Relations industrielles
Industrial Relations

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Volume 42, Number 1, 1987

URI: https://id.erudit.org/iderudit/050288ar
DOI: https://doi.org/10.7202/050288ar

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Publisher(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (print)
1703-8138 (digital)

Explore this journal

Cite this article

Auld, D. & Wilton, D. (1987). The Impact of Public Sector Wage Controls in Ontario. *Relations industrielles / Industrial Relations*, *42*(1), 132–149. https://doi.org/10.7202/050288ar

Article abstract

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D.A.L. Auld
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This paper seeks to evaluate the effectiveness of Ontario's public sector wage and price controls in terms of the rate of change in public sector wages.

In September of 1982, the government of the Province of Ontario introduced a program of public sector wage and price controls[1]. More than 2 700 collective bargaining contracts representing over 500 000 employees in the provincial and local government, health, education and other quasi-public sector groups in Ontario were affected by the controls program.

In his speech to the Legislature, the Treasurer made repeated reference that controls were necessary to prevent substantial layoffs in the public sector.

«This program, by limiting public sector wage increases, attempts to refrain from adding to these [unemployment] rolls by avoiding the need for public sector cutbacks and layoffs.»[2]

In short, the government argued that a fixed allocation from the budget would be applied to public sector wages and at current rates of wage increase this allocation would be insufficient to meet the payroll, thus necessitating layoffs. Lower «controlled» wage increases would mean greater job protection.

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** We wish to thank Kevin Dowd, David Conklin and Chris Robinson for their comments on an earlier draft of this paper. Christine Fung of the Ministry of Labour (Ontario) was instrumental in providing us with the micro data base. Andy Marshall and Jenny Arnott provided excellent research assistance. Last but not least, the financial support of the Ontario Economic Council is gratefully appreciated.

1 Miller, Hon. Frank, «Statement», The Ontario Legislature, September 21, 1982.

2 *Ibid.*, p. 10.

In addition to the drain on the public treasury occasioned by high wage settlements in the public sector, the Treasurer also hinted that public sector wage increases were influencing settlements in the private sector.

«The program... gives the private sector the opportunity to respond on its own to the need for restraint.»[3]

Furthermore, the Minister added, the program

«... should demonstrate to the private sector that we ask no more of them than we do of ourselves.»[4]

What exactly precipitated the imposition of public sector wage controls in Ontario? By the end of the summer of 1982 it was clear that the Canadian economy was in a recession. While recessionary pressures placed a ceiling on wage increases in some areas of the private sector, for the most part, wage increases in the public sector remained stubbornly in the 10 to 11 percent per annum range. In short, there was little evidence in September 1982 that, in aggregate, wages were responding to the recession. What was likely disturbing to policy makers were two facts:

1. a significant number of public sector contracts in the second and early third quarter of 1982 contained wage rate increase in the 12 to 15 percent range,
2. the appearance of a few wage increases in private sector contracts in the 2 to 6 percent per annum range.

These statistics obviously persuaded the government that the deepening recession was starting to have an impact on private sector wage contracts but high public sector wage increases were not only causing a drain on the treasury but perhaps inhibiting a more rapid adjustment in wages and prices in the private sector. The public sector had to be reined-in[5].

