The Impact of the Ontarian Minimum Wage on the Unemployment of Women and the Young in Ontario: A Note

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The purpose of this research note is to apply to Ontario a methodology developed and applied by one of the authors (Cousineau 1990) to measure the impact of Quebec's minimum wage on the unemployment of women and the young. This is of interest for two reasons. First, it allows us to examine the robustness of the methodology used by Cousineau (1990); and second, it permits us to contribute to the debate now ongoing in Ontario as to the impacts of raising the minimum wage in the province. This is of some interest, given the paucity of information on these impacts. The paper is divided into three parts. In the first one, we briefly summarize the analytical framework used. In the second, we discuss the data and variables used. In the third, we present and analyze regression results for Ontario, compare them to those obtained for Québec and use them to examine the proposed increase in the minimum wage.

THE ANALYTICAL FRAMEWORK

The analytical framework used in this paper is developed in detail by Cousineau (1990) and takes into account the work of Brown et al. (1982).

The main choices that need to be made are: i) what should be studied: employment or unemployment; ii) for whom (young/old, women/men); iii) with what measure of labour supply. Let us address each question in turn.

Employment or Unemployment

As discussed by Cousineau, there are various pros and cons to using either dependent variable. In one sense, employment is preferable since a binding minimum wage constraint increases the cost of employment, and thus reduces it while not necessarily increasing unemployment as usually measured by the same amount because some laid off workers may have withdrawn from the labour force. However, Cousineau (1990) argues that existing employment-based studies of the impact of the minimum wage are theoretically flawed, and that while it may be feasible to produce better studies of the impact of the minimum wage using that methodology, the use of unemployment as the dependent variable is justified given the existing literature. Since one of our goals is to verify the robustness of Cousineau's result, we will use unemployment as our dependent variable.

What Ggroup Should Be Studied?

In theory, all groups are affected by the minimum wage rate due to complementarities in the demand for various types of labour. In practice, it is low-skilled individuals who are most likely to hold low-paying jobs and thus to be most directly affected. These individuals are more likely to be young workers often holding entry-level jobs and female workers who often hold lower-paying jobs. Indeed, Cousineau reports that in Québec, in 1974, 68.4 % of minimum wage earners were women, while 51.8 % of these earners were aged less than 25 (1990, note 11). In Ontario "high proportions of low wage earners are young as well as female" (Ramsay 1983). Thus, the groups studied by Cousineau and ourselves are the young (15-24) and the women. Young workers (16-24) are also studied by Shannon since "it is expected that minimum-wage impacts will be most important for younger workers" (1991: 40).

What Measure of Labour Supply Should Be Used?

Cousineau (1990) notes that the true impact of the minimum wage on the degree of unemployment of a given group depends on both the

structural unemployment rate and the supply of competing workers. If one does not account completely for these two variables, one would incorrectly measure the impact of the minimum wage rate. In the second case, the appropriate variable depends on the degree of substituability or complementarity between groups. Hence, the first part of empirical results reported in this study will be used to select the labour supply variable used further on. Before turning to this section, let us present the data and variables used in the empirical work.

THE DATA AND VARIABLE

In this section, we present each variable and the relevant data sources. The model is estimated using quarterly data for the 1968(I)-1990(I) period for women (N=89) and the 1975(I)-1990(I) period for young adults (N=53). These periods, slightly longer than those used by Cousineau (1990), were selected on the basis of the availability of the data at the time of the analysis (ending point) and of data revised to account for the changes made to the Labour Force Survey by Statistics Canada as of January 1975 (starting point). Cousineau starts at the same date but ends in 1988 using semi-annual data.

Dependent Variables

The two dependent variables are: the unemployment rates for Ontario women (Cansim Serie D768602) and Ontario youth (Cansim Serie D768630). These are seasonally unadjusted unemployment rates.

Independent Variables

- Overall unemployment rate: This independent variable is the seasonally unadjusted unemployment rate for Ontario (Cansim Serie D768588).

- Relative minimum wage rate: This independent variable is ten times the ratio of the minimum wage rate with respect to the hourly average rate in the manufacturing sector for Ontario.[1] The minimum wage rate was obtained from the Commission des normes du travail du Québec. The hourly average rate is taken from *Employment Earnings and*

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1   Multiplying this ratio by ten yields the impact on the unemployment rate of a 10% variation in the relative minimum wage rate, a standard reference point in this type of analysis.

