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Short-term employment transitions of the Canadian labour force: rural–urban differences in underemployment

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Abstract

Using data from the Canadian Survey of Labour and Income Dynamics (SLID) for the period 1993–1996, we examine patterns and determinants of labour-force transitions of adequately employed and underemployed workers in an attempt to explore whether employment dynamics significantly differ between rural and urban workers so as to disadvantage rural economic performance. The results indicate that rural adequately employed workers are significantly more likely to enter underemployment but once they are underemployed, they also have a higher probability of re-entering adequate employment. Further, we also found weak evidence that the education level of workers has a lower impact on the probability of moving out of underemployment in rural than in urban areas. In addition, rural women are significantly less likely than their male counterparts and urban workers to enter adequate employment, although the presence of young children does not seem to especially constrain the employment of rural women. The results suggest that labour-force transition in and out of adequate employment, and particularly underemployment, significantly differ between rural and urban workers and should be taken into account when evaluating employment hardship in rural Canada.

JEL classification: R11; R23; J63

Keywords: Rural development; Structural change; Regional labour markets; Mobility; Underemployment

1. Introduction

The restructuring of economies in developed countries over the last few decades has had a considerable impact on the composition and characteristics of the labour market. While labour-force participation has increased, it has also resulted in a significant rise in employment hardship, referred to as underemployment. As a labour-force concept, 'underemployment' provides a comprehensive measure of under-utilised labour resources since it includes not only unemployment, but also some types of discouraged or subemployed, involuntarily part-time and low-income workers with marginal or unstable labour-market attachments (Hauser, 1974; Clogg, 1979; Clogg and Sullivan, 1983). This broader definition acknowledges that employment itself is an important route out of

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poverty and is central to issues of poverty and economic well-being for several reasons (Bane and Ellwood, 1986). First, frequent transitions to and from various disadvantaged labour states can bring about highly unstable monthly income flows and substantial annual income losses. Second, repeated episodes of joblessness may result in discouragement and precipitate eventual withdrawal from the labour market. Third, regular job departures preclude the accumulation of valuable job-specific tenure, which is positively related to lifetime earnings (Devine and Keifer, 1993). Finally, an inadequate work history might signal to prospective employers a certain lack of diligence, only compounding the problem. Hence, not only the degree of employment hardship but its dynamic aspect is of crucial importance in understanding poverty and poverty persistence.

Analyses on the determinants of underemployment suggest that the young, poorly educated and other minority groups are especially likely to suffer employment hardship reflecting their social stratification (Lichter, 1988, 1989; Hsueh and Tienda, 1994). However, few efforts have been made to assess the effects of geographical labour-market characteristics on the overall adequacy of employment (Sheets et al., 1987; Lichter and Costanzo, 1987; Tigges and Tootle, 1990; Clark and Davis Withers, 1999; Jensen et al., 1999; Neumark et al., 1999). Individuals participate in a geographically limited labour market, with boundaries quite often determined by proximity to residence. Empirical findings suggest that differential labour mobility among workers may be an important determinant of observed wage differences between regions (Dickie and Gerking, 1998). The rural–urban dichotomy is of particular interest. In his study, Stabler (1999) argues, "... *the development of the national economies of both Canada and the United States is characterised (at best) by persistent underemployment and income gaps between their rural and urban components*". It has been shown that rural areas are more likely to provide low-paying, part-time, seasonal and non-unionised jobs (McLaughlin and Perman, 1991; Jensen et al., 1999; Bryden and Bollman, 2000). Thus, although individual characteristics ('supply side' factors) may determine an individual's employment success, there is an increasing concern about 'demand side' issues that emphasise the quality and quantity of jobs available in rural areas and the subsequent effects these demand factors have on the degree and persistence of employment hardship among rural dwellers. Accordingly, the challenge for social scientists is to develop theoretical frameworks and empirical verifications to shed light into rural economic performance facilitating answers to questions on how to alleviate persistent underemployment in rural areas as compared with urban ones.

The principal objective of this paper is to explore empirically whether the employment dynamics of individuals experiencing underemployment in rural areas differs from those in urban ones. In particular, as the focus is on regional differences in labour-market conditions, two specific questions are to be addressed. First, are there residential differences in the probability of making transitions into and out of underemployment that work to disadvantage rural individuals after controlling for socio-demographic and labour-market characteristics? Second, do significant differences in any of the determinants affecting the transitions between labour-force states exist between rural and urban individuals?

This paper seeks to address these rarely explored questions by providing a comparative picture of employment transitions in 'rural' and 'urban' sub-samples of individuals drawn from the Survey of Labour and Income Dynamics (SLID)[1] of Canada. Few empirical studies of transitions between labour-force states and the difference between rural and urban dwellers have been undertaken so far (Lichter and Landry, 1991; Jensen et al., 1999). The unavailability of longitudinal data, together with an inadequate rural sample (in size and definition) has precluded the possibility of adequately examining and explaining underemployment transitions to determine whether a rural disadvantage exists. The panel nature of the SLID data allows a wide range of factors such as human capital, job type, firm and market characteristics to be used to explain short-term transitions into and out of different labour-force states by rural and urban individuals. Hence, we are able to use the data to test systematically for the sources of any rural–urban differences.

