

Unemployment Insurance, Unemployment Duration, and Excess Supply of Labour

Assurance-chômage, durée du chômage et offre de travail

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Résumé de l'article

Selon la théorie du chômage frictionnel de Reder, le taux de chômage associé à un niveau donné de la demande globale provient en partie de ce que les sans-travail font les « gueules fines » devant les postes qui leur sont offerts. Lorsqu'un travailleur se montre « difficile », il choisit de ce fait un entre-temps de chômage. Reder fait remarquer que « la surabondance d'offre de travail n'existe que dans la mesure où la durée exacte de la période de chômage dépasse l'intervalle de chômage auquel le travailleur s'attendait ». Donc, un changement d'attitude de la part d'un travailleur influencera, toutes choses étant égales, la durée moyenne du chômage et, par conséquent, le taux de chômage sans pour autant avoir d'effet direct sur la surabondance d'offre de travail.

Les modifications dans le régime des prestations d'assurance-chômage, par leur effet sur les revenus perdus pendant la période de recherche d'un emploi, devraient exercer une influence sur les exigences du sans-travail. Se demander si un tel effet s'est fait sentir au Canada est donc une question pratique. Aussi, le but de la présente étude est-il d'examiner le rapport entre la durée du chômage et les caractéristiques du régime d'assurance-chômage par une analyse de régression des séries chronologiques annuelles pour la période de 1953 à 1973.

Cinq variables dépendantes ont été utilisées, toutes tirées des statistiques officielles relatives à la main-d'oeuvre, soit: le pourcentage des travailleurs à la recherche de travail pendant moins d'un mois (PM1), d'un à trois mois (P1-3), de quatre à six mois (B4-6), plus de six mois (PP-6) et, finalement, la durée moyenne du temps de recherche (DMTR), cette dernière variable étant établie selon l'hypothèse que la durée moyenne était de quinze jours pour la première catégorie, de deux mois pour la seconde, de cinq mois pour la troisième et de sept mois pour la dernière.

On a aussi utilisé cinq variables indépendantes, deux représentant les caractéristiques du régime d'assurance-chômage. La première consistait dans le rapport entre les prestations hebdomadaires moyennes et les salaires hebdomadaires moyens (PHM/SHM), ceci afin de tenir compte de la part du revenu que les prestations remplaçaient; la deuxième dans le pourcentage des réclamations nouvelles ou renouvelées déclarées inadmissibles (REFUS). Considérant que les prestations (PHM) sont devenues imposables à partir de 1972, leur montant fut diminué de 10 pour cent, et à la suite d'une réévaluation, d'un second 10 pour cent. On introduisit encore d'autres variables indépendantes: le pourcentage de changement du produit national brut en dollars constants (PCPNB), cette variable étant reculée d'un an de façon à tenir compte des effets cycliques. Il en fut de même pour le groupe d'âge 14-24 ans en tant que pourcentage des chômeurs (P14-24) de manière à tenir compte des variations dans la structure des groupes d'âge. À cause de certains problèmes de multicollinéarité, on a substitué aux REFUS dans l'évaluation une nouvelle variable (INEL) qu'on pourrait désigner comme quantité résiduaire de la régression sur le PCPNB.

Les résultats de la régression indiquent que la durée moyenne de l'entre-temps de chômage dépend d'une manière significative à la fois de (PHM/SHM (positivement) et INEL (négativement). En outre, PHM/SHM affecte PMI (positivement) et P4-6 (négativement). Dans les autres catégories, les coefficients de .05 n'ont pas de signification statistique appréciable. Prenant pour acquis que l'imposition de PHM en 1972 et 1973 était de 20 pour cent (c'est-à-dire que 20 pour cent des sommes ainsi reçues retournaient à l'État), les résultats démontrent qu'il n'y avait guère d'écart dans la durée moyenne de chômage dont les modifications à la Loi sur l'assurance-chômage de 1971 soient la cause.

On ne peut tirer aucune conséquence politique ferme de ces résultats en ce qu'on ne trouve aucune preuve valable que l'accroissement des exigences des salariés conduit à des salaires plus élevés ou des conditions de travail non-monétaires meilleures.