Hours, Statistics Canada (72-002), Table 22, adjusted for a change in definitions in March 1983.

- Labour Force Variables (Ontario):

The following labour force competition variables are used:

- Segregated Labour Force: Ratio of Labour Force Women *or* Youth over total Labour Force (Cansim Series D768597, D768625 and D768583).

- Restricted Competition: Ratio of the Sum of Youth *and* Women Labour Force over Total Labour Force.

- Complete Competition: Labour Force participation rate (Cansim Serie D768587).

These three independent variables were seasonally adjusted using a multiplicative model of seasonality (TSP moving average). The combination of a seasonally unadjusted dependent variable and of seasonally adjusted independent variables is unusual. But since work by Tessier (1990) shows that the use of seasonably unadjusted values for the independent variables does not meaningfully change the results and since Cousineau (1990) uses seasonably adjusted independent variables, we chose to follow his approach.

- Seasonal Dummies: Three seasonal dummies (Winter: January to March; Spring: April to June; Summer: July to September) are included with Fall (October to December), the omitted category.

In addition, a moving average term of degree one will be used to correct for autocorrelation. This autocorrelation was detected in preliminary work using a Durbin-Watson test and was not corrected adequately by a Cochrane-Orcutt procedure.

THE RESULTS

In this section, we first address the choice of the appropriate labour force/competition indicator variable. We then estimate the impact of the relative minimum wage rate, using linear and squared functional forms. Finally, we calculate its impact on the relevant unemployment rates in Ontario and report, for comparative purposes, the impacts observed for Québec.

The Degree of Competition on the Labour Market

Three hypotheses are examined: 1) complete substitution; 2) almost complete substitution; 3) substitution restricted to youth *and* women; and 4) substitution restricted to youth *or* women, i.e. the group itself. Preliminary work showed, as Cousineau (1990) also found for Québec, that the two most likely alternatives were competition from both target groups or from only the group itself. This is not surprising insofar as the skills and experience of these two groups led us to identify them as the ones most likely to be affected by minimum wage laws. For Québec, Cousineau found that in the case of women they competed only with themselves, while in the case of the youth, they competed with themselves and women. In the case of Ontario, we found (Table 1) that in both cases the competing group is made up of youth and women.

The Impact of the Relative Minimum Wage

Table 2 reports the linear and squared estimates of the impact of the relative minimum wage on unemployment rates. Both specifications are used since Cousineau (1990) argues that the nonlinear form may be somewhat superior in the case of Québec. In the case of Ontario, the equations are statistically quite similar. Of greater interest perhaps is the similarity between the coefficients for Ontario and Québec, as shown in Table 3.

In terms of the impact on unemployment, an increase of 10% in the relative minimum wage in Ontario (Québec) increases the unemployment rate of women by 1.40 (1.25) and of youth by 1.53 (1.33) using the linear results (which approximate nonlinear results around the mean value of the relative minimum wage). Turning to the specific NDP proposal to raise the minimum wage to 60 % of the average industrial wage rate, this implies an increase of 13 percentage points in the ratio of the minimum wage to that target.[2] Assuming that it is the increase that matters, we can use our regression results to calculate that an increase of 13 percentage points in our relative minimum wage measure would lead, using the linear (squared) approach, to an increase of 1.82 (1.92) percentage point in the unemployment rate of women and 1.99 (2.10) percentage point in the unemployment rate of youth.[3] In terms of employment these could result in the loss of employment for 43,000 (45,000) women and 18,000

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2   See November 20, 1990 Throne Speech, as reported in "Minimum Wage to Rise in Bid to Protect Wages", *Toronto Star*, p. A-8, November 21, 1990. The article indicates that the minimum hourly wage rate is 5.40$ and the average hourly industrial wage 11.50$, yielding a ratio of 0.47.
3   The squared results are calculated at the mid point (0.535) of the 0.47-0.60 interval.

(19,000) youth if all adjustments were carried out by those already employed. In total, this could lead to a loss of 53,000 (55,000) jobs, once young women are netted out which corresponds to 1% of Ontario's overall labour force.[4] These numbers are comparable to those found in the existing literature (Brown et al. 1982) and somewhat smaller than those implied for Ontario in the work for Canada by Shannon (1991: 167-168).

