when interpreting our results have been outlined in section 2.

Previous to the 1971 Census of Canada, prospects for analyzing data on farm incomes have been virtually non-existent. This is evident in the 1969 report of the Federal Task Force on Agriculture which sought to profile low income farm households using extremely crude indices of returns to farming such as farm sales, farm capital value etc. With the 1971 Ag.-Pop. Linkage, however, prospects for evaluating levels and sources of income earned by farmers have been greatly enhanced. Accordingly, our findings are based largely on the 1971 Ag.-Pop. data base (with 1970 as referent year for incomes), and to a lesser extent on such sources as the 1941 Census of Agriculture and the 1958 Sample Farm Survey for purposes of crude historical comparisons.

Major findings can be summarized as follows (all findings derive from the 1971 Ag.-Pop. data base unless other-
1) 1970 per capita cash incomes in Canada's farm sector are about one-half those of Canada's urban sector (i.e., a ratio of about $1,500/3,000). With an adjustment for income in kind, the per capita farm:non-farm ratio increases to about .62 ($1,875/3,000). Provincial economies exert considerable influence on levels of farm versus non-farm incomes. For example, in Ontario and British Columbia we observe higher per capita incomes than in any other province and this applies to both the farm and urban sector. The bearing of provincial economies on incomes is observed to behave similarly regardless of the unit of analysis (income recipient, family), sector (farm, urban, metropolitan), or disaggregation of incomes by farm characteristic (size, type, capital value etc.).

2) Acknowledging that 1970 was a poor year for wheat farmers, a crude upward adjustment was incorporated for Canada, as a whole, with the result that the per capita intersectoral ratio of .62 (which included income in kind), rose to about .70.

3) The per capita cash farm:non-farm ratio of .50 rises to about .68 when income recipients are the unit of comparison. The income recipient ratio rises to about .80 with a crude adjustment for income in kind.

4) When the family is the unit of comparison, the ratio of census farm to urban family cash income is slightly lower at
.67. Even though rural families are usually slightly larger this does not necessarily imply more income earners per family unit given the tendency of farm family members (other than the operator head) to work as unpaid family labour.

5) The 1970 family farm:non-farm income ratio rises to about .84 with a crude adjustment for income in kind. In fact, for Newfoundland and British Columbia, the ratio exceeds 1.0 and for Prince Edward Island, Nova Scotia and Ontario it exceeds the .95 mark. In contrast, a relatively large gap is evident for Manitoba.

6) Towards gauging poverty in Canada's 1970 farm and non-farm sectors we used Statistics Canada low level income cut-off lines where <$5,000 total family cash income implies "poverty" for an urban family of 3.5-4.0 and a farm family of 4.0-5.0. Recognizing that this is a little more than a statistical device which helps monitor the general situation, we found that approximately 46% of Canada census farm families fall below this line versus approximately 18% of urban families, or about 2.6 times as many. With respect to the high end of the scale, about 8.4% of census farm families attain $15,000 or more total cash income per year as against about 16.0% of Canadian urban families, or a little more than half as many.

7) Toward gauging income inequality in 1970, Lorenze
curves for Canada and Gini coefficients for provinces revealed that the distribution of incomes among census farm families is about 1.55 times more unequal than among urban families. This implies that Canada census farm families are not only worse off than their urban counterparts in terms of the level of their cash incomes but are confronted by a greater range of inequality of incomes within their own sector. The provincial ratios of farm family to urban family Gini indices lie in a similar range between 1.3 to 1.6.

8) In answer to the question "Is the relative situation of Canada's census farm population improving over time?", we found (i) an improvement in per capita net farm self-employment income relative to per capita disposable income (of Canada's entire population) over the 1941-1971 period, (ii) a rise in the 1941 ratio of total farm family cash income to that of urban families of 0.40 ($760/1,800) to 0.58 in 1958 ($2,600/5,800) to .67 in 1970 ($6,900/10,250), or 0.70 after an adjustment to compensate for the 1970 wheat problem. These figures imply that the farm:non-farm cash income gap closed by about 30 points over the 30 year period between 1941-1971.

