Farm business analysis



# RELATIVE RATES OF RESOURCE RETURNS ON ONTARIO COMMERCIAL FARMS FROM 1971 TO 1974:

# A COMPARISON WITH NONFARM BUSINESSES



by Jack A. Gellner and George L. Brinkman

School of Agricultural Economics and Extension Education
Ontario Agricultural College
University of Guelph

ISSN 0318-1804

September 1977 AEEE/77/5

# RELATIVE RATES OF RESOURCE RETURNS ON ONTARIO COMMERCIAL FARMS FROM 1971 to 1974: A COMPARISON WITH NONFARM BUSINESSES

by

Jack A. Gellner and George L. Brinkman

School of Agricultural Economics and Extension Education
Ontario Agricultural College
University of Guelph

ISSN 0318-1804

September 1977 AEEE/77/5

# FOREWARD

This study provides information about the income situation in Ontario for commercial agriculture in recent years. It is different than most studies of farm income because it does not examine the conventional question of absolute levels of earnings in agriculture. Instead, it focuses on the relative farm to nonfarm rate of return to labour, management and capital/land resources engaged in agriculture by comparing the earnings of commercial farmers with the earnings that could be expected from similar resources used in nonfarm small businesses. As a consequence, the study examines whether farmers are underpaid, rather than poor.

The study is primarily oriented toward people concerned about agricultural policy and its analysis and formulation. It should be of interest to producer and consumer groups, as well as the general public. Since the study provides information about the relative profitability of commercial agriculture, it also should be of interest to those engaged in farming or considering it as a future career.

We are indebted to Agriculture Canada for providing study leave for Mr. Gellner and for assistance in tabulating Census data. We also acknowledge with thanks helpful comments during the study by Professor M.A. MacGregor and B.H. Davey and on earlier drafts of the manuscript by Professors T.K. Warley and E.L. Menzie. While we are grateful to those mentioned above, the viewpoints expressed in this manuscript are solely those of the authors.

Jack A. Gellner, Ottawa
George L. Brinkman, Guelph
September, 1977

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

## SUMMARY

A widespread belief underlying discussions of farm problems in recent years has been that farmers are underpaid because they receive on average a lower rate of return to their resources (earnings per unit of labour, management and capital) than people in other sectors of Canada. This study examined that belief for Ontario by comparing over 1971-1974 the earnings of commercial farmers with the earnings that could be expected by nonfarm, self-employed small businessmen with similar age, sex, and schooling to the farmer in utilizing the farmer's capital and hours of work.

The study found that commercial farmers in Ontario generally have not been underpaid in recent years as they on average earned quite similar rates of return to those expected for nonfarm businessmen. The largest farms tended to generate higher rates of return than nonfarm small businessmen, while smaller farms generated lower rates of return. The study also showed, however, that there were very large differences among farms of similar size and type, and that rates of return varied greatly from one year to another.

### Procedure

In the study, farms grossing over $15,000 in 1971 were taken as an approximation of commercial farms. Farm returns were measured from CANFARM records for a selected group of commercial farmers and consisted of net farm income (including income in kind) plus capital gains to farm real estate. Comparable earnings in nonfarm small businesses for the resources used in commercial agriculture were measured under a self-employment standard of comparison by 1) the earnings of unincorporated self-employed businessmen for the capital and hours of work of the farm operator, and 2) the earnings of nonfarm wage earners for the work of unpaid farm family help. Nonfarm capital gains were calculated by applying the rate of capital gains for assets employed in manufacturing industries to the farmer's equity in farm real estate. All nonfarm labour and management returns were adjusted for differences in age, sex, and schooling, and calculated on the basis of long run comparable earnings -- i.e. as if the farmer initially had entered a nonfarm profession instead of farming.

Relative rates of return in the farm and nonfarm sectors were computed by calculating the ratio of farm to nonfarm earnings. Return ratios were calculated both excluding and including capital gains for all farms together and three categories of farms classified by farm type, size, and geographic region in Ontario.

### Principal Findings

The main finding of the study was that the overall total returns ratio was .96 for the 1971-1974 period, indicating that overall total rates of return to resources in commercial agriculture were quite similar (96 percent) to rates of return for comparable resources in the nonfarm sector. Capital gains in agriculture, however, represented an important component of farm returns, as the exclusion of capital gains from the returns comparisons reduced the overall returns ratio to .83. (Capital gains in agriculture were higher than nonfarm capital gains during the study period, and amounted to 35 percent of farm returns). Farms with sales of over $50,000 in 1971 had an average

total returns ratio (including capital gains) of 1.19 over the 4 year period while those grossing $25,000 to $50,000 in 1971 had a ratio of 1.00. Farms grossing only $15,000 to $25,000 in 1971 had a total returns ratio of .73 over the 1971 to 1974 period. The returns comparisons by farm size yielded strong evidence of economies to size in agriculture.

In addition, the comparisons revealed significant differences in the returns ratio by type of farm. Over the sample period, hog, crop and dairy farms had total returns ratios which were close to 1.00, i.e. 1.03, 1.00 and .98 respectively. Cattle and mixed farms, on the other hand, had total returns ratios which were only .88 and .86 respectively.

The great disparity in relative rates of return between individual farmers, even within similar categories of farms, was shown by the coefficient of variation of the returns ratios (the standard deviation of the ratios divided by the mean). The overall coefficient of variation for the 1971 to 1974 period for the sample farms was 59 percent, meaning that the return ratios had to range from .39 to 1.53 ($.96 \pm .59 \times .96$) to include one standard deviation (roughly 68 percent) of the farms. When capital gains were excluded to measure disparities in rates of return for cash income the coefficient of variation increased to 75 percent. Similar high levels of disparity were found within farm groups for all sizes and types of farms, and in all regions.

High variability over time in the relative rates of return to commercial agriculture was shown by large differences in year to year returns ratios for the sample farms. For all farms over the sample period, the yearly returns ratios including capital gains were .26, .99, 1.47, and .80 for 1971 to 1974, respectively, and .52, .73, 1.29, and .72 excluding capital gains. The yearly returns ratios excluding capital gains for the smallest size category of farms ($15,000 to $25,000 in 1971) ranged from .36 to .82 per year over the study period, while those for the middle ($25,000 to $50,000 in 1971) and largest ($50,000+ in 1971) categories ranged from .52 to 1.38 and .74 to 1.91, respectively. The large farms, while having higher levels of return ratios, also had greater year to year variations. Dairy farms had the smallest range of return ratios excluding capital gains (.63 to 1.04), while hog farms had the highest (30 to 1.64). Crops, cattle, and mixed farms had yearly returns rations excluding capital gains over the sample period of .40 to 1.58, .32 to 1.22, and .44 to .91 respectively. The wide year to year variations in relative rates of return in this study probably overstate the long run variability in agriculture somewhat, but still tend to be indicative of the boom and bust cycles that exist in agriculture for many commodities.

## Conclusions and Implications

These results should be heartening to commercial farmers, as they indicate little disparity in the rates of return for self-employed businessmen between the nonfarm and commercial farm sectors. The returns ratios also indicate that farming generally may provide a competitive occupation for new and existing farmers who can establish reasonably large efficient operations. However, the great differences in return ratios between farms of different size or type strongly indicates that much of the success in farming depends on the individual's own skill and management ability.

The study results also have implications for agricultural programs and policies. First, given that the returns ratios were quite close to 1.0 during the sample period (and would likely be higher had the returns for 1975 and 1976 been included), agricultural programs should not focus on additional bolstering of general agricultural returns through increased subsidization of the industry. Rather, a variety of programs may be needed to deal with the problems of different groups of farmers, including special assistance for small farmers and management training for less efficient operators. In addition, the year to year instability in agriculture appears as a unique feature of this industry, and demonstrates a need for programs that will either reduce or help farmers accommodate to wide fluctuations in rates of return in order to facilitate orderly development of the agricultural sector. Finally, since capital gains represent an important component of farm returns, programs (e.g. refinancing) may be warranted to help farmers utilize their higher asset values for current production and consumption.

# RELATIVE RATES OF RESOURCE RETURNS ON ONTARIO COMMERCIAL FARMS FROM 1971 to 1974: A COMPARISON WITH NONFARM BUSINESSES

Jack A. Gellner and George L. Brinkman*

## 1.0 INTRODUCTION

### 1.1 The Problem and Its Significance

The rate of return to resources in agriculture relative to rates of return in the nonfarm sector has been a central issue in discussions of income problems in agriculture for several decades. Rates of return represent the earnings per unit of resource (labour, management, and capital/land), rather than the level of total earnings. Comparisons of rates of return in different sectors provide a measure of relative efficiency of resource use, and can be used to address the question of whether farmers are "underpaid." This is essentially a different question than whether farmers are poor (whether they have adequate absolute levels of income and welfare), although the two are often related. Some large farms may have low rates of return, but still generate adequate levels of income because they have many resources. Many farms, on the other hand, are too small and have too few productive resources to generate adequate family incomes from agriculture, even if all their resources are used at an optimal rate. Consequently, rates of return considerations are often more relevant to commercial farms, where resources usually are adequate to generate minimum income and welfare, than for smaller farms, where inadequate family income and part-time farming opportunities may be the most pressing problems. Higher rates of return may help operators of small farms, but may not help them enough to earn a decent living from farming.

Many farmers feel rates of returns to their resources are lower than these earned by comparable resources in other sectors, and actively support political intervention in the market place to improve their position. One example of Federal government activity is the amended Agricultural Stabilization Act [1]. This Act provides for a system of guaranteed minimum prices for specified commodities based on 90 percent of the most recent five year moving average price adjusted for changes in cash costs.[1/] In Ontario, the Farm Income Protection Act guarantees additional support from 90 to 95 percent

---

*Economist, Economics Branch, Agricultural Canada, and Associate Professor, School of Agricultural Economics and Extension Education.

1/Although the Agricultural Stabilization Act is primarily designed to stabilize rather than support earnings, it implicitly supports higher rates of resource returns by providing price floors without restrictions on maximum prices.

of prices calculated in a fashion similar to the Federal provisions. Programs in some of the other provinces establish minimum price support levels for specific commodities based on full costs of production, including returns to labour, management and capital [12].

In the development of many recent agricultural programs, the emphasis has been on ensuring Canadian farmers "fair" rates of returns to resources used on efficient farms. Questions arise, however, relating to what constitutes a fair return, what is an efficient farm unit, and what rates of return are Canadian farmers now earning? In measuring rates of returns to provide answers to these questions, one encounters many conceptual and statistical problems relating to data availability, the valuation of farm prerequisites, capital gains, non-monetary considerations, and so on. Consequently, despite all the attention and debate devoted to resource returns in agriculture, very little empirical evidence has been presented in Canada to reveal the magnitude or distribution of the problem.

In Canada, only few studies, Heads [6] and Kulshreshtha [8], for example, have examined labour earnings, and Jenkins [7] has examined capital returns. Labour earnings have typically been estimated by deducting fixed, predetermined returns to investment capital from net farm income. Jenkins, on the other hand, calculated capital returns by deducting from net farm income an imputed value for non-wage labour based on hired farm labour earnings. Unfortunately, none of the studies above were able to used the labour or capital returns calculated by the other, and all suffer from the limitation of requiring an arbitrary separation of returns to labour (and management when considered) from those to capital. As a result, they do not provide a good measure of the nonfarm opportunity costs of farm resources used jointly as economic complements.