Unemployment Insurance, Unemployment Duration and Excess Supply of Labour

Dennis R. MAKI

This paper examines the effect of the unemployment insurance scheme on the duration of unemployment spells in Canada in the period 1953-1973.

In his theory of frictional unemployment, Melvin Reder attempted to explain theoretically what unemployment rate would be associated with a given level of demand for goods and services.¹ For this purpose he constructed a model consisting of a worker search behaviour sub-model, an employer search behaviour sub-model and some market identities relating the behavioural models. The worker behaviour portion of Reder's model states that in determining how «fussy» he will be about the characteristics of the job he will accept, the worker implicitly chooses an expected unemployment interval, given the probability of finding a job with given characteristics. It is further noted that «Excess labour supply exists only if the actual unemployment interval exceeds the expected unemployment interval».² Thus an exogenously induced change in worker fussiness will, *ceteris paribus*, affect the average duration of unemployment and through this the unemployment rate, with no direct effect on the excess supply of labour. The greater the impact of these exogenously induced changes the less reliable the unemployment rate will be as an indicator of the excess supply of labour.

It is clear from the literature relating to job search behaviour³ that an important determinant of fussiness is the cost of job search, the main component of which is foregone earnings. Foregone earnings will be lower the higher the degree of earnings replacement through unemployment insurance benefits and the more easily these benefits

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¹ REDER (1969).

² *Ibid.*, p. 9.

³ See for example STIGLER (1962), MCCALL (1970) and the papers by PHELPS, HOLT, ARCHIBALD, and MORTENSEN in PHELPS, et. al. (1970).

are available to the worker, so changes in the unemployment insurance scheme can, in theory, affect the duration of unemployment and the relationship between the unemployment rate and excess labour supply. Whether this has occurred in Canada, and if so the magnitude of the effect, is basically an empirical question.

There has been a small number of studies in other countries of the relationship between the duration of unemployment and characteristics of the unemployment insurance scheme.⁴ These studies in general found only weak confirmation or no evidence in support of the hypothesis that the degree of earnings replacement was positively correlated with the duration of unemployment.⁵ There are three studies relating to Canada which investigate the relationship between unemployment insurance and the unemployment rate,⁶ all of which suggest there has been a significant effect. It is the purpose of the current paper to investigate the relationship between unemployment insurance and the duration of unemployment in Canada.

Aggregate data from the Labour Force Survey are used to derive the duration measures. While data on the duration of spells for unemployment insurance recipients would obviously be more appropriate, the duration categories used in a potentially useful series, claimants reporting to district offices by number of weeks on claim, were changed in 1955 and again in 1962 in a manner which does not allow construction of a compatible series by aggregation of categories.⁷ It is thus impossible to derive a long time series on the average duration of unemployment experienced by unemployment insurance recipients.

The Labour Force Survey data report the number of job seekers by four duration categories.⁸ These were converted into percentages of total job seekers to yield the variables: per cent seeking less than one month (PL1), per cent seeking one to three months (P1-3), per cent seeking four to six months (P4-6) and per cent seeking more than six months (PGT6). Persons on temporary layoff (non-seekers) were excluded from the analysis. All data used in this study are annual averages covering the period 1953-1973, inclusive. From the percentages by duration category, an additional variable, average duration

⁴ See CHAPIN (1971), LININGER (1962) and MACKAY and REID (1972).

⁵ For a brief critique of these studies, see MUNTS and GARFINKEL (1974), pp. 32-35.

⁶ GREEN (1973), GRUBEL, MAKI and SAX (1975) and WALLACE (1974).

⁷ Statistics Canada (73-001).

⁸ Data from Statistics Canada (71-201, 1973, p. 162; and 1975, pp. 210-214).

in months (AVDUR) was constructed by assuming the mean duration for the first category as one-half month; for the second, two months; for the third, five months; and for the fourth, seven months.⁹ The resulting series is shown in Table 1.

TABLE I

**Average Duration of Unemployment for Job Seekers,
Canada, 1953-1973.**

Year	Months	Year	Months	Year	Months
1953	2.27	1960	2.90	1967	2.50
1954	2.69	1961	3.24	1968	2.74
1955	2.80	1962	3.06	1969	2.88
1956	2.43	1963	2.97	1970	3.02
1957	2.30	1964	2.81	1971	3.36
1958	3.01	1965	2.69	1972	3.21
1959	2.99	1966	2.48	1973	3.07

Source: See text.