9) In response to the question "What of the post 1970 period?", we estimated that by 1974 the cash income ratio rose to 0.73. However, this figure was calculated with "average incomes of metropolitan families" as denominator. When "average incomes
of all families" was used as denominator, the ratio was .80. With an adjustment for income in kind, the figures were .89 and .98, respectively. After adjustments for income in kind, we observed near parity of provincial farm family incomes with incomes of all families in each province by 1973.

10) To a large extent the higher ratios reported in (9) are due to recovery among the prairie provinces in net self-employment farm income and the rising value of income in kind per capita. At the provincial level, Manitoba continues to lag considerably behind. On a yearly basis (1970-1973) it also experienced the smallest improvement in its farm:non-farm family income ratio. In contrast, the Maritime provinces seem to have surged ahead; this may be a welcome reflection of the heavy federal programming aimed at relocating underemployed farmers to more viable jobs and consolidating "abandoned" farms into more economically viable units.

11) It was proposed that aggregation and averaging of incomes of all census farm families may have biased the relative income situation of Canada's largely farm-dependent population upwards. Accordingly, our evaluation of the 1971 Ag.-Pop. data on "farm family major source of income", "off-farm earnings" etc., revealed that simple management/ownership of a census-classified farm did not necessarily imply farm-dependency. Indeed, we found that about 35% of Canada's 1971 census farm
operators reported other than a farm occupation during census week, about 38% received wage and salary income during 1970, and about 46% received employment income during 1970. These proportions are as high as 65%, 56% and 71% respectively, in Newfoundland, and between 20-30%, 25-35% and 35-44%, respectively, in the prairie provinces.

We also found that only 43.5% of Canada's census farm operators derive 50%+ of their total income from farming and that only 21.3% of all census farm families derive 75%+ of their total family income from farming. These findings implied that there is a significant census-classified farm population subgroup that is only marginally involved in farming. Accordingly, we set out to disaggregate farm families according to farm characteristics indicative of greater farm magnitude and, we hoped, greater farm dependency.

12) Our first disaggregation of farm families according to level of gross farm sales led to the following generalization:

If farm families with $5,000+ agricultural sales can be assumed to be indicative of Canada's most farm-dependent population (representing 53.8% of all census farms, 91.5% of total products sold, and 26.5% of total days worked off-farms), then the previously observed 1970 farm:non-farm cash income ratio of
.67 for all farms climbs to about .74 for farms with sales $5,000+ ($7,550/10,250); further, if (i) it is fair to assume that, on average, farm families described by (6) were those most heavily hit by the 1970 production cutbacks etc., and (ii) it is reasonable to adjust net farm incomes of these farm families upward accordingly, then their farm:non-farm ratio climbs from .74 to about .80.

13) Our second farm family disaggregation used was value of farm capital value:

If farm families with farm capital value in excess of, say, $74,950 can be assumed to be indicative of Canada's most farm dependent population (representing 27.3% of all farms, 63.6% of all products sold and 14.1% of all days worked off-farms), the 1970 farm:non-farm income ratio is about .80. If we add members of the next sales category ($19,950-74,949, with a relatively high representation among days worked off-farms), this ratio drops to .69.

14) We also disaggregated farm families according to farm type with the following result; fruit and vegetable, poultry and dairy farms seem to be in the most favorable income situation. These farms represent about 23.3% of all census farms and attain a 1970 farm:non-farm family income ratio of about .74 (i.e., $7,600/10,250). In contrast, the income ratio for cattle, hogs
and sheep, and wheat farms (i.e., 46.5% of all farms) is about .64.

Of course, there are vast differences in parity of income among provinces for each type of farm, with the result that some types of farms in some locations appear less in need of policy interventions to raise their level of monetary well-being. For example, we were able to generalize; "Not only do Ontario and British Columbia enjoy the highest average total farm family incomes and the lowest Gini indices of inequality, but their intersectoral income ratios are highest when disaggregated by select farm types". Does the double-barreled nature of this generalization marry well with the "direction" and "size of flow" of federal-provincial agricultural price and income supports etc.?