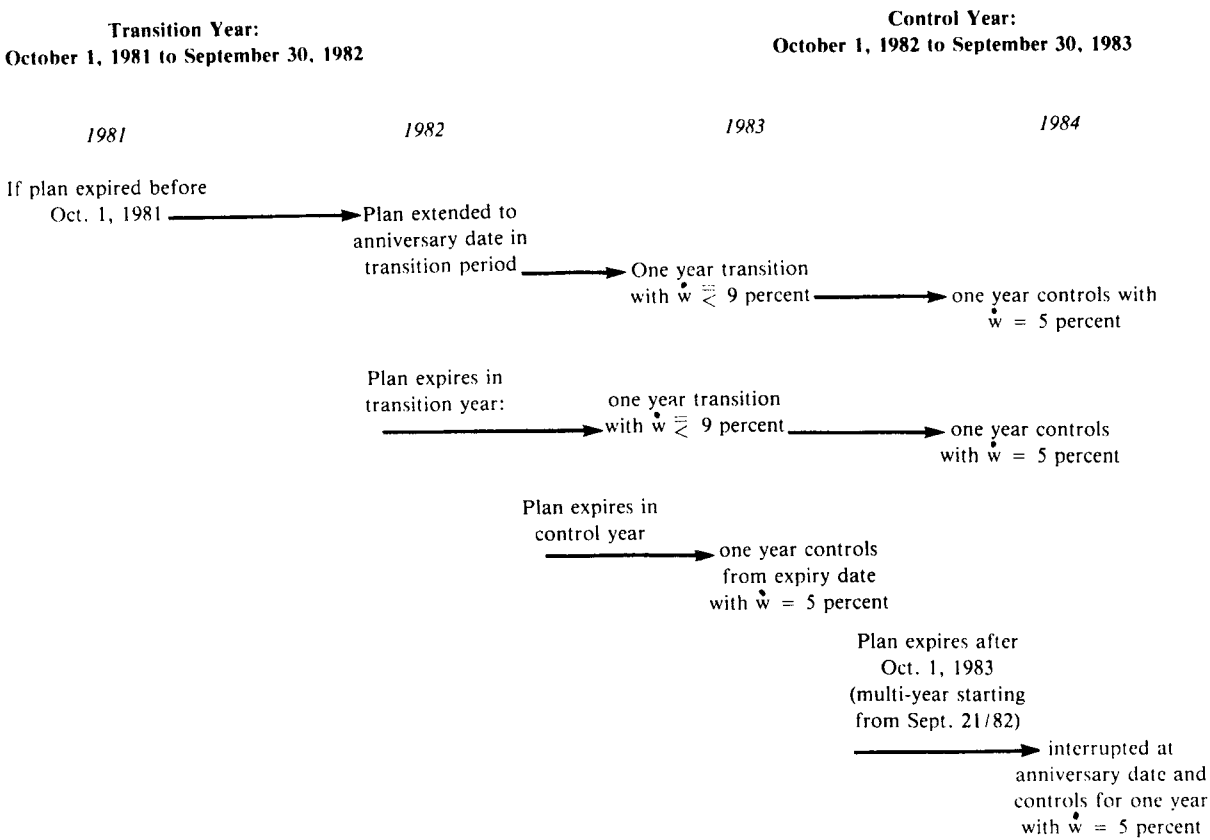
The purpose of this paper is to evaluate the effectiveness of this wage controls program in terms of reducing the rate of change in public sector wages. In addition, we shall evaluate the indirect effect which controls had on wage inflation in the private sector. Finally, since an important reason for public sector controls was the belief that public wage settlements were «spilling-over» into the private sector, we examine the extent to which this can be statistically measured.

3 *Ibid.*, p. 10.

4 *Ibid.*, p. 10.

5 It is of interest to note that Mr. Miller's successor, the Hon. Larry Grossman, made no mention of wage spillovers when introducing the second year of wage controls. The extension of controls into 1983-84 was necessary to ensure continuing employment in the public sector, given that revenues in all parts of the public sector were expected to rise by no more than 5 percent.

Figure 1


Transition Year:
October 1, 1981 to September 30, 1982
Control Year:
October 1, 1982 to September 30, 1983
1981
1982
1983
1984
If plan expired before Oct. 1, 1981
Plan extended to anniversary date in transition period
One year transition with ẇ ≤ 9 percent
one year controls with ẇ = 5 percent
Plan expires in transition year:
one year transition with ẇ ≤ 9 percent
one year controls with ẇ = 5 percent
Plan expires in control year
one year controls from expiry date with ẇ = 5 percent
Plan expires after Oct. 1, 1983 (multi-year starting from Sept. 21/82)
interrupted at anniversary date and controls for one year with ẇ = 5 percent

This paper is comprised of seven sections. The first section describes the structure of controls on the Ontario public sector. In the second section an Ontario Department of Labour micro data base containing all wage contracts involving 200 or more employees is used to analyze the pattern of public and private sector wage increases in Ontario during the 1978-83 period. This period was chosen since the earlier general wage controls program (for both private and public sector) under the Federal Anti-Inflation Board (AIB) terminated in 1978. In the third section these «micro» data are employed to estimate a basic wage settlements regression equation to determine the structure of wage determination in the Ontario public sector and to allow comparisons with regression results for the private sector[6]. The public sector wage equation is also disaggregated into four sub sectors: local government, education, health and provincial government. The fourth section of the paper focuses on the impact of the control program on public sector wage increases. The fifth section describes the results for the private sector wage settlements equation covering the same time period. It also examines the possible impact which controls might have on the private sector. The sixth section examines the question of wage spillovers from the public to private sector and within the private sector. The final section of the paper summarizes our findings.

THE STRUCTURE OF CONTROLS

The 1982 Ontario wage restraint program was not an «instant freeze»; in fact, a number of contracts ran for almost a year before having the 5 percent increase imposed. As Figure 1 illustrates there were four basic classifications to which a contract was assigned. All contracts were tied into a transition year (Oct. 1, 1981 to Sept. 30, 1982) and a control year (Oct. 1, 1982 to Sept. 30, 1983).