It is apparent from Table 1 that average duration exhibits a cyclical pattern, with peaks in the recession years 1958 and 1961 and troughs in the boom years 1956 and 1966. This is consistent with the theory, which would suggest that given a level of fussiness average duration will be high when the probability of finding a job with given characteristics is low. There also appears to be some lag effect, in that average duration increased from 1955 to 1956, and declined from 1956 to 1957, while unemployment rates moved in the opposite direction. Similarly, average duration declined from 1959 to 1960 and increased markedly from 1960 to 1961, while the unemployment rate increased a full percentage point from 1959 to 1960 and only one-tenth of a percentage point from 1960 to 1961. The existence of a lag effect is not surprising, particularly given seasonal unemployment patterns in Canada. Many persons who suffer long duration spells of unemployment in a given calendar year became unemployed near the end of the previous year.

Finally, there is some evidence average duration in the 1970's may be higher than historical patterns would predict. Granted unemployment rates in the 1970's were consistently above the average for the twenty-one year period considered, the unemployment rate in 1971

⁹ Reestimating assuming the average duration for the open-ended category was eight months instead of seven did not change the results qualitatively, though there were marginal changes in coefficient magnitudes.

was lower than the rates in 1958, 1960 and 1961, while average duration was higher. Similar comparisons for other years in the 1970's disclose a slight but perceptible upward shift in the duration series.

These observations suggest that, following Chapin (1971), one should regress average duration on the unemployment rate to control for cyclical variations in the probability of finding a job with given characteristics, possibly including a lagged unemployment rate term as well. This procedure was not followed herein because it would confound the unemployment insurance effects. If unemployment insurance benefits increase fussiness and hence the duration of unemployment, they will also increase unemployment rates. Hence the unemployment rate term, if included in the estimating equation, would pick up part of the unemployment insurance effect. What is desired is a cyclical proxy which will control for variations in the probability of finding a job without simultaneously including supply side effects from the unemployment insurance scheme.

Proxy variables which come to mind are gross national product, indexes of real domestic product or industrial production, and capacity utilization indexes. The first three variables listed could be used in the form of year-over-year percentage changes, ratios of actual to trend, or ratios of actual to potential. The concept of the ratio of actual to trend¹⁰ can be viewed as representing the ratio of actual to potential, using a naive interpretation of potential resting on a constant growth rate. As pointed out by the U.S. Council of Economic Advisers, however, «potential does not grow year by year at a constant rate».¹¹ Unfortunately, there is no general agreement on how one *should* estimate potential,¹² and there is no «official» series for Canada which covers the period of interest.¹³ The Economic Council of Canada does present (graphically) a potential output series covering a long time period,¹⁴ but this is not useful for current purposes since it is calculated by assuming a constant unemployment rate. Since the central thesis herein is that the unemployment rate at full employment may have changed over time, use of the ECC series on potential would be tantamount to assuming away the question to be investigated.

¹⁰ FELDSTEIN (1973) regressed the unemployment rate on the ratio to trend of the index of industrial production.

¹¹ Council of Economic Advisers (1974, p. 65).

¹² See PHILLIPS (1963) for a discussion of alternative approaches.

¹³ Canada Department of Finance (1975, pp. 29-31) reports measures of GNP gap for 1973 and 1974 by quarters.

¹⁴ Economic Council of Canada (1971, pp. 19-25).

Finally, the capacity utilization series published by the Department of Industry, Trade and Commerce¹⁵ is unavailable for years prior to 1961. Hence the only cyclical proxies investigated in this study were of the year-over-year percentage change variety, with the final estimations based on use of the percentage change in constant dollar gross national product (PCGNP) and the same variable lagged one year (PCGNP-1).¹⁶ It was expected that both variables would be negatively related to average duration.