15) Even after disaggregating farm families according to variables reflecting farm magnitude, we still observed relatively large shares of total farm family income deriving, on average, from off-farm employment of the farm operator. This implied a need to disaggregate census-classified operators according to the occupation they were actually involved in during census week (a busy time for farmers as census falls in June). This was a highly fruitful exercise as we not only found higher incomes among those reporting non-farm occupations during census week, but very little net self-employment farm income,
less total farm capital to work with, considerably lower farm sales, smaller farms and large shares of their time allocated to off-farm work. We also found the farm:non-farm cash income ratio of those reporting farming during census week to be considerably lower at .62 in comparison with .89 for the non-farm occupation group. Adjustments for income in kind would, of course, buoy the latter group above parity in all provinces (except Manitoba).

We concluded that off-farm employment income is a major key to understanding the monetary well-being of at least 27% of Canada's census-classified farm operators. If there is a lesson to be learned from this disaggregation, it is that every effort should be made to qualify census-classified farm operators according to occupation towards identifying who, on average, are (i) on the high end of the income scale, and (ii) are probably least in need of farm oriented government transfer payments, farm tax allowances etc.. In other terms, it is possible that a large proportion of persons operating Canada's seemingly most inadequately sized farms (i.e., in terms of available resources to work with) are those least in need of farm policy interventions because they actually rely to a very small extent on their farms as a source of livelihood.

16) Having described levels, sources and parity of farm family incomes, we presented correlations and regression results
of a study of conditioners of differential levels of 1970 total farm family cash incomes. The study is based on aggregation and averaging of values for 53 variables for 252 census divisions that were, in turn, subdivided into three geographic regions towards controlling for provincial differentials in overall prosperity and types of farming. Of the 53 variables that were initially considered, many were dropped due to insignificant correlations with incomes, multicollinearity etc. The most significant emerging from the correlation analysis were:

1) level of farm sales per census division (CD), (a + effect),

2) level of farm capital value per CD (a + effect),

3) emphasis on production of meat products such as hens, and livestock per CD (a + effect),

4) proportion of farm land rented per CD (a + effect), or proportion of farmers that are outright owners per CD (a - effect),

5) days of off-farm work per CD (a + effect), or proportion of family member farm operators that have off-farm occupations per CD (a + effect),

6) proportion of family member farm operators with less than grade 9 education per CD (a - effect), or proportion of operators with greater than grade 12 education per CD (a + effect),

7) proximity of CD's to urban areas (a + effect).
17) Log transformed multiple stepwise regression analysis was used towards untangling the relative importance of these, and other, variables in the farm family income equation. In order of importance, farm capital value (+), days of off-farm work (+), average family size (+), outright ownership of all holdings (-), proximity to urban areas (+), low levels of education (-) and emphasis on meat products (+), were statistically useful as predictors of family income levels.
1. For example, Canada's largest data source - the Census of population - provides basic data only on demographic and economic characteristics of Canada's rural population residing on census farms. Previous to 1971, census tabulation programs treated Canada's rural farm population primarily as an aggregate. Components such as farm operators, farm operator wives and family members have not been readily identified and characterized in socio-economic terms. As a result, data on Canada's farm operators and their dependents are particularly fragmentary. In no case are socio-economic characteristics of various farm population subgroups related to characteristics of their respective farm operations.

As for the Census of Agriculture, it is a farm enterprise oriented enumeration providing only limited data on Canada's farm operators. Furthermore, farm expenditure patterns, with the exception of a few principal items, have not been part of the Census of Agriculture since 1941. "Farm Net Income", the only annual publication in this area, is limited to coverage of components of aggregate expenditures and receipts. As a consequence, research workers have been at a disadvantage in developing income distributions and expenditure patterns for agriculture. In a sector as heterogeneous as agriculture, providing averages of incomes without understanding their distribution is misleading, often causing the misinformed many pitfalls.
2. Federal Task Force on Agriculture, "Low Income Sector in Canadian Agriculture" (1969: Ottawa, Mimeo); also, Canadian Agriculture in the Seventies, (1969; Ottawa, Queen's Printer).


