Relations industrielles
Industrial Relations

The Impact of Canadian Training Programs on Long Term Unemployed

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Volume 46, numéro 4, 1991

URI : https://id.erudit.org/iderudit/050718ar
DOI : https://doi.org/10.7202/050718ar

Aller au sommaire du numéro

Éditeur(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (imprimé)
1703-8138 (numérique)

Découvrir la revue

Citer cet article

Geehan, R. & Swimmer, G. (1991). The Impact of Canadian Training Programs on Long Term Unemployed. *Relations industrielles / Industrial Relations*, *46*(4), 803–818. https://doi.org/10.7202/050718ar

Résumé de l'article

Durant la dernière décennie, le Canada a connu une croissance inquiétante de son chômage de longue durée. Croyant qu'un tel phénomène résulte d'une combinaison de formation inadéquate, d'un bas niveau de qualification et d'une faible motivation, plusieurs gouvernements, y compris celui du Canada, ont établi des programmes de formation pour ces individus. Les participants à ces programmes ne sont pas choisis au hasard. Le processus de sélection implique des décisions prises tant par les administrateurs de programmes que par les candidats potentiels. Ainsi, de simples comparaisons entre participants et non participants quant à leur employabilité et leurs revenus seraient biaisées.

L'objet de cet article est de présenter un modèle économétrique (fondé sur celui de Heckman 1979) capable de corriger ce biais résultant de la sélection et de mesurer empiriquement l'effet cumulatif de trois programmes de formation pour les chômeurs de longue durée. Le modèle consiste en une équation de probabilité de type 'probit' eu égard à la possibilité de participation à la formation et d'une paire d'équations pour mesurer la performance (gains et employabilité) sur le marché du travail des participants et des non-participants. Plusieurs caractéristiques non observables (e.g. les habiletés et la motivation) influent à la fois sur la décision de participer à ces programmes et sur la performance sur le marché du travail. Comme résultat, la covariance des termes d'erreurs entre la participation et l'employabilité est différente de zéro. La procédure statistique utilisée permet cette possibilité et génère des estimations consistantes pour les équations de gains et d'employabilité tant pour les participants que pour les non participants. Les valeurs ainsi calculées des gains et de l'employabilité sont alors utilisées pour évaluer l'équation structurelle de probabilité concernant la participation à un programme de formation professionnelle.

Les estimations portent sur un échantillon d'approximativement 1 500 participants et non participants ayant travaillé moins de dix pour cent du temps en 1985. Des équations de régressions distinctes ont été estimées pour les hommes et pour les femmes de l'échantillon.

Les résultats indiquent que les femmes bénéficient clairement des programmes de formation en termes d'employabilité et de revenu. Pour les hommes, les résultats sont négatifs, comme aux États-Unis. Selon les hypothèses avancées, la participante moyenne travaillerait de 9 à 17 semaines de plus par année et gagnerait entre 41$ et 54$ de plus par semaine que la non participante moyenne. En contraste, le participant moyen travaillerait de 4 à 11 semaines de moins par année et gagnerait entre 96$ et 121$ de moins par semaine que le non participant moyen. Ces résultats ont été obtenus après une courte période post-formation durant laquelle toutes les personnes participant aux programmes pouvaient recevoir des prestations d'assurance-chômage alors que les non participants n'y étaient pas éligibles.

Il faut donc interpréter ces résultats avec prudence. De plus, les participants retirent sans aucun doute des avantages substantiels en termes d'estime de soi et de rémunération pour accomplir quelque chose de constructif, au lieu de ne rien faire. Les résultats obtenus suggèrent aussi des avenues pour l'administration de tels programmes de formation professionnelle. Ils devraient s'adresser de plus en plus aux femmes vu le succès de leur expérience de marché du travail post-formation. Ensuite, il faudrait accroître les efforts de placement des stagiaires auprès d'employeurs privés. Il appert que ce moyen augmente l'efficacité de la formation, sans doute parce que plusieurs personnes en formation chez des employeurs font une assez bonne impression pour ensuite être embauchées de façon permanente.

The Impact of Canadian Training Programs on Long Term Unemployed

Randall Geehan
and
Gene Swimmer

The purpose of this paper is to develop an econometric model capable of correcting the selection bias resulting from any simple comparison between participants and non-participants to training programs. It also aims at estimating the incremental impact of three Canadian training programs aimed at the long term unemployed.