Group One: If a contract expired *before* Oct. 1, 1981 and there was no new settlements as of Sept. 21, 1982, the expired contract was simply extended to the anniversary date within the transition year (Oct. 1, 1981 to Sept. 30, 1982). The contract was then placed in a transition period for one year where the wage increase could not exceed 9 percent and where the Inflation Restraint Board could impose a wage settlement if the parties could not agree. After the one year transition period, the contract went into a one year control period at 5%.

6 Using only collective bargaining data in both the private and public sector avoids problems associated with different sectoral levels of unionization.

Table 1

Average Wage Settlements for Contracts Without Cola Clauses in Ontario, 1978-1983
(number of contracts signed in quarter in parentheses)

	Private Sector	Total Public Sector	Education Sector	Provincial Sector	Local Sector	Health Sector
1978Q2	6.73% (62)	6.20% (88)	6.25% (33)	5.53% (3)	5.68% (26)	6.72% (26)
Q3	8.60% (83)	6.38% (61)	6.18% (32)	6.44% (3)	7.04% (12)	5.82% (14)
Q4	8.27% (52)	5.44% (75)	6.27% (38)	6.05% (2)	5.21% (5)	5.38% (30)
1979Q1	8.88% (36)	6.99% (46)	7.08% (29)	10.71% (1)	7.02% (10)	5.88% (6)
Q2	9.67% (56)	7.60% (94)	8.07% (34)	7.90% (15)	7.38% (16)	7.00% (29)
Q3	9.03% (14)	8.82% (95)	7.55% (27)	9.22% (1)	8.97% (28)	9.57% (39)
Q4	9.62% (23)	8.19% (49)	8.19% (19)	- (0)	9.50% (6)	7.86% (24)
1980Q1	10.85% (26)	9.05% (86)	8.68% (41)	10.11% (5)	9.29% (24)	10.12% (16)
Q2	9.83% (69)	9.07% (86)	8.90% (58)	9.87% (3)	8.82% (15)	10.20% (10)
Q3	11.77% (56)	10.37% (39)	9.45% (19)	11.76% (4)	10.81% (8)	11.40% (8)
Q4	12.04% (44)	10.13% (33)	9.69% (21)	10.04% (1)	10.74% (8)	11.65% (3)
1981Q1	11.97% (32)	12.16% (45)	11.23% (13)	13.04% (9)	11.70% (15)	13.53% (8)
Q2	12.38% (47)	15.13% (122)	10.71% (41)	13.12% (3)	12.44% (22)	19.52% (56)
Q3	13.22% (15)	13.24% (48)	12.32% (32)	- (0)	12.88% (10)	18.75% (6)
Q4	11.81% (26)	14.45% (69)	12.74% (23)	- (0)	13.44% (7)	15.63% (39)
1982Q1	10.64% (21)	13.66% (60)	11.69% (30)	12.70% (4)	12.49% (14)	20.26% (12)
Q2	11.42% (67)	12.25% (77)	11.55% (49)	14.00% (7)	12.46% (14)	14.95% (7)
Q3	10.95% (44)	11.20% (59)	11.04% (31)	14.46% (2)	11.49% (10)	10.90% (16)
Q4	9.54% (49)	7.99% (39)	8.70% (28)	6.99% (2)	5.99% (9)	- (0)
1983Q1	8.78% (49)	6.88% (188)	7.14% (46)	6.30% (17)	5.29% (26)	7.49% (89)
Q2	7.35% (59)	5.77% (173)	5.80% (120)	5.24% (2)	6.10% (20)	5.46% (31)
Q3	6.27% (26)	5.21% (78)	5.28% (43)	5.00% (3)	5.44% (6)	5.07% (26)
Q4	5.11% (28)	4.92% (19)	5.18% (3)	- (0)	3.08% (2)	5.12% (14)

Group Two: If the contract expired sometime *after* Oct. 1, 1981 but had not been renewed by Sept. 30, 1982, the contract was placed in a transition period for one year, where the wage increase could not exceed 9 percent, and then into a control year at 5%

Group Three: If the contract expired in the control year, it went directly into a control year, where wages were restricted to 5 percent.

Group Four: If a multi year contract was destined to expire *after* Oct. 1, 1983 (for a contract in effect before Sept. 21, 1982) the contract is interrupted on its anniversary date within the control year and placed in a control year at 5%.

THE PATTERN OF WAGES IN THE PUBLIC & PRIVATE SECTOR

Before turning to the econometric results, Table 1 presents the average size of wage settlements in each quarter of the year for the Ontario private sector, the Ontario public sector, and the four components of the public sector (the education sector, the provincial government sector, the local or municipal sector and the health and welfare sector). Clearly average wage settlements in the Ontario private and public sectors have moved in a very similar manner over the post-AIB, 1978-83 period. In fact, the correlation between average wage settlements in both the private and public sector exceeds 80%. Wage settlements in both sectors increased during the late 1970s, reaching a peak in mid-1981, and then rapidly declined during the latter part of 1982 and 1983. By the fourth quarter of 1983, wage settlements in the Ontario public sector were averaging only 4.9% and wage settlements in the Ontario private sector were down to a 5.1% average (record lows since Labour Canada began tabulating wage contract data in 1967).

