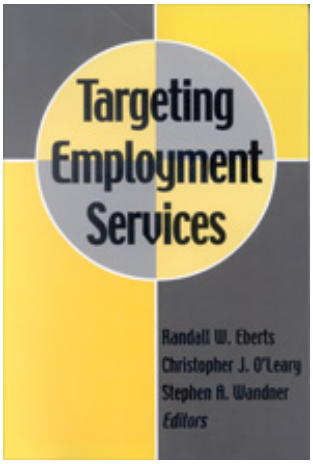
Predicting Long-Term Unemployment in Canada: Prospects and Policy Implications



Ging Wong
Privy Council Office, Government of Canada

Harold Henson
Human Resource Development Canada

Arun Roy
Human Resource Development Canada

Jeffrey A. Smith
University of Maryland

Chapter 11 (pp. 309-336) in:
Targeting Employment Services
Randall W. Eberts, Christopher J. O'Leary, and Stephen A. Wandner, eds.
Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2002
DOI: 10.17848/9781417524440.ch11

11
Predicting Long-Term Unemployment in Canada
Prospects and Policy Implications

Ging Wong, Harold Henson, and Arun Roy
Human Resources Development Canada

The problem of long-term unemployment—jobless but seeking work for 12 months or more—was persistent throughout the 1980s and 1990s in all 30 member countries of the Organisation for Economic Co-operation and Development (OECD). However, the extent of the problem differed greatly among countries. In Canada, Norway, Sweden, and the United States, the proportion of unemployed who were long-term unemployed (LTU) was relatively low, ranging from 9.5 percent in the United States to 17.1 percent in Sweden in 1996. This compares with 30.7 percent on average in the G7 countries, 34 percent on average for the 30 OECD countries, and 49.3 percent for the 15 members of the European Union (Organisation for Economic Co-operation and Development 1998b, 1998c). Nevertheless, these lower rates in North America and northern Europe represent significant increases over rates observed a decade earlier.

Targeting of reemployment services to the LTU became part of national employment policy in both the United States and Australia during the 1990s (Organisation for Economic Co-operation and Development 1998a). In the United States, the Worker Profiling and Reemployment Services (WPRS) system, established by 1993 legislation, required early identification and referral to services of unemployment compensation beneficiaries who are predicted as likely to be LTU. In Australia, a formal early identification and intervention strategy was devised and implemented by the Commonwealth Employment Service

(CES) in 1994 as part of their reform policy called "Working Nation." In Australia, the LTU and those determined to be "at risk" are given preferential access to case management and labor market programs delivered by either a public or private provider.

To date, Canada has not developed a policy for targeting services to the LTU. It has not been a pressing concern, because until recently the number of LTU has been low. Instead, Canada has focused its labor market reform efforts to deal with unemployment recidivism. Rather than large numbers of LTU, Canada has a high incidence of part-year employment in fishing, agriculture, and tourism with consequent seasonal unemployment. Public concern about long-term unemployment surfaced in the 1990s as the ratio of unemployment compensation beneficiaries to all unemployed (the B/U ratio) fell. The B/U ratio declined dramatically from 0.83 in 1989 to 0.42 in 1997. Research revealed that about half of this drop was due to tightening of the unemployment compensation system, but that the other half was due to changes in the nature of the labor market. In particular, B/U has dropped because the share of unemployed Canadians who have not worked for the last 12 months has nearly doubled, from 20.8 percent in 1989 to 38.4 percent in 1997.[1]

The next section of this chapter documents the rise in Canadian long-term unemployment, and the related trends in exhaustion of unemployment compensation entitlement. The chapter then reports on an empirical exercise using Canadian data that attempt early identification of individuals who are at risk of remaining jobless for 52 weeks or more. Such a model, however, is useful only if linked to efficacious employment measures. The next section therefore reports which services are most likely to promote reemployment for those at risk of long-term joblessness. For Canadian unemployment compensation recipients, estimates are provided of how net benefits of interventions vary depending upon the timing of the intervention. A summary and concluding remarks appear in the final section.

THE LABOR MARKET CONTEXT

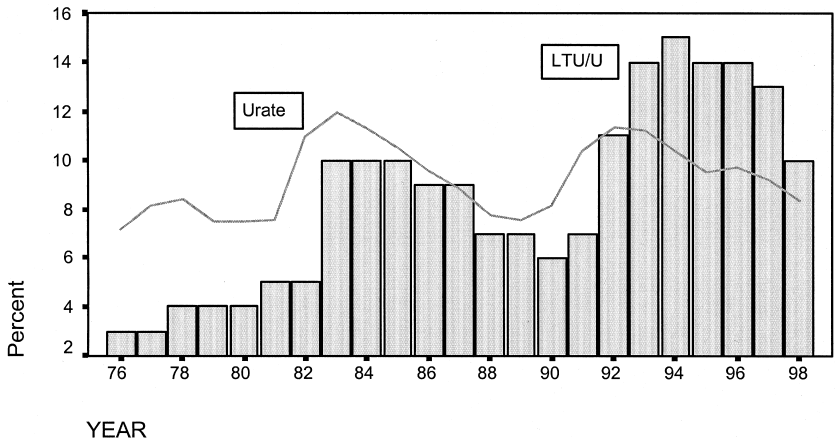
Labour Force Survey (LFS) data are used to provide descriptive statistics about the magnitude and trends in the growth of long-term un-

employment.[2] The LTU increased from 3 percent of all unemployed in 1976 to 5 percent in 1981, to 7 percent in 1991, and reached a peak of 15 percent in 1994. In recent years the LTU has declined, reaching 10 percent in 1998 (Figure 11.1). In spite of declines in recent years, the incidence of LTU doubled between 1981 and 1998 and increased threefold between 1976 and 1998. In absolute numbers, the size of the LTU has been in the range of 125,000 to 175,000 in recent years. In 1998, the number of workers reported to have been in the LTU category was 126,000.