4. Excluding the "1971 Agricultural Enumerative Survey" conducted by the Canada Department of Agriculture, the 1941 and 1958 sources represent Canada's only other national and provincial data sources on net self-employment farm income. Results of the 1971 Agricultural Enumerative Survey, (conducted by the Canada Department of Agriculture), have not been used here as CDA officials have been uncertain about the quality of the data and have been reluctant to release detailed income data for analysis by the present author.

5. Adjustments for income in kind have been made using the Canada Department of Agriculture's "Farm Net Income" yearly publication series which reports provincial estimates of income in kind. These provincial aggregate figures have been divided by total census farm persons in each province toward arriving at a crude per capita income in kind figure which has been added to per
capita cash income.

6. This claim applies largely to wheat farmers. As wheat is by far Canada's most important crop, it is of some importance that declining exports (1965-1968) resulted in (i) accumulation of unsold stocks, (ii) voluntary reduction of wheat plantings by about 15% in 1969-1970, and (iii) a one year federal scheme to remove up to 22 million acres of prairie land from wheat production in 1970.

7. How important is the wheat problem to our discussion of incomes? While producer incomes were boosted by government aids promoting shifts into production of barley, forage, oilseeds and livestock, the fact remains that total net farm income in Canada's farm sector was about 14% less than the 1961-1971 average.

Does this justify an adjustment of total incomes to farm operators and their family members etc., upwards? While it obviously justifies some upward adjustment, the question of "how much" is extremely difficult to answer. The reason is two-fold. First, as we shall see, off-farm employment and non-employment income contributes substantially to total farm operator and farm family incomes. In some provinces, farming seems to be a minor source of income, on average. If a large proportion of Canada's farm population are persistently off-farm income earners, then a reduction in farm income per se will have a much less
important impact on total cash incomes. Second, high off-farm incomes (in face of production cutbacks on the farm) could be due to farmers simply reallocating their labour input to wage and salary work during poor farm years. Thus, if low farm incomes were successfully supplemented by persons temporarily seeking off-farm work, there would be less reason to assume that total incomes would be that much less than would have resulted from a "good" farm year. The entire question is, of course, empirical and remains largely outside our field of investigation. About all we can do here is propose a "safe" upward adjustment of, say, 10-15%.

8. Of Canada's 366,000 some odd census farm operators (as of 1971), about 326,000 reside on census farms of which about 304,000 reside on census farms as members of families; the latter group represents Canada's census farm families for our purposes.


10. See Statistics Canada (Cat. 62-535, 536, 537).

11. In other terms, the low level income cut-offs are stan-
dardized for location of residence, meaning there is no need to adjust for effects of income in kind.

12. Gini coefficients are derived as follows;
   \[ I = \frac{1}{2} \sum_{i=1}^{n} (X_i - Y_i) - \frac{1}{2} \sum_{i=1}^{n} X_i Y_i \]
   where,
   \( X \) = cumulative percentage share of population,
   \( Y \) = cumulative share of income,
   \( i \) = population subgroups,
   \( n \) = No. of groups,
   \( I \leq 0, I \leq 1 \).

13. Derived by dividing estimated aggregate net farm income by total census farm population for the years 1941, 1961, 1966, 1971. The year 1951 has been excluded as the definition of a census farm, and therefore, the count of eligible census farm population was different for this year (see footnote 16).

14. Derived by dividing estimated disposable income by total Canadian population for the same years as mentioned in footnote 13.

15. The relevant sources are (a) DBS, Economic Differentials in Family Size, Canada, 1941, Bull. No. F-S, (which supplied average family income of families headed by male wage earners) and 1941 Census of Agriculture (which supplied average total farm family income), (b) J.M. Fitzpatrick, "Distribution of Income in Canadian Agriculture" Paper presented to the 35th Annual Meeting, 1965, (which supplied average total farm family income according to the 1958 Sample Farm Survey), and DBS (which supplied estimates of 1958 urban total family income), and (c) 1971 Ag.-Pop Linkage
and 1971 Census of Canada.

