

## Labour Market Imbalances in Canada, 1966-1983

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Résumé de l'article

Quand on considère le chômage et les postes à pourvoir, le concept des inadaptations ou des déséquilibres offre une méthode valable d'observer la performance du marché du travail. Les statistiques des vacances d'emploi furent colligées au Canada de 1971 à 1978 et elles sont utilisées dans cet article comme la base des séries de données sur le nombre de postes à pourvoir associées aux demandes d'assistance.

Au moyen de cette mesure et des statistiques usuelles du chômage, on a étudié les inadaptations du marché du travail au Canada de 1966 à 1983. Le débat porte sur deux questions. Premièrement, quelles sont les tendances au déséquilibre qui ont caractérisé le marché du travail canadien depuis 1966? Et deuxièmement, quels sont les facteurs qui sont de nature à expliquer ces tendances?

Les résultats démontrent que la magnitude des inadaptations crut considérablement depuis 1972 et, jusqu'à maintenant, cette situation a persisté. En effet, en utilisant «l'indice d'ajustement» Dow et Dick-Moreaux (la racine carrée du produit du chômage et des vacances d'emploi), en moyenne, le niveau trimestriel d'inadaptation était de 36.4 pour cent plus élevé de 1972 à 1983 qu'il l'avait été de 1966 à 1971. Pour expliquer les types d'inadaptation observés, on a mis au point et fait l'estimation d'un modèle qui comprend des facteurs fonctionnels et structurels. Le modèle ne donne pas de bons résultats en ce qui a trait à l'identification des éléments stables pour l'ensemble de la période 1966-1983. Étant donné cet échec, la nouvelle étape de l'analyse a surtout porté sur le changement dans la composition de ces déséquilibres au cours des années qu'on a considérées. À compter de 1975 jusqu'à aujourd'hui, l'élément principal en a naturellement été un taux de chômage sans cesse élevé. En supposant que les éléments déterminants des inadaptations dans un marché du travail facile de longue durée puissent être tout à fait différents de ce qui se produit dans un marché plus serré, les régressions des déséquilibres ont été regroupées séparément pour la période 1966-1974 et pour la période 1975-1983.

Les résultats de cette analyse confirment l'hypothèse selon laquelle les éléments déterminants antérieurs à 1975 ne sont pas les mêmes que ceux qui ont joué par la suite. Durant la période 1966-1974, les caractéristiques du régime d'assurance chômage et la composition des groupes d'âge sur le marché du travail exerçaient des influences importantes sur la grandeur des données relatives au chômage et aux vacances d'emploi. En conséquence, les modifications généreuses apportées à la Loi sur l'assurance-chômage en 1971 et le nombre de jeunes arrivés sur le marché du travail à ce moment eurent une influence significative dans l'accroissement notable des déséquilibres autour de 1972. Le maintien de ce fort déséquilibre à partir du milieu de la décennie 1970 jusqu'à maintenant ne peut toutefois être attribuable à ces facteurs institutionnel et démographique. Selon les appréciations, tandis que des motifs conventionnels de structure et de fonctionnement confirment l'accentuation initiale des déséquilibres, ils n'expliquent pas la persistance de ces niveaux élevés au commencement de la décennie 1970. Il faut regarder ailleurs pour comprendre ce qui s'est produit à la fin de la décennie 1970 et au début de la décennie 1980 qui, naturellement, reflètent de très hauts niveaux de chômage. Ces taux, supérieurs aux taux naturels courants, et leur prédominance par rapport aux taux des emplois à pourvoir montrent les conditions de la demande globale tout en expliquant les niveaux des déséquilibres de ces dernières années.

# *Labour Market Imbalances in Canada 1966-1983*

**Gordon Betcherman**

*This paper considers two questions. First, what imbalance trends have characterized the Canadian labour market since 1966? And, second, what factors explain these trends.*

The concept of labour imbalances pertains to the co-existence of unemployment and job vacancies. By considering both unutilized supply and unsatisfied demand, imbalances offer a comprehensive way of looking at labour market performance. Unfortunately, data shortcomings on the vacancy side have typically made the operationalization of imbalances difficult. Job vacancy statistics were collected in Canada, however, from 1971 to 1978 and in this paper these are used as the cornerstone for an extrapolated vacancy series. With this measure of unmet demand and the usual unemployment data, Canadian labour imbalances from 1966 to 1983 are explored.