There is a strong positive correlation between the aggregate unemployment rate and the incidence of long-term unemployment. This means that as the unemployment rate increases in a recession, the incidence of long-term unemployment also increases. It is also evident that the incidence of long-term unemployment declines much more slowly than the unemployment rate during subsequent recoveries.

Among age groups, long-term unemployment is substantially higher among older workers (55 and over) than among prime-age or young workers. The incidence is particularly low for youth because of their high turnover in the labor market.[3] By gender, the incidence of long-

Figure 11.1 Proportion of Total Unemployment That Is Long-Term and the Unemployment Rate, 1976–1998



SOURCE: Statistics Canada, LFS

term unemployment is also slightly higher among males than females. The incidence among those with only primary education is substantially higher than the average. But contrary to expectations, long-term unemployment is not lower among those with postsecondary education than among individuals with high school education.

There are some notable variations in the incidence of long-term unemployment among provinces. It is relatively high in Quebec and lower than the average in Ontario, the prairie provinces, and British Columbia. In the Atlantic provinces it has always remained at or below the national average. This is because a significant part of unemployment in the Atlantic provinces is of the seasonal variety (Green and Sargent 1995; Wesa 1995).

In summary, the aggregate data suggest that the LTU carry a large burden of the costs of recession and that this group shares relatively little in the benefits of recovery. The incidence of long-term unemployment appears to be higher for older workers, males, those with primary education, and in the province of Quebec.

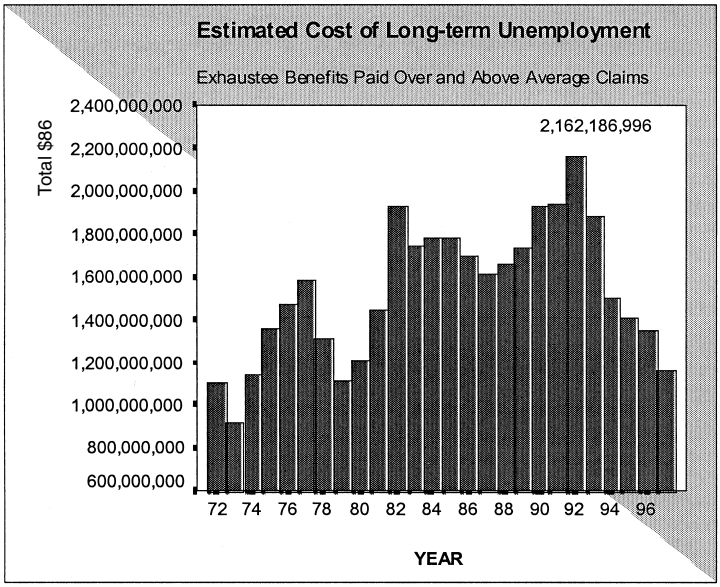
Higher levels of unemployment have budgetary implications that operate through lower tax receipts and higher outlays of income support for the unemployed than would have been the case. The unemployment compensation payment cost of long-term unemployment can be estimated as $(B_e - B_I) \times N_e$, where B_e is the average dollar amount paid to UI exhaustees, B_I is the average dollar amount paid to all UI claimants, and N_e is the total number of UI exhaustees.

In 1997, the cost of long-term unemployment was $1.6 billion, which works out to 16 percent of the total benefit payments in that year. This means that if the risk of long-term unemployment could be reduced by 75 percent through more active policies, a savings of $1.2 billion could be generated in the insurance account alone. Figure 11.2 shows that the cost of long-term unemployment varies cyclically, increasing in times of a recession and declining in times of a recovery.

PREDICTING LONG-TERM UNEMPLOYMENT

Our modeling approach for early identification of long-term unemployment draws on the practical experience of the United States and

Figure 11.2 Estimated Cost of Long-Term Unemployment



SOURCE: Our own estimates of $(B_e - B_l) \times N_e$ based on data from the HRDC Status Vector.

Australia (Wandner 1997; Chapman 1993). Worker profiling systems in those countries rely on readily observable personal and labor market characteristics as predictors of continuing unemployment. In the United States, the factors include recall status, union hiring hall agreement, education, job tenure, change in employment in previous industry, change in employment in previous occupation, and local unemployment rate. In Australia, seven key predictors are used: age, educational attainment, aboriginal status, foreign country birthplace, disability, English speaking ability, and geographic location.

Neither the U.S. nor the Australian system exploits the fact that the probability of exiting unemployment changes with the duration of unemployment.[4] Our models for Canada do capture this "duration dependence." In most cases the chance of exit falls as the unemployment spell lengthens. Consequently, the LTU find it increasingly difficult to find work. In part, this may be due to a reduction in job search intensi-

ty over time. There is evidence in Canada that job search effort remains at a fairly high level for the first 9 months of unemployment but declines steadily thereafter, stabilizing at a much lower level after 18 months.[5] Another reason for the declining likelihood of leaving unemployment may be the reluctance of employers to engage someone unemployed for an extended period.