During the past decade, Canada, as well as other OECD countries, has experienced a disturbing rise in the number of long term unemployed workers. In 1980, approximately 130,000 Canadians (15% of total unemployment) were unemployed for more than six months. During the mid 1980's the number rose to over 300,000 (25-28% of the total), before declining to 205,000 (20%) in 1989 (Statistics Canada 1990). Although some of this long term unemployment is related to inadequate aggregate demand, most Western countries have developed training programs to attack this problem from the "supply-side", based on the rationale that long term unemployment results from a combination of inadequate training, low skill levels, and poor motivation. Most of these programs combine some classroom training with an actual job. The government pays the employer a

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** The authors wish to thank Employment and Immigration Canada for allowing the presentation of the empirical material, which was originally analyzed as part of a research contract for the Department. The authors assume responsibility for all aspects of this paper and explicitly note that Employment and Immigration Canada does not necessarily agree with any of the statements herein. Shortly before the final draft of this paper was prepared, Randall Geehan passed away.

grant to cover costs of training and a portion of the trainees' wages. If these programs are successful, participants' employability should be sufficiently enhanced upon completion to recover the public's training investment.

It is not possible to observe what participants' earnings would be had they not taken the training, so the obvious alternative is to compare their performance to a group of non-participants with similar attributes. Participants are not randomly selected for training programs. The selection process involves decisions made by both program administrators and potential trainees. As a result, any simple comparison with non-participants would be biased.

The purpose of this paper is to develop an econometric model capable of correcting for this selection bias (based on the Heckman two stage estimation process) and to estimate the incremental impact of three Canadian training programs aimed at the long term unemployed.

REVIEW OF THE LITERATURE

The empirical literature on evaluation of training programs deals almost entirely with the U.S. experience. The common thread in these studies is how to account for the selectivity problem. To participate in a training program, an individual must decide to apply, and the government administrators must decide whether to accept the candidate. These decisions are based on measurable personal characteristics (such as education, age and marital status) and non-measurable characteristics such as motivation and the ability to learn. These same non-measurable characteristics are likely determinants of long term labour market success. There is substantial evidence that participants and non-participants vary systematically with respect to these non-measurable qualities. More motivated and able individuals are likely to apply for training. In addition, Bassi (1983) argues that program administrators will attempt to find the "best" candidates among eligible applicants, in the hopes of increasing program effectiveness. These "creaming effects" lead to selection of relatively less disadvantaged candidates, whose unemployment may be more transitory than permanent.

As a result, methodologies must be used to avoid attributing post-program success to the training function, when it is really due to higher participant non-measurable qualities. Bassi (1983) assumes that these qualities are fixed over time, and therefore estimates first difference earnings equations to compare participants and non-participants. Westat (reported in Burnow, 1987) weights the non-participant regressions so they better resemble participants on average, thereby correcting the specification error

associated with selectivity. Finally, Heckman (1979) develops a two step process to correct for selection bias. This procedure involves first estimating a probit equation for the likelihood of participation and then using the predicted probit value as an instrumental variable in the earnings equations for participants and non-participants.

Although no methodology is perfect, Lalonde (1986) finds that Heckman's two step procedure generates earnings estimates which are closer to "true" estimates, for a program with random assignment of training, than the other techniques.

Notwithstanding the different approaches to correcting selectivity bias, most studies agree that training programs have a substantially greater impact on earnings of female participants than males (Burnow 1987). Bassi (1983) and Dickinson *et al.* (1987) report negative training impacts on male earnings. One possible explanation is that, in addition to enhancing employability, females who participate in training programs send a positive signal to employers that they are ready to permanently enter (or re-enter) the labour force and will be motivated employees. No similar positive signal is sent by male participation, as these workers were previously involved in the labour market with very limited success.

Burnow (1987) also indicates that most U.S. studies find larger positive earnings impacts for subsidized job placements which provide on-the-job training, rather than for classroom training programs. The major exception is the Work Experience Program which offered subsidized employment to severely employment disadvantaged individuals. Studies find a very small or negative training impact for this program.

THE MODEL

The model consists of three equations: an equation for the probability of participation in government sponsored training, and separate equations for earnings/employability of participants and non-participants.

The decision to participate in training is determined by the probit equation:

$$I_i^* = X_i b + e_i \qquad (1)$$

where

$I_i = 1$ (individual i participates) if $I_i^* > 0$

$I_i = 0$ (individual i does not participate) otherwise

I_i^* is an unobservable index which determines the value of the dichotomous

variable I_i. X_i is a vector of exogenous variables which determines the value of I_i^*, b is the associated vector of coefficients (assumed constant across individuals) and e_i is the error term.