The ensuing discussion considers two questions in turn. First, what imbalance trends have characterized the Canadian labour market since 1966? On the basis of the co-existence of unemployment and vacancies, the analysis indicates that imbalances grew considerably around 1972 and that, since that time, this new level has persisted<sup>1</sup>. This leads to our second question: what factors have caused this trend? An increasingly youthful labour force and a growing liberalization of the unemployment insurance seem to have been significant determinants of the initial rise in imbalances around 1972. The continuation of this high level of imbalances after 1975, however, cannot be attributed to these demographic or institutional factors. Lacking the earlier structural-frictional explanation, then, one must look elsewhere

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\*\* Comments by James Medoff, Sanford Jacoby, Ron Masulis and Eden Cloutier on earlier drafts are gratefully acknowledged.

<sup>1</sup> The increase of imbalances around 1972 is consistent with earlier studies of imbalances in Canada employing the vacancy data. For example, see Frank Reid and Noah Meltz, «Causes of Shifts in the Unemployment-Vacancy Relationship: An Empirical Analysis for Canada», *Review of Economics and Statistics*, vol. 50, no. 3, August, 1979, pp. 470-74.

to account for the experience of the late 1970's and early 1980's which, of course, have predominantly reflected very high unemployment rates.

## LABOUR MARKET IMBALANCES DATA

Imbalances refer to the co-existence of unemployed people and unfilled job vacancies. A familiar concept in labour economics, imbalances have typically been depicted graphically through unemployment-vacancy maps or Beveridge curves. The traditional numerical measure is represented by

$$(1) uv = m; m \geq 0,$$

where  $u$  and  $v$  are unemployment and vacancy rates and the constant  $m$  represents a measure of aggregate imbalances. Taking the square root of  $m$ , we obtain an «index of maladjustment». The magnitude of this index is related directly to the level of imbalances and inversely to the degree of allocational efficiency in the labour market<sup>2</sup>.

Operationalizing this indicator tends to be problematic, since direct vacancy measures are not available in many countries. In the United States, for example, vacancy data have only been collected for very short periods of time and never on a national, all-industry basis<sup>3</sup>. The Canadian situation is significantly better, since quarterly estimates of job openings were generated on the basis of the Job Vacancy Survey (JVS) which was carried out from 1971 to 1978. Survey coverage included all ten provinces and every industry with the exception of agriculture, the military, domestic service, and fishing and trapping<sup>4</sup>.

The major shortcoming of the JVS is its brief duration<sup>5</sup>. The actual JVS data, however, can be used as the cornerstone for an expanded

<sup>2</sup> The index of maladjustment originated with J.C.R. DOW and L.A. DICKS-MIREAUX, «The Excess Demand for Labour: A Study of Conditions in Great Britain, 1945-56», *Oxford Economic Papers*, New Series, vol. 10, no. 1, February, 1958, pp. 1-33. Dow and Dicks-Mireaux also explain the geometric basis for the index in the  $u-v$  or Beveridge curves.

<sup>3</sup> For an account of U.S. efforts at collecting vacancy data, see Katharine G. ABRAHAM, «'Structural/Frictional versus Deficient Demand' Unemployment: Some New Evidence», Massachusetts Institute of Technology and National Bureau of Economic Research, February, 1982.

<sup>4</sup> For a description of the survey methodology, see Statistics Canada, *Canadian Job Vacancy Survey: Technical Appendix*, cat. 71-521, Ottawa, 1972. The complete vacancy series was published in Statistics Canada, *Annual Report on Job Vacancies, 1978*, cat. 71-203, Ottawa, 1979.

<sup>5</sup> Vacancy data themselves, have sometimes been treated with suspicion as a measure of unmet labour demands. On balance, however, the JVS anticipated and corrected for many potential biases. For a discussion, see ABRAHAM, *op. cit.*, pp. 6-20.

longitudinal file of unmet demand. To this end, an extension of the vacancy series, backwards to 1966 and forwards to 1983, has been carried out here by introducing the help-wanted index (HWI) and considering its relationship to the JVS data<sup>6</sup>.

The construction of an extended job vacancy series is very similar to the approach taken by Denton, Feaver, and Robb in a 1975 study of Canadian imbalances<sup>7</sup>. The methodology involves, first, establishing an empirical relationship between the help-wanted index and the job vacancy data for the period when the latter are available and, second, using this relationship to derive vacancy figures from the HWI for those years before and after the JVS<sup>8</sup>. The resulting vacancy series is shown in Table 1.

Underlying this approach is the assumption of a strong relationship between vacancy levels and the HWI. Indeed, the correlation between quarterly vacancies and the help-wanted index from 1971 to 1978 was .64, significant at the .99 level. The method also assumes that this relationship would have held back to 1966 and forward to 1983. As a note of caution, it should be recognized that the vacancy-HWI relationship might not have been so strong before 1971 or after 1978 if, for example, the use of newspaper advertising to fill job openings had changed over time.