Relative rates of return to agricultural resources have received wider attention in the United States. The most comprehensive analysis of rates of return to U.S. agriculture is the 1967 report to the U.S. Congress, Parity Returns Position of Farmers [11]. This report provided parity ratios (farm to nonfarm rate of return ratios) for 1959, 1964 and 1966. It estimated that large farms grossing over $20,000 had higher rates of return than the nonfarm standards of comparison, while other farms did progressively worse as their gross sales declined. While the U.S. report provides a good framework for making farm and nonfarm comparisons of rates of return, it also contains conceptual limitations. Explicit returns to management were not included in the nonfarm comparisons and nonfarm labour returns were measured as wage and salary earnings, rather than as earnings of nonfarm individuals who were self-employed (like farmers).

## 1.2 Objectives

The study reported in this article was undertaken to improve the methodology for calculating farm and nonfarm rate of return comparisons and to provide up-to-date information on rates of return in Canadian agriculture.

The specific objectives were to:

1. Develop an analytical framework for measuring the rates of return in agriculture relative to the nonfarm sector;

2. Measure relative rates of return to resources in commercial agriculture in Ontario for the farm versus the nonfarm sector, for different sizes and types of farms, different regions in Ontario, and over time;

3. Determine the implications of relative rates of return for agricultural policy.

## 1.3 Outline of the Report

The report of this study devotes about equal attention to the methodology and the results. First it provides a brief summary of the analytical framework in Section 2.0. Next, in Section 3.0, it explains the data sources and measurement techniques, because these are as crucial to the final outcome as the procedure. Section 4.0 presents the results of the relative rates of return calculations for the entire sample as well as for farm groups. This section also examines the variability of rates of return within and among farm groups, and over the four year time period of the study. Finally, Section 5.0 presents the conclusions and implications for agricultural policy.

## 2.0 ANALYTICAL FRAMEWORK

Relative rates of return in the farm and nonfarm sectors can be defined by the ratio of the actual returns to resources in agriculture to the returns comparable resources would earn in the nonfarm sector. The determination of relative rates of return in commercial agriculture in Ontario, therefore, involves two basic measurements:

1. The actual returns to labour, management and capital employed in commercial agriculture.

2. A nonfarm returns standard which reflects the earnings that comparable resources would earn in the nonfarm sector.

In this study, nonfarm returns are measured in terms of a self-employment standard of comparison. This standard measures nonfarm earnings in terms of the returns similar resources to those used by commercial farmers could earn in nonfarm unincorporated businesses, i.e., what nonfarm, self-employed businessmen with similar age, sex, and schooling to the farmer would earn with the farmers' resources and hours of work. The farm and nonfarm earnings are compared in the ratio below to measure relative rates of return.

$$\text{Returns ratio} = \frac{\text{actual farm earnings}}{\text{comparable earnings of nonfarm businesses}}$$

A ratio greater than 1.0 indicates that resources in agriculture are earning rates of return in excess of comparable nonfarm returns, while a ratio of less than 1.0 indicates that farm returns are less than comparable nonfarm returns. For example, a returns ratio of .96 would indicate that resources in agriculture were earning 96 percent of the returns to similar resources in the nonfarm sector.

The returns ratios provide measures of the relative efficiency of resource use in different sectors. For example, under reasonable conditions of competition and resource mobility, returns ratios of significantly less than one would imply that efficiency of resource use would be improved and national output would be increased if resources could be transferred out of the sector with lower rates of return until rates of return were equalized Under conditions of imperfect competition, corrections for divergences between private and social costs would also be needed to properly reflect a social optimum. Within the farm sector, if returns ratios are not equal among farm groups, efficiency of resource use could be improved by transferring resources from the groups with lower returns.

# 3.0 ANALYTICAL PROCEDURES

## 3.1 The Farm Sample

Because rates of return considerations are often more relevant to commercial farms, the measurements of resource returns in this study was limited to resources employed in commercial agriculture. The concept of commercial agriculture, however, is not readily definable. A common practice has been to define "commercial" in terms of farm size, i.e., gross sales [2:419]. In this study gross sales of $15,000 in 1971 were used as the minimum size criterion. This does not mean that all farms with sales of less than $15,000 are noncommercial. The assumption is simply that only commercial farms would be included in the $15,000 and over sales group.

### 3.1.1 Selection of Time Period and Sources of Farm Data

Farm returns were measured over a four year period from 1971 to 1974 and were calculated from a sample of Ontario farms chosen from the CANFARM Data System. A multi-year period was selected to reduce the effect of yearly income fluctuations due to annual variations in farm output and prices. In additon, the period of 1971 to 1974 included both years of low and high incomes and hence, should provide a satisfactory representation of farm income. For example, aggregate net farm income for Ontario was $366, $495, $718 and $878 million from 1971 to 1974 respectively [15]. (In 1975 and 1976, it was $999 and $814 million). Finally, because the sample period includes the census year, 1971, it was possible to use distributions of farm numbers from the Census of Agriculture to assess the representativeness of the sample farms.

Initially 260 farms with gross sales of $15,000 or more in 1971 were selected from the CANFARM system. Yearly data on net farm income (including inventory adjustments), gross sales by type of commodity, real estate values and equity levels[1/] were obtained for each farm during the sample period. In addition, a short questionnaire was mailed to each farm to obtain further information on the type of business organization. This included the number of acres of land owned and rented from 1971 to 1974, the age, sex, and level of schooling of each operator and unpaid family member who worked on the farm, and the number of hours of work per year for each individual during the sample period.[2/]

The response rate to the mail survey, including a reminder and a partial telephone follow-up, was approximately 80 percent. Excluding late and incomplete documents, there were 194 farms in the sample.

---

1/ In the Canfarm records, many farmers did not consistently update their equity levels in accordance with changing real estate values. Whenever possible, equity levels were adjusted to reflect real estate values in 1971 by using any up-dated real estate value reported by the farmer between 1971 and 1974 as the most accurate estimate and calculating values for other years from this figure on the basis of annual changes in real estate values in the particular county in which the farm was located [3,10].

2/ A copy of the questionnaire is contained in Appendix A.

The sample data from the CANFARM records and the questionnaire are summarized in Tables 1 and 2. From Table 1 it can be noted that average gross sales and farm equity increased consistently over the sample period. Net farm income, however, did not follow the provincial pattern in 1973 and 1974, i.e. average net income for the sample farms increased by 90 percent between 1972 and 1973, and decreased by 45 percent in 1974, while aggregate provincial income increased by only 40 percent in 1973 and continued to increase by 22 percent in 1974. Some of the difference may be explained by different procedures for calculating inventory changes, raising 73 incomes and reducing 74 incomes among the sample farms more than found throughout the province. The figures reported by the farmers in Table 1 also exclude income in kind which was included in the provincial figures and increased substantially (32 percent) between 1973 and 1974. (Income in kind subsequently was added in the calculations). Weighting the farms to conform to the provincial distribution further reduce these differences (section 3.1.2). It was not possible, however, to determine precisely how representative were the sample farms.

Table 1. Summary of Sample Data from CANFARM Records, 1971-1974

| Year | Number of Farms | Average Gross Sales ($) | Average Net Farm Income ($) | Average Farm Equity a/ ($) |
|---|---|---|---|---|
| 1971 | 194 | 39,746 | 9,149 | 108,911 |
| 1972 | 194 | 48,878 | 13,792 | 121,093 |
| 1973 | 194 | 62,646 | 26,522 | 141,063 |
| 1974 | 194 | 75,938 | 14,567 | 172,719 |

a/ Equity values have been adjusted to reflect current market values of real estate.

Table 2. Summary of Sample Data from Mail Survey, 1974

| Survey Unit | Number | Average Age | Average Education (grade) | Average Hrs. of Work/yr. (hours) | Management Proportion (%) | Average Acres (No.) |
|---|---|---|---|---|---|---|
| Farms | 194 | - | - | - | - | 216 |
| Farm Operators | 273 | 42 | 12 | 2,844 | 15 | - |
| Unpaid family members | 225 | 23 | 9 | 662 | - | - |

The average size of the 194 farms was 216 acres (Table 2). There were 273 individuals classified as farm operators and 225 individuals classified as unpaid family workers. The operators reported working an average of 2,844 hours per year.[1/] Unpaid family workers reported an average of 662 hours of work per year and accounted for 16 percent of the total labour input.

3.1.2 Classification and Weighting of the Sample Farms

The sample farms were classified according to 1) size of farm, 2) type of farm, and 3) region, and weighted to give the same distribution of farm numbers that existed for commercial farms in Ontario. This classification of the data provides a means of making inter-farm comparisons of rates of return according to size, type and region. Size was based on the level of gross sales in 1971 with three categories: $15,000 - $25,000, $25,000 - $50,000, and over $50,000. For classification purposes, farmers were kept in the category of their 1971 sales, even if their volume of sales increased in the later years of the study. The determination of farm type was based on the principal commodity sold (50 percent or more of gross sales), including dairy,

---

1/ To some extent, the responses to the questionnaire indicated a tendency for farmers to overstate hour of work as individual farmers reported as many as 5460 hours. This represents the equivalent of working from 6 a.m. to 11 p.m. everyday of the year allowing 2 hours for meals, but not allowing any time for days off, church, sickness, shopping, visiting with friends, vacations, or even days when work was impossible because of rain.

cattle, hogs, crops and mixed categories. The final classification criterion divided the sample into five regions in Ontario as outlined in Figure 1.

The classification of the data also provided a means of assessing the representativeness of the sample data. A comparison of the sample distribution of farms, cross-classified by the above criteria (Appendix Table B.1), to a similar distribution tabulated from census data (Appendix Table B.2), revealed a number of major differences. The sample contained an over-representation of dairy farms in the large and medium size group in all regions and an under-representation of dairy farms in the small size group in Western and Southern Ontario. Also, crop farms in Southern Ontario and cattle farms in Western Ontario were under-represented. Weights were therefore applied to the sample data to adjust for the major differences in the distributions. For example, dairy farms of size $15,000 to $25,000 in Southern Ontario were given a weight of 2.0 and dairy farms of size $25,000 to $50,000 in the same region were given a weight of .4 to yield a distribution of farms that corresponded to census data. The weights were obtained by dividing the census percentage for a given size, type and region by the corresponding sample percentage. For example, the census percentage for dairy farms of size $15,000-$25,000 in Southern Ontario was 5.1 (Table B.2) and the sample percentage was 2.6 (Table B.1). The weight for this cell, therefore, was 2.0.

The weighting factors for the various size, types, and regions are given in Appendix Table B.3 and the weighted and unweighted sample numbers in Appendix Table B.4. The weighted sample is intended to represent commercial farms in Ontario of the five types noted above. According to aggregate census data for 1971, commercial farms accounted for about 24 percent of all census farms and produced approximately 65 percent of the agricultural products sold in Ontario. Thus, while the weighted sample does not represent a large number of the census farms in Ontario, it does represent those which produce the major proportion of the output and accordingly, those who are most likely to benefit from programs operated on a per unit of output basis.

The main limitation of the sample data was the sample size. Because of this, returns ratios were not tabulated on the basis of three-way cross-classified data. Returns ratios, however, were tabulated separately for the three classification criteria.