[1] The data used in this paper were made available through Statistics Canada. Statistics Canada does not bear any responsibility for the analyses or interpretation presented here.

2. Theoretical arguments

For all workers, mobility into and from underemployment is determined by both labour supply and demand factors. On the supply side, human capital characteristics, especially education and training obtained on the job, increase the stability of adequate employment. Workers who have invested in job-specific skills/education are less likely than other workers to leave their jobs. To the extent that adequate employment[2] (normally full-time) requires higher investments in job-specific skills/education, adequately employed individuals are less likely to move into underemployment or to exit the labour force. Similarly, underemployed workers who have higher education levels are more likely to move into full-time employment in order to better use their skills, while the less-skilled have higher rates of employment interruptions.

Other socio-demographic characteristics, such as age, gender and marital status, are also likely to influence the transition into and from underemployment. A woman's employment decisions are determined, for the most part, by factors at the family level and the roles imposed on women by society. Women experience a variety of transitions among different employment statuses over their family life cycle, and not many of them work continuously in full-time jobs. Some women drop out of paid employment to take care of the household when they have children, while others maintain their attachment to the labour market by moving into part-time employment (Moen, 1985; Madamba and De-Jong, 1994).

The move into and out of underemployment is also conditioned by occupation and by the industrial structure of the labour market (labour demand characteristics). From a dual labour-market theory (Doeringer, 1984), high paid, high-skilled jobs are concentrated in the industries that constitute the primary segment of the market, while the less stable, lower-skilled jobs are more likely to be in the secondary one. Primary workers, who are usually highly skilled and most attractive to employers, have a high holding power over their jobs, and for them mobility takes place within internal, vertical ladders. In the secondary market, job stability is lower; workers move between occupations and jobs, but are less likely to enter primary jobs. Thus, above and beyond socio-demographic constraints, workers employed in primary industries and occupations are less likely to move into underemployment and out of the labour force because of the high opportunity costs involved in such moves.

There are a number of reasons why the effect of human capital, socio-demographic and labour-market structure on underemployment transitions might be expected to differ in rural areas. Research has emphasised how individuals and particularly women may be disadvantaged in rural labour markets. Smaller rural markets mean that potential participants face fewer employment opportunities and higher search costs, as well as certain rural specific barriers to employment due to difficulties accessing transport and childcare (Lichter and Eggebeen, 1993; Porterfield, 1998; Phimister et al., 2000). Further, evidence also suggests job mismatch tends to be greater, and job progression and training opportunities more limited (Lichter and Costanzo, 1987), and this may be compounded by lower returns to human capital (Freshwater, 1997).

Rural labour markets are comprised of a disproportionate share of the least skilled and educated workers, including high school dropouts (Lichter and Eggebeen, 1993; Teixera, 1993). While Lichter and Costanzo (1987) identify educational composition as a major factor accounting for the metropolitan-nonmetropolitan underemployment differential, it is also possible that differences in job opportunities and returns to education affect the impact of human capital variables on underemployment transitions in rural labour markets. Similarly, although the female metropolitan-nonmetropolitan underemployment differential may reflect a more traditional role for women in rural areas (Mauthner et al., 2001), differences could also reflect rural specific problems faced by women in rural areas, such as lack of transport or childcare.

Evidence suggests that, perhaps as a result of a spatial division of labour, rural economies are increasingly becoming the recipients of part-time, low skilled and low-paying jobs (Bluestone and Harrison, 1982; Barkley, 1995; Findeis and Jensen, 1998). Tigges and Tootle (1990) argue that one reason for such

[2] The results for the sample out of the labour force in year t did not produce any significant results due to the small sample size and the lack of enough shifts from period t to $t+1$ and, hence, are omitted.

concentrations is the role of education in the social infrastructure of labour market. Educational attainment of the population attracts certain types of employers and, therefore, certain types of jobs. Employers offering low-skilled, low-paying jobs seek out areas where educational levels are lower, along with worker's expectations. Theory suggests that such low skilled jobs will be less stable, and therefore the higher proportion of such jobs in rural areas is another possible source of differences in the metropolitan-nonmetropolitan underemployment rate. However, differences in employment opportunities and search costs in rural areas may also affect the way in which occupational and industrial structure impact on rural underemployment transitions.

The above discussion suggests a number of general hypotheses concerning how rural underemployment transitions may differ. First, differences in the way rural labour markets operate mean there may be a significant rural difference in underemployment transitions even after accounting for human capital, socio-demographic characteristics and occupational and industry structures. Second, differences are likely to arise in the impact of variables such as education, gender and occupational and industry structure. Thus, we expect education to have a significantly lower impact on the probability of moving out of underemployment in rural areas, that being a rural female worker and having family responsibilities (i.e. presence of children in the household) will decrease the stability of adequate employment and increase the likelihood of entering underemployment, and that the greater presence of secondary/low-skills job types in rural areas is likely to increase labour-force instability among rural workers.