Two variables were introduced to account for the effects of the unemployment insurance scheme on fussiness, and hence on duration. The first of these is the ratio of average weekly unemployment insurance benefits paid¹⁷ to average weekly wages and salaries¹⁸ (UCB/AWW), introduced to account for the degree of earnings replacement. Ideally, the denominator of this ratio should be «average weekly wages and salaries available to the insured unemployed», measured net of income and payroll taxes and adjusted upward to include the value of fringe benefits. The data to make the adjustments suggested by this observation are unavailable.¹⁹ The second unemployment insurance variable introduced is the percentage of new and renewal claims for benefits which are ruled ineligible (DENIALS).²⁰ As the degree of earnings replacement increases, fussiness increases, but there are limits to the degree of fussiness allowable set by law and administrative discretion. The extent to which these limits become operational is assumed to be reflected in the denial rate. It was therefore hypothesized that average duration would be associated positively with UCB/AWW and negatively with DENIALS. In the course of estimation, it became apparent that DENIALS was collinear with PCGNP. Hence DENIALS was regressed on PCGNP and the residuals from this equation, denoted INEL, were used in place of DENIALS. This procedure produces a coefficient and associated t value for INEL which are the same as would obtain if DENIALS were used in unadjusted form, but the t value of PCGNP is improved.

There are a number of structural factors which could be associated with the duration of unemployment, most of them difficult

¹⁵ See Canada Department of Industry, Trade and Commerce (1974).

¹⁶ Data from Statistics Canada (11-003, p. 14) and (11-505, p. 16).

¹⁷ Data from Statistics Canada (73-001, December 1973, p. 25).

¹⁸ Data from Statistics Canada (11-003, p. 16) and (11-505, p. 58).

¹⁹ The problems introduced by the fact that unemployment benefits became subject to income tax in 1972 are discussed below.

²⁰ Data from Statistics Canada (73-001).

to model empirically. The only factors in this category which were investigated in this paper were the age and sex composition of the unemployed. Four variables were introduced, in various combinations. These were females as per cent of the unemployed (PFEM), persons aged 14 — 24 years as per cent of the unemployed (P14-24), males aged 25 — 54 years as per cent of the unemployed (PAM) and as per cent of the male unemployed (PAM/M).²¹ The prime age male variables were consistently insignificant. Both PFEM and P14-24 proved strongly and positively related to average duration, which was the expected sign for P14-24 but not for PFEM.²² Further, P14-24 and PFEM are strongly intercorrelated ($r = .97$). Hence P14-24 was retained, and is the only characteristics variable included in the results reported in Table 2.

Unemployment insurance benefits became subject to income tax for the first time in 1972. Thus the last two observations in the UCB/AWW series are potentially biased to an unknown degree. An attempt was made to correct for this by assuming that the average tax rate on benefits was 20 per cent in these two years, resulting in equation 1) in Table 2; 10 per cent, resulting in equation 1a); and zero, resulting in equation 1b). It may be noted that both the R^2 and the t value of UCB/AWW increase as higher tax rates are assumed. While the appropriate tax rate is unknown, ensuing discussion will be based on the assumed 20 per cent rate (equation 1), and equations 2) through 5) are estimated assuming a 20 per cent tax rate on benefits in 1972 and 1973.²³

The coefficients in all of the average duration equations possess the hypothesized signs and are, with the exception of the coefficients for PCGNP, significant at the .05 level using a one-tailed test. From equation 1), the elasticity of average duration with respect to UCB/AWW is 0.47, and with respect to DENIALS -0.20, both measured at the point of means. Since the two unemployment insurance va-

²¹ Data from Statistics Canada (71-201, 1973, p. 156; and 1975, pp. 172, 174, 193 and 197).

²² OSTRY and ZAIDI (1972, pp. 140-141) report on the basis of 1968 data that persons aged 14 — 24 years are more prone to long term unemployment than other age groups, and males experience longer average duration than females.

²³ FELDSTEIN (1974) estimates that in the United States in 1970, over half of total unemployment compensation paid went to families whose income, exclusive of unemployment compensation, was in excess of \$10,000 per year. While similar data are unavailable for Canada, these figures suggest the average tax rate could be as high as 20 per cent.

TABLE 2

Regression Results, Canada, 1953-1973.