The probability that $I_i = 1$ is given by

$$P(I=1) = P(e_i > -X_ib) = 1 - F(-X_ib)$$

where F is the cumulative normal density function.

The earnings/employability equations are given by:

$$W_p = Yd_p + u_p \quad (2)$$

$$W_{np} = Yd_{np} + u_{np} \quad (3)$$

for participants ($_p$) and nonparticipants ($_{np}$) respectively. W represents the wage or employability rate, Y is a vector of variables which determines W, and d is the associated coefficient vector, assumed constant across individuals within each of the two groups ($_p$ and $_{np}$) but differing across groups. The error term in each equation is u. the covariances cov(e, u_p) and cov(e, u_{np}) are not equal to zero, when selectivity bias occurs, i.e. when the unobservable ability of a participant which results in above average probability of participation (and a high value of e) also results in a high value for W_p (and a high value for u_p).

The sets of explanatory variables X and Y are overlapping and include age, education, family status and location (see Table 1 for complete details). To identify equation 1 in practice requires that X include variables explaining the participation decision which do not also appear as explanatory variables in the wage equations (2) and (3). A proxy variable for knowledge of training availability (the number of visits to the employment centre in a six month period) was used as the identifier of the participation equation in this study.

To estimate the incremental impact of the training program on the ith participant, the actual outcome W_{pi} is subtracted from the estimated potential outcome without the program, $E(W_{npi}|I_i = 1)$. Under the assumption that the error terms are jointly normally distributed, this difference is:

$$W_{pi} - E(W_{npi}|I_i=1) = W_{pi} - Y_id_{np} - cov(u_{np},e)|f(Xb)/F(Xb)| \quad (4)$$

where f and F are the normal density and cumulative distribution functions, respectively.

The ordinary least squares estimate of $E(W_{npi}|I_i = 1)$ would be Y_id_{np}, which is biased and inconsistent because it assumes the covariance term is zero. Heckman's (1979) estimation procedure allows for consistent estimation of the three equation model. The expected program benefit, measured by $(W_p - W_{np})$, is included as one of the determinants of the participation

equation (1). Equations (2) and (3) are first substituted into (1) and the resulting reduced form probit equation is estimated. This permits estimation of u_p, u_{np}, and consistent estimates of (2) and (3). Consistent predictions of W_p and W_{np} can then be generated and substituted into (1) to enable estimation of the structural probit equation for the participation decision.

DESCRIPTION OF THE DATA

Participants in this study were enrolled in one of three Canadian training programs aimed at the long term unemployed[1]. Although all three programs share a maximum length of one year, in other respects they can be thought of as providing a continuum of training support. Program one aims at those with fewest employment disadvantages. A partial wage subsidy is available to employers to provide training and experience for jobs requiring somewhat higher skills than the other two programs. Program two is directed at those long term unemployed who are deemed to have a social or cultural barrier to employment. It typically involves a larger wage subsidy (though less than 100%) and emphasizes generating work experience, without necessarily increasing skill levels. Finally, program three (the reference group in the regressions) is targeted to severely employment disadvantaged, defined as having one or more of the following traits: problematic work habits, attitude problems, functional illiteracy, prolonged institutionalization or substance abuse. It provides complete wage subsidization and aims at developing job readiness skills as well as preparing these individuals for additional training.

Only individuals employed less than 10% of the time in 1985 are included in the sample. The participant sample contains two cohorts, those who entered a training program between September 1985 - August 1986 and those entering between September 1986 - August 1987. Comparison samples of non-participants were matched to participants in terms of sex, age, cohort status, geographic location and program eligibility (based on employment history). Data were obtained through a combination of telephone interviews and administrative files[2].

A pair of dependent variables are used to measure the training impact, employability and earnings. Employability is defined for participants as the

1 Minimum eligibility for all three programs is unemployment for 24 out of the last 30 weeks before referral.

2 The overall response rate of completed surveys to attempted contacts was 50 percent. Eighty percent of those individuals who were actually contacted, responded to the survey.

percentage of calendar time employed since training ended. For non-participants, the equivalent periods for measuring the percentage of time employed are the most recent 12 months (1986-87 cohort) or 20 months (1985-86 cohort)[3]. These figures represent the median time since program completion for the respective participant cohorts. The other dependent variable was defined as average weekly earnings in the current or most recent job[4].