Considering this six year period as a whole, public sector wage settlements were, on average, .60% per annum lower than wage settlements in the Ontario private sector (9.17% compared to 9.77%). Of the four components of the public sector, only the health sector achieved wage settlements which were on average higher than that obtained in the private sector (10.33% compared to 9.77%), largely the result of some very «healthy» settlements in 1981 and 1982. On the other hand, wage settlements in the education sector have averaged more than one full percentage point per annum lower than private sector wage settlements (8.6% compared again to 9,77% in the private sector). In summary, a quarterly tabulation of average wage settlements over the 1978 to 1983 period reveals that public sector

Table 2

Ontario Public Sector Wage Settlement Regressions
(t-statistics in parentheses)

Constant	*Inflation Expectations*	*Inflation Catch-up*	*Reciprocal Unemployment*	*Help-Wanted*	*Contract Directly Controlled*	*Transition Contract*	*Interrupted Contract*	*S.E.E.*	R^2
-11.82	1.40	.02	52.63					3.127	.446
(39.12)	(76.74)	(1.32)	(17.54)						
-7.72	1.20	.03		.165				3.029	.480
(-11.60)	(19.21)	(1.92)		(18.89)					
-12.61	1.44		55.80					3.208	.432
(-21.04)	(27.93)		(20.34)						
-8.52	1.24			.177				3.108	.467
(-16.76)	(24.15)			(23.54)					
-15.24	1.42	.02	74.78		1.28	1.97	-.68	3.116	.451
(-38.22)	(24.66)	(1.11)	(38.38)		(4.86)	(5.75)	(-1.08)		
-8.39	1.10	.05		.210	.97	1.94	-.49	3.007	.487
(-11.56)	(15.32)	(2.72)		(13.69)	(2.62)	(4.29)	(-.77)		
-15.71	1.44		76.46		1.14	1.92	-.79	3.195	.437
(-11.91)	(26.74)		(9.61)		(2.26)	(3.45)	(-1.29)		
-9.24	1.19			.211	.53	.160	-.74	3.091	.473
(-14.59)	(21.90)			(14.70)	(1.63)	(4.01)	(-1.26)		

wage settlements follow the same cyclical path as private sector settlements and, with the exception of the health sector, have been lower (on average) than wage settlements obtained by private sector unionized workers.

WAGE DETERMINATION IN THE ONTARIO PUBLIC SECTOR

In order to examine wage determination in the Ontario public sector, a price expectations augmented Phillips curve was estimated in which each individual wage settlement was assumed to depend on conditions in the Ontario labour market, inflation expectations, and inflation catch-up for unexpected (and uncompensated) inflation over the previous contract period. The precise form of the equation estimated was the following:

$$W_t = c + aPE_t\, b[(PA_{t-1} - aPE_{t-1})*L_{t-1}/L_t] + dX_t^7$$

where W_t is the annual compound percentage change in the base wage rate during the current contract period; PE_t is the expected annual inflation rate over the previous contract period; PA_{t-1} is the actual annual inflation rate over the previous contract period; L_t is the length of the current contract period in years; X_t is a measure of labour market conditions; and c, a, b, d are parameters to be estimated. Information on W_t, L_t and L_{t-1} was obtained directly from the Ontario Department of Labour, and the change in the consumer price index over the previous contract period (expressed at an annual rate) was used to determine PA_{t-1}. An autoregressive forecasting equation, based on quarterly changes in the consumer price index, provided estimates for inflation expectations, PE_t and PE_{t-1}. Finally we experimented with a number of proxy variables for labour market conditions, including the Ontario help-wanted index (normalized by the size of the Ontario labour force) and the Ontario unemployment rate.

The first two rows of Table 2 provide OLS wage settlement regressions for the total Ontario public sector utilizing the reciprocal of the Ontario unemployment rate and the normalized Ontario help-wanted index to proxy Ontario labour market conditions. Since the inflation catch-up variable requires information on the previous contract, these two regressions contain only 1537 public sector wage settlement observations (193 observations had to be deleted from the sample because of a lack of data on their previous contracts). These results of these estimations lead to the following observations.

7 This model was used to examine public sector wage determination in the period 1966-75, prior to the imposition of Federal wage controls in 1975. See D. AULD, L. CHRISTOFIDES, R. SWIDINSKY and D. WILTON. «A Microeconomic Analysis of Wage Determination in the Canadian Public Sector», *Journal of Public Ecnomics*, 1980.