Equation Number	Dependent Variable	Intercept	UCB/AWW	Independent Variables				R ²	D.W.
				INEL	PCGNP	PCGNP-1	P14-24		
		0.369 (0.50)	4.521 (2.59)	-0.024 (-2.14)	-0.017 (-1.03)	-0.070 (-4.20)	0.041 (3.89)	.73	2.31
1).	AVDUR	0.909 (1.58)	3.365 (2.56)	-0.024 (-2.17)	-0.020 (-1.16)	-0.070 (-4.22)	0.035 (3.49)	.73	2.26
1a).	AVDUR	1.253 (2.52)	2.595 (2.49)	-0.024 (-2.14)	-0.021 (-1.22)	-0.070 (-4.22)	0.032 (3.16)	.72	2.20
1b).	AVDUR	63.065 (6.48)	-76.369 (-3.32)	0.349 (2.38)	0.419 (1.87)	1.025 (4.70)	-0.498 (-3.62)	.77	2.39
2).	PLTI	50.595 (8.48)	-12.748 (-0.90)	0.105 (1.17)	-0.063 (-0.45)	0.273 (2.04)	-0.238 (-2.82)	.49	1.93
3).	PI-3	3.582 (0.64)	52.219 (3.91)	-0.133 (-1.57)	-0.310 (-2.38)	-0.535 (-4.23)	0.107 (1.35)	.75	2.81
4).	P4-6	-15.660 (-1.60)	36.144 (1.56)	-0.289 (-1.95)	-0.037 (-0.17)	-0.764 (-3.47)	0.595 (4.29)	.69	1.99
5).	PGT6								

Notes: t values shown in parentheses.

Equation 1a) estimated assuming average tax rate on benefits in 1972 and 1973 was 10 per cent. Equation 1b) assumes a zero tax rate, and other equations assume a 20 per cent tax rate.

riables tend to be offsetting in their effect on average duration, it is interesting to ask what the effect of the 1971 changes in the Unemployment Insurance Act was on duration. Multiplying the differences between the 1953-1970 average values of UCB/AWW and INEL and their 1972-1973 average values by the respective coefficients and summing the products yields 0.01 months. That is, equation 1) suggests the 1971 revisions in the Act increased average duration of unemployment by a negligible amount. Equations 1a) and 1b) predict larger increases, .09 months and .13 months, respectively. It should be stressed that this is an extremely tentative estimate, in that the coefficient of UCB/AWW is very sensitive to the tax rate assumed, and the true value of the rate is unknown.

Equations 2) through 5) were estimated in an attempt to analyze in greater detail the effects of the unemployment insurance variables on the structure of unemployment duration. Since the dependent variables in these four equations are not independent of each other (they must sum to 100.0), the pattern of signs must differ among equations, e.g. if UCB/AWW is positively associated with long duration, it must be negatively associated with short duration.

The results conform to expectations, in that the signs of coefficients differ between the first two duration category equations and the last two. Concentrating attention on the unemployment insurance variables, they are both significant at the .05 level in the PLTI equation, only UCB/AWW is significant in the P4-6 equation, only INEL is significant in the PGT6 equation, and neither is significant in the PI-3 equation. Since PI-3 contains the mean duration for most of the years considered, the non-significance in this equation of many of the variables chosen to explain average duration is not surprising. Note also that the coefficient of UCB/AWW declines from equation 4) to equation 5). Thus the results suggest that the effect of an increase in the benefit-wage ratio is to decrease the percentage of spells of unemployment falling in the less than one month duration category, and to increase the percentage falling in the four to six months category, with no significant effect on other categories.

The lack of significance for the benefit-wage ratio in the PGT6 equation may be an indication that persons in this category suffer from genuine inability to obtain a job, not fussiness. This would be consistent with Holt's declining aspirations model.²⁴ In addition,

²⁴ HOLT (1970), p. 63).

benefit exhaustion may contribute to non-significance of the benefit-wage ratio in equation 5).

Changes in the denial rate appear to have their greatest influence on the lowest duration category. A one percentage point increase in the denial rate increases the percentage of job seekers in the less than one month category by about three-tenths of a percentage point, *ceteris paribus*.

In summary, it appears that characteristics of the unemployment insurance scheme have affected the duration of unemployment in Canada, but since the two characteristics chosen for analysis in this paper have offsetting effects, it appears the net effect may be small. Given the crudeness of the data utilized, it is unwarranted to generalize further.

