

# THE DYNAMICS OF EMPLOYMENT: LABOUR FORCE INSTABILITY IN RURAL CANADA

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## I. Introduction

In recent years, researchers have turned their attention away from the traditional approach of labour market equilibrium where employees have the ability to choose their number of hours worked. Instead, their interest has focussed on constraining factors, which may cause problems of employment adequacy. This broader scope provides information on a variety of labour market outcomes, including unemployment, low income employment and involuntary part-time employment which are directly linked to issues of poverty and economic well-being, and each represents a different form of employment hardship<sup>1</sup>. Most of the initial work has been based on cross-sectional data. However, several recent studies have shown that labour force instability may be more pervasive than indicated by estimates based on annual interviews from cross-sectional data (Clogg, Eliason, and Wahl, 1990; Hsueh and Tienda, 1996).

Analyses on the determinants of employment hardship for individuals suggest that the young, poorly educated and other minorities are especially likely to suffer employment hardship reflecting the social stratification of people and places (Hsueh and Tienda, 1994), (Lichter, 1989). However, few efforts have been made to assess the effects of geographical labour market characteristics on the overall adequacy of employment (Tigges and Tootle, 1990); (Jensen *et al.* 1999). Individuals participate in a geographically limited labour market, with boundaries quite often determined by proximity to residence. 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). Thus, although individual characteristics (“supply side” factors) may determine individual’s employment success, there is however an increasing concern about “demand side” issues that emphasise the quality and quantity of jobs available in rural areas and are likely to influence the degree of employment hardship among rural dwellers.

To the extent that employment instability may be more pervasive among rural individuals, then a closer look at the differences on labour force dynamics between rural and urban individuals based on longitudinal data may generate potentially new insights about the mechanisms driving labour market inequality along geographical areas. Further, substantive considerations also support a research like this one. First, labour force instability is of interest because frequent transitions to and from various joblessness states can bring about highly unstable monthly income flows and substantial annual income losses (Yetley, 1989; Hsueh and Tienda, 1995). This reality is likely to particularly affect the rural poor since their earnings comprise a larger share of family income (Jensen and Eggebeen, 1994).

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<sup>1</sup> “Employment hardship” and “underemployment” are used interchangeable in this paper.

Second, repeated episodes of joblessness may result in discouragement and precipitate eventual withdrawal from the labour market (Tienda, Hsueh, Wu, and Wilson, 1992). Finally, repeated job departures preclude the accumulation of valuable job-specific tenure, which is positively related to lifetime earnings (Devine and Keifer, 1993).

Few empirical studies of transitions between labour force states and the difference between rural and urban dwellers have been undertaken so far. To a limited extent, Lichter and Landry (1991) took advantage of the quasi-longitudinal nature of U.S. data (Current Population Survey –CPS) and analysed transitions between “good jobs”, “bad jobs” and “no jobs” using two-year period. Among many other results, they found that rural residents were more likely to make a transition to more severe forms of underemployment, and less likely to move out from them. Further recent work by Jensen *et al.* (1999) using CPS year-to-year employment transitions for the quarter century 1968 to 1993, had a greater rural/urban focus. They searched for rural disadvantage in the dynamics of underemployment, as well as for the sensitivity of rural residence to cyclical changes in the state of the economy. To date, however, no one has undertaken a systematic analysis looking at longitudinal data to study the transition between different labour force states (i.e. underemployment, adequate employment and out of the labour force) to determine whether rural disadvantage exists and to attempt to explain it. Accordingly, we contribute to this line of research by investigating individuals’ mobility between the various labour forces states using three consecutive years of the longitudinal Survey of Labour and Income Dynamics (SLID). Since labour force instability is the purpose of this research, we will attempt to examine how structural features of labour markets differently affect employment hardship levels within labour markets in rural and urban areas.