First, and most important, the parameter estimate for inflation catch-up is not significantly different from zero in the Ontario public sector during the 1978-83 period. Perhaps the relative stability of inflation in the late 1970s and early 1980s, followed by a persistent downward trend in inflation in late 1982 and 1983, has minimized the need for any inflation catch-up wage increases in the 1978-83 time period. Given the more stable inflation rate and lack of inflation catch-up wage demands in this period, it is perhaps not surprising that the inflation expectations coefficients are highly significant in this more recent period, with estimated coefficient values in the neighbourhood of unity. Second, both the reciprocal of the unemployment rate and the normalized help-wanted index are also highly significant determinants of wage settlements in the Ontario public sector. Finally, there are very large and significant negative constants or intercepts in this period. This is in contrast to insignificant positive intercepts in identical equations estimated for an earlier period (1966-75)[8]. In summary then, recent wage settlements in the Ontario public sector have been responsive to labour market conditions, sensitive to inflation expectations and influenced little by inflation catch-up demands.

Since the inflation catch-up variable is insignificant in the public sector wage regressions based on the recent time period, the model has been re-estimated to exclude inflation catch-up considerations (using the entire sample of 1730 public sector wage contracts). As presented in rows three and four of Table 2, inflation expectations and both labour market variables continue to be highly significant factors in determining the size of wage settlements in the Ontario public sector (with t- statistics in excess of 20). In both equations the coefficient estimate for inflation expectations is significantly greater than unity. However, the constants have very large negative values, offsetting the relatively high estimated coefficients for the inflation expectations and labour market variables. For example, using the estimated coefficients in row 3 of Table 2, a 10% inflation rate and an 8% unemployment rate generate a public sector wage settlement of only 8.8%, *i.e.* a decline of 1.2% in the real wage. For an expected inflation rate of 5%, the regression results suggest that public sector wages will decline in real terms for all Ontario unemployment rates in excess of 5.4%. The Ontario public sector wage structure in the 1978 to 1983 period can be characterized in three words: «real wage restraint».

Table 3 presents separate wage settlement regression equations for the four components of the public sector. Since the inflation catch-up variable was nearly always insignificant in these sectoral regressions (it was only

8 D. AULD, and D. WILTON, *Public Sector Wage Inflation in Ontario*, Ontario Economic Council, Paper 12, Toronto, 1980.

Table 3

Disaggregated Ontario Public Sector Wage Settlement Regressions
(t-statistics in parentheses)

	Constant	*Inflation Expectations*	*Help-Wanted*	*Contract Directly Controlled*	*Transition Contract*	*Interrupted Contract*	*S.E.E.*	R^2
Education Sector (810 contracts)	-5.19	1.05	1.08				2.293	.466
	(-9.43)	(18.72)	(12.92)					
	-.3.77	1.02	.078	-1.17	.21	-2.15	2.255	.483
	(-5.32)	(17.52)	(5.03)	(-3.39)	(.49)	(-2.93)		
Local Government Sector (323 contracts)	7.10	.98	.201				2.101	.589
	(8.02)	(11.68)	(16.60)					
	-6.14	1.01	.164	-1.14	1.96	.77	2.068	.602
	-6.17)	(11.03)	(6.89)	(2.04)	(1.55)	(1.19)		
Provincial Government Sector (87 contracts)	-9.67	1.23	.231				2.050	.638
	(5.51)	(7.80)	(9.96)					
	-8.59	1.43	.148	-2.27	-1.71	-2.3	1.980	.663
	(3.77)	(8.39)	(2.91)	(2.11)	(.77)	(2.05)		
Health Sector (510 contracts)	-13.64	1.66	.243				4.118	.524
	(11.81)	(13.87)	(13.84)					
	-17.59	1.62	.360	3.50	2.95	-1.00	4.047	.540
	(-12.21)	(11.90)	(10.68)	(4.48)	(3.31)	(-.42)		

significant in 2 cases out of 16), the inflation catch-up variable is again excluded in the sectoral regressions based on the complete sample of 1730 public sector wage contracts. To conserve space, we present regression results for only the help-wanted specification of the labour market variable. Even though the sectoral sample sizes are obviously much smaller (for example there are only 87 individual wage contracts signed by workers employed directly by the provincial government), the price expectations augmented Phillips curve model performs remarkably well at the disaggregated level. While there are differences in estimated sectoral coefficients (particularly for the Health sector), labour market conditions and inflation expectations significantly affect the size of wage settlements in the four components of the Ontario public sector during the 1978-83 time period.