3. The model

The approach for examining the factors that influence the shifts from one labour-force status to another involves estimating logistic regression models of employment transitions. For each labour-force state, the probabilities of shifting from the initial labour-force state to each of the other two states are estimated. The employment states are denoted as 0 for underemployment, 1 for adequate employment, and 2 if the individual is out of the labour force. To analyse the corresponding transitions between states, we estimate the following multinomial logit model:

$$\lambda ijk(xi) = \frac{\exp(\beta'_{jk} x_i)}{\sum_{m=0,1,2} \exp(\beta'_{jm} x_i)} \quad (1)$$

where $m = 0$ (underemployment), 1 (adequate employment), and 2 (out of the labour force); λ_{ijk} is the conditional probability of a transition into employment state k in the interval of 1 year (year $t + 1$), given that individual i is in employment state j in year t. We estimate four transition equations, namely: λ_{i10} (from adequate employment to underemployment); λ_{i12} (from adequate employment to out of the labour force); λ_{i01} (from underemployment to adequate employment); and λ_{i02} (from underemployment to out of the labour force).[3]

In (1), x_i is a vector of covariates for individual i that are considered to affect the transitions rates, and β_{jk} a vectors of parameters to be estimated. The indicated specification implies independence of the three possible labour-force states, and underemployment is taken as the base category in λ_{01} and λ_{02} whereas adequate employment is that for λ_{10} and λ_{12}.[4] Thus, the estimated effects are obtained relative to the effect of the respective variable on the conditional probability of remaining in either underemployment (λ_{01} and λ_{02}) or adequate employment (λ_{10} and λ_{12}). Hence, the probability (or the *relative risk ratio* (RRR)) that an individual in underemployment in year t will enter adequate employment in year $t + 1$ relative to staying in underemployment is

$$\ln\left[\frac{\lambda_{i01}}{\lambda_{i00}}\right] = \exp(X_i \beta_{01}), \quad (2)$$

and the same rule would apply to the other scenarios, namely: (a) being out of the labour force relative to underemployment $\exp(X_i \beta_{02})$; (b) being in underemployment relative to adequate employment $\exp(X_i \beta_{10})$; and (c) being out of the labour force relative to adequate employment $\exp(X_i \beta_{12})$.

[3] The results for the sample out of the labour force in year t did not produce any significant results due to the small sample size and the lack of enough shifts from period t to $t + 1$ and, hence, are omitted.

[4] The probability of staying in underemployment or in adequate employment are implicitly calculated. Since our interest is on the transitions we consider these as the base category.

Following the hypotheses presented above, the vector of covariates (x_i) includes the three dimensions that are expected to affect any labour market related move: socio-demographic characteristics, labour-market characteristics (occupation and industry), and region. Education, which serves as a proxy for skills, is differentiated into three levels: less than high school (as the omitted category), high school and more than high school. Other socio-demographic variables are the age of the worker and age squared, marital status, gender and the interaction of gender with the presence of children below 5 years of age. Market characteristics are denoted by the type of occupation ranging from less skilled individuals to professionals (six categorical variables). Dummies for four industry groups are also included: (1) resource-based activities; (2) manufacturing; (3) construction, distribution and transport; and (4) service and financial sector as the omitted category. Finally, dummy variables for each province are used to capture the state of the regional labour market. Year dummies are also included to adjust for employment trends across all regions.

Later, we estimate residence-specific models to ascertain whether the determinants of upward or downward employment transitions significantly differ between rural and urban areas. Thus, we redefine the multinomial model such that:

$$\lambda_{ijk}(xi) = \frac{\exp(\beta'_{jk}x_i + \delta_{jk}x_i d_i)}{\sum_{m=0,1,2}\exp(\beta'_{jm}x_i + \delta_{jm}x_i d_i)}, \quad (3)$$

where d_i is the rural residence dummy variable (equal to one if individual i is a resident in a rural area in year t). The parameter vector β measures the impact of the explanatory variables on the probability of moving from employment state j in year t to any of the other two categories k in year $t+1$ for the urban sample. The vector δ measures the extent of the rural effect for each of the explanatory variables with the overall impact of the explanatory variables in the rural sample given by $\beta+\delta$. The significance of the rural effect for each of the relevant issues can be tested using the hypothesis H_0: $\delta = 0$ for each of the corresponding coefficients. These residence-specific models permit the calculation of the predicted transitions for rural individuals supposing they live in an urban area, thereby allowing another comparison between rural and urban labour-market performance. The probability (or the *relative risk ratio*) that a rural individual in underemployment in year t will enter adequate employment in year $t+1$ relative to staying in underemployment is $\exp[\boldsymbol{X}_i(\beta_{01} + \delta_{01})]$, whereas if this same individual lived in an urban area that probability would be $\exp[\boldsymbol{X}_i\beta_{01}]$. The same reasoning applies to the other transitions.

4. Data and definitions

4.1. Data description and definitions

The data are derived from the first 4 years (1993–1996) of the Survey of Labour and Income Dynamics (Statistics Canada, 1999), a longitudinal household survey of a national representative sample of approximately 15,000 households containing a total of around 31,000 individuals aged 16 and over. The survey is designed to capture changes in the economic well being of individuals and households over time and contains the detailed information on adults within households needed to operationalise the different states of employment hardship and many socio-demographic correlates of employment hardship. Individuals originally selected for the sample are interviewed at least once a year, as is any person who lives with the original respondent. Hence, by matching individual's responses across years, the experience of each individual over time can be constructed. From this data, a balanced panel was drawn of individuals aged between 18 or more in 1993 and 60 or less in 1996 who provided complete information at each of the four interview dates. This sample consisted of 10,479 individuals, of which 24% were classified as living in rural areas. A small number of individuals who moved between urban and rural areas were excluded from the sample. Hence, the results presented below are conditional on being either rural or urban for the entire 4-year period.