The objective of this paper then is to address in the best way the following three questions about the character and correlates of labour force instability. First, are there residential differences in the probability of making transitions into and out of the three different labour force states (i.e. adequate employment into underemployment and vice-versa; adequate employment into out of the labour force and vice-versa; and underemployment into out of the labour force and vice-versa) that work to disadvantage rural individuals? Second, to what extent can observed residential differences be accounted for by other socio-economic correlates of labour force instability? Finally, are there significant differences between rural and urban individuals in the determinants of labour force transitions?

The paper begins with the theoretical arguments of geographical distribution and labour force instability. Section III provides information on the data and the measurements of labour force states and employment hardship. The model is presented in Section IV followed by the results in Section V. Conclusions are presented in Section VI.

## **2. Theoretical Arguments**

In this section, an attempt is made to outline the determinants of employment hardship and labour force instability and to hypothesised why we may expect them to have a greater effect among rural dwellers. Both labour supply and demand factors represent the structural determinants of employment success. Labour supply factors include both demographic and human capital characteristics of individuals within a local area. Alternatively, demand for labour is determined by the organisation of work specific to the local areas. Although these structural characteristics should affect rural and urban

employment adequacy in similar ways, it is likely that most will have weaker effects in rural areas owing, as presented later, to the inefficiencies of matching people and jobs.

Rural-urban differences in employment adequacy may simply reflect differences in demographic characteristics, such as age, sex, and marital status. If the rural workforce includes a disproportionate share of individuals in statuses that typically experience high employment hardship, then rural-urban differences may be entirely compositional in origin. Further, differences in human capital (i.e. education) of working individuals provide another potential source of rural-urban differences in employment hardship. Low educational attainment of individuals can be expected to produce higher levels of employment hardship because of the increasing individual probability of inadequate employment (Lichter, 1989), the aggregation of poorly educated people might be reflected in areal levels of underemployment. Thus, Lichter and Constanzo (1987) identify educational composition as a major factor accounting for the metropolitan-nonmetropolitan underemployment differential. Even among those not completing high school, nonmetropolitan underemployment rates were higher than metropolitan rates. Sheets *et al.* (1987) also find higher median education lowers metropolitan underemployment. As a structural effect, 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 workers' expectations (Storper and Walker, 1984).

Finally, the differential employment hardship observed in rural areas may be due to the quality and quantity of jobs available, which reflect the employment opportunities and options in rural labour markets and ultimately affect their economic well being. Rural and urban areas have followed different developmental trajectories. First, as a result of the declining importance of resource-based economic activity in rural areas and the parallel industrial restructuring, rural locations became particularly attractive for employers in search of a way to regain or maintain a comparative advantage (Bluestone and Harrison, 1982). Thus, low-wage, less stable, labour intensive transformative or routine manufacturing industries were concentrated in rural areas. Second, the increasing service industry with its direct relationship between consumers and service providers has not loosened its ties to big urban areas and are unlikely to decentralise to rural ones in the near future. Lower order service activities that, once again, rely on unskilled labour, primarily consumer services, are commonly found in rural areas (Miller and Bluestone, 1988). Thus, urban and rural areas seem to be marked by distinctive patterns of socio-economic organisation resulting in different employment opportunities. Lichter and Costanzo (1987, p. 341) argued that this problem of different economic performance is "...exacerbated by inefficiencies in institutional mechanisms both for the dissemination of job-related information and for administering human-resource development programs to a spatially dispersed labor force...". That is, rural labour markets are less efficient in matching people to jobs.

### **3. Data and definitions**

The data is derived from the first four years (1993-1996) of the *Survey of Labor and Income Dynamics* (SLID). This consists of a longitudinal household survey conducted by Statistics Canada of a national representative sample of approximately 15,000 households containing a total of around 31000 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 household

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 once or twice a year as are any person who lives with the original respondent. The target population for SLID is all persons living in Canada, excluding people in the Yukon or Northwest Territories, residents of institutions, persons living on Reserves, and full-time members of the Canadian Armed Forces living in barracks (Statistics Canada). Due to the longitudinal nature of the sample (individuals are re-interviewed every consecutive year), it allows matching individuals across years and observing change. From this data a balanced panel was drawn of individuals aged between 18 or more in 1993 and 60 or less in 1996 that provided complete information at each of the four interview dates. This sample consisted of 15749 individuals, of which 21.5% were classified as living in rural areas.