To try models identifying workers at risk of long-term unemployment, we use 1996 data from a relatively new longitudinal database called the Canadian Out of Employment Panel (COEP) (Crossley and Wong 1997). The COEP survey collects detailed microlevel information on the sampled individuals and their households on a regular basis.

A sample from the 1996 COEP was selected to include UI/EI[6] covered workers who had job separations between October 1995 and September 1996. The sample was restricted to those who were laid off, ended a contract, or were dismissed. A final sample of 8,020 observations was used for regression analysis. Table 11.1 summarizes the statistical characteristics of this sample data. The first column reports the proportion of the sample with various demographic, labor market, and job search characteristics. The second column reports the proportion in each subgroup who experienced long-term unemployment.

Overall, 23.3 percent of the individuals in the analytical COEP sample became LTU. The figures in Table 11.1 suggest several factors which may be relevant in predicting long-term unemployment. For example, 28.4 percent of females were found to become LTU, as were 43.3 percent of older workers, 36.6 percent of disabled, 33.6 percent of those without a recall date, and 39.9 percent of those dismissed from their last job.

We examine two different approaches for predicting long-term unemployment. These alternate models are referred to as the Weibull and the probit (see the appendix for technical details). A practical distinction between the two regards the form of the dependent variable. For the Weibull model, the number of weeks unemployed is the dependent variable, while for the probit model the dependent variable is binary having a value of 1 if long-term unemployment was experienced, and 0 otherwise.

When comparing probit and Weibull results, it should be remembered that probit coefficient signs are opposite those obtained from Weibull formulations. Probit coefficients represent the effect of factors

Table 11.1 Sample Characteristics

Variable	% of Sample	LTU (%)
Demographics		
Males	56.9	19.5
Females	43.1	28.4
Youth (15–24)	15.4	15.8
Prime (25–54)	75.8	22.5
Older 55+	8.8	43.3
More than high school	45.0	21.6
Disabled	7.3	36.6
Not disabled	92.7	22.3
Disabled and old	1.1	46.6
Not disabled and old	98.9	23.0
Has child 3–5 yr. old	6.4	17.5
Canadian-born	86.8	22.6
Not Canadian-born	13.2	27.8
Labor market		
Atlantic	12.0	24.3
Quebec	31.7	26.3
Ontario	30.6	22.2
Prairies	13.9	18.7
British Columbia	11.8	20.2
Primary industry	6.9	19.6
Manufacturing industry	18.7	23.3
Construction industry	12.7	14.0
Services industry	53.3	24.9
Public administration	7.0	32.5
Knowledge occupation	7.0	18.1
Management occupation	4.6	31.5
Data occupation	7.8	28.3
Services occupation	13.2	30.2
Goods occupation	45.3	17.2
Data and service occupation	1.4	35.0
Seasonal job	29.0	15.3
Nonseasonal job	71.0	26.6
Had part-time job	13.2	20.7
Had full-time job	86.8	23.7

Table 11.1 (Continued)

Variable	% of Sample	LTU (%)
Job search		
Had a recall date	55.3	15.0
No recall date	44.7	33.6
Dismissed	4.6	39.9
Not dismissed from last job	95.4	22.5
Had UI/EI in previous year	47.5	18.2
No UI/EI in previous year	52.5	27.9

SOURCE: Statistics Canada (2001).

on the probability of becoming LTU, while the Weibull coefficients represent the effect of factors on the probability of leaving unemployment. Table 11.2 presents the results of model estimation with the influence of each factor listed as a determinant of long-term unemployment. For the probit model, both the variable coefficient estimate and the marginal impact of the variable on the probability of long-term unemployment are given.

Beyond the simple correlations suggested in Table 11.1, the model estimates provide information about the influence of a factor controlling for all other measured factors. The negative sign for males in the probit regression indicates that, *ceteris paribus*, male job losers are less likely to become LTU. For the Weibull regression, the positive sign for males indicates a more favorable prospect for reemployment. The probit models also suggest that older job losers are more at risk of LTU, as are individuals who reported a disability and those who did not have a recall date. Not surprisingly, educational attainment appears to have a significant negative relationship with long-term unemployment. Coefficients on regional location are not significant, except in Atlantic Canada. This may be due to the fact that regional dummies are masking within-region unemployment differentials. Taken at face value, the regression results appear to suggest that once a person becomes unemployed, there is little difference among regions in the probability of becoming LTU.

The U.S. systems for WPRS are based on models predicting UI claimants' exhaustion of benefit entitlement. Table 11.3 presents results of predicting UI/EI benefit exhaustion in the Canadian context. The same set of variables is used to predict benefit exhaustion as were used for the probit and Weibull models given in Table 11.2. Therefore, this Canadian benefit exhaustion model was expected to have many properties similar to those reported in Table 11.2. One interesting difference is that part-time workers in general were less likely to be LTU, but part-time status had no impact on the probability of exhausting UI/EI.

At this exploratory stage of system development, an important question concerns the predictive accuracy of the estimated equations. Predictions were computed from the above equations using estimated parameter values. For the probit model, predicted probabilities greater than or equal to 0.5 were classified as likely to experience long-term unemployment.[7] For the Weibull model, the time until exit from unemployment was predicted for each observation with predicted values greater than 52 weeks classified at risk of long-term unemployment.