The SLID sample is drawn using a stratified, multi-stage design using probability sampling. The principal stratification of the sample takes place by province, economic regions, and urban and rural areas. Primary sampling units were selected in different ways depending upon whether the relevant part of the stratum was deemed to be urban or rural. The definition of the rural and urban samples is based upon the concept of the relevant geographically limited labour market rather than a simple population based measure.

Table 1
Number of workers by labour-market state and type of employment (percentage in brackets)

Type of employment	Labor market states				Total
	Full-time	Part-time	Unemployed	Out labour force	
Underemployment	5730 (26.5)	2717 (67.9)	837 (99.2)	67 (1.4)	9351 (29.8)
Adequate employment	15774 (72.9)	1178 (29.4)	7 (0.8)	0 (0.0)	16959 (54.0)
Out labour force	129 (0.6)	109 (2.7)	0 (0.0)	4889 (98.7)	5127 (16.3)
Total	21633 (100.0)	4004 (100.0)	844 (100.0)	4956 (100.0)	31437 (100.0)

The large urban sample (henceforth the urban sample) is composed of Census metropolitan areas and Census agglomeration (CMA/CA) containing large urban areas, together with adjacent urban and rural areas that have a high degree of economic and social integration with that urban area (Howatson and Earl, 1995). The rural and small town sample (henceforth the rural sample) is composed of non-CMA and non-CA areas.

As discussed earlier, the measure of underemployment is a useful one to classify different kinds of employment hardship. It goes beyond the limited measure of unemployment (being out of a job and looking for one), to include the working poor as well as discouraged or sub-employed and involuntarily part-time workers with marginal or unstable labour-market attachments. Because we lack data on worker's intentions, such as whether part-time workers desire a full-time job, we follow Salinas (1982) definition of underemployment and refer to the inability of the labour-force participants to earn poverty-level wages and salaries[5] (125% of poverty-level income) through their labour-market activity over the previous year (see also Nord, 1989 for further empirical applications of the concept). A labour-force participant is defined as a non-student adult aged between 18 and 60 who has been employed or seeking employment (unemployed) for at least 15 weeks over the previous year. The SLID data set provides a useful poverty-level threshold defined by the Canadian Government (i.e., low-income cut-off (LICO)). The exact level of the threshold is based on data from the Canadian family expenditure survey and varies by household and community size, the latter being extremely important to us for the geographical component of our study, as it alleviates/mitigates the cost-of-living problem (Noreau et al., 1997). This alternative definition has a number of advantages. First, it is linked to the concept of poverty which, as already mentioned, is directly associated to employment hardship. Second, although we do not have information on discouraged or involuntary part-time workers, as shown in Table 1 we do capture a considerable amount of part-time workers, i.e. it does capture important aspects of underemployment. Lastly, even if our definition is not the standard one, the ability to track the dynamics through time makes the analysis worthwhile as it provides a comprehensive and detailed way to assess the level of, and dynamics in employment hardship in the Canadian population.

[5] Self-employed are also included. The strong presence of the self-employed (e.g., farmers) in rural areas justifies their inclusion in this study.

4.2. Descriptive analysis

Selected characteristics of workers (both underemployed and adequately employed) are presented in Table 2. Slightly more than half of the sample was adequately employed both in rural and urban areas with a larger proportion being underemployed in the rural sample (31.73%) versus the urban households (26.50%). In general, underemployed and adequately employed workers show interesting differences across both regions. A greater concentration of underemployment is found among the younger age categories, those with less education, and the most unskilled occupations. In addition, the underemployed tend to consist of a higher proportion of female workers, particularly those with young children which may indicate that family responsibilities affect women's employment decisions.

The rural underemployed differ from their urban counterparts and the adequately employed in several respects. First, they are the less educated group,

Table 2
Socio-economic characteristics of Canadian workers aged 18–60 years by employment status and place of residence

Group	Underemployment		Adequate employment	
	Rural	Urban	Rural	Urban
Age group (years; % by category)				
<25	7.1	5.5	2.2	0.9
25–34	25.5	27.8	21.5	19.5
35–44	32.9	31.8	38.6	37.5
>44	34.5	34.9	37.7	42.0
Education (% by category)				
Less high school	41.7	24.1	24.2	15.0
High school	19.2	20.7	18.9	16.1
More high school	39	55.2	56.8	68.9
Other demographic characteristics				
Women (%)	57.6	61.4	32.1	36.1
Married (%)	77.6	69.5	81.5	77.9
Women with young children (%)	11.3	13.1	5.3	5.9
Occupation (% by category)				
Professional	2.9	4.6	11.6	18.1
Semi-professional, technical	5.4	7.4	9.3	11.8
Middle management supervisor	8.9	12.7	19.0	19.3
Skilled, worker employee, farmer	10.9	15.4	19.2	20.7
Semi-skilled worker	31.5	34.1	18.7	15.6
Unskilled worker	40.4	25.7	22.2	14.4
Industry (% by category)				
Resource-based activities	16.8	3.3	13.2	3.7
Manufacturing	12.9	10.6	19.3	19.6
Construction, distribution and transport	31.7	36.9	28.6	28.6
Service and financial sector	38.6	49.2	38.9	48.1
Total earnings $CAN (including self-employed)	9979	12493	36058	44378
Hourly wages $CAN/h (employees only)	10.3	10.7	17.5	20.4
N (number)	4304	5047	6192	10767
Share of total sample (5)[a]	31.7	26.5	51.5	57.4