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. 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, 1995). The Rural and Small Town sample (henceforth the rural sample) is composed of Non-CMA and Non-CA areas.

#### *Measures of employment hardship*

As shown in this paper, the concept of underemployment is a useful one to classify different kinds of employment hardship. It goes beyond well-known unemployment (being out of the job and looking for one), to include the working poor and employment that is inadequate to the training received. We defined categories of the Labor Utilization Framework (LUF) first composed by Hauser (1974) using procedures similar to those of Clogg and Sullivan (1983); Litcher and Constanzo (1986) and Jensen *et al.* (1999). We take advantage of several labour force status and income related variables available in SLID to operationalise a five-category ordinal variable<sup>2</sup> that measures the severity of employment hardship among individuals. Thus, individuals are classified into one of the following categories:

1. *Not in the labour force.* This category contains people who are not currently working because they are not interested in doing so. As explained in footnote 2, this category may also contains individuals who are not working and are not looking for a job, but who nonetheless would like to be working if they could find a job.
2. *Unemployed.* Individuals who are not working but are actively looking for work.
3. *Involuntary Part-time Workers.* Also known as underemployed by low hours. Individuals who are working less than full-time hours (30 hours per week) only because they are not able to find a full-time job.
4. *Underemployed by low income.* Individuals whose labour market earnings in the previous year were less than 2/3 the median hourly wage of the whole sample. This

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<sup>2</sup> Originally, it is a six-category ordinal variable. However, SLID does not allow to identify Sub-unemployed or “discouraged workers”. That is, adults who are not working and are not currently looking for work, but who nonetheless would like to be working if they could find a job. As a reference, they represent between 1 and 2 per cent of the underemployed sample for the American case (Jensen, *et al.* 1999 p. 421). We will considered them part of the *not in the labour force* category.

definition was selected because of the reasonable link between income level in the preceding year and current employment status.

5. *Adequately employed*. Employed individuals who do not fit the above categories. Voluntarily part-time workers are included among the adequately employed.

The concept of underemployment provides a comprehensive and detailed way to assess the level of, and dynamics in, employment hardship in the Canadian population. We are concerned about employment hardship in rural areas. There is evidence that rural individuals are more likely to suffer of employment hardship than their urban counterparts. Table 1 confirms this rural disadvantage by showing the

TABLE 1. Labour Force State by residence and year

	Total	Rural	Urban
<b>1994</b>			
Adequately Employed	63.68%	56.36%	65.69%
Underemployed	19.72	25.75	18.07
Unemployed	3.12	3.92	2.91
Low-Hours	2.83	3.22	2.72
Low-Income	13.77	18.61	12.44
Not in the Labour Force	16.6	17.89	16.25
<b>1995</b>			
Adequately Employed	61.31	55.27	62.97
Underemployed	22.46	27.57	21.07
Unemployed	3.03	3.34	2.94
Low-Hours	2.97	2.64	3.06
Low-Income	16.46	21.53	15.07
Not in the Labour Force	16.23	17.22	15.96
<b>1996</b>			
Adequately Employed	60.81	54.06	62.68
Underemployed	22.58	28.55	20.94
Unemployed	2.85	3.73	2.61
Low-Hours	2.68	3.12	2.57
Low-Income	17.05	21.70	15.76
Not in the Labour Force	16.60	17.39	16.38

distribution of Canadian working-age individuals across the different categories of employment. The underemployment rate in rural areas is never less than 6 percentage points higher than that for urban areas. If we now look across specific categories of underemployment, we observe, with only one exception, that all forms of underemployment are more prevalent in rural than urban areas. We also note that most of the inequality between rural and urban areas underemployment is accounted for by differences in the low-income category, which somehow confirms that rural workers are particularly likely to be counted among the working poor (Economic Research Service, 1995). The data in Table 1 also show the higher percentage of not in the labour force individual in rural areas. Although the difference is narrower (between 1 and 1.6 percentage points) it contributes to decreasing the percentage of adequately employed in rural areas.