In our calculations, the probit prediction success rate of 55.0 percent was better than the 45.5 percent observed for the Weibull. Both models are good improvements on the 21.3 percent point estimate of LTU given by the sample proportions.[8] For the Canadian exhaustion model, the probit prediction success rate of 56.4 percent was much better than the 32.6 percent success rate given by the sample proportions. These prediction reliability rates compared favorably with those obtained for U.S. models. Olson, Kelso, Decker, and Klepinger (see p. 29) reported success rates of 58.8 percent for their effort with U.S. models. Notably, exhaustion in U.S. models occurs at 26 weeks, while the Canadian models must predict 52 weeks into the future.

IMPACTS OF REEMPLOYMENT SERVICES

If a good model for predicting the probability of long-term unemployment can be developed, it could be used as part of a system for early referral to reemployment services in Canada. To make such referrals to services valuable, estimates of the net impacts of reemployment

Table 11.2 Determinants of Long-Term Unemployment

	Probit			Weibull	
Variable	Coefficient	P > |t|	Marginal impact (%)	Coefficient	P > |t|
Demographics					
Male	–0.36	0.00	–10.2	0.24	0.00
Youth	–0.99	0.00	–19.9	0.57	0.00
Prime	–0.71	0.00	–22.5	0.41	0.00
More than high school	–0.21	0.01	–5.7	0.15	0.00
Disabled	0.42	0.00	13.3	–0.29	0.00
Disabled and old	–0.15	0.58	–4.0	0.06	0.70
Has child 3–5 yr. old	–0.05	0.72	–1.3	0.05	0.64
Canadian-born	–0.22	0.03	–6.5	0.15	0.04
Labor market					
Atlantic	0.20	0.03	5.9	–0.25	0.00
Quebec	0.15	0.15	4.4	–0.16	0.03
Ontario	–0.07	0.52	–1.8	0.03	0.69
Prairies	–0.16	0.07	–4.2	0.07	0.29
Primary industry	0.13	0.51	3.7	–0.14	0.24
Manufacturing industry	0.04	0.80	1.2	0.08	0.45
Construction industry	–0.09	0.61	–2.3	0.03	0.74
Service industry	–0.14	0.33	–3.9	0.11	0.21
Knowledge occupation	–0.37	0.22	–8.8	0.27	0.24
Management occupation	–0.14	0.63	–3.7	0.22	0.32

Data occupation	–0.14	0.59	–3.9	0.23	0.28
Service occupation	–0.04	0.87	–1.2	0.17	0.41
Goods occupation	–0.39	0.15	–10.8	0.42	0.05
Weeks of work in last 52	–0.13	0.33	–12.8	0.28	0.00
Seasonal employment	–0.09	0.20	–2.6	–0.01	0.77
Had part-time job	–0.26	0.02	–6.7	0.32	0.00
Job search					
Had recall date	–0.63	0.00	–18.1	0.49	0.00
Dismissed	0.15	0.43	4.5	–0.04	0.74
Weeks of UI/EI entitlement	0.00	0.28	0.0	0.00	0.94
UI/EI in previous year	–0.20	0.01	–5.6	0.21	0.00
Constant	1.10	0.00		–4.92	0.00
P				0.94	0.00
N	8,020			8,020	
Pseudo R^2	0.1226				
log Likelihood	–3,771			–3E+06	

NOTE: Estimated with COEP data, $P = 1$ indicates no duration dependence. Coefficients on Weibull indicate the percent change in the probability in leaving unemployment in a week.

Table 11.3 Predicting UI/EI Benefit Exhaustion

	Probit		
Variable	Coefficient	P > |t|	Marginal impact (%)
Demographics			
Male	–0.38	0.00	–13.1
Youth	–0.61	0.00	–17.9
Prime	–0.51	0.00	–18.7
More than high school	–0.32	0.00	–10.8
Disabled	0.20	0.20	7.1
Disabled and old	0.17	0.60	6.2
Has child 3–-5 yr. old	0.01	0.96	0.2
Canadian-born	–0.27	0.03	–9.9
Labor market			
Atlantic	0.36	0.00	13.2
Quebec	0.07	0.61	2.3
Ontario	0.11	0.41	3.7
Prairies	0.03	0.82	0.9
Primary industry	0.30	0.15	11.0
Manufacturing industry	0.00	0.99	0.1
Construction industry	0.22	0.27	8.0
Service industry	–0.14	0.45	–4.7
Knowledge occupation	–0.63	0.05	–17.7
Management occupation	–0.55	0.08	–16.3
Data occupation	–0.62	0.03	–19.5
Service occupation	–0.19	0.52	–6.4
Goods occupation	–0.85	0.00	–27.6
Weeks of work in last 52	–0.79	0.00	–27.2
Seasonal employment	0.02	0.81	0.8
Had part-time job	0.08	0.54	3.0
Job search			
Had recall date	–0.39	0.00	–13.6
Dismissed	0.06	0.80	2.2
Weeks of UI/EI entitlement	–0.01	0.08	0.0
UI/EI in previous year	–0.15	0.10	–5.2
Constant	2.26	0.00	
N	4,432		
Pseudo R^2	0.1059		

NOTE: Estimated with COEP.

services for participants from the predicted LTU group and non-LTU group are required. A recently completed project on benchmarking reemployment services for the purposes of setting new baselines for the UI/EI reforms provides some evidence of impact on UI/EI claim durations.