[a] The remainder of the sample was out of the labour force in year *t* (16.7% for urban and 16.1% for rural).

as 42% have less than a high school education as compared to 25% or less of the workers in the other three categories. The rural underemployed also tend to be concentrated in the less-skilled occupations and working in resource-based activities. The proportion of underemployed rural women is lower than that of urban ones, and the same applies to rural women with young children. This may be because rural women are more likely to drop out the labour force than to remain underemployed. These differences in socio-demographic and labour-market characteristics of the underemployed workforce, and particularly in rural areas, are ultimately reflected in annual earnings and hourly wages that are significantly less than those received by the adequately employed.

The mobility between employment states for individuals in rural versus urban areas is indicated in Table 3 by the 'average' movements over the 3 years (1994–1996) of individuals into and out of adequate employment.[6] The estimated Markov transition matrices (StataCorp, 1997, p. 652) in Table 3 provide little evidence that rural individuals are more likely to suffer

[6] Note that because the definition of employment hardship is based on the previous year's poverty threshold, we lose 1993 for the rest of the paper.

Table 3
Transitions between labour-force states (%)

State period t	State period $t+1$		
	Underemployment	Adequate employment	Out labour force
Underemployment			
Rural	78.5	16.9	4.6
Urban[a]	77.9	16.3	5.8
Adequate employment			
Rural	8.6	90.0	1.4
Urban[b]	5.9	92.9	1.2

[a] $\chi^2(2) = 13.52$ (P-value $= 0.2724$).
[b] $\chi^2(2) = 45.615$ (P-value $= 0.0008$).

employment hardship than their urban counterparts. In the rural sample, 78% of those underemployed in given year were still in underemployment the following year. In contrast, 17% moved to adequate employment, and the remaining approximately 5% were no longer in the labour force. The mobility of those designated as underemployed in year t is practically identical over the rural and urban sub-samples. The null hypothesis that regional location (rural versus urban) is independent of employment state in the previous period for the underemployed can be rejected at the 27% significance level which provides little support for the hypothesis that overall mobility from the underemployment category differs over the two sub-samples.

However, for individuals who are adequately employed in a given year there is a significant difference in the transitions to other employment states between the rural and urban households. A lower proportion of the rural sample (90%) remains in the adequate employment category the year $t+1$ as compared with the urban sample (93%). In addition, there is a greater probability that an adequately employed rural individual will move into underemployment (9%) than a corresponding urban individual (6%). Statistically, the two distributions are significantly different (at 1%), providing strong evidence that overall mobility from the adequately employed category differs over the rural and urban samples.

While the information given in Table 3 provides a picture of the extent of overall employment mobility, it assumes mobility is identical for all individuals. However, the probabilities of moving between employment states will vary across individuals due to individual characteristics, such as education level, and market characteristics. To control these effects, it is necessary to model the transition process statistically, so as to isolate the extent to which these residential differences can be accounted for by other observable characteristics. In the remainder of the paper we endeavour to do this.

5. Multivariate analysis

The next stage of the analysis examines the factors that influence the transition from one employment status to another using a multinomial logit framework. The effects of the sampling design used by the SLID data—in particular, the clustering, stratification and unequal selection probabilities—means that it cannot be assumed that the sample is drawn from independent and identical distributions. If the assumption of a randomly drawn sample were valid, estimation of Eqs. (1)–(3) could use the standard maximum likelihood (ML) estimator for the multinomial logit model. However, the complex sample design means that these equations must be estimated using a pseudo-maximum likelihood estimator, otherwise Type I error rates will be substantially above their nominal level α. While the estimates of the parameters β, γ and δ generated are therefore not efficient, they are consistent and the estimator of the associated covariance matrix is robust (Eltinge and Sribney, 1997). In the pseudo-ML function, it is assumed that sample clusters are independent, while within cluster correlation is not specified but may be of any general form. Hence, although not explicitly modelled, the correlation which will occur between observations of the same individual over time are accounted for within this approach (Lehtonen and Pahkinen, 1994). Finally, the use of this estimation technique precludes the use of the likelihood ratio test, so that any joint hypothesis test results must be calculated from an adjusted Wald test procedure (Eltinge and Sribney, 1997).

