INCOME DETERMINANTS OF ONTARIO DAIRY FARM EMPLOYEES

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As part of a recent study of personnel management practices and problems on Ontario dairy farms [1], detailed information was collected on the level of cash wages, fringe benefits, and extra payments included in compensation programs for full-time dairy farm employees. Results of this research revealed that the average dairy farm employee received total compensation of slightly more than $8,000 per year in 1974. The distribution of this income, however, was found to vary over a wide range with 15 percent of the employees receiving less than $3,000 per year, 20 percent between $3,000 and $6,000 per year, 40 percent between $6,000 and $9,000 per year, 20 percent between $9,000 and $12,000 per year, and 5 percent over $12,000 per year. Given this distribution, a major objective of the research was to identify and analyze the determinants of dairy farm labour income.

Model

To account for variations in total annual income among full-time dairy farm employees, a linear regression model was specified and estimated. In this model the dependent variable was total annual income while the major classes of independent variables were: (1) employee characteristics, (2) farm characteristics, (3) work periods, and (4) compensation plan characteristics. The specific independent variables and their symbols were:

\[ AG = \text{Employee Age} \]
\[ AG_1 = 1 \text{ when employee is between 25 and 45 years of age; otherwise zero.} \]
\[ AG_2 = 1 \text{ when employee is older than 45 years; otherwise zero.} \]
\[ MS = \text{Marital status of employee} \]
\[ MS = 1 \text{ when employee is married; otherwise zero} \]
\[ SL = \text{Skill level of employee} \]

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1 For a detailed description of the sample design and method of data collection see [1, pp. 3-5].
2 Total annual income was defined to include cash wages, fringe benefits, and extra payments in the form of incentives and bonuses.
3 The constant (intercept) of the regression (Table 1) indicates that the average total annual income of an employee who is under 25, single, semi-skilled, born in Ontario, raised in a city, working on a farm in Eastern Ontario with gross returns below $50,000, with no incentive, bonus, or overtime payments, was $3536.39.
4 The definitions of skill levels were taken from [2, pp. 7-8]. The actual definitions used were:
   Semi-skilled – denotes those jobs which include craft and manual work where the

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$SL_1 = 1$ when employee is classified as skilled; otherwise zero