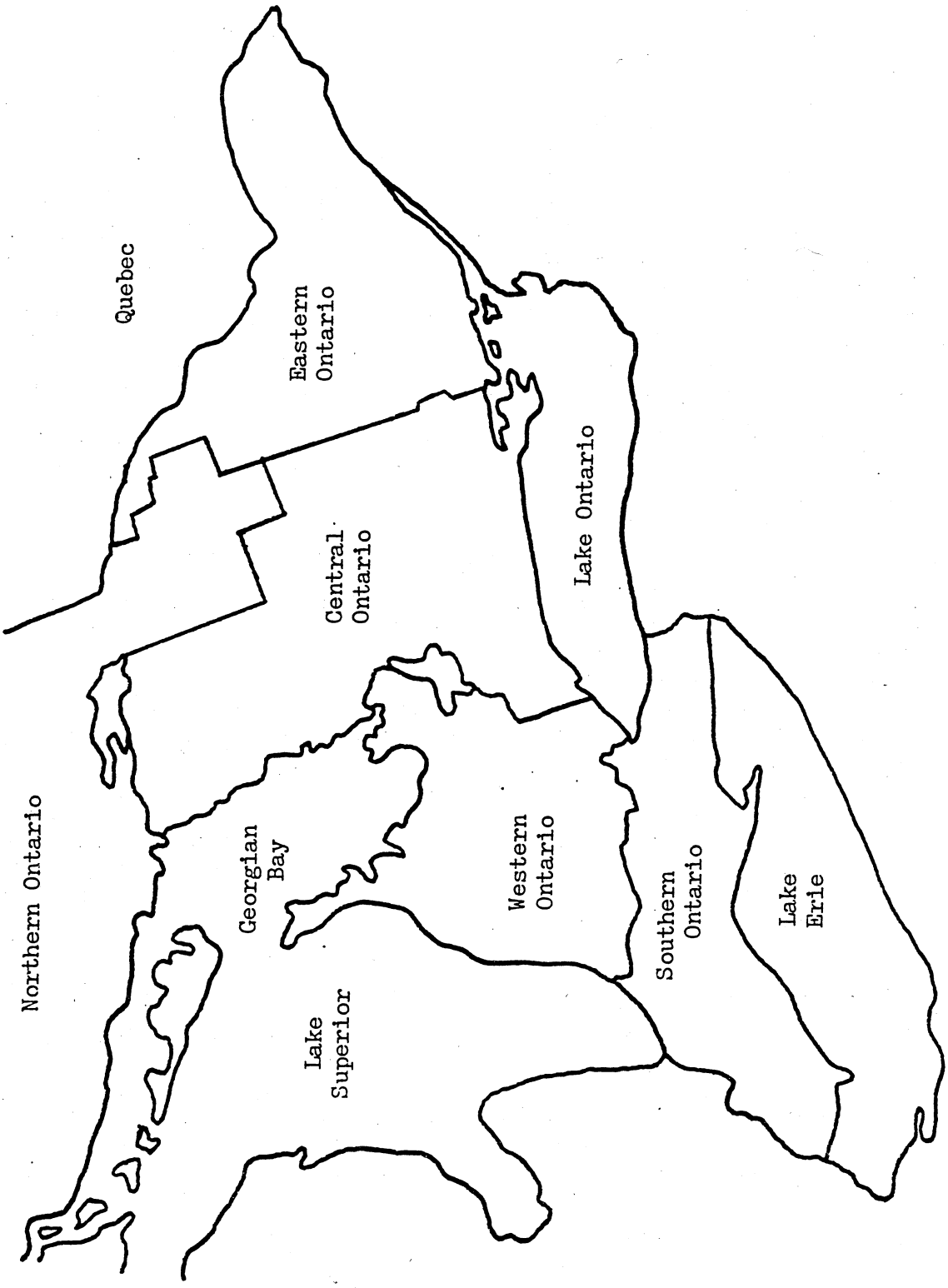
## 3.2 Calculation of Farm Returns[1/]

Returns for each farm were defined as the total of 1) net farm income as reported on the CANFARM records, 2) supplementary estimates of income in kind, and 3) capital gains to real estate. In this study, resources in agriculture included only the labour and capital owned and supplied by the farm operators and their unpaid families. All other labour and capital, such as hired labour, borrowed capital, and the resources of landlords, were treated

---

1/ For a more detailed discussion of the calculations and data used in measuring farm and nonfarm returns the reader is referred to [4].

Figure 1. Regional Classification in Ontario



as production expenses and hence, were reflected in the calculations as deductions from the net farm income.[1/] Because of the difficulty in separating paid family labour from hired labour, paid family labour was considered to be hired labour.

The inclusion of capital gains in farm returns is subject to some debate. On the one hand, it can be argued that capital gains should not be included in farm returns because they are not realizable until the farmer sells his assets. Hence, farmers cannot benefit from their capital gains unless they retire or otherwise cease farming. On the other hand, it has been argued that capital gains have much the same characteristics as current income in that they can be saved (used to increase net worth) or consumed (via borrowing) without decreasing net worth [5:370]. Saving through capital gains reduces the need for farmers to contribute to pension or retirement savings plans, enabling a farmer to consume a greater share of his current income than someone who must set aside funds for retirement. Similarly, borrowing on the basis of capital gains allows the farmer to liquidate his equity. In this sense capital gains do form part of farm returns. Indeed, farmers may be willing to accept low current rates of return to resources in light of existing or anticipated capital gains. Hence, capital gains do affect resource allocation decisions and should be included as part of farm returns.

The specific calculations for determining total farm returns are listed below:

1. Net Farm Income. Net farm income from the CANFARM records consisted of: 1) farm cash receipts from the sale of agricultural products, 2) adjustments to account for changes in inventories, 3) deductions for farm operating expenses and 4) deductions for depreciation charges. Inventories were valued as income in the year they were produced rather than the year they were sold.

2. Income in Kind. Income in kind included the value of farm produced food consumed on the farm plus an imputed net house rent.[2/] Average

---

1/ The study essentially considers farmer-owned resources and examines comparable nonfarm earnings in terms of farm labour, management, and equity. Using only equity capital may give a slightly different return to the capital portion of farm and nonfarm resources than including all capital (owned as well as borrowed) because of different capital-equity ratios and credit subsidies in the two sectors. Data limitations prevented adjustments for different capital-equity ratios, so only comparisons of equity capital were made. Subsidies were not considered, but likely would result in higher comparable nonfarm income because of the greater availability of subsidized capital in agriculture.

2/ Imputed net house rent was obtained from Statistics Canada sources and its inclusion in income in kind follows their procedure for calculating net farm income [15]. Imputed house rent was intended to account for the fact that farm families receive rental benefits from residing on their business properties.

farm values of income in kind in Ontario were obtained from data published by Statistics Canada. Aggregate estimates of income in kind for 1971 to 1974 were divided by estimates of the total number of census farms in Ontario to give average per farm values. The details of the calculations and the resulting average values are given in Table 3.

3. Capital Gains to Farm Real Estate. Capital gains in agriculture were calculated only for agricultural real estate. Farm dwellings were not included in agricultural real estate because they represent non-business assets. Capital gains to non-real estate assets were not estimated, although capital gains to livestock and crop inventories were reflected, in part, in inventory adjustments. Real estate capital gains were calculated by multiplying the number of acres of land owned and operated on each farm by the change in average real estate values in the country in which the farm was located. The change in the value of real estate was calculated over the period of 1970 to 1974. For example, if a given farmer owned and operated 200 acres and average real estate values in his county from 1970 to 1974 increased by $200 per acre, the capital gain attributed to his farm would be $40,000. This method of estimating capital gains was necessary because the real estate values recorded for the sampel in the CANFARM records were not generally adjusted annually to reflect changes in land values.

Estimates of average annual real estate values by county were based on data collected and tabulated by the Ontario Ministry of Agriculture and Food [3,10]. The real estate values were tabulated from the sales information of all rural properties transferred in each of the years from 1970 to 1974. The data were limited to sales of rural properties exceeding 11 acres,[1/] and edited to ensure that only open market sales to private individuals were included. Thus, certain types of sales such as family sales, i.e. sales for $1.00 plus love and affection, were not included in the data. The sales data included speculative transactions as well as bona fide agricultural sales. The valuation of real estate may reflect nonfarm influences on prices which occur most often in urban fringe areas. Consequently, real estate values measure the current market value of real estate owned by farmers, but do not necessarily reflect the value of real estate for use in agriculture alone.

Total farm returns as calculated above were summed for all farms combined and separately by the three categories of farms (size, type and region) for comparison with the nonfarm returns standard.

## 3.3 Calculation of Nonfarm Returns

The self-employment standard of comparison was developed in this study as a conceptually valid measure for comparing farm and nonfarm rates of return

---

1/ The series of real estate values was not strictly comparable over the sample period. For 1970 and 1971 the sales data included properties exceeding 11 acres while the sales data for 1972 to 1974 included properties exceeding 25 acres.

Table 3. Average Income in Kind, Ontario, 1971-1974

| Year | Number of Census Farms [b/] | Total Income in Kind [a/] | | | Average Income in Kind | | |
|---|---|---|---|---|---|---|---|
| | | Produce Consumed ($'000) | Net House Rent ($'000) | Total ($'000) | Produce Consumed ($) | Net House Rent ($) | Total |
| 1971 | 94,638 | 47,725 | 136,356 | 184,081 | 500 | 1,450 | 1,950 |
| 1972 | 92,300 | 50,875 | 141,000 | 191,875 | 550 | 1,530 | 2,080 |
| 1973 | 90,000 | 60,783 | 174,966 | 235,749 | 680 | 1,940 | 2,620 |
| 1974 | 87,600 | 60,099 | 242,891 | 302,990 | 690 | 2,770 | 3,460 |

a/ Source: Farm Net Income, Statistics Canada, Cat. No. 21-002 and unpublished Statistics Canada Data.

b/ Estimated from 1971 census farm numbers assuming a 2.5% decrease in farm numbers per year.

by measuring nonfarm returns under conditions as close as reasonably possible to those found in agriculture. In the development of this standard, emphasis was placed on selecting a consistent and viable set of nonfarm alternatives for resources used in agriculture whereby resource control was maintained by the individual operator. 1/ In the self-employment standard, comparable nonfarm returns to resources in agriculture consist of three parts:

1. Comparable nonfarm earnings of farm operators, measured by the earnings of nonfarm self-employed businessmen. This represents the nonfarm labour, management and investment return for the farm operators.

2. Comparable nonfarm earnings of unpaid family workers, measured by the earnings of nonfarm wage-earners.

3. Nonfarm capital gains, measured by the rates of capital gain to assets employed in nonfarm businesses.

By using the earnings of nonfarm self-employed businessmen in the standard, the monetary returns of both farmers and nonfarm self-employed operators can be measured as a joint management, labour and investment return, hence there is no requirement for an arbitrary allocation of returns to each factor. Both farmers and nonfarm businessmen also primarily invest in their own businesses, rather than external capital markets. In addition, psychic incomes tend to be similar, as they are derived from similar conditions of business freedom and independence. Although the levels of risk between farmers and nonfarm businessmen may not be strictly comparable, they should provide a reasonable comparison. Furthermore, this comparison is still more acceptable than previous studies calculating nonfarm returns to management only in terms of wage-earners or salaried management personnel. Finally, the hours of work and conditions of employment likely are quite comparable. The calculations of the components of this standard are given below.