### IMBALANCE TRENDS IN CANADA, 1966-1983.

The 1966-83 annual unemployment and vacancy rate pairings are presented in Figure 1. While the u-v plot forms a fairly discrete curve up to 1971, the mapping begins to move outward from the origin in 1972. Indeed, from that year, the curve is clearly to the northeast. Some slight retreat is visible from 1976-78, but in 1979, the mapping moves outward again for the duration of the sample period.

Figure 1 suggests an increase in the level of imbalances in the Canadian labour market from 1972 on. Indeed, a simple regression using quarterly data from 1966-1983 of the vacancy rate on the unemployment rate with a dummy variable differentiating the period from 1972 on indicates that the outward movement of the u-v curve was significant<sup>9</sup>.

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<sup>6</sup> Details of the Canadian help-wanted index are available in Statistics Canada, «Technical Note — The Canadian Help-Wanted Index», unpublished, January, 1983.

<sup>7</sup> F.T. DENTON, C.H. FEAVER, and A.L. ROBB, «Patterns of Unemployment Behaviour in Canada», Economic Council of Canada, Discussion Paper No. 36, Ottawa, 1975.

<sup>8</sup> A technical appendix describing the methodology is available from the author.

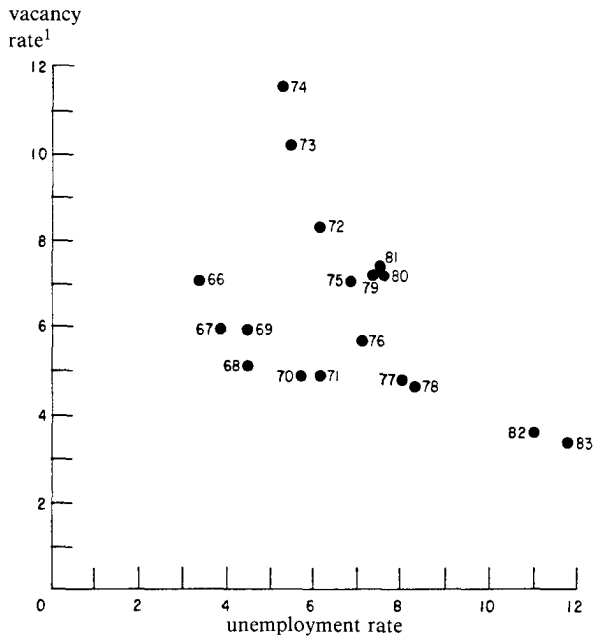
<sup>9</sup> The equation was estimated using the Cochrane-Orcutt correction for autocorrelation. Numbers in parentheses are t-statistics.

**Table 1**  
**Derived Job Vacancy Rate Series, Canada, 1966-83**

	<i>Job vacancy rate</i>		<i>Job vacancy rate</i>
1966.1	6.9	1975.1	7.2
.2	8.1	.2	7.9
.3	7.5	.3	7.7
.4	6.1	.4	5.7
1967.1	6.0	1976.1	5.5
.2	6.9	.2	6.0
.3	6.5	.3	6.6
.4	4.6	.4	4.5
1968.1	4.8	1977.1	4.5
.2	5.8	.2	5.4
.3	5.7	.3	5.5
.4	4.7	.4	3.8
1969.1	5.4	1978.1	4.2
.2	6.5	.2	4.8
.3	6.9	.3	5.1
.4	5.0	.4	4.6
1970.1	5.1	1979.1	6.4
.2	5.1	.2	7.3
.3	5.3	.3	8.2
.4	4.1	.4	6.8
1971.1	3.5	1980.1	7.0
.2	5.3	.2	6.9
.3	5.6	.3	8.1
.4	5.1	.4	6.7
1972.1	5.8	1981.1	7.1
.2	6.7	.2	7.0
.3	10.8	.3	8.7
.4	9.8	.4	6.2
1973.1	9.2	1982.1	4.9
.2	10.5	.2	3.7
.3	11.2	.3	3.3
.4	10.0	.4	2.5
1974.1	10.5	1983.1	2.6
.2	12.5	.2	3.2
.3	14.4	.3	4.1
.4	9.0	.4	3.6

Source: Job vacancies for 1971-78 from Statistics Canada, *Annual Report on Job Vacancies, 1978*. Vacancies for other years based on calculations by the author using unpublished data from Statistics Canada on the help-wanted index. Quarterly vacancy rates were calculated as the number of vacancies per 1,000 jobs (employment) plus vacancies. Employment data for computation of rates from Statistics Canada, *Historical Labour Force Statistics — Actual Data, Seasonal Factors, Seasonally Adjusted Data*, various years.