The estimated results of the multinomial logit model are presented in Table 4. The first column presents the relative risk ratios of entering underemployment in year $(t+1)$ from adequate employment in year t. As expected, the chances of entering underemployment diminish at an increasing rate with age. The higher the education level the less likely individuals are to make

Table 4
Multinomial logistic regression results for transition from one employment type to another

Independent variable[a]	Entering underemployment	Entering adequate employment	Exiting the labour force	
	From adequate employment	From underemployment	From adequate employment	From underemployment
Age variables				
Age	0.83**	1.06	0.70**	1.00
Age squared	1.00**	0.99*	1.00**	1.00
Education				
High school	0.68**	1.19	0.97	0.46**
More high school	0.71**	1.49**	0.78	0.44**
Other demographic characteristics				
Female	1.56**	0.43**	1.34	2.13**
Married	1.00	1.28	1.35	0.93
Women with young children	3.79**	1.56**	6.40**	3.25**
Occupation				
Professional	0.21**	3.01**	0.94	0.26**
Semi-professional, technical	0.34**	2.67**	0.72	0.73
Middle management supervisor	0.57**	1.98**	1.73	0.50
Skilled, worker employee, farmer	0.61**	1.77**	1.19	0.67
Semi-skilled worker	0.71**	0.97	2.05**	0.43**
Industry				
Resource-based activities	0.89	0.84	0.96	0.72
Manufacturing	0.63**	1.85**	0.90	1.60
Construction, distribution and transport	1.01	1.05	0.38**	0.92
Regional variables				
British Columbia	1.46*	1.27	0.71	0.51*
Prairies	1.42**	0.85	0.87	0.47**
Quebec	1.48**	0.81	1.10	0.60**
Maritimes	1.48**	0.55**	1.57	0.73
Rural[b]	1.32**	1.32**	1.15	0.66**
N moved	824	973	146	306
Sample[c] (%)	6.45	16.48	1.25	5.48

Relative risk ratios: e^{β}.

[a] Omitted categories: less than high school, Ontario, unskilled worker, service and financial sector, 1996.

[b] A likelihood ratio test of the joint significance of the rural dummies was undertaken in both regressions. The results indicate that the variables are significant at $P < 0.1$.

[c] The percentage of people within a certain employment type in time t who move to another employment type in time $(t + 1)$.

* $P < 0.1$.

** $P < 0.05$.

a transition into underemployment (as opposed to the reference category, which is less than a high school education). In addition, and as anticipated, women are significantly more likely to move into underemployment than their male counterparts, especially if there are young children in the household.

In terms of labour-market characteristics, individuals with high skill occupations are less likely to slide into underemployment. Further, compared with those adequately employed in service/financial sector (omitted category), those in manufacturing are significantly less likely to (roughly 40%) fall into underemployment, which is consistent with the documented higher presence of low-paid, unstable, more discontinuous jobs in the service sector (Nord, 1989). There are also differences by regions with residents from British Columbia, the Prairies, Quebec and the Maritimes being significantly more likely to move out of adequate

employment compared with individuals from Ontario, which is expected due to the relative economic prosperity in the province of Ontario.

Concentrating now on the rural effect, the estimated parameter on the rural dummy indicates that, other things equal, individuals living in rural areas are significantly more likely (approximately 30%) to enter underemployment than their urban counterparts. Therefore, even after controlling for socio-demographic and labour-market characteristics, the rural disadvantage observed in Table 3 remains.[7]

The RRRs of entering adequate employment for those who left underemployment are in column 2 of Table 4. The overall effect of age on the probability of entering adequate employment from underemployment is ambiguous. However, higher levels of education are associated with increasing transition rates to adequate employment. Being female significantly decreases the probability of moving into adequate employment. Marriage increases the probability of moving into adequate employment. Somewhat surprisingly, the coefficient on being female and having young children implies an increased transition rate into adequate employment, although at a lower rate (RRR = 1.56) than moving into underemployment from adequate employment (RRR = 3.79). However, once the coefficients for being female and being female with children are added, the overall effect of being female with children is to slightly reduce the overall probability of moving into adequate employment. Additionally, higher skill professional jobs are associated with increasing transition rates to adequate employment, as does employment in manufacturing (as opposed to employment in the service and financial sector). As for the regional dummies, only those people in the Maritimes are significantly less likely to move up to adequate employment than people from Ontario.

If we now consider rural differences, we find that, after controlling for differences in observed characteristics, individuals living in rural areas are significantly more likely (approximately 30%) to move from underemployment into adequate employment from 1 year to the next than their urban counterparts. Since the raw transitions results in Table 3 indicated no significant difference in overall mobility from underemployment between rural and urban individuals, this is a somewhat surprising result. Further, as both entry and exit rates to and from underemployment are higher in the rural sample, this suggests that the 'persistence' of rural underemployment is likely to be less but that the extent of cycling between underemployment and adequate employment seems higher in rural areas.

The last two columns of Table 4 present the RRRs of transitions out of the labour force from each type of employment. Although these findings should be interpreted carefully as sample sizes are small, they suggest that the likelihood of dropping out of the labour force from adequate employment in the previous year significantly decreases with age. We also find that women with children are significantly more likely to leave the labour force, as are semi-skilled workers compared with unskilled ones. As for the underemployed sample in year t, education decreases the transitions from this category to out of the labour force. Women in general and those with young children are more likely to leave the labour force. Lastly, living in a rural area and being underemployed in period t significantly reduces the likelihood of exiting the labour force.