1. Nonfarm Returns of Farm Operators. The nonfarm earnings of the farm operators were measured by the earnings of self-employed (unincorporated), full-time, full year individuals in all nonfarm occupations in Ontario. Self-employed individuals included workers whose jobs consisted mainly of employment in their own unincorporated businesses or professional practices.2/

---

1/ This approach in maintaining the individual's control over his resources examines resource efficiency from a micro standpoint. It calculates opportunity costs in terms of what an individual could expect to earn in the nonfarm sector and is necessary to address the question of whether farmers are underpaid. An alternative measure of efficiency could be examined from the macro standpoint, whereby opportunity costs are calculated as earnings of all nonfarm capital, regardless of how it is owned or invested. This approach would include the return to capital invested by corporation presidents, research staffs, and other management consultants unavailable to farmers, and would require that the farmer give up control over his capital resources.

2/ Self-employed individuals who were incorporated were classified as wage-earners.

Table 4. Hourly Self-Employment Earnings of Self-Employed (Unincorporated), Full-Time, Full Year [a/] Individuals in All Occupations, Except Farming, Ontario, 1970.

| Age | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level of Schooling | | | | | Level of Schooling | | | | |
| | Less than Grade 9 | Grades 9 to 13 | Some University | Diploma or Bachelor Degree | Post-Grad. or Professional Degree | Less than Grade 9 | Grades 9 to 13 | Some Univ. | Diploma or Bachelor Degree | Post-Grad. or Professional Degree |
| | - - - dollars - - - | | | | | | | | | |
| 15-19 | 1.98 | 1.46 | - | - | - | 1.42 | 1.40 | - | - | - |
| 20-24 | 2.20 | 2.31 | 2.47 | 1.92 | 5.35 | 1.62 | 2.16 | 1.28 | 2.63 | 4.06 |
| 25-34 | 3.34 | 3.26 | 3.54 | 4.66 | 9.06 | 1.69 | 2.04 | 2.05 | 3.33 | 9.35 |
| 35-44 | 3.50 | 3.78 | 4.68 | 8.02 | 13.81 | 1.69 | 2.10 | 2.15 | 2.63 | 7.62 |
| 45-54 | 2.22 | 3.63 | 4.43 | 7.93 | 14.34 | 1.71 | 2.03 | 2.42 | 3.26 | 7.74 |
| 55-64 | 2.92 | 3.57 | 3.70 | 7.79 | 13.24 | 1.52 | 1.95 | 1.82 | 2.98 | 8.18 |
| 65 | 2.30 | 2.79 | 4.65 | 6.66 | 10.70 | 1.50 | 2.07 | 3.07 | 1.36 | 3.87 |
| Total | 3.14 | 3.49 | 4.11 | 7.23 | 12.72 | 1.62 | 2.04 | 2.17 | 2.92 | 7.86 |

Source: 1971 Census of Canada, Special Tabulation.

[a/] Full-time indicates full weeks of work rather than part weeks and full year indicates at least 40 weeks of work per year.

Because the farm operatios in the sample were mainly full-time operators, only the earnings of full-time, full year, nonfarm self-employed individuals were included in the standard. Hourly nonfarm self-employment earnings were tabulated from data collected in the 1971 Census of Canada and are given in Table 4. To account for the major long term determinants of earnings in the returns standard the data were cross-classified by level of schooling, age, and sex [14]. The classification by level of schooling included a category for individuals with post-graduate or professional degrees. Because few farmers have post-graduate or professional degrees, the expected nonfarm earnings of the farm operators for the most part did not include the earnings of individuals in professional occupations e.g., doctors and lawyers.

Given the characteristics of each operator, the expected nonfarm hourly rate of self-employment earnings can be determined from Table 4. For example, a 50 year old male farm operator with high school education would receive $3.63 per hour with average nonfarm investment. This rate, multiplied by the annual hours of work reported, would yield the total expected nonfarm earnings for the operator in 1970.

The data in Table 4 relate to self-employment earnings in 1970. To obtain earnings for all years in the sample period, 1971 to 1974, these data were indexed forward on the basis of changes in average business earnings in Ontario. The indexes for business earnings, which were calculated from income tax statistics [20], are given in the columns under business earnings in Table 5.

Table 5. Changes in Business and Employment Earnings in Ontario, 1971-1974

| Year | | Business Earnings | | Employment Earnings | |
|---|---|---|---|---|---|
| | | Male | Female | Male | Female |
| 1970 | Average/Taxfiler ($) | 7,481 | 4,791 | 7,978 | 4,519 |
| | Change (%) | - | - | - | - |
| 1971 | Average/Taxfiler ($) | 8,220 | 5,335 | 8,813 | 5,104 |
| | Change (%) | 9.9 | 11.3 | 10.5 | 13.0 |
| 1972 | Average/Taxfiler ($) | 9,050 | 5,641 | 9,609 | 5,479 |
| | Change (%) | 10.1 | 5.7 | 9.0 | 7.3 |
| 1973 | Average/Taxfiler ($) | 10,050 | 6,290 | 10,449 | 5,945 |
| | Change (%) | 11.0 | 11.5 | 8.7 | 8.5 |
| 1974[a/] | Average/Taxfiler ($) | - | - | - | - |
| | Change (%) | 11.0 | 11.5 | 8.7 | 8.5 |

Source: Taxation Statistics, Revenue Canada, 1972 to 1975.

a/ Data for 1974 are not available. Changes for 1973 are applied to 1974.

As noted earlier, hourly self-employment earnings were tabulated from 1971 census data. In the Census, nonfarm earnings from self-employment, in 1970, were reported for all individuals over the age of 15. Also reported were data on the number of weeks worked and the usual number of hours worked per week.[1/] These data were used to calculate annual hours worked for nonfarm individuals. On the census questionnaire, however, weeks and hours of work were reported by categories. Annual hours were estimated by averaging the products of the lower and upper limits of the reported categories for each individual. For example, if an individual reported working 40 to 48 weeks per year and 35 to 39 hours per week the calculation of total hours was as follows:

$$\text{Total hours} = \frac{(40 \times 35) + (48 \times 39)}{2} = 1636$$

Total employment earnings were divided by the estimate of total hours to arrive at an hourly rate of earning.

The highest category on the census questionnaire for hours worked per week was "50 hours or more." For this study, 60 hours was selected as the upper limit of this category to facilitate the calculation of total hours. The hourly nonfarm earnings therefore were based on a maximum of 60 hours of work per week. Accordingly, to maintain consistency in the farm to nonfarm returns comparisons, the hours of work of farm operators were also limited to a maximum of 60 per week.

It was also found that the average equity levels on commercial farms were greater than the average equity levels of nonfarm unincorporated businesses by about 53 percent per individual operator.[2/] To account for this discrepancy, earnings in the self-employment standard were adjusted by 10 percent of the difference in equity, representing a 10 percent rate of return on the additional equity owned by farmers. For example, if a farmer had $20,000 more equity than the average of nonfarm unincorporated businesses, his expected nonfarm earnings would be increased by $2,000.

---

1/ There was a minor conceptual difficulty in estimating hours of work from the census data. Specifically, weeks worked were reported for the entire 1970 year, while hours usually worked per week were reported for the week prior to the census reference date ( June 1, 1971). If no job was held in that week, weekly hours were reported for the job of longest duration since January of 1970. For individuals who, between the end of 1970 and the census reference date, changed to employment involving significantly different hours of work, 1970 earnings and weekly hours would not correspond. This difficulty likely arises more for part-time workers than for full-time workers.

2/ In the 1970 Consumer Income and Expenditure Survey it was estimated that average business equity for nonfarm self-employed individuals in Ontario was 16 percent higher than average equity for all farm self-employed individuals [16]. However, from the 1971 Census of Agriculture it was determined that the average capital value of census farms with sales over $15,000 was 77 percent higher than the average captial value of all census farms [17]. Based on these data, average business equity of commercial farms was estimated to be 53 percent higher than nonfarm unincorporated businesses.

2. Nonfarm Earnings of Unpaid Family Labour. Comparable nonfarm earnings of unpaid family workers not participating in management decisions (non-operators) were measured by the earnings of full-time, full year wage-earners in all nonfarm occupations in Ontario. Wage-earners included individuals who worked for wages, salaries, tips or commissions. Hourly wage-earnings were calculated from 1971 census data using the same procedure applied to self-employment earnings. The data are given in Table 6. Given the age, sex, and level of schooling for each unpaid family worker, comparable hourly nonfarm earnings can be determined from this table. While it is recognized that many unpaid workers could be classified as part-time, it was not possible to obtain satisfactory data on part-time wage-earnings from available information. Accordingly, the earnings of full-time nonfarm wage-earners were applied to all unpaid family labour. Wage-earnings were indexed forward for the years 1971 to 1974 by applying indexes of employment earnings, given in the last two columns of Table 5.

The allowable hours of work for calculating comparable nonfarm earnings of unpaid family workers were limited to a maximum of 50 hours per week because it was felt that they normally would have difficulty finding nonfarm jobs that would permit them to work as many hours as on the farm, particularly on their own work schedule. Furthermore, to work the same number of hours, most would have to take part-time supplementary jobs at reduced rates of pay.

In summary, the comparable nonfarm earnings for a farm worker in a given year were determined by selecting the appropriate rate of earnings, applying the appropriate index and multiplying by the numbers of hours of work reported by the individual. The summation of comparable nonfarm earnings for all farm operators and unpaid family workers yielded the total nonfarm labour, management and investment earnings for the self-employment standard.

3. Nonfarm Capital Gains. Nonfarm capital gains for the self-employment standard were measured by the rates of capital gains of assets employed in manufacturing industries. Rates of capital gain in manufacturing industries were calculated by comparing aggregate estimates of net fixed capital assets less net fixed capital formation for successive years in the sample period. The data were based on Statistics Canada estimates of capital flows and stocks in manufacturing industries. Explanations of the above terms and the estimated rates of capital gain are given in Table 7. The annual rates of gain were applied to farm equity levels for 1971 to obtain comparable nonfarm capital gains for the self-employment standard. Comparable nonfarm capital gains were combined with nonfarm self-employment and wage earnings to complete the self-employment standard.