**Figure 1**  
**Unemployment-Vacancy Map, Canada, 1966-83**



1) The vacancy rate is the number of vacancies per 1,000 employed and vacancies  $((v/e v)*1000)$ .

$$(2) v_q = 9.13 - 0.70u_q + 2.92 D72.1, N = 71$$

$$(-5.35) \quad (3.73)$$

$$R^2 = .76; S.E.E. = 1.16; F\text{-stat} = 106.09; D.W. = 2.12$$

where  $v_q$  is the quarterly vacancy rate,  $u_q$  is the quarterly aggregate unemployment rate, and  $D72.1_q$  is a dummy variable indicating whether the quarter is 1972.1 or later (yes = 1). The significant dummy variable coefficient reveals that, starting in the first quarter of 1972, the vacancy rate has been 2.92 points higher for a given level of unemployment than it was previously<sup>10</sup>.

<sup>10</sup> Since the transition from the HWI-based vacancy rates to the JVS rates occurred in 1971, it is conceivable that the significance of the dummy variable in equation (2) merely reflects the change in the data base. To address this possibility, the regression was re-estimated using the HWI-derived rates throughout. The result indicate that the 1972 shift was unrelated to the construction of the vacancy series. As before, the coefficient of the dummy variable is again highly significant, and its magnitude is actually slightly higher than before.

To complete this documentation of labour imbalance trends, we return to the «index of maladjustment» discussed earlier. The quarterly mean in 1972-83 was 6.89, as compared to 5.05 for the 1966-71 period. From 1972 on, then, the level of imbalances as measured by  $\sqrt{uv}$ , was, on average, 36.4 per cent greater than it had been before.

## EXPLAINING THE IMBALANCES

Why did the Canadian u-v curve behave as it did during the sample period? To consider this question, a model incorporating frictional and structural factors to explain the level of imbalances is specified and estimated.

### Frictional and Structural Imbalances

Frictional imbalances occur simply because the process of matching people and jobs is not instantaneous. The time taken depends upon the quality of information available and the costs involved in searching. Regarding the quality of labour market information, there is little evidence to suggest that it has varied to any significant extent in Canada during the sample period. Search costs, on the other hand, deserve more attention. Of particular importance have been changes in unemployment insurance (U.I.). In 1971, amendments to the *Unemployment Insurance Act* rendered the system substantially more liberal than it had previously been. Research has been fairly consistent in concluding that the 1971 amendments did reduce the cost of being unemployed, thus contributing to imbalances<sup>11</sup>. Since the mid-1970's, the U.I. program has been somewhat tightened on three separate occasions, which may well have reduced its impact on unemployment levels.

When the requirements of employers do not match the characteristics of workers, structural imbalances result. This lack of correspondence can occur along a number of dimensions, most notably, geographic location, skills, or experience. The major development on the supply side concerns

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<sup>11</sup> For overviews of earlier studies, see Robin W. BOADWAY and Harry M. KITCHEN, *Canadian Tax Policy*, Canadian Tax Papers No. 63, Toronto, Canadian Tax Foundation, 1980, pp. 244-48 and Pierre FORTIN and Keith NEWTON, «Labor Market Tightness and Wage Inflation in Canada», in Martin Neil Baily (ed.), *Workers, Jobs, and Inflation*, Washington, The Brookings Institution, 1982, pp. 243-75.

the changing composition of the workforce<sup>12</sup>. This shift is most apparent in the increasing shares accounted for by young people (over most of the period) and women and the attendant decline in the proportion of prime-age males (Table 2). It has been argued that compositional changes such as these may augment structural imbalances. First, many youths and women entering the workforce may not be able to offer much work-related experience or vocational skill. In addition to the human capital issue, barriers in the labour market appear to lead to the concentration of women and young people in some sectors with incomplete access to others, typically characterized by prime-age male employment. While the demographic changes might be expected to contribute to imbalances, previous studies have been inconclusive regarding the shifting composition argument in Canada<sup>13</sup>. Changes in labour demand can also make the matching task more difficult and, thus, contribute to structural imbalances. During the period under consideration, the composition of employment changed both regionally and by sector. With respect to the former, particularly rapid expansion took place in the western provinces and, to a lesser degree, in Ontario. Regarding sectoral changes, employment trends have been characterized by an increasingly important service sector (Table 2).

### Empirical testing

Imbalances are modelled as follows:

$$(3) \quad \sqrt{m}_t = \sqrt{u}_t v_t = a + b\bar{X}_t e_t$$

where  $\sqrt{m}_t$  or  $\sqrt{u}_t v_t$  — the «index of maladjustment» — measures the extent of imbalances  $\bar{X}$  is a vector of potential determinants. These determinants have been specified to capture developments which may have affected the degree of friction or structural mismatching in the labour market. Elements in this vector include average weekly unemployment insurance benefits as a percentage of the all-industry average weekly earnings (UIB), the percen-

<sup>12</sup> The characteristics of the labour supply may also be affected by non-demographic factors, including education, training, and immigration. To consider their impact would require largely unavailable detailed skill-related data and, accordingly, they are not incorporated into the analysis here. Regarding the information question, see Keith NEWTON, Gordon BETCHERMAN, and Noah METZ, «Diagnosing Labour Market Imbalances in Canada», *Canadian Public Policy*, vol. 7, no. 1, Winter, 1981, pp. 94-102.