Using administrative data prior to the 1996 UI/EI reform, the net UI savings impact resulting from reemployment services was calculated by comparing the actual UI benefits draw of a claimant with his or her expected draw in the absence of a reemployment service. The expected values for claim duration were derived from UI actuarial tables as the comparison group matched on several characteristics to the reemployment service program participants.

For this chapter, UI savings in terms of UI/EI benefit weeks payout have been recalculated to illustrate the potential of selected reemployment services within time frames that could reduce unemployment time and cost. Savings are measured from the end of participation in the reemployment service and are equal to the difference between actual weeks collected on the claim following participation and the expected remaining weeks estimated from the actuarial tables.[9]

Descriptions of the reemployment services are provided in Table 11.4. Table 11.5 reports estimates of net UI/EI weeks of benefit payments saved for selected reemployment services. Positive values indicate savings relative to the expected claim duration derived from actuarial tables; negative values mean that program interventions exceed the expected duration of benefits for people without interventions. This shows that each intervention has a different schedule in which it could work to generate UI savings.

The following highlights can be drawn from Table 11.5:

- For each service or program appearing in the table, the earlier the program delivery, the greater the net savings. An intervention commencing in the first five weeks of a claim generated at least two weeks of savings in all cases except Self-Employment Assistance.
- Job Creation Projects and Job Opportunities both provide wage subsidies and are both effective in producing savings. In the case of Job Creation Projects, the wage subsidy is in the form of regular UI benefits or enhanced UI benefits. Job Opportunities

Table 11. 4 Canadian Reemployment Services

Employment Assistance Services typically follow from a preliminary client assessment or Service Needs Determination. These include job search strategies (two-day course); job-finding clubs (up to three weeks); group employment counseling (9–15 hours); community-based employment assistance for targeted disadvantaged clients; and diagnostic assessment from a counselor referral.

Feepayers are enrolled in an approved training course but pay their own tuition or course costs. They receive their regular UI benefits for as long as they attend the course. At the end of the course, benefits may be paid for an additional three weeks while the feepayer looks for work.

Direct Purchase Option is an option available to local employment offices in a variety of programs for the purchase of training from public or private institutions.

Job Entry was designed to help youth, particularly those who did not complete secondary school or make the school-to-work transition. It offered a mix of classroom training and work experience.

Coordinating Groups are a component of Purchase of Training, which provides clients with the opportunity to learn new job skills in a classroom setting. Training may be purchased from private or public sector trainers either directly through government-to-government and Canada Employment Center purchases, or indirectly through local coordinating groups. Eligible training must meet the needs of the local labor market and the client's interests and aptitudes.

Job Opportunities are directed to persons who have problems joining the labor force, the objective being to provide job opportunities leading to long-term employment. The program provides employers with a wage subsidy to hire selected clients.

Job Creation Projects provide opportunities for unemployed workers to maintain their work skills during unemployment. Participants receive regular or enhanced UI benefits in place of wages.

Self-Employment Assistance promotes self-sufficiency in the labor market through self-employment. Income support may be paid for a maximum of 52 weeks while a person is starting and running a microbusiness. Counseling, training, and technical support could be provided by a designated community organization.

Table 11.5 Net Weeks of UI/EI Benefits Saved Following Participation in Selected Reemployment Services, 1995

Intervention start week	Employment assistance services	Training				Wage subsidy		Self-employment assistance
		Fee-payers	Direct purchase option	Job entry	Coordinating groups	Job creation	Job opportunities	
0–5	2.53	2.05	3.65	3.44	3.64	2.96	11.88	1.35
6–10	1.47	1.08	2.16	2.28	2.39	1.99	11.35	0.56
11–15	1.35	0.61	1.00	1.85	1.78	1.33	9.02	0.46
16–20	1.01	–0.03	0.45	1.11	1.37	1.07	9.01	0.53
21–25	0.47	–0.34	–0.27	0.34	0.62	0.69	6.22	0.33
26–30	0.71	negative	–0.87	–0.36	–0.10	0.16	6.32	0.26
31–35	0.46	—	negative	–1.12	–0.37	0.08	5.53	0.12
36–40	–0.20	—	—	negative	negative	–0.46	5.74	0.00
41–45	–0.60	—	—	—	—	–0.73	3.19	0.00
Av. duration (weeks)	7	33	26	22	17	14	2 UI weeks[a]	45

[a] Job Opportunities participants spent about 24 weeks in their program. They collected UI for about 2.5 weeks and received a wage subsidy for about 21.5 weeks.

clients stop collecting UI and their wage subsidy derives from other sources. The UI savings are thus much larger for Job Opportunities clients.

- Self-employment assistance (SEA) allows a participant up to 52 weeks of income support. The average in 1995 was 45 weeks. Given the long duration, savings from SEA are small. The savings occurring for programs beginning in the first five weeks of a claim reach 1.35 weeks and apply to clients with SEA programs of relatively short duration (about 25 weeks).
- The three training programs (Direct Purchase Option, Job Entry, and Coordinating Groups) yield about the same net savings when delivered in the first 10 weeks of UI. Feepayers, paid by the participant and typically of longer duration, delivers lower but still positive savings.

SUMMARY AND CONCLUSIONS

To sum up, there is evidence that long-term unemployment is a growing and serious labor market problem in Canada. Having just completed a major structural reform in UI/EI and reemployment services (employment benefits and support measures) to address problems associated with recurrent unemployment spells, the Canadian government is committed to a new prevention strategy for the at-risk populations. In this policy context, there is an interest in discovering what has worked (and what has not) regarding worker profiling and early reemployment services for the LTU.