TABLE 1

Regression Results, Choice of Competing Group, Ontario

| | Dependent Variable: Unemployment Rate of | | | |
| | Women | | Youth | |
Competing with:	Self	Self + Youth	Self	Self + Women
Independent variables				
Constant	-6.19	-15.98	-5.88	-34.40
	(-5.12)	(-4.23)	(-6.90)	(-4.55)
Total unemployment rate	0.99	0.88	1.52	1.66
	(36.55)	(33.39)	(27.75)	(31.37)
Relative minimum wage	1.00	1.40	-0.50	1.53
	(7.13)	(11.61)	(-1.74)	(6.33)
Competition group (see above)	0.07	0.08	0.37	0.44
	(3.53)	(3.35)	(6.54)	(4.01)
Seasonal dummy variables[a]				
Winter	0.83	0.91	2.38	2.41
	(7.20)	(8.62)	(12.58)	(11.47)
Spring	0.38	0.39	1.01	0.90
	(3.32)	(3.73)	(5.33)	(4.29)
Summer	0.54	0.61	-0.52	-0.51
	(4.57)	(5.74)	(-2.72)	(-2.44)
Moving average error adjustment term[a]	0.58	0.51	0.43	0.52
	(5.20)	(3.74)	(3.07)	(3.71)
Statistics				
R^2	0.9601	0.9663	0.9729	0.9666
Standard error	0.3881	0.2912	0.5250	0.5820
Durbin-Watson	1.91	1.97	1.94	1.86
N	89	89	53	53

Sources: Calculations made by the authors.

[a] Fall omitted.

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4   Estimated using December 1990 labour force data (The Labour Force, December 1990) Statistics Canada (71-001) Table 2, Ontario, data p. B-8.

TABLE 2
Linear and Quadratic Regressions,
Impact of Minimum Wage Rate, Ontario

| Relative minimum wage: | Dependent Variable: Unemployment Rate of | | | |
| | Women | | Youth | |
	Linear	Squared	Linear	Squared
Independent variables				
Constant	-15.98	-14.13	-34.40	-32.39
	(-4.23)	(-3.76)	(-4.55)	(-4.36)
Total unemployment rate	0.88	0.87	1.66	1.65
	(33.39)	(32.61)	(31.37)	(31.08)
Relative minimum wage	1.40	0.179	1.53	0.196
	(11.61)	(11.26)	(6.33)	(6.24)
Competition variable	0.18	0.20	0.44	0.45
(Youth and women)	(3.35)	(3.49)	(4.01)	(4.06)
Seasonal dummy variables[a]				
Winter	0.91	0.90	2.41	2.40
	(8.62)	(8.45)	(11.47)	(11.39)
Spring	0.39	0.38	0.90	0.89
	(3.73)	(3.60)	(4.29)	(4.22)
Summer	0.61	0.60	-0.51	-0.52
	(5.74)	(5.57)	(-2.44)	(-2.47)
Moving average error	0.51	0.53	0.52	0.52
adjustment term	(3.74)	(3.89)	(3.71)	(3.76)
Statistics				
R^2	0.9663	0.9652	0.9666	0.9663
Standard error	0.2912	0.2958	0.5820	0.5849
Durbin-Watson	1.97	1.98	1.86	1.86
N	89	89	53	53

Sources: Calculations made by the authors. [a] Fall omitted.

TABLE 3

Impact of Relative Minimum Wage on Unemployment,
Québec and Ontario

| Relative minimum wage: | Women | | Youth | |
	Linear	Squared	Linear	Squared
Québec	1.25	0.136	1.33	0.147
Ontario	1.40	0.179	1.53	0.196

Sources: Québec: Cousineau (1990, Table 3).   Ontario: Calculations by the authors.

CONCLUSION

This note presents regression results that can be used to calculate the impact on the unemployment rate of women and youth in Ontario of a variation in the minimum wage. While they constitute one of the rare attempts that we know of to calculate this impact, these regressions yield results very similar to those obtained for Québec an economy whose structure is fairly similar to that of Ontario. These results indicate that the proposed increase in the minimum wage in Ontario would lead to a 1 percentage point increase in the unemployment of women and youth in that province, which, in terms of the unemployment rate of 1991, is approximately a 10% increase in employment. Such a result is in agreement with the conclusion of West and McKee that "there is no convincing evidence to refute the prediction that minimum wages cause reduction of employment" (1980: 99) and should perhaps be taken into account by policymakers.

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