<sup>13</sup> Reid and Meltz, for example, found the increasing labor force importance of youths, but not women, contributing to imbalances over the 1953-75 period. Siedule and Newton, examining 1971-78 data, found no significant demographic effect. See REID, and MELTZ, *op. cit.*, and Tom SIEDULE and Keith NEWTON, «The Relationship between Unemployment and Job Vacancies in Canada: Theory and Evidence», Economic Council of Canada, mimeo., 1983.



**Table 2**  
**Summary Description of Labour Market Trends, Canada, 1966-83**

	1966	1972	1983	% Change 1966-1983
<b>A. Unemployment insurance</b>				
% of earnings replaced (UIB) <sup>1</sup>	25.2	41.4	36.9	+ 46.4
% of labour force covered (UIC)	60.3	88.2	88.6	+ 46.9
<b>B. Labour supply</b>				
Labour force:				
% aged 15-24 (YTH)	24.1	26.1	23.0	- 4.6
% female (FEM)	31.3	34.8	41.7	+ 33.2
% male, aged 25-54	44.3	41.2	38.2	-13.8
<b>C. Labour demand</b>				
Employment:				
% in Ontario, Prairies and British Columbia (REGSH)	64.0	66.1	68.0	+ 6.3
in manufacturing and primary industries (INDSH)	35.1	30.2	24.6	-29.9

1) Average weekly unemployment insurance benefits as a percentage of average weekly earnings.

Source Statistics Canada, *Historical Labour Force Statistics — Actual Data, Seasonal Factors, Seasonally Adjusted Data*, various years, Statistics Canada, *Canada Yearbook*, various years; Employment and Immigration Canada (previously Unemployment Insurance Commission), *Annual Report*, various years.

tage of the labour force covered by unemployment insurance (UIC), the female labour force as a percentage of the total labour force (FEM), the percentage of the total labour force between 15 and 24 years old (YTH), employment in Ontario and the western provinces as a percentage of national employment (REGSH), and employment in the primary and manufacturing sectors as a percentage of all-industry employment (INDSH). Also included are dummies to incorporate seasonal effects of the unadjusted quarterly data.

The signs of the coefficients of these variables can be predicted from the earlier discussion in this section. To quickly reiterate, a generous U.I. system and high rates of youth and female participation may be expected to increase imbalances; thus, positive signs are anticipated for UIB, UIC, FEM and YTH. Regarding the changing composition of labour demand, employment has increasingly moved towards Ontario and the west and away from the primary and manufacturing industries. Accordingly, a positive coefficient for REGSH and a negative coefficient for INDSH are expected.

The model was estimated with quarterly data for the 1966-83 period<sup>14</sup>. Results are shown in Table 3. The first column, where the  $\bar{X}$  vector is specified as above, suggests a multicollinearity problem, as evidenced by the high F-statistic and low t-ratios. Without richer information practically available, the model was scaled down. First, the two U.I. variables were combined into a weighted (by coverage) earnings replacement rate (UI), calculated as  $(UIB*UIC/100)$ . Second, INDSH and FEM were eliminated due to collinearity with several  $\bar{X}$  vector variables. In the revised model, UI exhibits the expected positive coefficient, significant at the .95 level, while YTH also has a positive coefficient, significant at the .90 level (column 2, Table 3).

Thus far, the analysis has not indicated any demand-side effects on imbalances. One way to capture these structural changes is to look at the unevenness of employment growth, for example by region and sector. The more uniform the growth along these dimension, the less the adjustment task imposed by structural change. Recent research by Samson in Canada and by Lilien and Medoff in the United States indicates that structural shifts, manifested in uneven geographical or sectoral employment growth, have posed adjustment difficulties, thus contributing to imbalances<sup>15</sup>. In order to test the impact of the variation in employment growth in Canada, dispersion indices similar to those used by Samson, Lilien and Medoff were introduced into the model. These variables, PROVAR and INDVAR, are weighted (by employment share) variances of provincial and industrial employment growth rates, respectively. They have been computed as follows:

$$(4) \text{ PROVAR} = \frac{10}{\sum_{p=1}^{10} E_{p_q}} (\dot{E}_{p_q} - \dot{E}_{c_q})^2$$

where  $E_{p_q}$  is employment in province  $p$  at quarter  $q$ ,  $E_{c_q}$  is national employment at quarter  $q$ , and  $\dot{E}_{p_q}$  and  $\dot{E}_{c_q}$  are their quarterly growth rates. Similarly,

14 The Cochrane-Orcutt correction involves first differencing and, accordingly, the first observation was eliminated in all estimations using data from the beginning of the time series. In addition, estimations including variables that, themselves, are the product of first differencing lose a second observation.