Throughout the self-employment standard of comparison, the nonfarm opportunity cost of agricultural resources were measured from a long run rather than a short run viewpoint [13]. The long run viewpoint considers opportunity costs in terms of comparable nonfarm earning possibilities based on the assumption of appropriate long run training and experience. The short run viewpoint, on the other hand, considers nonfarm opportunity costs in terms of nonfarm earning possibilities based upon the immediate transfer of resources from farm to nonfarm employment. The distinction perhaps can be demonstrated

Table 6. Hourly Employment Earnings of Full-Time, Full Year[a/] Wage-Earners[b/] in All Occupations Except Farming, Ontario, 1970.

| Age | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level of Schooling | | | | | Level of Schooling | | | | |
| | Less than Grade 9 | Grades 9 to 13 | Some Univ. | Diploma or Bach. Degree | Post-Grad. or Prof. Degree | Less than Grade 9 | Grades 9 to 13 | Some Univ. | Diploma or Bach. Degree | Post-Grad. or Prof. Degree |
| | - - - dollars - - - | | | | | | | | | |
| 15-19 | 1.70 | 1.86 | 1.73 | 2.19 | - | 1.49 | 1.65 | 1.52 | 2.04 | - |
| 20-24 | 2.61 | 2.86 | 2.85 | 3.21 | 3.30 | 1.76 | 2.28 | 2.54 | 3.07 | 3.24 |
| 25-34 | 3.31 | 3.87 | 4.24 | 4.83 | 5.47 | 1.89 | 2.65 | 3.29 | 3.85 | 4.35 |
| 35-44 | 3.67 | 4.51 | 5.31 | 6.66 | 7.82 | 1.95 | 2.69 | 3.54 | 4.38 | 5.71 |
| 45-54 | 3.59 | 4.57 | 5.63 | 7.31 | 8.98 | 1.98 | 2.67 | 3.48 | 4.48 | 5.95 |
| 55-64 | 3.37 | 4.38 | 5.52 | 7.31 | 8.81 | 1.99 | 2.70 | 3.64 | 4.83 | 5.72 |
| 65 | 2.84 | 3.55 | 5.54 | 5.37 | 7.20 | 1.89 | 2.36 | 2.77 | 3.52 | 4.77 |
| Total | 3.43 | 4.03 | 4.66 | 5.91 | 7.24 | 1.93 | 2.54 | 3.19 | 3.98 | 5.04 |

Source: 1971 Census of Canada, Special Tabulation.

a/ Full-time indicates full weeks of work rather than part weeks and full year indicates at least 40 weeks of work per year.

b/ Includes self-employed individuals who are incorporated and earning a salary or wage from their business.

as follows: The long run comparison views the opportunity costs of the 50 year old farmer in terms of the earnings he could expect if 30 years ago he had entered some other occupation. The short run viewpoint considers the non-farm opportunity costs of a 50 year old farmer in terms of what he could earn today if he had to cease farming and find employment in the nonfarm sector. No doubt, both of these have relevance to efficiency questions. However, in this study, opportunity costs of labour resources in agriculture were examined from the long run perspective to reflect the earnings of nonfarmers with similar experience and training in their job to what the farmer has in his. By using the long run perspective it can be assumed that resource adjustment can occur between the farm and nonfarm sectors or within the agricultural sector itself.

Table 7. Capital Gains to Fixed Capital Assets in Manufacturing Industries, 1971 to 1974.

| Year | (1) Mid-Year Net Fixed Assets[a/] ($ Million) | (2) Net Fixed Capital Formation[b/] ($ million) | (3) Appreciated Value, i.e. (1) - (2) ($ million) | Percent Change, i.e. (3)÷(1) of previous year | |
|---|---|---|---|---|---|
| | | | | Yearly (%) | Cumulative (%) |
| 1970 | 26,102.1 | - | - | | |
| 1971 | 28,544.3 | 1,139.5 | 27,404.8 | 5.0 | 5.0 |
| 1972 | 30,584.7 | 957.9 | 29,626.9 | 3.8 | 9.0 |
| 1973 | 33,959.9 | 1,288.7 | 32,671.2 | 6.8 | 16.4 |
| 1974 | 38,884.6 | 1,961.5 | 36,923.1 | 8.7 | 26.5 |

Source: Fixed Capital Flows and Stocks, Statistics Canada, Cat. No. 13-211.

a/ Net fixed assets equal gross assets less deductions for losses in value through physical deterioration and obsolesence.

Gross assets equal the cumulative value of gross investment in capital goods less cumulative discards. Gross assets are revalued annually to reflect current market prices.

b/ Net fixed capital formation equals gross fixed capital formation less capital consumption allowances.

Gross fixed capital formation equals the value of new capital goods purchased by industries.

Generally, opportunity costs are higher in the long run than in the short run. Short run opportunity costs imply that resources must take whatever employment is available to them whereas long run opportunity costs imply that adjustments such as retraining can occur. In measuring the rates of return position of resources in agriculture, therefore, long run opportunity costs give farm labour resources the benefit of the highest possible nonfarm earnings.

On the basis of the self-employment standard, returns ratios were calculated to compare actual farm returns to comparable nonfarm returns. The return ratios were calculated both including and excluding capital gains. The ratios were calculated for all farms in the sample and for three categories of farms classified by size of farm, type of farm, and region in Ontario. Since the farm and nonfarm returns were compared in a ratio, no adjustments for inflation were made.[1/]

---

1/ This assumes that the effects of inflation were similar in each sector in each year. Deflating both the numerator and the denominator of the ratio, including capital gains, by the same annual index would not effect the yearly return ratios.

## 4.0 RELATIVE FARM TO NONFARM RATES OF RETURN TO RESOURCES IN COMMERCIAL AGRICULTURE

Relative farm to nonfarm rates of return were measured by comparing actual returns to resources in commercial agriculture with the returns that comparable resource could expect to earn in the nonfarm sector. Table 8 gives the average farm and nonfarm returns and returns ratios over the sample period for the self-employment standard. Total farm returns, including capital gains, averaged $26,749 per year over the sample period, while comparable nonfarm returns averaged $27,943. The overall returns ratio for commercial farms in Ontario was .96. When capital gains were excluded from the comparison, the ratio was reduced to .83. Capital gains were an important component of farm returns averaging $9,249 per year from 1971 to 1974 and amounting to 35 percent of total farm returns. On the other hand, capital gains were 25 percent of the total nonfarm return under the self-employment standard.

The overall returns ratio indicates that over the sample period returns to resources in commercial agriculture in Ontario were generally very close to the returns to comparable resources in the nonfarm sector. However, a ratio of close to 1.0 does not imply that all resources were receiving rates of return which were similar to nonfarm rates of return. Farm labour and investment returns were only 83 percent of nonfarm returns, but capital gains to farm land were high enough to compensate for the difference.

Table 8 Average Farm and Nonfarm Returns and Returns Ratios for Resources in Commercial Agriculture, Ontario, 1971-1974. a/

| Return | Farm Returns | Self-Employment Standard b/ | |
|---|---|---|---|
| | | Nonfarm Returns | Returns Ratio |
| | ($) | ($) | (ratio) |
| Total Returns | 26,749 | 27,943 | .96 |
| Labour and Investment Return | 17,500 | 21,141 | .83 |
| Capital Gains | 9,249 | 6,802 | 1.36 |

a/ The levels of farm and nonfarm returns are expressed as a one year average of the current dollar values for the four years in the sample period.

b/ Hours of work are limited to a maximum of 60 per week for farm and nonfarm self-employed individuals and to a maximum of 50 per week for unpaid family labour. Adjustments have been made for differences in the average levels of investment in farm and nonfarm businesses.

A summary of average farm to nonfarm returns ratios is given in Table 9 for farms of different size, product types, and geographic region. Due to the small sample size, farms were analyzed by one category at a time, and not cross-classified by the three categories. The returns comparisons reveal a high level of variability of returns ratios by each category of farms. Further details of these ratios are given in the following sections.

Table 9 Ratio of Farm to Nonfarm Returns for Commercial Farms by Farm Size, Farm Type, and Region, Ontario, 1971-1974

| Category of Farms | Self-Employment Standard | |
|---|---|---|
| | Including Capital Gains | Excluding Capital Gains |
| | (ratio) | (ratio) |
| All Farms | .96 | .83 |
| Farm Size ($'000) | | |
| 15-25 | .73 | .53 |
| 25-50 | 1.00 | .89 |
| 50+ | 1.19 | 1.21 |
| Farm Type | | |
| Dairy | .98 | .81 |
| Cattle | .88 | .72 |
| Hog | 1.03 | .88 |
| Crop | 1.00 | .97 |
| Mixed | .86 | .66 |
| Region | | |
| Southern | 1.02 | .93 |
| Western | .93 | .80 |
| Central | .92 | .71 |
| Eastern | .85 | .73 |
| Northern | .81 | .57 |

## 4.1 Variation Among Farm Groups

Variability of relative rates of return among farm groups was measured by the differences in the levels of average returns ratios for the different categories of farms. The first measure of viability was obtained by classifying the sample by size of farm. A comparison of average farm and nonfarm returns and the returns ratios for the three sizes of farms is given in Table 10. The returns ratios based on total returns increase significantly with increases in farm size. More specifically, the ratio for total returns (including capital gains) was considerably less than 1.00 for farms with sales in 1971 of $15,000 - $25,000 (.73), and significantly greater than 1.00 for farms with sales over $50,000 (1.19). The total returns ratio for farms with sales of $25,000 - $50,000 was 1.00. When the ratios were considered excluding capital gains, the gap between the small and large farms widened, i.e., the returns ratio for the smallest size group was .53 while it was 1.21 for the large size group. Even without capital gains large commercial farms had returns ratios of greater than 1.00. As a percentage of total returns, capital gains represented 42 percent for the small commercial farms but only 32 and 31 percent for the two largest size groups of farms.

Table 10 Average Farm and Nonfarm Returns and Returns Ratios by Size of Farms, Ontario, 1971-1974

| Size of Farm ($'000 in 1971) | Farm Returns | Self-Employment Standard | |
|---|---|---|---|
| | | Nonfarm Returns | Returns Ratio |
| | ($) | ($) | ratio |
| 15 - 25 | | | |
| Total Returns | 16,447 | 22,523 | .73 |
| Labour Investment | 9,498 | 18,031 | .53 |
| Capital Gains | 6,949 | 4,492 | 1.55 |
| 25 - 50 | | | |
| Total Returns | 28,589 | 28,280 | 1.00 |
| Labour & Investment | 19,310 | 21,746 | .89 |
| Capital Gains | 9,279 | 6,534 | 1.42 |
| 50+ | | | |
| Total Returns | 45,967 | 38,662 | 1.19 |
| Labour & Investment | 31,641 | 26,144 | 1.21 |
| Capital Gains | 14,325 | 12,518 | 1.14 |

The second measure of the variability of resource returns among farm groups was obtained by grouping the farms by type of commodity sold. Table 11 provides a comparison of average farm and nonfarm returns and the returns ratios for the types of farms. Over the sample period, hog, crop, and dairy farms had total returns ratios which were close to 1.00, i.e., 1.03, 1.00 and .98, respectively, indicating that on the average they received adequate returns. Cattle and mixed farms, on the other hand, had total returns ratios

Table 11 Average Farm and Nonfarm Returns and Returns Ratios by Type of Farm, Ontario, 1971-1974

| | | Self-Employment Standard | |
|---|---|---|---|
| Farm Type | Farm Returns | Nonfarm Returns | Returns Ratio |
| | ($) | ($) | ratio |
| Dairy | | | |
| Total Returns | 25,566 | 26,173 | .98 |
| Labour & Investment | 16,613 | 20,605 | .81 |
| Capital Gains | 8,953 | 5,568 | 1.61 |
| Cattle | | | |
| Total Returns | 29,210 | 33,357 | .88 |
| Labour & Investment | 18,252 | 25,176 | .72 |
| Capital Gains | 10,958 | 8,181 | 1.34 |
| Hog | | | |
| Total Returns | 25,544 | 24,861 | 1.03 |
| Labour & Investment | 17,231 | 19,525 | .88 |
| Capital Gains | 8,313 | 5,336 | 1.56 |
| Crop | | | |
| Total Returns | 26,641 | 26,520 | 1.00 |
| Labour & Investment | 18,589 | 19,220 | .97 |
| Capital Gains | 8,052 | 7,300 | 1.10 |
| Mixed | | | |
| Total Returns | 27,684 | 32,247 | .86 |
| Labour & Investment | 14,103 | 21,517 | .66 |
| Capital Gains | 13,581 | 10,730 | 1.27 |

which were significantly less than 1.00, i.e., .88 and .86 respectively. Excluding capital gains, crops farms were the only farm type with ratios close to 1.00, i.e., .97. It must be recognized, however, that the returns comparisons reflect the market situation which existed for the particular commodities during the four year sample period. A longer period of study is necessary to obtain a more representative picture of relative rates of return of farms producing different commodities.