$SL_2 = 1$ when employee is classified as highly skilled; otherwise zero

$OR = \text{Employee's place of birth}\$

$OR_1 = 1$ when employee was born in Canada, but not in Ontario; otherwise zero

$OR_2 = 1$ when employee was born outside of Canada; otherwise zero

$BK = \text{Employee's background}\$

$BK_1 = 1$ when employee was raised on a farm; otherwise zero

$BK_2 = 1$ when employee was raised in a town; otherwise zero

$RG = \text{Region of Ontario}\$

$RG_1 = 1$ when farm is located in Western Ontario; otherwise zero

$RG_3 = 1$ when farm is located in Northern Ontario; otherwise zero

$GR = \text{Farm's gross returns from dairy}\$

$GR_1 = 1$ when returns are between $50,000$ and $75,000; otherwise zero

$GR_2 = 1$ when returns are greater than $75,000; otherwise zero

$IP = \text{Presence of incentive plan}\$

$IP = 1$ when farm has an incentive plan; otherwise zero

$BN = \text{Presence of bonuses}\$

$BN = 1$ when farm pays bonuses; otherwise zero

$OV = \text{Use of overtime payments}\$

$OV = 1$ when farm pays overtime; otherwise zero

**Results**

The results of this analysis are shown in Table 1. Because the dependent variable, total annual income, was expressed in dollars, the unstandardized regres-
TABLE 1.
Regression of Total Annual Income
on Independent Variables, Ontario, 1974*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3536.39</td>
<td>636.86</td>
</tr>
<tr>
<td>AG1</td>
<td>2102.72b</td>
<td>805.17</td>
</tr>
<tr>
<td>AG2</td>
<td>1900.84b</td>
<td>542.94</td>
</tr>
<tr>
<td>MS</td>
<td>413.17</td>
<td>760.19</td>
</tr>
<tr>
<td>SL1</td>
<td>75.70</td>
<td>1641.71</td>
</tr>
<tr>
<td>SL2</td>
<td>-1231.14</td>
<td>1099.06</td>
</tr>
<tr>
<td>OR1</td>
<td>-62.04</td>
<td>616.95</td>
</tr>
<tr>
<td>OR2</td>
<td>589.91</td>
<td>1624.51</td>
</tr>
<tr>
<td>BK1</td>
<td>-2806.65</td>
<td>2727.92</td>
</tr>
<tr>
<td>BK2</td>
<td>1677.79b</td>
<td>598.74</td>
</tr>
<tr>
<td>RG1</td>
<td>-637.16</td>
<td>1063.24</td>
</tr>
<tr>
<td>RG2</td>
<td>400.09</td>
<td>633.77</td>
</tr>
<tr>
<td>GR1</td>
<td>1500.54b</td>
<td>675.98</td>
</tr>
<tr>
<td>GR2</td>
<td>1464.58b</td>
<td>605.18</td>
</tr>
<tr>
<td>IP</td>
<td>403.25</td>
<td>531.42</td>
</tr>
<tr>
<td>OV</td>
<td>1484.97b</td>
<td>702.33</td>
</tr>
</tbody>
</table>

* The adjusted R² for the regression equation was 0.63.

b Significance greater than 0.95.

The adjusted coefficients for the dummy variables can be interpreted as the change in income associated with the presence of the characteristic implied by the dummy variable assuming all other variables remain the same. 7

The results in Table 1 show that six of the independent variables were significantly related to total annual income. The first two significant variables are dummy variables for age categories. The positive coefficients associated with these variables imply that total annual income for employees in the older age categories is higher than total income for employees in the younger category. However, the fact that the coefficient for variable AG1 is larger than for variable AG2 means that total income for middle age employees (25 to 45 years) is higher than for older employees (over 45 years).

The third significant variable is the dummy for the Western Ontario region. The positive sign and value of this coefficient indicates that total income for a dairy farm employee in Western Ontario is approximately $1700 higher than for employees with identical characteristics in Eastern Ontario.

A significant relationship was also found between total annual income and gross returns from dairy. The positive coefficient associated with variable GR2 implies that employees on farms where the gross returns from dairy are greater than $75,000 earn approximately $1500 more income than employees on dairy units with gross income below $50,000.

Finally, significant coefficients were found for the dummy variables associated with region and gross returns which might affect the stability of the results. Close examination revealed that these problems were inconsequential.

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7 Some problems of high intercorrelation were suspected between such independent variables as region and gross returns which might affect the stability of the results. Close examination revealed that these problems were inconsequential.
associated with the presence of incentive plans and overtime payments. In both cases, the results show substantial increases in total income on dairy farms where these methods of compensation are used.

Summary and Conclusions

Based on the above results, several important conclusions can be drawn. The most important of these are:

1. There are very few relationships between employee characteristics and their incomes. The only significant characteristic found in this research was the age of the employee. For this variable, the relationship was such that incomes were low for employees under 25, somewhat higher for employees over 45, and highest for employees in the 25 to 45 age bracket. This result would seem to reflect the fact that middle-aged employees can demand higher levels of compensation since they have more experience than younger employees, and more alternative opportunities and greater aspirations than older employees.

2. Although theoretically one would expect to find some difference in the level of compensation for workers with different skill levels, no such relationship was found in this research. This could be a major reason for high employee turnover in the dairy industry.

3. Substantial differences were found between incomes of dairy farm workers by geographical regions. The higher incomes received by employees in Western Ontario reflect the higher opportunity costs and productivity of labour in this area.

4. A large, positive income differential was found for employees on larger dairy units. The apparent rationale for this result is that because of size economies, workers on larger units are more productive, hence worth more to their employers. Also, the operators of these farms are probably more aware of the need to pay competitive wages to attract and retain competent hired labour.

5. Although no relationship was found between average hours worked per week and total income, the fact that overtime payments contributed significantly to workers' incomes implies that compensation, to some extent, is related to the amount of time worked.8

REFERENCES


8 An earlier model included average weekly hours worked in the regression, but its coefficient was close to zero. Since, however, the relationship was extremely insignificant, this variable was omitted from the final model.