As hypothesised, the findings suggest that the lower the education level for an individual worker, the greater the probability of moving into underemployment. Also, for those workers with adequate employment, women are more likely to enter underemployment or drop out of the labour force than their male counterparts, especially if family responsibilities exist. Further, workers in high-skill occupations have lower probabilities of exiting the labour market or entering underemployment relative to unskilled workers. Finally, place of residence (rural–urban dichotomy) also seems strongly related to the likelihood of labour-market mobility. Living in a rural area significantly increases the likelihood of entering underemployment from an adequate job. We also find that the rural underemployed are more likely to remain so than to drop out of the labour force as compared to their urban counterparts. However, living in a rural area does not simply 'disadvantage' workers as previous work has suggested. Rather, because rural individuals who are underemployed are also more likely than those in urban areas to get an adequate job than remain underemployed, mobility between

[7] A more disaggregated analysis that allows the rural effect to vary by region was also undertaken. The results with differential rural effects did not differ significantly from those presented here.

Table 5
Log-likelihood parameter estimates for transition from one employment type to another—specific rural–urban estimates

Independent variable	Entering underemployment		Entering adequate employment		Exiting the labour force			
	From adequate employment		From underemployment		From adequate employment		From underemployment	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Age variables								
Age	−0.21**	−0.16**	0.07	0.02	−0.26*	−0.54**	−0.02	0.062
Age squared	0.01**	0.01**	−0.00	−0.00	0.01**	0.01**	0.00	−0.00
Education								
High school only	−0.14	−0.74**,†	0.25	0.07	0.01	−0.17	−0.93**	−0.11†
More than high school	−0.22	−0.51**	0.47**	0.29**	−0.33	−0.25	−0.93**	−0.36
Other demographic characteristics								
Female	0.44**	0.41**	−0.73**	−1.14**,†	0.05	0.81*	0.97**	0.19*,†
Married	−0.06	0.19	0.33*	−0.03	0.37	0.23	−0.09	0.07
Women with children	1.48**	0.90**	0.39*	0.57**	2.28**	0.51*,†	1.28**	0.79**
Occupation								
Professional	−1.59**	−1.59**	1.16**	0.75	−0.64	1.98**,†	−1.58**	−0.54
Semi-professional, technical middle management	−1.07**	−1.15**	1.04**	0.72*	−0.84*	1.54**,†	−0.16	−0.98
supervisor	−0.66**	−0.29	0.55**	1.17**	0.40	1.31*	−0.59	−3.23**,†
Skilled, worker employee, farmer	−0.53**	−0.42*	0.51**	0.75**	0.05	0.88	−0.34	−0.79
Semi-skilled worker	−0.43**	−0.17	−0.09	0.21	0.52	1.63**,†	−0.91**	−0.74**
Industry								
Resource-based activities	−0.33	−0.07	−0.36	−0.29	−1.34**	1.17**,†	−0.01	−0.76*
Manufacturing	−0.39**	−0.64**	0.59**	0.69**	−0.29	0.66	0.57	0.19
Construction, distribution and transport	0.05	−0.15	0.19	−0.34†	−0.97**	−0.91	0.07	−0.66*
Regional variables								
British Columbia	0.48*	0.01	0.06	1.02**,†	−0.21	−0.61	−0.75*	−0.38
Prairies	0.41**	0.14	−0.31*	0.19†	0.07	−0.64	−0.92**	−0.16
Quebec	0.39	0.39	−0.19	−0.26	0.09	−0.04	−0.52*	−0.23
Maritimes	0.46**	0.22	−0.58**	−0.56**	0.71*	−0.09	−0.62**	0.25†
N moved	577	427	659	522	130	72	216	179

* $P < 0.05$.
** $P < 0.1$.
† Coefficient is significantly different from that for urban areas at $P < 0.1$.

underemployment and adequate employment states appears higher in rural areas.

Thus, after controlling for socio-demographic and labour-market characteristics, there does seem to be a regional component to labour-market mobility but its character is somewhat different from prior expectations. One possible explanation is that these results may be partly driven by the behaviour of certain rural groups, e.g. small farmers, fishermen and their families. For example, Brox (1995) argues that in Scandinavia these groups often move between employment, e.g. in construction, and self-employment depending upon overall demand conditions.

We move on now into our second question and search for significant differences between rural and urban individuals in the determinants of labour-force transitions. To determine whether the effects of the socio-economic (supply) and labour-market (demand)

covariates (x_i) differ by rural–urban residence, we re-estimated the transition Eqs. (1)–(3) separately for rural and urban residents. The results of the regional specific models presented in Table 5 include significance tests for the differences in coefficients between the rural and the urban models.[8] We hypothesised earlier that education has less of an impact on transitions out of underemployment in rural areas. The urban underemployed do have a higher chance of entering adequate employment the higher their education level as compared with the rural underemployed, but these differences are not statistically significant. Also, a high school education reduces the probability of the urban underemployed dropping out of the labour force to a greater extent than for the rural underemployed. We do observe for the rural adequately employed sample that higher levels of education do not necessarily lower the chances of entering underemployment. For example, high school level adequately employed workers in rural areas are roughly 52% less likely to enter underemployment ($\text{RRR} = e^{\hat{\beta}+\hat{\delta}} = e^{-0.738} = 0.48$), whereas the probability decreases to 40% when we consider more than high school level education ($\text{RRR} = e^{-0.514} = 0.60$). Thus, there is weak evidence that education levels in rural areas have a lower impact on the transitions out of underemployment than in urban areas.