A complete description of the dependent and explanatory variables for the wage/employability equations is contained in Table 1. Thirteen personal characteristics, including age, education, family status, and race, are used to explain earnings/employability. In addition, these equations contain lagged dependent variables which allow for an additional selectivity control. Pre-program employment and earnings may be indicative of non-measurable ability. This model allows for the possibility that an individual's non-measurable qualities change over time (unlike fixed effects models). The employability regressions include measures of short term and long term pre-program employment success (defined as percentages of time employed in 1985 and time employed in 1982-84), while the wage regressions contain only a short term variable, average weekly earnings in 1985.[5].

Finally, a number of program related variables are included in the participants' employability equations. Some relate to specific training program attributes such as the use of classroom instruction and/or on-the-job training with a public or private sector employer. Other variables capture whether the individual completed the program and how much time has elapsed since completion.

Given the divergent impacts of training on males and females documented in the literature, separate regressions for each sex are estimated throughout.

3 Employability rates are restricted to the 0 to 100% range, but a regression model may predict outside this range. The outcome is rare for our regressions, and in these cases the individual prediction is censored back to the appropriate limit of the range.

4 To avoid upwardly biasing the impact of training by including students who have not been in the labour market prior to training, observations in these regressions are restricted to individuals who reported non-zero earnings for a pre-program job. Unlike employability, wage data are not available from administrative records and have to be obtained from survey responses. Obvious errors in reporting are removed from the data by eliminating individuals reporting wages outside the range of 3-25 dollars per hour.

5 Long term employability data are available from administrative files. No equivalent data on earnings exist.

Table 1

Summary of Variables Used in Regressions

Variable Name	Description
EMPLOYED	Percentage of calendar time employed since the training program for participants, or for the equivalent time period for comparison group
EARNINGS	Average weekly earnings in most recent job
AGE, AGE^2	Individual's age and age squared
MARRIED	1 if married or common law; 0 otherwise
CANADIAN	1 if born in Canada; 0 otherwise
HIGH SCHOOL	1 if educated to at least grade 12 but without a university degree; 0 otherwise
UNIVERSITY	1 if respondent holds a university degree; 0 otherwise
CITY	1 if respondent lives in a city; 0 otherwise
EMPLOYED RELATIVE	1 if living with an employed parent or spouse; 0 otherwise
CHILD	1 if respondent lives with a dependent child under six; 0 otherwise
FRANCOPHONE	1 if respondent speaks French; 0 otherwise
SAR	1 if respondent is known to be a social assistance recipient before the program for participants or in 1985 for comparison group; 0 otherwise
SELF SELECTION	inverse mills ratio; measures selectivity bias
EMPLOYED85*	percentage of time employed in 1985
EMPLOYED82-84*	percentage of time employed in 1982-1984
EARNINGS85*	average weekly earnings (in 1988 $'s) on last job before program, for participants; or on main job in 1985 for non-participants
PROGRAM1**	1 if participant was enrolled in program one; 0 otherwise
PROGRAM2**	1 if participant was enrolled in program two; 0 otherwise
COMPLETE PROGRAM**	1 if participant completed training program; 0 otherwise
LENGTH**	length of training program in weeks
PRIVATE EMPLOYER**	1 if respondent worked for a private sector employer during training program; 0 otherwise
CLASSROOM**	number of days of classroom training received during program
ON-THE-JOB**	1 if on the job training was received during program; 0 otherwise
WEEKS SINCE PROGRAM**	number of weeks since completing the training program
VISITS***	number of visits to Employment Centre in six month period before training program began; 2 is coded for two or more visits

* Lagged dependent variables used only in the respective employability or earnings equations.

** Used only in the participant employability or earnings equations.

*** Used only in the probability of participation equation.

THE EMPIRICAL RESULTS

Tables 2 and 3 summarize the regression results for the percentage of time employed and average weekly earnings, respectively. Each table presents estimates of four equations: female participants, female non-participants, male participants and male non-participants.

Overall, the independent variables generally explain about 18-25% of the variation in the dependent variable. This is typical for regressions based on disaggregated data and similar to the overall predictive power of other studies which report the value of r^2 [6]. The self selection coefficient is generally large in absolute size, but only reaches statistical significance in the female participant employability equation. Few personal characteristics are statistically significant in the equations (family status, education, visible minority and disability being the exceptions). This mediocre performance can be explained by the fact that all regressions also include lagged dependent variables and the impact of most personal characteristics is already embedded in these variables. The full set of variables has been included because we are more concerned with the overall predictive power of the regressions than the significance of specific personal characteristics.

A number of programmatic variables are significant determinants of participant employability and wages. Those who complete the program are more successful at staying employed than dropouts. Labour market performance generally increases for lengthier training programs and as the elapsed time since program completion increases.