THE IMPACT OF WAGE CONTROLS

These econometric results encompass the first five quarters of Ontario's wage restraint program described earlier and it is clear that a large number of contracts fell under the controls program, in one way or another, during late 1982 and 1983. The structure of the wage control program was outlined earlier and it is important to isolate any possible independent effects of controls on changes in basic wage rates.

To test the hypothesis that wage controls exerted a significant and independent effect on public sector wage settlements, three control «dummy» variables (for directly controlled, transition contracts and interrupted contracts) were incorporated into the basic wage equation to correspond to the explicit form of the controls in the time period when the contract was signed. For example, if a contract had expired in July of 1982 and was not settled by September 30, 1982, that bargaining group was placed in a transition year and a wage increase of up to 9% was permitted. In this particular instance, the dummy variable for a transition contract would be assigned a value of one, with a zero value assigned to the dummy variables for direct controls and interrupted contracts. If a contract was directly controlled at 5%, a one was assigned to the directly controlled dummy variable and so forth.

The last four rows of Table 2 provide public sector wage settlement regressions which include these three additional dummy variables representing the Ontario government's wage control programme. Perhaps due to the small number of contracts involved, no *significant* controls effect is detected for those long-term contracts which were interrupted by the controls programme (the estimated coefficients are negative in the one half to three quarters of one percent point range). The coefficient estimates for public sector contracts directly controlled and for contracts in a transition

year are all positive and significantly greater than zero. These results suggest that the wage controls program actually increased wage settlements over what they would have been in the absence of the controls program, by .5% to 2.0% per year! While the nature of the transition year which allowed wage increases of up to 9% before entering the controls program may have inflated wage settlements over what they would have been, the positive coefficients on the dummy variable for contracts directly controlled is more disturbing. However, as we shall see below, these wage controls effects for the entire public sector are sharply skewed by the wage behaviour in the health sector.

Turning to the analysis of controls at the disaggregate level, (Table 3) a very different picture emerges. For the provincial government sector itself, all three control dummy variables have negative coefficients. Since there are only 4 and 1 contracts respectively in the transition and interrupted controls categories for the provincial government sector, the direct controls category (which contains 23 contracts) is the most important. For provincial government employees directly under the controls programme, wage increases are significantly lower (by 2%) than they would have been in the absence of controls. In the education sector, 2 out of 3 coefficients for the controls dummy variables are also negative. Education employees who were either directly controlled or whose contracts were interrupted by controls (of which there were 10 contracts) received significantly lower wage increases because of the wage controls programme (a negative controls effect of between 1.2% and 2.2%). In the local government sector, the only significant controls effect is a negative one on wage contracts which were directly controlled. In the health sector a very different set of controls effects are observed. While contracts in the health sector which were interrupted by controls were somewhat lower than would have been the case without controls, those contracts directly under controls or in a transition year were significantly higher under the wage control programme than they would have been otherwise. Thus the positive and perverse set of controls effects which were obtained in Table 2 for the entire Ontario public sector can be traced to wage behaviour in the health sector. In the remaining three components of the provincial public sector, the Ontario government's wage controls programme exerted a modest negative effect on wage settlements.

COMPARISONS WITH THE PRIVATE SECTOR

For comparison purposes the basic price expectations-augmented Phillips curve has been estimated for the Ontario private sector over this 1978 to 1983 time period. The econometric results presented in Table 4 are

Table 4

Ontario Private Sector Wage Settlement Regressions
(t statistics in parentheses)

Constant	*Inflation*	*Inflation*	*Help-Wanted*	*Controls*	*Public Last*	*Sector Penultimate*	*Private Last*	*Sector Penultimate*	*S.E.E.*	R^2
.83	.17	.29	.155						3.379	.332
(1.39)	(2.76)	(15.34)	(10.18)							
2.13	.14	.29	.126	-1.30					3.360	.340
(-2.95)	(2.21)	(15.48)	(7.14)	(2.94)						
2.38	.01	.26	.094	-1.24	.091	.126			3.324	
(2.99)	(0.08)	(14.08)	(4.88)	(-2.56)	(1.81)	(2.03)				
1.5	.01	.26	.109	-.1.29			.12	.11	3.291	
(2.09)	(.13)	(14.73)	(6.06)	(2.78)			(3.70)	(3.48)		
1.83	-.09	.25	.088	-1.23	.07	.09	.11	.09	3.272	
(2.42)	(-1.09)	(14.27)	(4.72)	(-2.78)	(1.22)	(1.74)	(3.13)	(2.41)		

based on a sample of 813 contracts and to conserve space, we only present regressions for the help-wanted specification of the labour market variable. We find that inflation expectations, inflation catch-up, and labour market conditions all significantly affect the size of Ontario private sector wage settlements. Comparing the private sector coefficients of Table 4 with the total public sector coefficients of Table 2, a number of differences between the private and public sector clearly emerge. In the private sector inflation catch-up is much more important than in the public sector, but inflation expectations coefficients are much lower in the private sector. However, the relatively higher inflation expectations coefficients in the public sector are offset by much higher negative constants. Finally, there does not appear to be much difference in labour market coefficients between the private and public sectors. It is interesting to note, however, that the private sector labour market coefficients are lower than those found in the public sector.