The third measure of the variability of resource returns among farm groups was obtained by classifying the farms by region in Ontario. Table 12 provides a comparison of average farm and nonfarm returns and the returns rations for the five regions. Farms in Southern Ontario had the highest total returns ratios (1.02) while farms in Northern Ontario had the lowest total returns ratios (.81). The ratios revealed substantial differences in the rates of return to resources among the regions. The differences, for the most part, reflect the comparative advantages of agricultural production in the various areas, e.g. climatic conditions, soil quality and nearness to markets. When returns ratios excluding capital gains were considered, the differences in the returns ratios among regions increased. For example, the ratio for Southern Ontario was .93 and the ratio for Northern Ontario was .57. Central Ontario had the highest level of farm capital gains. Much of the capital gain in this region can be attributed to nonfarm competition for real estate arising in the Toronto area.

## 4.2 Variation Within Farm Groups

The variability of returns ratios for individual farms within farm groups was measured by the coefficient of variation, defined as the standard deviation of the returns ratio divided by the average returns ratio for the composite four year sample period. The coefficient of variation provides a relative measure of the dispersion of returns ratios for individual farmers within groups. Table 13 provides a comparison of the coefficients of variation for the sample farms collectively and grouped by size, type and region. Large coefficients indicate high levels of variability among individual farms.

Table 13 indicates tremendous variability in relative rates of returns among individual commercial farms in Ontario. The coefficient of variation for total returns for all farms together was 59 percent of the average .96 returns ratio. This means that the interval of returns ratios containing one standard deviation (68 percent of the observations) was .96 $\pm$ .57 (.96 $\pm$ .59 x .96), or a range of return ratios of .39 to 1.53. When capital gains were excluded, the coefficient of variation increased significantly to .75, indicating that current farm income was more unstable than total returns. As an additional indication of variability, the individual farm total returns ratios ranged from a low of -.35 to a high of 3.34.

Table 13 further reveals high variability within all the different size groups, farm types and geographic regions over the complete four-year period. This variability is somewhat expected in light of the high overall variability, however, since each size category contains farms of different types, and each farm type group consists of farms of different sizes, etc. With the lone exception of mixed farms, every farm size, type, and regional

Table 12 Average Farm and Nonfarm Returns and Returns Ratios by Region, Ontario, 1971-1974

| Region | Farm Returns | Self-Employment Standard Nonfarm Returns | Return Ratios |
|---|---|---|---|
| | ($) | ($) | (ratio) |
| Southern | | | |
| Total Returns | 28,358 | 27,751 | 1.02 |
| Labour & Investment | 19,148 | 20,539 | .93 |
| Capital Gains | 9,210 | 7,212 | 1.28 |
| Western | | | |
| Total Returns | 26,942 | 28,875 | .93 |
| Labour & Investment | 18,184 | 22,701 | .80 |
| Capital Gains | 8,762 | 6,174 | 1.42 |
| Central | | | |
| Total Returns | 29,023 | 31,495 | .92 |
| Labour & Investment | 15,958 | 22,401 | .71 |
| Capital Gains | 13,065 | 9,094 | 1.44 |
| Eastern | | | |
| Total Returns | 21,196 | 24,983 | .85 |
| Labour & Investment | 14,372 | 19,741 | .71 |
| Capital Gains | 6,824 | 5,242 | 1.30 |
| Northern | | | |
| Total Returns | 14,300 | 17,761 | .81 |
| Labour & Investment | 8,586 | 15,117 | .57 |
| Capital Gains | 5,714 | 2,644 | 2.16 |

category also had greater variability of current returns (excluding capital gains) than for total returns. The coefficients excluding capital gains for the smallest to the largest size group, for example, were 89, 67, and 69 percent. Dairy and mixed farms had the lowest variation coefficients (54 and 47 percent excluding capital gains) while cattle, hog, and crop farms were extremely high (98, 100, and 92 percent respectively). This reflects to some degree greater vulnerability to market uncertainties of crop, cattle, and hog producers than mixed farmers, who achieve greater stability through diversification, or dairy farmers, who operate under administered prices and quotas. Differences by region for the most part reflected the predominance of certain farm types in the area.

Table 13 Variability of Returns Ratios by Farm Size, Farm Type and Region, Ontario, 1971-1974

| Category of Farms | Coefficient of Variation | |
|---|---|---|
| | Including Capital Gains | Excluding Capital Gains |
| | (percent) | (percent) |
| All Farms | 59 | 75 |
| Size ($'000) | | |
| 15-25 | 60 | 89 |
| 25-50 | 55 | 67 |
| 50+ | 62 | 69 |
| Type | | |
| Dairy | 44 | 54 |
| Cattle | 64 | 98 |
| Hog | 68 | 100 |
| Crops | 86 | 92 |
| Mixed | 63 | 47 |
| Region | | |
| Southern | 59 | 69 |
| Western | 60 | 84 |
| Central | 68 | 98 |
| Eastern | 47 | 55 |
| Northern | 51 | 59 |

## 4.3 Variation By Year

Variation of rates of return over time was measured by computing average returns ratios for the sample farms for each year in the sample period. Table 14 provides a comparison of the yearly average returns ratios for the three categories of farms and reveals a high degree of variability of returns over time. The returns ratios for 1971 to 1974 for all farms were .26, .99, 1.47 and .80, including capital gains, and .42, .73, 1.29 and .72, excluding capital gains, respectively. Because the 4 year period of 1971 to 1974 included years of very low and very high farm incomes, the returns comparisons may overstate the long-term variability of farm returns. Nevertheless, the yearly returns ratios revealed wide variations of rates of return in agriculture over time.

The returns ratios for the total four year period in Table 8 do not represent an average of the yearly returns ratios in Table 14. The nonfarm returns for the total period (Table 8) were calculated using farm equity levels at the beginning of the sample period and capital gains over the entire period. The nonfarm returns on a yearly basis (Table 14) were calculated using farm equity levels at the beginning of each year.

The yearly returns ratios also revealed wide variations for the different farm size groups over time. Considering only coefficients excluding capital gains to provide a better measure of variability in current income, it can be seen that the return ratios ranged for the small size category of farms from .36 to .82 over the four year period. The ratios for the middle and large size categories ranged from .52 to 1.38 and from .74 to 1.91, respectively. Thus, while the returns ratios were higher for the larger farms they also exhibited a higher degree of variation over time.

Of the different types of farms, dairy farms had the smallest range of yearly returns ratios excluding capital gains over the sample period, i.e., .63 to 1.04. Hog farms had the largest range of ratios, from .30 to 1.64. The returns ratios of cattle and crop farms ranged from .32 to 1.22 and from .40 to 1.58, respectively. As might be expected, mixed farms had a smaller range of returns ratios, i.e., .44 to .91.

The high range of returns ratios is indicative of the boom and bust cycles that exist in agriculture for many commodities. This is particularly apparent from the returns ratios of hog, crop, and cattle farms. Returns for dairy and mixed farms, on the other hand, tended to be more stable, likely reflecting production conditions, government policies, and producer organizatio in the dairy industry, and greater stability through diversification for mixed farms. The variation of the returns ratios in the various regions, for the most part, reflected the predominance of certain farm types in the areas.

## 4.4 Sensitivity Adjustments

In the preceding calculations the returns ratios were based on a maximum of 60 hours of work per week for farm operators. In addition, the value of income in kind was included in farm returns and hourly nonfarm

Table 14. Average Yearly Returns Ratios by Farm Size, Farm Type, and Region, Ontario, 1971-1974

| Category of Farms | 1971 | | 1972 | | 1973 | | 1974 | |
|---|---|---|---|---|---|---|---|---|
| | Including Capital Gains (ratio) | Excluding Capital Gains (ratio) | Including Capital Gains (ratio) | Excluding Capital Gains (ratio) | Including Capital Gains (ratio) | Excluding Capital Gains (ratio) | Including Capital Gains (ratio) | Excluding Capital Gains (ratio) |
| All Farms | .26 | .52 | .99 | .73 | 1.47 | 1.29 | .80 | .72 |
| Size ($'000) | | | | | | | | |
| 15-25 | .20 | .36 | .82 | .53 | 1.17 | .82 | .54 | .39 |
| 25-50 | .30 | .52 | 1.10 | .81 | 1.47 | 1.38 | .86 | .78 |
| 50+ | .30 | .74 | 1.09 | .94 | 1.89 | 1.91 | 1.08 | 1.17 |
| Type | | | | | | | | |
| Dairy | .38 | .63 | 1.11 | .77 | 1.43 | 1.04 | .70 | .75 |
| Cattle | .33 | .62 | 1.15 | .80 | 1.46 | 1.22 | .39 | .32 |
| Hogs | .24 | .30 | 1.12 | .90 | 1.72 | 1.64 | .71 | .62 |
| Crops | .11 | .40 | .71 | .58 | 1.44 | 1.58 | 1.32 | 1.18 |
| Mixed | .18 | .44 | .77 | .70 | 1.36 | .91 | 1.04 | .54 |
| Region | | | | | | | | |
| Southern | .11 | .51 | .77 | .71 | 1.49 | 1.36 | 1.24 | 1.05 |
| Western | .17 | .52 | 1.35 | .86 | 1.56 | 1.34 | .44 | .48 |
| Central | .51 | .49 | .94 | .69 | 1.65 | 1.31 | .47 | .36 |
| Eastern | .75 | .62 | 1.00 | .55 | .84 | .88 | .72 | .81 |
| Northern | .58 | .18 | .74 | .48 | 1.30 | 1.05 | .41 | .47 |

earnings were calculated as long-term returns. In this section, adjustments are made to these conditions to reflect their effect on the returns ratios. These effects are given in Table 15 for total returns (including capital gains).

### 4.4.1 Effect of Limitation of Hours Worked

In Table 15 the returns ratios are calculated using alternative weekly labour maximums for farm operators. In all cases, however, the expected non-farm earnings of unpaid family workers are based on a maximum of 50 hours per week. Using the actual hours reported by the farmers (no weekly maximum), the ratio is reduced from .96 (60 hours per week maximum) to .90. With a maximum of 55 hours per week the ratio rises from .96 to .99.

A maximum of 60 hours per week for farm operators reduced average allowable hours of work per year from 2,778 to 2,518. This compares with 2,380 hours per year for nonfarm self-employed individuals with a 60 hour per week maximum. A maximum of 55 hours per week for farm operators gives a yearly average of 2,386 which is approximately the equal to the nonfarm average. Under the self-employment standard, therefore, expected nonfarm labour and investment earnings of farm operators are based on average yearly hours of work which are greater than the hours they would normally work in nonfarm self-employment. While variations in the maximum allowable hours of work per week do affect the returns ratios, the changes that result do not appear to be large enough to alter the implications of the returns comparisons.