Private sector placements are highly correlated with eventual employment prospects. *Ceteris paribus,* male and female participants who worked for private employers during their training, had post-program employability levels which were 20-25 percentage points higher than other trainees. Presumably, many of these trainees continued to work for the employer after their wage subsidy ran out.

The results for classroom and on-the-job training are inconsistent, making it impossible to comment on the optimal mix of these training alternatives. The program aimed at the most severely disadvantaged (the reference group) appears to be more successful in increasing employability of its constituents than the less basic programs (1 and 2), other things equal[7]. This last result is contrary to U.S. experience (see Burnow 1987).

6 Seeborg, Seeborg and Zegeye (1986) report r^2 values of .12 and .16 for their U.S. wage equations. Jimenez and Kugler (1987) report substantially higher r^2 values (from .19 - .37) for Columbian earnings functions. None of the previously cited U.S. studies report coefficients of determination (r^2).

7 It is probably true that had program 3 been available at the specific time and location, many participants would have been assigned to it, instead of programs 1 or 2.

Table 2

Regression Results for the Percentage of Time Employed

Variable Name	*Females*				*Males*			
	Participants		*Non-Participants*		*Participants*		*Non-Participants*	
	Coeff	*T Ratio*	*Coef*	*T Ratio*	*Coeff*	*T Ratio*	*Coeff*	*T Ration*
CONSTANT	-17.85	-0.78	79.94	2.64†	20.62	0.91	6.22	0.25
AGE	1.35	1.34	-0.34	-0.22	-0.62	-0.61	4.10	3.11†
AGE SQUARED	-0.19	-1.43	-0.05	-0.24	0.00	0.10	-0.06	-3.50†
MARRIED	-4.48	-1.13	-7.54	-1.07	12.86	3.04†	5.66	0.98
CANADIAN BORN	4.87	0.85	-9.51	-1.30	5.81	1.11	-6.98	-1.06
HIGH SCHOOL	5.37	1.62*	2.51	0.45	7.00	1.91†	5.50	1.06
UNIVERSITY	5.68	1.01	-5.12	-0.59	9.93	1.89†	-8.49	-1.21
CITY RESIDENT	3.98	0.93	-7.70	-1.31	10.54	2.67†	-5.48	-1.04
EMPLOYED RELATIVE	10.95	2.75†	-0.81	-0.12	4.17	1.19	1.10	0.23
CHILD	-8.73	-2.43†	-7.14	-1.21	0.98	0.22	0.42	0.06
FRANCOPHONE	-4.67	-0.44	-3.70	-0.31	9.95	0.74	13.69	1.20
SAR	4.89	1.33	-3.87	-0.49	0.28	0.06	-19.61	-2.60†
VISIBLE MINORITY	14.99	2.07†	-19.53	-1.65*	-8.32	-1.19	-10.17	-0.87
NATIVE	-7.48	-1.07	-13.13	-0.99	-3.01	-0.52	-11.12	-1.29
DISABLED	-1.67	-0.24	-37.11	-2.37†	-7.89	-1.57	-24.40	-3.47†
WEST	2.03	0.41	0.17	0.02	2.83	0.60	9.19	1.38
ONTARIO	-2.38	-0.44	2.22	0.26	6.59	1.18	6.78	0.88
QUEBEC	8.92	0.88	1.55	0.14	-9.92	-0.70	-2.59	-0.21
EMPLOYED85	-0.97	-1.65*	1.15	1.73*	-0.20	-0.38	1.17	1.61
EMPLOYED82-84	0.14	2.03†	0.08	0.80	0.20	2.76†	0.14	1.28
PROGRAM1	-11.55	-2.28†	-9.70	-1.44	-7.20	-1.11	0.49	0.07
PROGRAM2	-11.55	-1.67*	-7.60	-1.07	-12.53	-1.66†	-1.66	-0.24
COMPLETE PROGRAM	10.12	2.66†			7.91	2.14†		
LENGTH	0.38	2.79†			0.29	1.85†		
PRIVATE EMPLOYER	24.77	4.73†			20.79	4.03†		
CLASSROOM	-0.04	-0.81			0.00	0.02		
ON-THE-JOB	4.85	1.36			-7.19	-2.10†		
TIME POST PROGRAM	0.05	0.66			0.21	2.84†		
SELF SELECTION	18.53	1.75*	-7.00	-0.62	7.03	0.55	13.55	1.16
NO. OBSERVATIONS	602		232		528		232	
R SQUARE	0.18		0.13		0.18		0.25	

* Significant for a two tail test at the 10% level.
† Significant for a two tail test at the 5% level.