Our preliminary analysis indicates some modest prospects for success in identifying the probability of long-term unemployment for the newly unemployed. Assuming that the existing array of reeemployment services are appropriate for the LTU, targeting of this at-risk group could produce both labor market efficiency and equity benefits.

Notes

We are indebted to Jeff Smith (University of Western Ontario) and Alice Nakamura (University of Alberta) for invaluable advice on modeling issues, and to Lesle Wesa for producing net impact estimates for employment interventions used in this study. All errors are, of course, ours.

1. See Applied Research Branch (1998, pp. 41 and 43). Note that the number used in the analysis is not the LTU but those not employed for a year, which includes both unemployed and out of the labor force.
2. The Canadian LFS is a monthly survey of the labor market activities of the sampled population and is comparable with the U.S. Current Population Survey. The LFS data covers the entire labor market and thus provides a measure of long-term unemployment at the aggregate labor market level.
3. See Lavoie 1996, Table I.
4. The following discussion draws heavily from Chapman and Smith (1993, pp. 7–9).
5. This appears to be true regardless of UI eligibility (Créémieux et al. 1995a, 1995b).
6. Unemployment insurance was renamed employment insurance in 1996.
7. See Greene (1993, pp. 651-653) for further discussion of this procedure. Note that the results can be improved by using other cutoff values. The use of the mean of the dependent variable improves the results somewhat. A grid search of possible values can raise the 55.0 percent to over 80 percent. However, as the issue of the appropriate cutoff is controversial, it was decided to stay with the value of 0.5.
8. Note that the 21.3 percent LTU is different than the 23.3 percent given in Table 11.1. The results reported here are based on the observations used in the regression, whereas Table 11.1 is based on all observations. The sample used in the regression is different because any observation with even one undefined variable is omitted from the analysis.
9. See Wong and Wesa (1999) for a more complete description of the methodology, in particular the difference strategy that was used to control for self-selection.

Appendix

Estimating the Probability of Long-Term Unemployment

Duration models are typically used to empirically investigate the probability or hazard of exiting unemployment at time t given that the unemployment spell has lasted to time t (Kiefer 1988). Following the formulation of Chapman and Smith (1993), the general specification of the Cox proportional hazard framework is used:

(A.1) $h(t, \mathbf{X}'\boldsymbol{b}, a) = H(\mathbf{X}'\boldsymbol{b}) \times H_0(t, a)$,

where $h(.)$ is the hazard function given the unemployment duration t; $H(.)$ is the relative hazard; $H_0(.)$ is the baseline hazard; $\mathbf{X}$ is a matrix of explanatory variables; $\boldsymbol{b}$ is a vector of parameters associated with $\mathbf{X}$, and a is a parameter associated with baseline.

The function is made up of the proportional factor H, which represents the observed heterogeneity effect, and H_0, which captures baseline hazard. Since the chance of leaving unemployment often declines with duration, the efficient estimator is based on the Weibull distribution. The component parts of the Weibull form for Equation A.1 can be written as follows:

$$H(\mathbf{X}'\mathbf{b}) = \exp(\boldsymbol{b}_0 + \mathbf{X}'\boldsymbol{b})$$

and

$$H_0(t, a) = t^{(a-1)},$$

so that Equation A.1 can be written as

(A.2) $h\,(t, \mathbf{X}'\boldsymbol{b}, a) = \exp(b_0 + \mathbf{X}'\boldsymbol{b}) \times t^{(a-1)}$.

This general formulation permits both duration dependence and observed heterogeneity. If the value of parameter a is constrained to equal 1, no duration dependence is allowed. On the other hand, values of less than 1 mean there is negative duration dependence.

Probit regression models for predicting the probability of long-term unemployment are also estimated in this chapter. For the probit, the risk of unemployment is assumed to be distributed normally, and the dependent variable is dichotomous. The variable takes a value of 1 representing the event of long-term unemployment for those with 52 or more consecutive weeks of unemployment, and 0 otherwise. The probit model permits measurement of the strength of the relationship between the outcome and independent variables in an equation predicting the probability of long-term unemployment.

References

Applied Research Branch. 1998. *An Analysis of EI Employment Insurance Benefit Coverage*. Ottawa: Human Resources Development Canada.

Chapman, Bruce. 1993. *Long-Term Unemployment in Australia: Causes, Consequences and Policy Responses*. A report prepared for the Department of Employment, Education and Training, Canberra, Australia.

Chapman, Bruce, and Peter Smith. 1993. "Predicting the LTU: A Primer for the Commonwealth Employment Service." Discussion paper 285, Australian National University, Canberra, Research School of Social Sciences, Centre for Economic Policy Research.

Créémieux, Pierre-Yves, Pierre Fortin, Paul Storer, and Marc Van Audenrode. 1995a. *Unemployment Insurance and Job-Search Productivity*. Ottawa: Human Resources Development Canada, Macro-Evaluation Directorate.

———. 1995b. *The Impact of Unemployment Insurance on Wages, Search Intensity and the Probability of Re-employment*. Ottawa: Human Resources Development Canada, Macro-Evaluation Directorate.

Crossley, Thomas, and Ging Wong. 1997. "The Canadian Out of Employment Panels: An Introduction." Photocopy. Human Resources Development Canada, Ottawa.