15 Lucie SAMSON, «A Study of the Impact of Sectoral Shifts on Aggregate Unemployment in Canada», *Canadian Journal of Economics*, vol. 18, no. 3, August, 1985; David M. LILIEN, «Sectoral Shifts and Cyclical Unemployment», *Journal of Political Economy*, vol. 90, no. 4, August, 1982; James MEDOFF, «U.S. Labor Markets: Imbalance, Wage Growth and Productivity in the 1970s», *Brookings Papers on Economic Activity*, 1, 1983, pp. 87-120.

**Table 3**  
**Factors Contributing to Imbalances ( $\sqrt{uv}$ ), Canada, 1966-83**

Dependent variable	<i>Equation</i>			
	(1)	(2)	(3)	(4)
	$\sqrt{uv}$	$\sqrt{uv}$	$\sqrt{uv}$	$\sqrt{uv}$
Sample period	1966-83 (n = 71)	1966-83 (n = 71)	1966-83 (n = 70)	1966-83 (n = 70)
Independent variable				
UIB	0.01 (0.15)			
UIC	0.03 (1.26)			
UI		0.05 (2.41)	0.03 (1.32)	0.03 (1.49)
FEM	0.06 (0.47)			
YTH	0.26 (1.91)	0.22 (1.80)	0.11 (0.84)	0.16 (1.21)
REGSH	-0.17 (-0.92)	0.06 (0.43)		
INDSH	-0.12 (0.96)			
PROVAR			0.06 (2.16)	0.06 (2.12)
INDVAR			0.01 (1.74)	
Q1	0.85 (5.35)	0.72 (5.51)	0.73 (6.01)	0.71 (5.81)
Q2	0.48 (2.63)	0.40 (2.49)	0.43 (2.69)	0.44 (2.73)
Q3	0.07 (0.19)	0.11 (0.33)	0.41 (1.12)	0.22 (0.61)
Constant	9.68 (3.41)	-5.28 (-2.37)	1.74 (3.07)	0.66 (1.12)
Summary Statistics				
R <sup>2</sup>	.89	.88	.89	.89
S.E.E.	0.38	0.39	0.37	0.38
F	55.70	79.27	74.18	83.29
D.W.	1.75	1.83	1.80	1.88

1) All equations were estimated with quarterly data, using the Cochrane-Orcutt transformation to correct for first-order autocorrelation.

2) T-statistics are given in parentheses.

$$(5) \text{ INDVAR} = \sum_{i=1}^9 \frac{E_{i_q}}{E_{c_q}} (\dot{E}_{i_q} - \dot{E}_{c_q})^2$$

where  $E_{i_q}$  is employment in major industry division  $i$  at quarter  $q$  and  $\dot{E}_{i_q}$  is its quarterly growth rate<sup>16</sup>. It is anticipated that both of these employment growth variables would exert a positive effect on imbalances. Estimations with these dispersion indices suggest that the regional variance in employment growth has had a positive and significant impact on imbalances (column 3 and 4, Table 3). In these equations, however, the precision of the estimated UI and YTH coefficients has decreased to the extent that neither is significant.

On balance, the model estimations reported in Table 3 indicate difficulty in identifying stable determinants of imbalances over the 1966-83 period. The performance of PROVAR does suggest that the uneven employment growth geographically has contributed to the uv product. An alternate way of modelling the shifting regional locus of labour demand (with REGSH), however, did not prove to be significant. Moreover, the UI variable exhibited instability while YTH and the variables measuring sectoral employment patterns (INDSH and INDVAR) were never significant at the .95 level.

These difficulties may reflect a lack of continuity in the labour market throughout the period under consideration. To understand this suspicion, it would be useful to return for a moment to the u-v map (Figure 1). Thus far, we have emphasized the outward movement and maintenance of the u-v curve from 1972 on. Another point of interest, however, concerns the concentration of the plots since about 1975 to the south and east of the earlier pairings. This, of course, reflects the slack conditions which have persisted in the Canadian labour market since that time.

Perhaps the determinants of imbalances in a persistently slack labour market are quite different from those operating in a much tighter market. If, indeed, there have been two distinct regimes within the 1966-83 time span, this way may well provide some explanation for the difficulties in modelling the period as a whole. To test this hypothesis, the imbalance regressions were fitted separately for 1966-74 and 1975-83, which correspond to periods of relative tightness and slackness, respectively. The results of this exercise are presented in Table 4 where models 2, 3, and 4 correspond to the specifications of the equations of the same number in Table 3.