Given the rising and falling of the employment structure in the two samples (rural/urban), the following step is to understand inequalities in labour force dynamics through the analysis of panel data. Table 2 provides an aggregate picture of mobility across the two samples, reporting the 'average' movements of individuals out of adequate employment, not in the labour force and underemployment (from now on we gather the 3 categories of

employment hardship under a single one) over the 3 years (1994-1996)<sup>3</sup>. Formally, these are derived from the appropriate Markov transition matrices (StataCorp 1997, p. 652). Hence, in the rural sample, on average 71 per cent of those who fell into underemployment in any year were still in underemployment the following year. In contrast, 22.52 per cent moved to adequate employment, and 6.49 per cent were no longer in the labour force.

TABLE 2. Transitions from labour force states (%)

<i>State Period t</i>		<i>State Period t+1</i>		
		<b>Underemp</b>	<b>Ad. Emp</b>	<b>Out LF</b>
<b>Underemployment</b>	<i>Rural</i>	71.00	22.52	6.49
	<i>Urban</i>	65.63	27.46	6.92
	$\chi^2(2) = 86.72$ ( $p$ -value 0.0026)			
<b>Adequate Employment</b>	<i>Rural</i>	13.52	83.79	2.69
	<i>Urban</i>	10.91	85.23	3.86
	$\chi^2(2) = 48.612$ ( $p$ -value 0.0000)			
<b>Out of Labour force</b>	<i>Rural</i>	8.62	12.05	79.33
	<i>Urban</i>	7.26	15.89	76.85
	$\chi^2(2) = 73.00$ ( $p$ -value 0.0094)			

In terms of mobility of those starting in the underemployed category, as expected there seems to exist some evidence of lower rural mobility with a higher proportion of the rural sample remaining underemployed the following year (71 per cent against 65.63 per cent). Statistically, the two distributions are significantly different (1 per cent significance level), which provides a strong evidence that overall mobility differs over the two samples. Equally significant statistical differences exist between the rural and urban samples ( $p$ -value=0.000) in terms of the mobility of those starting with an adequate job. The results show higher rural mobility with a lower proportion of the rural sample remaining in the adequate employment category the following year (83.79 per cent against 85.23 per cent) and a larger proportion moving to the underemployment category the following year (13.52 per cent as opposed to 10.91 per cent). Finally, if we consider the mobility of individuals from the 'not in the labour force' category, again there does appear some significant evidence ( $p$ -value=0.0094) of lower rural mobility (79.33 per cent as opposed to 76.85 per cent) and a slightly larger movement of rural residents to the underemployed category the following year (8.62 per cent against 7.26 per cent).

Summarising, the distributions for the three labour force states are statistically different at the 1 per cent significance level, providing strong evidence that overall mobility differs over the two samples. Thus, we observed that rural individuals seem significantly more likely to remain in underemployment and to slide into underemployment (from both adequate and not in the labour force states), and less likely to exit once they are underemployed. However, this descriptive evidence attributes the observed differences solely to the rural/urban residence. As discussed earlier on, these differences might arise from differences in other observed characteristics (i.e. demographics, education, and economic structure). To control these effects, it is necessary to statistically model

<sup>3</sup> Note that because one of the definitions of employment hardship is based on previous year low-pay threshold, we lose 1993 year for the rest of the paper.

the transition process, so we can find out 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.