Green, David, and Timothy Sargent. 1995. *Unemployment Insurance and Employment Durations: Seasonal and Non-Seasonal Jobs*. Ottawa: Human Resources Development Canada, Macro-Evaluation Directorate.

Greene, William. 1993. *Econometric Analysis*. Second ed. Englewood Cliffs, New Jersey: Prentice-Hall.

Kiefer, Nicholas. 1988. "Economic Duration Data and Hazard Functions." *Journal of Economic Literature* 26(2): 646–679.

Lavoie, Claude. 1996. "Special Report: Youth Unemployment." *Quarterly Macroeconomic and Labour Market Review* (Spring): 20–26.

Organisation for Economic Co-operation and Development. 1998a. *Early Identification of Job Seekers at Risk of Long-Term Unemployment*. Paris: OECD.

———. 1998b. *OECD Employment Outlook*. Paris: OECD, September.

———. 1998c. *OECD in Figures 1998*. Paris: OECD.

Statistics Canada. 2001. "Canadian Out of Employment Panel Survey." Available at http://stcwww.statcan.ca/english/sdds/4418.htm; last accessed December 2001.

Wandner, Stephen A. 1997. "Early Reemployment for Dislocated Workers: A New United States Initiative." *International Social Security Review* 50(4): 95–112.

Wesa, Lesle. 1995. *Seasonal Employment and the Repeat Use of Unemployment Insurance*. Ottawa: Human Resources Development Canada, Macro-Evaluation Directorate.

Wong, Ging, and Lesle Wesa. 1999. *Management by Results: Employment Benchmarks and Savings Impacts for Employment Insurance*. Ottawa: Human Resources Development Canada, Strategic Evaluation and Monitoring.

Comments on Chapter 11

Jeffrey Smith
University of Maryland

This chapter presents two separate analyses. The first considers the predictability of long-term unemployment, or its close cousin, exhaustion of unemployment insurance (UI/EI) benefits.[1] The second presents some basic estimates of the impact of particular employment and training services on the duration of unemployment, with the impacts varying both by type of service and by when the services begin in the course of the UI/EI spell. I consider each analysis in turn.

In thinking about predicting long-term unemployment, it is useful to step back and ask an important but sometimes neglected question: why bother? There are two possible reasons. The first is that we might want to allocate some treatment based on predicted probabilities of being long-term unemployed for equity reasons. That is, we may have a limited budget for providing employment and training services to the unemployed, and so we may want to concentrate them on the worse off among the unemployed, where we equate worse off with having a long expected duration of unemployment. Although Berger, Black, and Smith (2000) show that this equation is not as obvious as it might seem, it is surely not unreasonable. Once we decide to focus services on those likely to become long-term unemployed, we would like to find a model that does a good job of sorting persons by expected duration; that is, a model that effectively predicts (out of sample!) long-term unemployment.

The model presented by Wong, Hensen, and Roy appears to do reasonably well at predicting long-term unemployment (within sample, in this case). In future work, it would be nice to go further—in particular, to compare the specification employed here with the specifications used in the various profiling models in the Worker Profiling and Reemploy-

ment System (WPRS) for UI recipients in the United States. These range from the very spare specification with only a small handful of variables utilized in the Maryland model to the vast armada of covariates employed in the Kentucky model (see Berger et al. 1997). There are also intermediate models such as those of Pennsylvania and Washington.

Three related questions are important here. First, how well do these models perform in the Canadian context? Second, can evidence on their relative performance based on U.S. data be generalized to the Canadian context? Third, what variables represent the most important predictors of unemployment duration in the Canadian context? The second question indicates the extent to which Canada can rely on U.S. research on predictive models. The third question holds great practical importance, as including additional covariates can substantially increase the cost (if additional data sets must be employed) and complexity of a predictive model.

The second reason for basing service allocation on the predicted probability of long-term unemployment or some close analogue such as UI/EI benefit exhaustion is efficiency. We might imagine that the impact of employment and training services, whether required as in the U.S. WPRS, or optional as in the current Canadian policy environment, varies with the probability of long-term unemployment. Assuming that the cost of providing the services is roughly constant across persons, efficiency dictates assigning the services to those with the largest impacts. In general, the presumption is that the impact of employment and training services will be larger for persons with a high probability of long-term unemployment, although the evidence for this presumption is mixed at best. On this point see, e.g., Black et al. (2001) and O'Leary, Decker, and Wandner in this volume (p. 161).

When efficiency is the aim, the model predicting long-term unemployment has both a different justification and a different goal. It should now seek to do the best job possible of distinguishing persons who will and will not have a large impact from whatever services are to be provided conditional on the predicted probability. This is not quite the same thing as simply doing as well as possible at predicting long-term unemployment. For example, if subgroups among the long-term unemployed have low mean impacts of service, then the model should exclude them from services. The present chapter does not address the

conceptual and practical distinctions between the two motivations for predicting long-term unemployment; it would be useful to do so in future work.