### 4.4.2 Effect of Short-Term Nonfarm Earnings for Farm Labour

In the returns comparisons the opportunity costs of resources in agriculture were measured as long-run nonfarm earning opportunities. No accurate statistics were available on short-term earning opportunities for farmers, but these earnings would be significantly lower than the long-term earnings used in the previous calculations. In Table 15, a reduction of 20 percent is used to illustrate the effect of short-term nonfarm earning opportunities, which increases the overall returns ratio from .96 to 1.20. The perspective of the opportunity costs, therefore, does have a significant effect on the returns ratios. The use of the long run perspective gives farm labour the benefit of the highest possible expected non-farm earnings, and greatly reduces the relative rates of return to farm resources compared with a short-run perspective. Hence, since farmers now in agriculture must consider only short-term opportunity earnings if they want to leave agriculture, many of them (particularly older ones) may be best off to stay in agriculture.

### 4.4.3 Effect of Excluding Income in Kind

In the returns comparisons average farm values of income in kind were included in farm returns. For the four year sample period income in kind averaged $2,527 per year of which $1,922 represented net house rent and $605 measured the value of produce consumed. From Table 15 it can be noted that excluding net house rent from the returns comparison reduced the overall

Table 15 Sensitivity of Overall Returns Ratios to Adjustments for Hours of Work, Short-Term Nonfarm Earnings for Labour, and Income in Kind, 1971-1974

| Sensitivity Adjustment | Self-Employment Standard (returns ratio) |
|---|---|
| Effect of maximum hours of work per week for operators.[a] | |
| No weekly maximum on hours (2,778) | .90 |
| Weekly maximum of 60 hours (2,518) | .96[b] |
| Weekly maximum of 55 hours (2,386) | .99 |
| Effect of Short-Term Expected Nonfarm Earnings | |
| Long-term expected earnings | .96[b] |
| Short-term expected earnings.[c] | 1.20 |
| Effect of Income in Kind | |
| Including total income in kind | .96[b] |
| Excluding net house rent | .89 |
| Excluding net house rent and produce consumed | .87 |
| Total income in kind with net house rent valued at its after tax value | .99 |

a/ Hours with no weekly maximum represent actual hours reported. Average yearly hours of work calculated under the different weekly maximums are given in parenthesis. The nonfarm earnings of unpaid family members are based on a maximum of 50 hours per week in all cases.

b/ This returns ratio was used in the previous analyses (Table 8).

c/ Short-term expected nonfarm earnings for labour are assumed to be 20 percent lower than long-term expected earnings.

returns ratio by .07, i.e., from .96 to .89. When both net house rent and produce consumed were excluded from the comparison the returns ratio was reduced by .09. This indicates that income in kind is an important component of farm returns, and should not be ignored in farm to nonfarm return comparisons. This is particularly true when after-tax values are considered. Because imputed house rent is not taxable, the after-tax value is considerably higher than the before-tax value. Assuming a 35% marginal tax rate (Federal and Provincial) for farmers, the increased value of house rent after taxes would result in a 3 percent increase in the overall returns ratio. The after-tax value of produce consumed was not calculated because it is taxable if reported, but some farmers may not report all the consume.[1/]

In summary, it would appear that the conditions in the study for calculating the returns ratios have not overestimated the income of farmers and resulted in ratios that were too high. On the contrary, the evidence presented here tends to support the opposite conclusion, at least for current adjustments in agriculture. Even though limits on weekly hours were used, counting all hours is not appropriate either, as some of the farmers appeared to overstate their productive hours and the nonfarm hourly rates under the self-employment standard were based on a 60 hour maximum. Nonfarm hourly rates also do not reflect business failures and unemployment in these sectors. Furthermore, calculating hourly earnings as long-term opportunity costs gives farmers the benefit of highest nonfarm earnings. Using short-term opportunity costs creates a much larger offsetting increase in ratios than the effect of including all reported hours. (Any current adjustments from agriculture will have to consider existing earning opportunities).

Finally, the study examined agriculture over the 1971-74 period. If the most recent 4 year period (1973-76) was considered instead, one likely would find that agriculture was relatively better off than during the study period. In 1971 and 1972 provincial net farm income was only $366 and $495 million, while it reached $999 and $814 million in 1975 and 1976 [15]. As a consequence, provincial net farm income earned over the 1973-76 period was 39% higher than that earned during the 1971-74 period of the study. Business earnings, on the other hand, were only about 19% higher [19]. As a consequence, including earnings from 1975 and 1976 in the calculations likely would result in even higher relative returns ratios than found in this study.

---

1/ Although a detailed examination of farm and nonfarm tax rates was outside the scope of this study, the average tax rates excluding income in kind for farm and nonfarm self-employment earnings tend to be quite similar [20]. Consequently, after-tax returns ratios under the self-employment comparison should not be greatly different from the ratio including the after-tax value of imputed house rent.

## 5.0 CONCLUSIONS AND POLICY IMPLICATIONS

This study indicates that resources in commercial agriculture in Ontario over the study period generally received rates of return quite close to the rates earned by similar resources in the nonfarm sector. The study revealed, however, that the rates of return were not equal to all resources or among different groups of farms throughout the commercial farm sector. The overall relative rates of return were similar because capital gains accounted for a significant share of farm returns in recent years. There was also great disparity among farms of different size. Large commercial farms on average had total rates of return as good as or better than those expected in the nonfarm sector, particularly the largest farms grossing over $50,000 in 1971. Rates of return for small commercial farms (grossing under $25,000 in 1971), on the other hand, were only about three fourths of comparable nonfarm rates. Smaller farms which were not represented in the sample (those with less than $15,000 sales) likely had even lower relative rates of return. At the same time, the comparisons revealed tremendous variability among farms of similar size and type and over time.

Since farmers have been concerned about being "underpaid," these results should provide heartening assurance that commercial operators are earning relatively good rates of return. The study reveals little disparity in the general rates of return among people choosing to be self employed businessmen in the nonfarm and commercial farm sectors in Ontario. The relatively similar farm and nonfarm rates of return also indicate that agriculture has good potential as a competitive occupation for current as well as new farmers, most particularly for those who can establish efficient units of a reasonable size. Much of the success in agriculture, however, will depend on the individual's skill and management ability, as evidenced by the wide differences in rates of return between farms of similar size and type.

These results have implications for agricultural programs and policies. The relatively similar rates of return were achieved during the 1971-1974 period under improving market conditions and several different types of government assistance. Since the study period, general conditions in agriculture have improved even more relative to nonfarm businesses in Ontario, although conditions for some commodities have deteriorated recently. As long as current rates of return in commercial agriculture are close to nonfarm rates, the emphasis of future programs should not be on the further bolstering of general returns. However, this does not mean that government assistance to agriculture should be eliminated, as government programs were responsible in part for the similar rates of return in the study period. Depending on market conditions, many current programs may need to be continued to maintain comparable earnings in agriculture.

Different policy approaches also may be needed for different groups of farms, particularly for differences in size. Most current agricultural programs are based on commodity sales. Because the large farms produce a high proportion of total sales they receive the largest proportion of benefit from commodity programs supporting product prices, even though many are already generally receiving adequate rates of return and may not need additional

support. Small commercial farms, on the other hand, may have sales volumes which are too small to benefit sufficiently from commodity based programs. This is even more true for noncommercial farms. Accordingly, programs may be required to assist some small farms to expand to take advantage of economies of size in agriculture and improve their management. At the same time, it may be necessary to assist the transfer of some resources out of agriculture or to provide direct income support for those resources which cannot be transferred easily.

The great differences in rates of return among individual farms, even within similar categories of farm size, type and region, have two major implications. First, they demonstrate a need for extension programs, particularly in the areas of farm management, to help bring the rates of return for less efficient farmers closer to the potential demonstrated by the better farmers. Secondly, they demonstrate the dilemma of commodity programs, as given programs will yield substantially different benefits for different farmers. To provide adequate rates of return to all farmers would require very high levels of subsidization, which in turn would both encourage inefficient farmers to remain in the industry and necessitate large transfers of public tax funds to support agriculture.

The variability of rates of return by year indicates the susceptibility of farmers to variations over time (although the time period of the study likely overestimates variations in the long run). Variations in rates of return over time create difficulties for farmers and agri-business firms in making good long-term planning decisions. This may be particularly true for large commercial farmers who, even though they had higher returns ratios than smaller commercial farms in the study, also had both greater ranges of returns ratios among farms and higher variability over time. Some instability in agriculture may be beneficial by accelerating desirable adjustments, as periodic periods of low returns may encourage inefficient farmers to leave the industry or to improve their production practices. From a policy viewpoint, however, the returns comparisons indicate a need for programs that will prevent wide year to year fluctuations in rates of returns in agriculture to facilitate better long-term planning and development. Since the overall rates of return in commercial agriculture tended to be quite similar to expected nonfarm rates of return for similar resources, however, publicly financed financed programs for "stabilization" generally should focus on just that, i.e. stabilizing, rather than supporting returns for large commercial farmers.

Finally, special attention to capital gains may be warranted, as they unquestionably represent a very important component of farm returns. In effect, farmers may be compensated for low current investment returns by high future returns in the form of capital gains. Many farmers may find this an entirely acceptable situation.[1/] On the other hand, high capital gains may reflect a situation where farmers accumulate a large proportion of their returns in the form of assets, i.e. farmers "live poor and die rich."

---

1/ For example, under present tax laws a farmer can transfer his farm to a child without incurring any liability for tax on the capital gain.

Accordingly, programs which help farmers to transform their capital gains into productive capital for use in current operations and consumption may be necessary, e.g. refinancing. It is also possible that high capital gains may result from increased competition for land from the nonfarm sector, which gives rise to questions of land use.

SELECTED REFERENCES


1. Agricultural Stabilization Act. Statute of Canada. Ottawa, 1958.

2. Canadian Agriculture in the Seventies. Report of the Federal Task Force on Agriculture. Ottawa, 1969.

3. Dehn, M. and McCabe, B. "An Approach to the Study of Agricultural Real Estate Markets in Ontario." Report of the Federal-Provincial Committee on Agricultural Statistics. (March, 1975):135-161.

4. Gellner, J.A., "A Farm to Nonfarm Comparison of Rates of Return to Resources in Commercial Agriculture in Ontario, 1971-1974." Unpublished M.Sc. Thesis, University of Guelph, 1976.

5. Hathaway, D.E., "Improving and Extending Farm and Nonfarm Income Comparison, American Journal of Agricultural Economics. 45(2) (May, 1963:367-375).

6. Heads, John, "Raising Farm Incomes: Transfer Payment Versus Output Restrictions." Canadian Journal of Agricultural Economics. 22 (July, 1974):31-39.

7. Jenkins, Glenn P., "Analysis of Rates of Return From Capital in Canada." Unpublished Ph.D. Thesis. University of Chicago, 1972.

8. Kulshreshtha, S.N., "Measuring the Relative Income of Farm Labour, 1941-1961." Canadian Journal of Agricultural Economics. 15(1) (1967):28-43.