<sup>16</sup> For the industry index, the sectoral disaggregation has followed the conventional 11-division classification, with the exception of collapsing forestry, fishing and trapping, and mining, quarries, and oil wells into a single «other primary» grouping.

**Table 4**  
**Subsample Analysis of Factors Contributing to Imbalances ( $\sqrt{uv}$ ) Canada, 1966-74 and 1975-83**

	Independent variables										Summary statistics		
	UI	YTH	REGSH	PROVAR	INDVAR	Q1	Q2	Q3	Constant	R <sup>2</sup>	S.E.E.	F	D.W.
<b>Model 2</b>													
(a) 1966-74	0.09 (5.49)	0.50 (2.37)	-0.26 (-1.28)	0.07 (1.30)	0.00 (0.19)	1.02 (3.08)	0.27 (1.18)	-0.79 (-1.23)	7.72 (0.91)	.93	0.38	58.41	1.72
(b) 1975-83	-0.15 (-1.92)	0.25 (1.53)	0.17 (0.49)	0.07 (1.39)	0.01 (1.01)	0.91 (4.75)	0.33 (1.54)	-0.00 (-0.00)	-6.68 (-0.94)	.81	0.31	20.41	1.77
<b>Model 3</b>													
(a) 1966-74	0.08 (4.13)	0.49 (2.07)		0.07 (1.30)	0.00 (0.19)	0.86 (2.33)	0.06 (0.19)	-0.73 (-1.09)	-8.83 (-2.40)	.93	0.39	48.09	1.61
(b) 1975-83	-0.15 (-2.25)	0.22 (1.64)		0.07 (1.39)	0.01 (1.01)	0.94 (6.61)	0.29 (1.46)	0.03 (0.08)	5.30 (5.16)	.82	0.31	18.52	1.95
<b>Model 4</b>													
(a) 1966-74	0.08 (4.24)	0.48 (2.12)		0.07 (1.42)	0.00 (0.19)	0.82 (2.66)	0.08 (0.30)	-0.73 (-1.11)	-8.49 (-2.43)	.93	0.38	58.17	1.62
(b) 1975-83	-0.17 (-2.66)	0.24 (1.78)		0.05 (1.18)	0.01 (1.01)	0.99 (7.60)	0.34 (1.80)	-0.07 (-0.18)	5.82 (5.69)	.82	0.31	21.42	1.86

1) All equations are estimated with quarterly data, using the Cochrane-Orcutt transformation to correct for first-order autocorrelation.  
 2) The dependent variable in all equations is  $m(\sqrt{uv})$ . Model 2(a) has 35 observations, Models 3(a) and 4(a) have 34, and Models 2(b), 3(b), and 4(b) have 36.  
 3) T-statistics are given in parentheses.

For each of the subsamples, the estimations of the individual variable coefficients are consistent. Looking at the early period first (models 2(a), 3(a), and 4(a)), both UI and YTH exhibit positive and significant coefficients in all three cases. None of the employment variables (REGSH, PROVAR, and INDVAR), however, are significant at the .95 level. The estimations for 1975-83 (models 2(b), 3(b), and 4(b)), on the other hand, are quite different. The overall fit of the models is not nearly as good and the estimations of the individual coefficients depart considerably from those in the earlier subsample. The YTH variable, significant at the .95 level during 1966-74, does not attain that level of significance in the later period. The most striking difference, however, concerns the performance of UI. In contrast to the earlier subsample, this variable exhibits a negative coefficient in all three estimations for 1975-83.

In order to ascertain whether or not two statistically significant regimes exist within the complete sample period, Chow tests were performed on the three pairs of equations in Table 4. In all cases, the results of this test led to a rejection of the null hypothesis that there is a stable functional relationship through the 1966-83 years. This determination can be made with 99 per cent confidence in the case of model 2 ( $F = 3.31$ ;  $F_{99}^* = 2.97$ ) and with 95 per cent confidence for model 3 ( $F = 2.12$ ;  $F_{95}^* = 2.11$ ) and model 4 ( $F = 2.88$ ;  $F_{95}^* = 2.18$ ). Accordingly, we can accept the conclusion that the determinants of imbalances before 1975 were different than those operating from that year on.

## CONCLUSION

On the basis of the joint incidence of unemployment rates and vacancy rates, imbalances in Canada have been significantly greater since 1972 than they were before that time. There appears to be no singular explanation, however, for these observed trends. Indeed, the analysis suggests that determinants prior to 1975 were not the same as those operating after that time.