Turn now to the authors' analysis of the impacts of reemployment services on the duration of UI/EI claims, conditional on type of employment and training service received and on when in the spell the service is received. This analysis addresses the right questions—what are the impacts of different services that might be provided to the unemployed, and when is the optimal point in a spell to provide a given service. The first of these two questions relates to the discussion of the Service Outcomes and Measurement System and other profiling methods described in Chapter 10. For efficiency reasons, we want to assign unemployed persons to those services that will benefit them the most. The second question is also an important one, and one that has received relatively little study. It is a question that has implicitly been answered in different ways by different programs. On the one hand, the WPRS system in the United States implicitly assumes that early service provision is best. On the other hand, the service allocation scheme embodied in the new Workforce Investment Act program in the United States assumes that expensive services should be deferred until inexpensive ones have been tried. Despite this variation in practice, I am not aware of much evidence on this question in the literature. More evidence, such as that provided here, is of great use.

At the same time, while the chapter asks the right questions, it is difficult to evaluate the quality of the answers. The text omits important aspects of the econometric strategy used to identify the impacts of training, both in terms of broad concepts and specific details. A long literature, including papers such as LaLonde (1986), Heckman and Hotz (1989), Heckman, LaLonde, and Smith (1999), and Smith and Todd (forthcoming), documents the importance of the choice of nonexperimental evaluation strategy. While the audience for this book is a nontechnical one, it remains very important to convey the gist of the econometric strategy so that readers familiar with the econometric evaluation literature can judge the likely extent and source of bias in the impact estimates.

The reader should also keep in mind that impacts on UI/EI benefit receipt represent only one component of a complete social cost/benefit analysis. Providing employment and training programs to the unem-

ployed has a number of effects. Some effects are distributional. For example, employed persons paying payroll taxes benefit if the training reduces the amount of benefits paid by an amount that exceeds the direct cost of training. This reduction in benefits comes at the expense of the unemployed persons who would otherwise have received them. Other effects of the program may relate to efficiency, as when the program allows efficient training to occur that would otherwise not have occurred due to credit constraints. These aspects of the social cost/benefit calculation need to be carefully distinguished. In particular, all costs, including the direct costs of training and the net effects of the training programs on the efficiency costs associated with the distortionary taxes used to fund the UI program, should be taken into account in the analysis.

It is also important to keep in mind that there may be general equilibrium effects associated with these programs. For example, such effects could result from skill price changes resulting from increases in the supply of skilled labor due to the training being provided. Partial equilibrium analyses such as that presented in this chapter will not capture these effects. Indeed, the impact estimates provided by a partial equilibrium analysis may be biased in the presence of general equilibrium effects, which may cause the experiences of comparison group members to differ from what they would have been in the absence of the program.

Note

1. A few years ago, Canada took the bold step of changing the name of unemployment insurance (UI) to employment insurance (EI). To avoid confusion, in these comments I will refer to the program as either unemployment insurance or UI/EI.

References

Berger, Mark, Dan Black, Amitabh Chandra, and Steven Allen. 1997. "Profiling Workers for Unemployment Insurance in Kentucky." *Kentucky Journal of Economics and Business* 16: 1–18.

Berger, Mark, Dan Black, and Jeffrey Smith. 2000. "Evaluating Profiling as a Means of Allocating Government Services." In *Econometric Evaluation of*

Labor Market Policies, Michael Lechner and Friedhelm Pfeiffer, eds. Heidelberg: Physica-Verlag, pp. 59–84.

Black, Dan, Jeffrey Smith, Mark Berger, and Brett Noel. 2001. "Is the Threat of Training More Effective than Training Itself? Experimental Evidence from UI Profiling in Kentucky." Unpublished manuscript, University of Maryland.

Heckman, James, and V. Joseph Hotz. 1989. "Choosing among Alternative Methods of Estimating the Impact of Social Programs: The Case of Manpower Training." *Journal of the American Statistical Association* 84 (408): 862–874.

Heckman, James, Robert LaLonde, and Jeffrey Smith. 1999. "The Economics and Econometrics of Active Labor Market Policies." In *Handbook of Labor Economics, Volume 3A*, Orley Ashenfelter and David Card, eds. Amsterdam: North-Holland, pp. 1865–2097.

LaLonde, Robert. 1986. "Evaluating the Econometric Evaluations of Training Programs with Experimental Data." *American Economic Review* 76(4): 604–620.

Smith, Jeffrey, and Petra Todd. Forthcoming. "Does Matching Overcome LaLonde's Critique of Nonexperimental Methods?" *Journal of Econometrics*.

Part IV

New Directions for Targeting Employment Services

Targeting Employment Services

Randall W. Eberts
Christopher J. O'Leary
Stephen A. Wandner
Editors

2002

W.E. Upjohn Institute for Employment Research
Kalamazoo, Michigan

Library of Congress Cataloging-in-Publication Data

Targeting employment services / Randall W. Eberts, Christopher J. O'Leary, Stephen A. Wandner, editors.
p. cm.
Proceedings from a conference held on April 29 to May 1, 1999 in Kalamazoo, Michigan.
Includes bibliographical references and index.
ISBN 0-88099-244-1 (cloth : alk. paper) — ISBN 0-88099-243-3 (pbk. : alk. paper)
1. Unemployed—Services for—Government policy—United States—Congresses. 2. Employment agencies—United States—Management—Congresses. 3. Manpower policy—United States—Congresses. I. Eberts, Randall W. II. O'Leary, Christopher J. III. Wandner, Stephen A.
HD5875.T37 2002
362.85′84′0973—dc21

2002024572

W.E. Upjohn Institute for Employment Research
300 S. Westnedge Avenue
Kalamazoo, Michigan 49007-4686

Cover design by Jan Underhill.
Index prepared by Nancy Humphreys.
Printed in the United States of America.