Table 3

Regression Results for the Average Weekly Earnings

Variable Name	*Females*				*Males*			
	Participants		*Non-Participants*		*Participants*		*Non-Participants*	
	Coeff	*T Ratio*	*Coef*	*T Ratio*	*Coeff*	*T Ratio*	*Coeff*	*T Ration*
CONSTANT	-143.94	-1.58	177.47	1.73*	61.36	0.47	196.46	1.54
AGE	5.86	1.43	3.09	0.65	2.00	0.33	12.34	1.79*
AGE SQUARED	-0.09	-1.61	-0.08	-1.35	-0.07	-0.88	-0.17	-1.99†
MARRIED	-30.41	-1.85†	-31.70	-1.35	51.62	2.04†	37.42	1.17
CANADIAN BORN	-2.37	-0.10	-15.58	-0.61	-33.16	-0.10	-21.16	-0.63
HIGH SCHOOL	34.29	2.49†	29.67	1.58	22.16	1.09	33.03	1.26
UNIVERSITY	89.41	3.77†	78.13	2.75†	96.16	3.09†	69.28	1.83*
CITY RESIDENT	7.92	0.52	-8.91	-0.44	41.26	1.74†	-30.88	-1.10
EMPLOYED RELATIVE	2.16	0.13	11.06	0.47	-12.93	-0.68	-55.27	-2.32†
CHILD	-13.62	-0.91	-43.60	-2.18†	2.03	0.08	-10.43	0.31
FRANCOPHONE	-35.42	-0.80	-4.37	-0.11	4.30	0.06	5.34	0.09
SAR	15.51	1.03	-38.82	-1.47	-18.46	-0.68	-52.97	-1.25
VISIBLE MINORITY	17.19	0.59	-54.75	-1.38	-89.50	-1.96†	-73.60	-1.06
NATIVE	-5.04	-0.18	-16.65	-0.33	-53.72	-1.62	-43.73	-0.96
DISABLED	-53.69	-1.88*	-84.09	-1.57	-65.81	-2.22†	-131.60	-3.56†
WEST	0.80	0.04	22.24	0.84	-23.66	-0.86	15.65	0.47
ONTARIO	9.44	0.42	26.15	0.94	19.66	0.61	28.81	0.73
QUEBEC	55.36	1.28	12.26	0.32	-8.22	-0.11	-46.26	-0.74
EARNINGS85	0.24	4.10†	0.16	1.54	0.16	2.86†	0.25	3.55†
PROGRAM1	-0.94	-0.05	-18.15	-0.85	30.78	0.77	10.92	0.28
PROGRAM2	21.50	0.75	-13.97	-0.58	16.46	0.36	-48.81	-1.22
COMPLETE PROGRAM	25.24	1.60			22.81	1.08		
LENGTH	1.93	3.41†			0.95	1.09		
PRIVATE EMPLOYER	12.53	0.57			35.28	1.22		
CLASSROOM	0.00	0.02			-0.15	-0.64		
ON-THE-JOB	7.05	0.48			9.40	0.48		
TIME POST PROGRAM	1.18	4.06†			2.11	4.99†		
SELF SELECTION	62.63	1.57	-32.69	-0.82	-82.59	-1.14	70.16	1.03
NO. OBSERVATIONS	497		245		454		229	
R SQUARE	0.18		0.21		0.23		0.31	

* Significant for a two tail test at the 10% level.
† Significant for a two tail test at the 5% level.

For each participant, predicted employability or earnings from the non-participant equation (given his/her actual attributes) is subtracted from the participant's actual value. The mean difference represents the average impact of training on employability or earnings. Table 4 summarizes the average estimated returns to females and males. In addition to the actual average difference, additional impacts are estimated on the assumptions that all candidates complete training, all have private sector training placements and both that all complete and have private sector placements. The results are striking. Females have gained substantially from the government sponsored training programs. Employability increased by 18-33 percentage points (or 9-17 weeks per year, depending on the how optimistic the assumptions) and simultaneously weekly earnings increased by $41-54 per week in 1988 dollars[8]. Under the somewhat heroic assumptions that weekly earnings on the most recent job are indicative of average annual weekly compensation, these results would correspond to about $370-920 annual earnings increase. We cannot say whether this increase is transitory. The fact that the gain in weekly earnings increases significantly with time since completion is encouraging, but other evaluations suggest that the employability gain starts to fall after two years[9].