9. Kulshreshtha, S.N., "An Approach to Develop Comparisons of Farm and Nonfarm Incomes in Canada." Canadian Journal of Agricultural Economics. 14(1) (February, 1966):61-76.

10. Lentz, G., Rural Real Estate Values in Southern Ontario, 1971. Ontario Ministry of Agriculture and Food, December, 1974.

11. Parity Returns Position of Farmers. Report to the United States Congress. S. Dec. 44, 90th Congress, 1st session, 1967.

12. Pearson, G.G., "The Impact of Farm Income Assurance and Other Formula Pricing Upon Agricultural Stability." Canadian Journal of Agricultural Economics. Workshop Proceeding (March 1976): 53-58.

13. Perkins, B.B., "Farm Income and Labour Mobility." Canadian Journal of Agricultural Economics. (August, 1973):913-920.

14. Podoluk, J., Incomes of Canadians, 1961 Census Monograph, Ottawa: Queen's Printer, 1968.

15. Statistics Canada. Net Farm Income, 1976. Catalogue 21-202, Ottawa.

16. Statistics Canada. Incomes, Assets and Indebtedness of Families in Canada, 1969. Catalogue 13-547, Ottawa.

17. Statistics Canada. 1971 Census of Agriculture. Catalogue, 96-707, Ottawa.

18. Statistics Canada. Fixed Capital Stocks and Flows. Catalogue 13-211, Ottawa.

19. Statistics Canada. National Income and Expenditure Accounts Catalogues 13-201 and 13-001, Ottawa.

20. Taxation Statistics. Revenue Canada, 1972-1975, Ottawa.

# Appendix A: Questionnaire

## LAND AND LABOUR USAGE IN COMMERCIAL AGRICULTURE

A. Is this farm operation: (check appropriate box)

a) ☐ operated privately by an individual
b) ☐ a partnership
c) ☐ incorporated
d) ☐ other

B. What was the total area of land you operated from 1971 to 1974 inclusive?

| | 1971 acres | 1972 acres | 1973 acres | 1974 acres |
|---|---|---|---|---|
| 1. Area OWNED (Do not include land rented to others) | | | | |
| (a) Tillable area owned | | | | |
| (b) Rough pasture and bush owned | | | | |
| 2. Area RENTED or LEASED from others | | | | |
| 3. Total area operated (1 plus 2) | | | | |

C. Please provide the following information for each operator and each unpaid family member who worked on this farm operation during the years 1971 - 1974. Please use the same column to answer all questions about each individual. (Do not include hired labour or housework.) If you exchanged labour with a farmer on another farm operation, count the time you spent on his farm as part of your farm work and do not include his work on this questionnaire.

| | | | Operator Labour and Management | | | Unpaid Family Labour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Operator 1 | Operator 2 | Operator 3 | Person 1 | Person 2 | Person 3 |
| 1. Age on last birthday | | | | | | | | |
| 2. Sex (M=male, F=female) | | | | | | | | |
| 3. Check the highest level of schooling completed by each person: ( ✓ ) | | | | | | | | |
| a) Elementary (grades 1 to 8) | | | | | | | | |
| b) Secondary (grades 9 to 13) | | | | | | | | |
| c) Some university | | | | | | | | |
| d) University degree or diploma | | | | | | | | |
| e) Post graduate degree | | | | | | | | |
| 4. In how many weeks did each person work on this farm during the crop season (planting to harvest) and the non-crop season (mainly winter) for each year? (Include only farm work) | 1971 | crop | | | | | | |
| | | noncrop | | | | | | |
| | 1972 | crop | | | | | | |
| | | noncrop | | | | | | |
| | 1973 | crop | | | | | | |
| | | noncrop | | | | | | |
| | 1974 | crop | | | | | | |
| | | noncrop | | | | | | |
| 5. How many hours does each person usually work on the farm each week* during each season: (Include only farm work) | | a) crop | | | | | | |
| | | b) noncrop | | | | | | |
| 6. What percent of each operator's time goes to managing the farm? (planning, organizing, directing, etc.) | | | | | | | | |

* Hours usually worked per week should reflect the times when you worked only part of the week as well as the times when you worked the full week.

Appendix B

Table B.1 Percent Distribution of Sample Farms by Product Type, Economic Size, and Region, Ontario.

| Region | Size ($'000) | Product Type | | | | | |
|---|---|---|---|---|---|---|---|
| | | Dairy | Cattle | Hog | Crop | Mixed | Total |
| Southern Ontario | 15-25 | 2.6 | - | 2.1 | 2.1 | .5 | 7.3 |
| | 25-50 | 9.3 | - | 1.5 | 2.6 | 1.5 | 14.9 |
| | 50 | 2.6 | 3.1 | .5 | 2.6 | .5 | 9.3 |
| | Total | 14.5 | 3.1 | 4.1 | 7.3 | 2.5 | 31.5 |
| Western Ontario | 15-25 | 1.0 | 1.5 | 2.6 | - | 1.0 | 6.1 |
| | 25-50 | 6.2 | .5 | 3.6 | - | - | 10.3 |
| | 50 | 1.0 | 1.0 | .5 | 1.0 | - | 3.5 |
| | Total | 8.2 | 3.0 | 6.7 | 1.0 | 1.0 | 19.9 |
| Central Ontario | 15-25 | 3.6 | 2.1 | - | .5 | .5 | 6.7 |
| | 25-50 | 6.7 | 2.1 | 2.1 | 1.0 | .5 | 12.4 |
| | 50 | 2.1 | 1.0 | .5 | 1.0 | 1.0 | 5.6 |
| | Total | 12.4 | 5.2 | 2.6 | 2.5 | 2.0 | 24.7 |
| Eastern Ontario | 15-25 | 5.2 | 2.1 | - | .5 | - | 7.8 |
| | 25-50 | 10.3 | - | .5 | - | - | 10.8 |
| | 50 | 1.0 | - | - | .5 | - | 1.5 |
| | Total | 16.5 | 2.1 | .5 | 1.0 | - | 20.1 |
| Northern Ontario | 15-25 | 1.0 | - | .5 | .5 | - | 2.0 |
| | 25-50 | 1.5 | - | - | - | - | 1.5 |
| | 50 | - | - | - | - | - | - |
| | Total | 2.5 | - | .5 | .5 | - | 3.5 |
| All Regions | 15-25 | 13.4 | 5.7 | 5.2 | 3.6 | 2.0 | 29.9 |
| | 25-50 | 34.0 | 2.6 | 7.7 | 3.6 | 2.0 | 49.9 |
| | 50 | 6.7 | 5.1 | 1.5 | 5.1 | 1.5 | 19.9 |
| | Total | 54.1 | 13.4 | 14.4 | 12.3 | 5.5 | 100.0 |

Table B.2 Percent Distribution of Census Farms with Sales Greater Than $15,000 by Product Type, Economic Size, and Region, Ontario, 1971.

| Region | Size ($'000) | Product Type | | | | | |
|---|---|---|---|---|---|---|---|
| | | Dairy | Cattle | Hog | Crop | Mixed | Total |
| Southern Ontario | 15-25 | 5.1 | 2.2 | 1.8 | 7.6 | 1.1 | 17.8 |
| | 25-50 | 4.0 | 2.0 | 1.8 | 10.9 | .9 | 19.6 |
| | 50 | .6 | 1.9 | .9 | 4.7 | .4 | 8.5 |
| | Total | 9.7 | 6.1 | 4.5 | 23.2 | 2.4 | 45.9 |
| Western Ontario | 15-25 | 6.4 | 5.2 | 2.8 | .8 | .4 | 15.6 |
| | 25-50 | 4.0 | 4.5 | 2.5 | .9 | .2 | 12.0 |
| | 50 | .5 | 2.8 | .9 | .5 | .1 | 4.8 |
| | Total | 10.9 | 12.5 | 6.2 | 2.2 | .7 | 32.5 |
| Central Ontario | 15-25 | 3.1 | 1.0 | .5 | .6 | [a] | 5.2 |
| | 25-50 | 1.8 | .7 | .3 | .6 | - | 3.4 |
| | 50 | .4 | .5 | .2 | .4 | - | 1.5 |
| | Total | 5.3 | 2.2 | 1.0 | 1.6 | .1 | 10.2 |
| Eastern Ontario | 15-25 | 5.3 | .5 | .1 | - | - | 5.9 |
| | 25-50 | 2.2 | .3 | .1 | .1 | - | 2.7 |
| | 50 | .3 | .2 | .1 | - | - | .6 |
| | Total | 7.8 | 1.0 | .3 | .3 | .1 | 9.5 |
| Northern Ontario | 15-25 | 1.1 | - | - | - | - | 1.1 |
| | 25-50 | .5 | - | - | - | - | .5 |
| | 50 | .1 | - | - | - | - | .1 |
| | Total | 1.7 | .2 | - | - | - | 2.0 |
| All Regions | 15-25 | 21.0 | 8.9 | 5.2 | 1.5 | 1.5 | 45.6 |
| | 25-50 | 12.5 | 7.5 | 4.7 | 1.1 | 1.1 | 38.2 |
| | 50 | 1.9 | 5.4 | 2.1 | .5 | .5 | 15.5 |
| | Total | 35.4 | 22.0 | 12.0 | 3.3 | 3.3 | 100.0 |

Source: 1971 Census of Agriculture

[a] Blanks (-) indicate less than .1%.

Table B.3 Weighting Factors for Sample Farms

| Region | Size ($'000) | Product Type | | | | |
|---|---|---|---|---|---|---|
| | | Dairy | Cattle | Hog | Crop | Mixed |
| Southern Ontario | 15-25 | 2.0 | - | - | 3.6 | - |
| | 25-50 | .4 | - | - | 4.2 | - |
| | 50 | .3 | - | - | 1.8 | - |
| Western Ontario | 15-25 | 5.0 [a] | 3.5 | - | - | - |
| | 25-50 | .7 | 5.0 | - | - | - |
| | 50 | .5 | 2.8 | - | - | - |
| Central Ontario | 15-25 | - | .5 | - | - | - |
| | 25-50 | .3 | .3 | .2 | - | - |
| | 50 | .2 | - | - | - | - |
| Eastern Ontario | 15-25 | - | - | - | - | - |
| | 25-50 | .2 | - | - | - | - |
| | 50 | .3 | - | - | - | - |
| Northern Ontario | 15-25 | - | - | - | - | - |
| | 25-50 | - | - | - | - | - |
| | 50 | - | - | - | - | - |

[a] A maximum weight of 5.0 is set for any cell.

Table B.4 Weighted and Unweighted Farm Sample Numbers by Economic Size, Product Type and Region, Ontario.

| Category | Weighted Numbers | Unweighted Numbers |
|---|---|---|
| All Farms | 196 | 194 |
| Farm Size | | |
| 15-25 | 83 | 54 |
| 25-50 | 76 | 101 |
| 50 | 37 | 39 |
| Farm Type | | |
| Dairy | 68 | 105 |
| Cattle | 36 | 26 |
| Hog | 26 | 28 |
| Crop | 55 | 24 |
| Mixed | 11 | 11 |
| Region | | |
| Southern | 82 | 61 |
| Western | 57 | 39 |
| Central | 28 | 48 |
| Eastern | 22 | 39 |
| Northern | 7 | 7 |