#### 4. The Model

To assess residential differences in labour force mobility, we estimate logistic regression models of employment transitions. Since our concern is on labour force instability, we will concentrate on the dynamics of underemployment. In particular, as there are three possible (unordered) states –underemployment, adequate employment, and not in the labour force- a multinomial logistic model is used (Sloane and Theodossiou, 1996). Consider the transition out of underemployment<sup>4</sup>. The possible outcomes are that underemployed workers in period t are observed in one of the following situations in period t+1: (1) underemployment, (2) adequate employment, and (3) not in the labour force. To analyse the corresponding transitions we estimate the following multinomial logit model:

$$I_{ij}(x_i) = \frac{\exp(\mathbf{b}'_j x_i)}{\sum_{m=1,2,3} \exp(\hat{\alpha}'_m x_i)} \quad (1)$$

where  $I_{ij}$  is the conditional probability of a transition into state  $j$  (underemployment, adequate employment, and not in the labour force) in the interval of one year (period  $t+1$ ), given that the individual  $i$  is underemployed at survey date of the period  $t$ ;  $x_i$  is a vector of covariates for individual  $i$  that are considered to affect the transition rates;  $\mathbf{b}_j$  is the vector of parameters to be estimated. The indicated specification implies independence of the three possible labour force states. Assuming that underemployment is taken as the base category (this will change in the result section and it will be highlighted when necessary), then the estimated effects (or the relative risk ratio) are obtained relative to the effect of the respective variable on the conditional probability of remaining in underemployment.

We calculate two sets of models. This first one looks at whether someone moved downward from adequate employment to either underemployment or not in the labour force status. The second set examines whether someone moved upward from either underemployment or out of the labour force to adequate employment. We start with pooled models to verify, and potentially explain, they hypothesised rural disadvantage in employment transitions. Later, we estimate residence-specific models to ascertain whether the determinants of upward or downward employment transitions significantly differ between rural and urban areas.

#### 5. The results

##### *Transitions from adequate employment*

Table 3 contains logistic regression models of the transition from adequate employment to both underemployment and not in the labour force statuses. We start (following Jensen, *et al.* 1999) with a simple model (Model I) with only the rural dummy as

<sup>4</sup> The rest of regressions are obtained by conditioning the appropriate samples, i.e., adequately employed in period t, or not in the labour force in period t.

covariate. Thus, we can test the relationship between residence and downward transitions. As expected, results (columns 1 and 4) show that adequately employed rural residents are over 25 per cent ( $e^{\beta}=1.260$ ) more likely than their urban counterparts to get into underemployment, and 30 percent less likely ( $e^{\beta}=0.709$ ) to move into not in the labour force status.

TABLE 3. Multinomial Logistic Regression: Transition from adequate employment to underemployment and to not in the labour force statuses. (Relative Risk Ratios -  $e^{\beta}$ )

Sample	Adequate employment <i>t</i>					
	Underemployed <i>t+1</i>			Not in Labour Force <i>t+1</i>		
	Model I	Model II	Model III	Model I	Model II	Model III
Rural Dummy	1.260**	1.281**	1.241**	0.709**§	0.748**§	0.727**§
Age		0.820**	0.849**		0.626**	0.623**
Age squared		1.002**	1.001**		1.005**	1.005**
Married		0.850**	0.863*		1.074	1.087
High school only		0.785*	0.783*		0.574*	0.581**
More than high school		0.429**	0.417**		0.634**	0.611**
Female		2.246**	2.277**		1.909**	1.728**
British Columbia			0.829			0.973
Prairies			1.150*			0.686**
Quebec			1.185*			1.037
Maritimes			1.733**			1.221
Resource based activities			0.549**			1.101
Manufacturing			1.035			0.536**
Construction, Distribution and Transport			1.244**			0.691
No industry			2.184**			0.912
1995			0.802**			1.026
Sample size	18548	18548	18548	18548	18548	18548
			IA= -6.472 <sup>†</sup>			

<sup>†</sup> Hausman Test for independence of the out of labour force alternative. As is common the finite sample covariance matrix associated with this test was not found to be positive semi-definite and therefore the test statistic can be negative. The evidence (Hausman and McFadden, 1984, pp.1226) suggests that such cases can be interpreted as supporting the non-rejection of the null hypothesis of independence of the alternatives.