Even though the Ontario government's wage control program applied only the public sector workers, a controls dummy variable was included in the private sector wage settlement equation for all contracts signed after October 1, 1982. If, as the government believed, controls in the public sector would set a good «example» for the private sector, the effect might show up in this private sector equation. The results presented in Table 4 suggest that the public sector controls programme may have had a modest negative impact on private sector wage bargaining. The dummy variable for the controls period had a significant negative coefficient of just over one percent. It is possible that such a dummy variable could be «picking up» the effects of some omitted variable, which just happened to change in value during the controls period.

SPILLOVERS

Up to this point the analysis of wage settlements and controls has focussed on two factors: inflation and labour market conditions. No attempt was made to allow for direct interrelationships or interdependencies between bargaining groups, as each bargaining group was assumed to negotiate a contract in isolation from all other bargaining groups. However, it is frequently alleged that the wage inflation process is intensified by wage comparisons between different groups of workers. As argued earlier there appears to be a fairly wide-spread belief that (large) public sector settlements «spillover» into the private sector and permeate throughout the en-

tire economy. To examine this issue, we extend our analysis of Ontario private sector wage settlements to determine whether they are affected by public sector wage spillovers[9].

The presence of wage spillovers can only be detected by examining micro wage contract data. However, a nasty methodological problem immediately presents itself: can one distinguish «causation» from «correlation»? To illustrate the nature of this rather fundamental statistical problem, two successive wage settlements may be «determined» by the same set of economic factors and thus have virtually identical values. The second settlement will obviously «correlate» very highly with the first, but it may not be «caused» by the first. Both settlements may be independently responding to a common set of economic variables (such as inflation expectations and labour market conditions) which happen to have similar values because the two successive settlements occur very close to each other (either in time or space). To overcome the problem that a wage spillover effect may be inadvertently mistaken for some common explanatory variable, all spillover models must be formulated in a manner which tests for the significance of a wage spillover in addition to other basic wage determinants. Therefore, public sector wage spillover variables are included along with inflation expectations, inflation catch-up and labour market conditions in an expanded model of wage contract determination within the private sector.

Table 4 presents micro wage settlement regressions for the private sector which include the last two wage settlements in the Ontario public sector. Additional public sector wage spillover variables based on the third, fourth and fifth most recent public sector settlements had insignificant effects on private sector wage bargaining and are not included in Table 4. While the last two public sector wage settlements affect private sector wage settlements it is important to point out that these public sector spillover effects are quantitatively not very large. The combined coefficients of the two public sector spillover variables are approximately .22, *i.e.* only about 22% of each additional percentage point of public sector wage inflation feeds into the private sector. Furthermore, the addition of the public sector wage spillover variables considerably lowers the size of the coefficients on inflation expectations, inflation catch-up and the help-wanted index (similar results are obtained when the reciprocal of the unemployment rate is used rather than the help-wanted index). Thus, the additional public sector spillover effect is (partially) offset by a somewhat reduced impact of expected inflation and labour market conditions on private sector wage settlements.

9 For a discussion of the theoretical rationale for wage spillovers, see D. AULD, L. CHRISTOFIDES, R. SWIDINSKY and D. WILTON, *The Determination of Negotiated Wage Settlements in Canada*, Anti Inflation Board, Ottawa, 1979.

While public sector wage settlements appear to influence private sector wage increases, wage spillovers from the private sector are likely more important. A 1980 study found that the key distinguishing characteristic of wage spillovers in the Canadian private sector was industrial classification[10]. The authors found strong empirical support for the proposition that wage spillovers occurred within narrowly defined industries (*e.g.* the automobile manufacturing industry) and not between widely disparate industries (*i.e.* not from the mining industry to the brewery industry). Thus a properly specified spillover equation should include spillover variables based on previous wage settlements within the same industry (as the particular observation on the dependent variable). Using the specific industrial classification definitions employed in this earlier study, fifteen different private sector spillover reference groups have been constructed within the province of Ontario. Wage spillovers are assumed to take place within a particular industrial group (such as textiles) but not between industrial groups.