Table 4

Estimated Impact of Training on Employment and Earnings

Group/Assumptions	*Employability Gain (percentage points)*	*Earnings Gain ($)*
Females		
Average	18.10	41.30
All complete training	20.44	47.36*
All private sector placements	31.48	48.32*
All complete + all private sector placements	33.82	54.38*
Males		
Average	-20.72	-120.90
All complete training	-18.43	-114.29*
All private sector placements	-10.12	-102.91*
All complete + all private sector placements	-7.83	-96.30*

* Regression coefficient on which revised estimate is based was not statistically significant.

8 The average actual employability rate for female participants was 51.54% while their average weekly wage rate was $195.20.

9 These other results were pointed out during discussions with department officials.

By contrast, the results for males discouraging. The average gain from training in terms of both employability and earnings is negative. Employability estimates range from an 8-21 percentage point decline (or by 4-11 weeks per year), while weekly earnings are estimated to fall from between $96-121 per week[10]. These results are similar to the previously discussed U.S. experience. It is probably true that the female trainees are viewed positively by prospective employers in terms of motivation and skill, and that their lack of employment in 1985 was likely a result of family related responsibilities. Employers may feel that males with a history of long term unemployment will not be good employee prospects, despite training. In addition, each week of training generates one week of credit towards Canadian Unemployment Insurance (UI) benefits. Few individuals in this sample would otherwise have access to UI, so the post-training period generally compares participants who are eligible for UI, with non-participants who are not. Part of the negative training impacts for males may result from the fact that their job search is subsidized by UI. Lower weekly earnings could result from fewer hours worked per week and/or lower hourly wages which embody general training. Indirect support for this scenario is found from the result that male employability and earnings increase significantly with the time since program completion (female employability is unaffected).

Table 5 summarizes the structural probit equation estimates for the decision to participate in training. The most important finding is the extremely significant and positive relationship between the estimated individual gain in employability (and/or earnings) and the probability of training participation. In other words, the right men and women are being trained in that they can expect the greatest benefits from the program.

The frequency of visits to the employment office (a proxy for knowledge of training availability) is generally directly related to training participation, while holding a university degree, residing in a city and being disabled are inversely related to participation.

CONCLUSION

This paper applied the two stage Heckman procedure to evaluate the impact of training programs targeted to the long term unemployed. The major finding is that females clearly benefit from these programs in terms of both employment stability and weekly earnings. Females who complete training are estimated to work an additional 11 weeks annually and earn an

10 The actual employability rate for male participants was 51.58%, while their average weekly wage was $281.60.

Table 5

Structural Probit Regression Results for the Probability of Training Participation

Variable Name	*Females*				*Males*			
	Employability Eq.		*Earnings Eq.*		*Employability Eq.*		*Earnings Eq.*	
	Coeff	*T Ratio*	*Coef*	*T Ratio*	*Coeff*	*T Ratio*	*Coeff*	*T Ration*
CONSTANT	2.24	6.74†	5.21	6.89†	6.32	11.44†	6.29	7.38†
EMPLOYABILITY GAIN	0.08	13.97†			0.11	14.02†		
EARNINGS GAIN			0.04	9.82†			0.03	9.96†
CANADIAN BORN	-0.11	-0.43	0.07	0.17	-1.11	-3.91†	0.48	1.38
HIGH SCHOOL	-0.43	-2.72†	-0.20	-0.75	-0.02	-0.14	0.57	2.00†
UNIVERSITY	-1.31	-5.08†	-0.82	-1.63	-1.38	-4.86†	0.18	.48
CITY RESIDENT	-0.90	-5.93†	-0.93	-3.01†	-1.93	-9.34†	-2.59	-7.38†
FRANCOPHONE	-0.25	-1.55	0.36	1.20	1.04	-4.86†	-1.20	-3.80†
SAR	-0.06	-0.31	-1.95	-4.99†	-1.18	-5.80†	0.21	.80
VISIBLE MINORITY	-1.94	-4.70†	-2.81	-4.62†	0.47	1.10	0.74	1.44
NATIVE	-0.02	-0.07	1.42	2.03†	-0.25	-0.94	0.69	1.48
DISABLED	-2.30	-4.75†	-1.02	-1.48	-1.90	-6.35†	-1.88	-4.58†
VISITS	0.43	5.56†	0.41	2.78†	0.34	3.47†	0.06	0.41
NO. OBSERVATIONS	834		742		760		683	
CHI SQUARE	571.18		822.35		615.17		721.42	
DEGREES OF FREEDOM	11		11		11.00		11	

* Significant for a two tail test at the 10% level.