In the 1966-74 period, characteristics of the unemployment insurance system and the age composition of the labour force exerted important influences on the magnitude of the unemployment-vacancy product. Thus, the liberalizing amendments to the *Unemployment Insurance Act* in 1971 and the flow of young people into the labour market at the time both played significant roles in the marked rise in imbalances around 1972. The maintenance of this high level of imbalances from the mid-1970's on cannot be attributed, however, to these forces. First, the youth factor, declining in magnitude, was no longer significant. Second, since 1975, the liberalization of the U.I. system has not only been halted but actually reversed.

From the estimations presented here, conventional structural-frictional arguments support the initial rise of imbalances in the early 1970s but they do not explain why the high level of imbalances has persisted into the 1980s. Obviously, the possibility remains that such an interpretation could be sustained with alternate specifications and data. The composition of the imbalances, however, seems to indicate otherwise. That is, the very high unemployment rates, in excess of prevailing natural rates, and their dominance in relation to apparent vacancy rates, point to the significance of aggregate demand conditions in explaining recent imbalance levels.

### *Les inadaptations du marché du travail au Canada, 1966-1983*

Quand on considère le chômage et les postes à pourvoir, le concept des inadaptations ou des déséquilibres offre une méthode valable d'observer la performance du marché du travail. Les statistiques des vacances d'emploi furent colligées au Canada de 1971 à 1978 et elles sont utilisées dans cet article comme la base des séries de données sur le nombre des postes à pourvoir associées aux demandes d'assistance. Au moyen de cette mesure et des statistiques usuelles du chômage, on a étudié les inadaptations du marché du travail au Canada de 1966 à 1983.

Le débat porte sur deux questions. Premièrement, quelles sont les tendances au déséquilibre qui ont caractérisé le marché du travail canadien depuis 1966? Et deuxièmement, quels sont les facteurs qui sont de nature à expliquer ces tendances?

Les résultats démontrent que la magnitude des inadaptations crût considérablement depuis 1972 et, jusqu'à maintenant, cette situation a persisté. En effet, en utilisant «l'indice d'ajustement» Dow et Dicks-Mireaux (la racine carrée du produit du chômage et des vacances d'emploi), en moyenne, le niveau trimestriel d'inadaptation était de 36.4 pour cent plus élevé de 1972 à 1983 qu'il l'avait été de 1966 à 1971.

Pour expliquer les types d'inadaptation observés, on a mis au point et fait l'estimation d'un modèle qui comprend des facteurs fonctionnels et structurels. Le modèle ne donne pas de bons résultats en ce qui a trait à l'identification des éléments stables pour l'ensemble de la période 1966-1983. Étant donné cet échec, la nouvelle étape de l'analyse a surtout porté sur le changement dans la composition de ces déséquilibres au cours des années qu'on a considérées. À compter de 1975 jusqu'à aujourd'hui, l'élément principal en a naturellement été un taux de chômage sans cesse élevé. En supposant que les éléments déterminants des inadaptations dans un marché du travail facile de longue durée puissent être tout à fait différents de ce qui se produit dans un marché plus serré, les régressions des déséquilibres ont été regroupées séparément pour la période 1966-1974 et pour la période 1975-1983.

Les résultats de cette analyse confirment l'hypothèse selon laquelle les éléments déterminants antérieurs à 1975 ne sont pas les mêmes que ceux qui ont joué par la suite. Durant la période 1966-1974, les caractéristiques du régime d'assurance-chômage et la composition des groupes d'âge sur le marché du travail exerçaient des influences importantes sur la grandeur des données relatives au chômage et aux vacances d'emploi. En conséquence, les modifications généreuses apportées à la *Loi sur l'assurance-chômage* en 1971 et le nombre des jeunes arrivés sur le marché du travail à ce moment eurent une influence significative dans l'accroissement notable des déséquilibres autour de 1972.

Le maintien de ce fort déséquilibre à partir du milieu de la décennie 1970 jusqu'à maintenant ne peut toutefois être attribuable à ces facteurs institutionnel et démographique. Selon les appréciations, tandis que des motifs conventionnels de structure et de fonctionnement confirment l'accentuation initiale des déséquilibres, ils n'expliquent pas la persistance de ces niveaux élevés au commencement de la décennie 1970. Il faut regarder ailleurs pour comprendre ce qui s'est produit à la fin de la décennie 1970 et au début de la décennie 1980 qui, naturellement, reflètent de très hauts niveaux de chômage. Ces taux, supérieurs aux taux naturels courants, et leur prédominance par rapport aux taux des emplois à pourvoir montrent les conditions de la demande globale tout en expliquant les niveaux des déséquilibres de ces dernières années.

## LE STATUT DE SALARIÉ EN MILIEU DE TRAVAIL

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