In the fourth row of Table 4 the two public sector spillover variables are excluded and the last two settlements within the particular industrial category (to which the dependent variable belongs) are added. These two private sector spillover variables are highly significant (with much larger t-scores than found for the public sector spillover variables) and produce a better overall statistical fit for the equation. In the last row of Table 4 spillover variables from both the public sector and the private sector are included. Clearly the private sector spillover variables dominate the public sector spillover variables. In a properly specified spillover model which includes private sector spillover effects as well, wage settlements in the public sector have a minimal impact on private sector wage settlements. There is no strong statistical support for the proposition that public sector wage settlements (be they high or low) spillover into the private sector, increasing or decreasing the rate of private sector wage inflation.

SUMMARY AND CONCLUSION

In this paper, we have used a conventional wage determination model to examine the impact which key economic variables have on wage changes in the public and private sector in Ontario. The statistical evidence, based on a large number of contracts in *both* the public and private sector, suggests that price expectations and labour market conditions influence the size of wage settlements. While the importance of the explanatory variables is

10 L. CHRISTOFIDES, R. SWIDINSKY, D. WILTON, «A Microeconomic Analysis of Spillovers Within the Canadian Wage Determination Process», *Review of Economics and Statistics*, May 1980.

somewhat different between the two sectors, there is no evidence to suggest that aggregate public sector wage increases are detemined in a radically different manner than wage increases in the private sector over the 1978-83 period. The story is somewhat different at a disaggregate level, particularly for the health sector.

The Ontario public sector wage control program appears to have dampened wage rate increases slightly during the controls period in education, local government and provincial government sub sectors. However in the health sector, controls appear to have increased the size of wage settlements. Perhaps surprisingly, controls also appear to have had a very modest impact in dampening wages in the private sector.

Finally, since there was widespread belief that public sector wage increases were influencing private sector wage determination, we tested for the statistical significance of wage spillovers. Industry specific spillovers in the private sector are very strong while the impact of public sector wage settlements on the private sector was minimal. The claim that private sector wage inflation was being sustained or exacerbated by the public sector during 1978-82 cannot be supported by the statistical evidence.

L'impact du contrôle des salaires dans le secteur public en Ontario (1982-1983)

Dans cet article, les auteurs analysent le processus d'inflation des salaires en Ontario pendant la période 1978-1983 en accordant une attention particulière aux effets du programme de contrôle des salaires dans le secteur public en 1982-1983. On s'est penché principalement sur les données détaillées de 2 543 contrats salariaux pour établir le modèle et la structure des majorations de salaires, tant dans le secteur public que dans le secteur privé en Ontario, en divisant le secteur public en quatre sous-sections: (municipalités, conseils scolaires, institutions de santé, fonction publique provinciale).

Les données statistiques révèlent que les ententes en matière de salaires dans le secteur public en Ontario ont suivi les conditions changeantes du marché du travail et les fluctuations de l'inflation. Les statistiques fortement négatives de la régression relative aux variations des salaires démontrent que la structure des gains salariaux dans le secteur public en Ontario peut être caractérisée par une véritable restriction des salaires durant la période 1978-1983. Alors que l'importance relative des variables explicatives est quelque peu différente entre le secteur public et le secteur

privé, il n'y a pas d'indication marquée que les augmentations de salaires en général ont été établies d'une façon radicalement différente que les majorations dans le secteur privé au cours de la période 1978-1983.

En septembre 1982, le gouvernement ontarien a mis au point un programme de contrôle des salaires dans le secteur public, limitant les augmentations de traitement à cinq pour cent pour une année. Une étude économétrique démontre que le programme de contrôle des salaires des années 1982-1983 dans le secteur public en Ontario a exercé un effet négatif plutôt modeste sur les ententes en matière de salaires dans les sous-secteurs des conseils scolaires, des municipalités et de la fonction publique provinciale. Cependant, dans le sous-secteur des institutions de santé, les contrôles semblent avoir augmenté le volume des règlements salariaux. Il se peut, ce qui est surprenant, que les contrôles dans le secteur public apparaissent aussi avoir eu une très légère influence en freinant les majorations de salaires dans le secteur privé qui n'était soumis à aucun contrôle.

Alors qu'il y a une opinion très répandue selon laquelle les augmentations de traitement dans le secteur public influencent les négociations salariales dans le secteur privé, nous avons aussi vérifié, à des fins statistiques, la signification des dépassements dans le secteur privé du rapport des changements de salaires. Tandis que les dépassements de gains industriels spécifiques à l'intérieur du secteur privé sont très considérables, les ententes relatives aux salaires dans le secteur public ont eu un effet minimal sur les négociations des salaires dans le secteur privé. Prétendre que les fluctuations des salaires dans le secteur public au cours de la période 1978-1983 ont soutenu et exacerbé l'inflation salariale dans le secteur privé ne saurait être démontré statistiquement.