No hard policy implications can be drawn from these results, in that although the evidence presented suggests that increases in unemployment benefits and decreases in the enforcement of eligibility rules increase fussiness and hence unemployment duration, no evidence is available regarding whether this increased fussiness produces jobs with higher wage rates or better non-pecuniary characteristics as viewed by the worker. Hence it is an open question what the effect of unemployment insurance has been on labour market efficiency. The magnitudes of the elasticities estimated in this paper do suggest that analysis of the effect on efficiency is warranted.

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Assurance-chômage, durée au chômage et offre de travail

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durée exacte de la période de chômage dépasse l'intervalle de chômage auquel le travailleur s'attendait». Donc, un changement d'attitude de la part d'un travailleur influencera, toutes choses étant égales, la durée moyenne du chômage et, par conséquent, le taux de chômage sans pour autant avoir d'effet direct sur la surabondance d'offre de travail.

Les modifications dans le régime des prestations d'assurance-chômage, par leur effet sur les revenus perdus pendant la période de recherche d'un emploi, devraient exercer une influence sur les exigences du sans-travail. Se demander si un tel effet s'est fait sentir au Canada est donc une question pratique. Aussi, le but de la présente étude est-il d'examiner le rapport entre la durée du chômage et les caractéristiques du régime d'assurance-chômage par une analyse de régression des séries chronologiques annuelles pour la période de 1953 à 1973.

Cinq variables dépendantes ont été utilisées, toutes tirées des statistiques officielles relatives à la main-d'œuvre, soit: le pourcentage des travailleurs à la recherche de travail pendant moins d'un mois (PM1), d'un à trois mois (P1-3), de quatre à six mois (B4-6), plus de six mois (PP-6) et, finalement, la durée moyenne du temps de recherche (DMTR), cette dernière variable étant établie selon l'hypothèse que la durée moyenne était de quinze jours pour la première catégorie, de deux mois pour la seconde, de cinq mois pour la troisième et de sept mois pour la dernière.

On a aussi utilisé cinq variables indépendantes, deux représentant les caractéristiques du régime d'assurance-chômage. La première consistait dans le rapport entre les prestations hebdomadaires moyennes et les salaires hebdomadaires moyens (PHM/SHM), ceci afin de tenir compte de la part du revenu que les prestations remplaçaient; la deuxième dans le pourcentage des réclamations nouvelles ou renouvelées déclarées inadmissibles (REFUS). Considérant que les prestations (PHM) sont devenues imposables à partir de 1972, leur montant fut diminué de 10 pour cent, et à la suite d'une réévaluation, d'un second 10 pour cent. On introduisit encore d'autres variables indépendantes: le pourcentage de changement du produit national brut en dollars constants (PCPNB), cette variable étant reculée d'un an de façon à tenir compte des effets cycliques. Il en fut de même pour le groupe d'âge 14-24 ans en tant que pourcentage des chômeurs (P14-24) de manière à tenir compte des variations dans la structure des groupes d'âge. À cause de certains problèmes de *multicollinéarité*, on a substitué aux REFUS dans l'évaluation une nouvelle variable (INEL) qu'on pourrait désigner comme quantité résiduaire de la régression sur le PCPNB.

Les résultats de la régression indiquent que la durée moyenne de l'entre-temps de chômage dépend d'une manière significative à la fois de (PHM/SHM (positivement) et INEL (négativement). En outre, PHM/SHM affecte PMI (positivement) et P4-6 (négativement). Dans les autres catégories, les coefficients de .05 n'ont pas de signification statistique appréciable. Prenant pour acquis que l'imposition de PHM en 1972 et 1973 était de 20 pour cent (c'est-à-dire que 20 pour cent des sommes ainsi reçues retournaient à l'État), les résultats démontrent qu'il n'y avait guère d'écarts dans la durée moyenne de chômage dont les modifications à la Loi sur l'assurance-chômage de 1971 soient la cause.

On ne peut tirer aucune conséquence politique ferme de ces résultats en ce qu'on ne trouve aucune preuve valable que l'accroissement des exigences des salariés conduit à des salaires plus élevés ou des conditions de travail non-matérielles meilleures.