16. The 1951 Census of Agriculture defines a census farm as a holding of (a) 3 acres +, or (b) 1 - 3 acres + with $250+ sales during the previous year. The definition for the 1941, 1961, 1966 and 1971 census was a holding of 1 acre + and $50+ sales during the previous year.

17. To calculate the ratios in Table IV and Figure VII we first estimate:

\[ (Y_t + 1)_i = (Y_t\phi)_i (NFI_t + 1/NFI_t)_i \]
\[ + (Y_t^{1-\phi}_t)_i (TFI_t + 1/TFI_t)_i, \]
where;
- \( Y \) = total income of census farm families,
- \( \phi \) = that % deriving from farming; thus \( 1 - \phi \) is that % deriving from non-farm sources,
- \( NFI \) = net farm income, aggregated by area,
- \( TFI \) = total family income of all families, aggregated by area,
- \( t \) = year, in this case we begin with \( t = 1970 \),
- \( i \) = area, in this case \( i = \) Canada or individual provinces,

we then estimate;

\[ (Y_t + 1)_i / (TFI_t + 1)_i. \]

For the ratios in Table IV, we also adjust incomes upwards to compensate for declining farm numbers between 1971-1974.
18. Our upward adjustment makes use of a 16% inflator for Canada's farm sector as a whole (see footnote 7). This is weighted according to total agricultural products sold by farms with sales >$5,000 and then applied to the 1970 average net farm income to derive a "normal" net farm income figure.

19. Correlations and regressions were initially performed by the author for a forthcoming Canada census monograph on Canada's census farm population.

20. Admittedly, many of the variables in Appendix II were expected to be collinear but were chosen in an effort to identify the best predictors of total farm family income among clearly collinear variable subsets.

21. This implies that we are seeking a best-fit equation given the exploratory nature of our inquiry. At the same time, however, it does not imply that we have chosen conceptually shallow variables over more meaningful ones simply towards attaining a higher correlation coefficient or coefficient of multiple determination.

22. "Proximity to urban areas" was represented by a dummy variable; 1 = close, 2 = not close. A value of 1 was assigned to a census division if (i) within its boundaries it had an urban center of 25,000+ or, (ii) was adjacent to a census division containing a census metropolitan area.
23. Data were transformed (to base 10) towards reducing problems of non-linearity.

24. $\Delta FFY/\Delta KV$ is interpreted as follows; holding all else constant, a change in $KV$ will result in a change in $FFY$ that is greater than zero (i.e., $\Delta FFY/\Delta KV > 0$) or positive.
INCOME QUESTION FROM THE LONG FORM 1971 CENSUS
POPULATION QUESTIONNAIRE

QUESTION SUR LE REVENU TIRÉE DU QUESTIONNAIRE COMPLET DU RECENSEMENT DE LA POPULATION DE 1971

40. INCOME FOR 1970 (State in dollars only)
   (a) During 1970 what were your total wages and salaries, commissions, bonuses, tips, etc.? (before any deductions)
   Amount $__________/00  ○ None
   (b) During 1970 what was your net income from self-employment or operating your own non-farm business or professional practice? State total business income less expenses of operation. If lost money, give amount and write "Loss".
   Amount $__________/00  ○ None
   (c) During 1970 what was your net income from operating a farm on your own account or in partnership? State total farm income less expenses of operation. If lost money, give amount and write "Loss".
   Amount $__________/00  ○ None
   (d) During 1970 how much income did you receive from:
       1. Family and youth allowances?
       Amount $__________/00  ○ None
       2. Government old age pensions, Canada pensions, and Quebec pensions?
       Amount $__________/00  ○ None
       3. Other government income? (e.g., unemployment insurance, welfare, pensions and allowances, welfare)
       Amount $__________/00  ○ None
       4. Retirement pensions from previous employment?
       Amount $__________/00  ○ None
       5. Bond and deposit interest and dividends?
       Amount $__________/00  ○ None
       6. Other investment income? (e.g., net rents)
       Amount $__________/00  ○ None
       7. Other income? (e.g., alimony)
       Amount $__________/00  ○ None
   (e) During 1970 what was your total income? (a+b+c+d)
   Amount $__________/00  ○ None