Further, we also hypothesised a significantly different effect of gender in rural areas. Accordingly, we find that rural women are significantly less likely than their male counterparts to enter adequate employment ($\text{RRR} = e^{-1.14} = 0.32$), and this likelihood differs significantly from that for urban women ($\text{RRR} = e^{-0.73} = 0.48$) at a 10% significance level (columns 3 and 4 of Table 5). Further, underemployed urban women are more likely to drop out of the labour force than their rural counterparts. Thus, though women seem equally likely to enter underemployment (columns 1 and 2 of Table 5) both in rural and urban areas, rural women seem significantly more likely to remain underemployed than to move back into adequate employment or drop out of the labour force. The presence of young children does not seem to especially constrain rural women as compared to their urban counterparts.

Lastly, we expect the greater presence of secondary/low-skill job types in rural areas to increase labour-force instability among rural workers. Looking at columns 1 and 2 in Table 5, we observe how the higher the level of skills the less likely workers are to slip into underemployment. There are some indications that this relationship is different among rural workers (although many of the rural–urban differences are not significant). For example, the results in columns 5 and 6 of Table 5 seem to suggest that in rural areas semi-professional, technical and middle management are far more likely to drop out of the labour force than urban ones.

To judge the empirical significance of the differences in responses across the rural and urban samples, we use the estimated urban and rural coefficients from Table 5 to calculate predicted transition probabilities for the rural sample. The values using the urban coefficients may be interpreted as the average predicted transition probabilities for the rural sample if rural behaviour was identical to urban behaviour. Hence, comparing these predicted values with the predictions using the estimated rural coefficients provides a method of measuring the overall impact of rural–urban differences while controlling for observed characteristics.

The results in Table 6 (rows 3 and 4) show that while the average predicted probability of moving into underemployment from adequate employment for the

Table 6
Average predicted probabilities for transitions between labour-force states (%)

Period t	Period $t+1$		
	Underemployment	Adequate employment	Out labour force
Estimated coefficients used			
Underemployment			
Rural	73.71 (0.35)	21.77 (0.39)	4.51 (0.07)
Urban	76.76 (0.23)	17.05 (0.26)	6.18 (0.11)
Adequate employment			
Rural	12.13 (0.18)	86.47 (0.17)	1.39 (0.00)
Urban	9.29 (0.15)	88.73 (0.17)	1.96 (0.05)

Using rural and urban coefficients for rural characteristics—standard errors in parentheses. Predictions use rural and urban estimated coefficients from Table 5.

[8] The statistical significance of coefficient differences across urban–rural models is computed by dividing the absolute difference in the logistic regression coefficients by the square root of the sum of their respective squared standard errors.

rural sample is 12.1%, if urban conditions applied, the average transition probability would fall to approximately 9.3%. Similarly, the probability of remaining in adequate employment would rise for the average rural individual in an urban market. However, the probability of remaining underemployed would rise while the chances of moving into adequate employment would fall from 21.8% for the average rural resident to 17.1% if that same individual was in an urban labour market.

6. Summary and conclusions

Employment status is intricately linked to poverty and economic well-being. Previous studies have examined the influence of socio-economic (supply) and labour-market (demand) characteristics on the likelihood of employment. This study contributes to the literature by considering a more comprehensive concept of employment hardship and the factors influencing the probability of moving into and out of underemployment. Particular emphasis is placed on the previously unexamined regional differences in labour mobility given the policy concerns surrounding the 'rural disadvantage' facing workers in non-urban areas. The size and time series nature of the Canadian Survey of Labour and Income Dynamics allows for the empirical testing of these previously unexamined issues. The results indicate that after controlling for socio-demographic and labour-market characteristics, rural adequately employed workers are significantly more likely to enter underemployment than their urban counterparts. Surprisingly however, once they are underemployed, they have a higher probability of re-entering adequate employment in the following period. This suggests that the extent of cycling between underemployment and adequate employment is higher in rural areas. We also found that the rural underemployed are more likely to remain underemployed than to drop out of the labour force as compared with their urban counterparts, which may be a sign of the different labour-market characteristics in rural areas. Further, we also found weak evidence that education has less of an impact on the probability of moving out of underemployment in rural than in urban areas. In addition, women are significantly less likely than their male counterparts to enter adequate employment, and this effect is more pronounced in rural areas. Rural women are significantly more likely to remain underemployed than to move back into adequate employment or drop out of the labour force. The presence of young children does not seem to especially constrain employment for rural women as compared to their urban counterparts. Overall, our findings seem to corroborate the apparently more precarious position of rural individuals in terms of labour-market transition in and out of adequate employment. This should be taken into account when evaluating employment hardship in rural Canada.

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