† Significant for a two tail test at the 5% level.

extra $47/week. The results for males are not encouraging, with negative estimates for employability and weekly earnings. However, the negative impacts are likely overstated, because the data are based on a relatively short post-program period, 12 to 20 months depending on the cohort. During much of this period the trainee is entitled to unemployment insurance benefits, which would encourage looking for better jobs and/or taking additional training. The facts that both male employment and earnings increase significantly as the time since program completion increases point to this possibility. Follow-up interviews would be required, i.e. five years after training, to make definitive statements. It must also be remembered that these individuals have had tremendous pre-program difficulties in the labour market, and there are undoubtedly positive benefits to trainees' self esteem from being paid to do something constructive rather than being on the dole.

The results also provide evidence about how training programs for the long term unemployed ought to be run. It appears that these programs should be increasingly targeted to women, given their superior post-program labour market success. Secondly, private employer placements are extremely effective training devices. Many trainees make a sufficiently good impression that they are taken on as regular employees.

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L'impact des programmes canadiens de formation professionnelle sur le chômage de longue durée

Durant la dernière décennie, le Canada a connu une croissance inquiétante de son chômage de longue durée. Croyant qu'un tel phénomène résulte d'une combinaison de formation inadéquate, d'un bas niveau de qualification et d'une faible motivation, plusieurs gouvernements, y compris celui du Canada, ont établi des programmes de formation pour ces individus. Les participants à ces programmes ne sont pas choisis au hasard. Le processus de sélection implique des décisions prises tant par les administrateurs de programmes que par les candidats potentiels. Ainsi, de simples comparaisons entre participants et non participants quant à leur employabilité et leurs revenus seraient biaisées.

L'objet de cet article est de présenter un modèle économétrique (fondé sur celui de Heckman 1979) capable de corriger ce biais résultant de la sélection et de mesurer empiriquement l'effet cumulatif de trois programmes de formation pour les chômeurs de longue durée. Le modèle consiste en une équation de probabilité de type 'probit' eu égard à la possibilité de participation à la formation et d'une paire d'équations pour mesurer la performance (gains et employabilité) sur le marché du travail des participants et des non-participants. Plusieurs caractéristiques non observables (e.g. les habiletés et la motivation) influent à la fois sur la décision de participer à ces programmes et sur la performance sur le marché du travail. Comme résultat, la covariance des termes d'erreurs entre la participation et l'employabilité est différente de zéro. La procédure statistique utilisée permet cette possibilité et génère des estimations consistantes pour les équations de gains et d'employabilité tant pour les participants que pour les non participants. Les valeurs ainsi calculées des gains et de l'employabilité sont alors utilisées pour évaluer l'équation structurelle de probabilité concernant la participation à un programme de formation professionnelle.

Les estimations portent sur un échantillon d'approximativement 1 500 participants et non participants ayant travaillé moins de dix pour cent du temps en 1985. Des équations de régressions distinctes ont été estimées pour les hommes et pour les femmes de l'échantillon.

Les résultats indiquent que les femmes bénéficient clairement des programmes de formation en termes d'employabilité et de revenu. Pour les hommes, les résultats sont négatifs, comme aux États-Unis. Selon les hypothèses avancées, la participante moyenne travaillerait de 9 à 17 semaines de plus par année et gagnerait entre 41$ et 54$ de plus par semaine que la non participante moyenne. En contraste, le participant moyen travaillerait de 4 à 11 semaines de moins par année et gagnerait entre 96$ et 121$ de moins par semaine que le non participant moyen.

Ces résultats ont été obtenus après une courte période post-formation durant laquelle toutes les personnes participant aux programmes pouvaient recevoir des prestations d'assurance-chômage alors que les non participants n'y étaient pas éligibles. Il faut donc interpréter ces résultats avec prudence. De plus, les participants

retirent sans aucun doute des avantages substantiels en termes d'estime de soi et de rémunération pour accomplir quelque chose de constructif, au lieu de ne rien faire.

Les résultats obtenus suggèrent aussi des avenues pour l'administration de tels programmes de formation professionnelle. Ils devraient s'adresser de plus en plus aux femmes vu le succès de leur expérience de marché du travail post-formation. Ensuite, il faudrait accroître les efforts de placement des stagiaires auprès d'employeurs privés. Il appert que ce moyen augmente l'efficacité de la formation, sans doute parce que plusieurs personnes en formation chez des employeurs font une assez bonne impression pour ensuite être embauchées de façon permanente.