40. REVENU DE 1970 (Montant en dollars seulement)
   a) Quel a été, en 1970, le montant total de votre salaire ou traitement, de vos commissions, gratifications, pourboires, etc. (avant les déductions)?
   Montant $__________/00  ○ Aucun
   b) Quel a été, en 1970, votre revenu net provenant d'un travail à votre compte, de l'exploitation d'une entreprise non agricole ou de l'exercice d'une profession? Indiquez le revenu total moins les frais d'exploitation. En cas de perte, donnez le montant et écrivez "Perte".
   Montant $__________/00  ○ Aucun
   c) Quel a été, en 1970, votre revenu net provenant d'une exploitation agricole à votre compte ou en association? Indiquez le revenu total moins les frais d'exploitation. En cas de perte, donnez le montant et écrivez "Perte".
   Montant $__________/00  ○ Aucun
   d) Quel a été, en 1970, votre revenu provenant des sources suivantes: Allocations familiales et allocations scolaires?
   Montant $__________/00  ○ Aucun
   2. Pensions du vieillissement de l'État, du Régime de pensions du Canada et du régime des rentes du Québec?
   Montant $__________/00  ○ Aucun
   3. Autres sources publiques (par ex., prestations d'assurance-chômage, pensions aux anciens combattants, bien-être social)?
   Montant $__________/00  ○ Aucun
   4. Retraites relatives à un emploi antérieur?
   Montant $__________/00  ○ Aucun
   5. Intérêts d'obligations et de dépôts et dividendes?
   Montant $__________/00  ○ Aucun
   6. Autres revenus de placements (par ex., loyers nets)?
   Montant $__________/00  ○ Aucun
   7. Autre revenu (par ex., pension alimentaire)?
   Montant $__________/00  ○ Aucun
   e) Quel a été votre revenu total en 1970 ? (a+b+c+d)
   Montant $__________/00  ○ Aucun
Appendix II: List of Independent Variables

Farm Variables

1. % Farms with Sales < $5,000
2. Ratio Census Farms in 1970 to same for 1960
3. % Farms < 70 Acres
4. Average Capital Value
5. Average Size
6. % of Area under Crops
7. Average Crop Area
8. Average Area Fertilized
9. Average Number of Cattle
10. Average Number of Hens
11. Average Paid Labour
12. Average Sales
13. % Area Rented
14. Average Number of Tractors per Farm
15. Average Value of Machinery
16. Average Cash Wages Paid
17. Average Taxes Paid
18. Average Rent Paid
19. Average Feed Purchases
20. Average Fuel and Oil Costs
21. Average Fertilizer Cost
22. Average Total Expenditures
23. % Cattle, Poultry and Livestock Combination Types

Farm Operator Variables

24. % Non-Resident
25. % Owners
26. Average Off-Farm Work
27. % with Zero or Less Farm Income
28. % with >50% Total Income from Farming
29. % with >75% Total Income from Off-Farm Employment
30. Average Employment Income
31. % Stating Non-Farm Occupation
32. % with Wages and Salaries
33. % with Off-Farm Income
34. % Immigrants
35. Major Source Dummy, 1 = Farm, 2 = Non-Farm
36. % with < Grade 9 Education
37. % with > Grade 12 Education
38. % Working < 39 Weeks per Year
39. % Working < 40 Hours per Week
40. Average Total Income
41. % < 44 Years of Age
42. Average Farm Income
43. % of Total Income from Farming

Farm Family Variables

44. Urban Proximity; 1 = Not Close, 2 = Close
45. Per Capita Family Income
46. Average Family Size
47. % without Flush Toilet in their Dwellings
48. % with Cold or No Water in their Dwellings
49. % with Clothes Dryer in their Dwellings
50. % with Dishwasher in their Dwellings
51. Ratio of Farm Family Income to CMA Family Income
52. % Families with < $5,000
53. % Farm Operator Contribution to Total Family Income
LKC
HD 4966 .F32 C36 1976 c.2
Farm incomes a look at levels, origins, distributions and farm-non-farm comparisons