§ Likelihood ratio test of joint significance of the rural dummies in adequate employment and not in the labour force categories was undertaken systematically in all regressions. This symbol “§” indicates that the variables were significant at  $p<0.1$

\*\*  $p<0.5$

\*  $p<0.1$

Omitted Categories: Less than High School, Ontario, Service and Financial sector.

However, characteristics other than residence may, of course, be the source of rural individuals' relatively greater likelihood of moving downwards from adequate employment. Thus, Model II adds several socio-demographic characteristics that seem likely to be correlated with employment adequacy: age and age squared, marital status, education, and gender. We observe that while increasing age diminishes the chances of a downward move toward underemployment, and out of the labour force, this function is concave upward as indicated by the positive effect of age-squared. Older individuals have less chances to go into out of the labour force ( $e^{\beta}=0.626$ ) against underemployment ( $e^{\beta}=0.820$ ). Married individuals are 15 per cent less likely than non-married ones to get into underemployment, and slightly over 7 per cent more likely to get into the not in the labour force status although this latter result is not statistically

significant. The higher the education level the less likely individuals are to make a transition into underemployment or out of the labour force (as opposed to the reference category, which is less than high school education). Finally, women are significantly more likely to move into underemployment or out of the labour force than their male counterparts.

Interestingly however, the positive detrimental effect of residence in the probability of sliding into underemployment becomes slightly stronger (1.281 against 1.260). That is, if rural residents were similar to their urban counterparts in their socio-demographic characteristics, their risk of sliding into underemployment would be even worse. Additional models (provided upon request) indicate that the differences in age, marital status and gender largely account for this effect. When age alone is added to Model I the effect of rural residence increases from 1.260 to 1.328. It increases again to 1.3402 and to 1.395 when marital status and gender are progressively added to Model I. These results reflect the fact that adequately employed rural individuals are less likely than their urban counterparts to be younger and/or married and more likely to be male, characteristics that reduces their risk of become underemployed. These results coincide with the descriptive statistics provided in the graphs at the end of the paper.

Model III adds several additional variables that are closely connected to the economic structure where labour force transitions take place. These are the industry of employment and region of residence<sup>5</sup>. Time related variables were also included to control for potential macroeconomic changes. Compared to adequately employed in service/financial sector (omitted category), those in resources based industries are significantly less likely to (roughly 60 per cent) to slide into underemployment. This significant result may be due to the scarce proportion of adequately employed in this type of industry (3.68 per cent). Alternatively those in construction, distribution and transport are 24 per cent more like to get into underemployment. Parallely, compared to those adequately employed in the service sector, people in manufacturing industries are roughly 45 per cent ( $p\text{-value}<0.05$ ) less likely to get out of the labour force. There are also differences by regions with residents from the Prairies, Quebec and the Maritimes being significantly more likely to slide into underemployment as compared to individuals from Toronto, which was somehow expected due to the economic advantage of the Ontario region. Interestingly, people from the prairies are significantly less likely to move from adequate employment into out of the labour force status than are people from Ontario.

Thus, the inclusion of industry, region, and time variables attenuates the disadvantage of rural residence in transitions to underemployment and out of the labour force statuses. However, the rural disadvantage remains. To put this in perspective, if we apply the urban coefficients of the multinomial logit (shown in Table 5) to the rural sample, one gets the average predicted transition probabilities for the rural sample if rural conditions were identical to urban ones. The results in Table 4 show that while the average predicted probability of moving into underemployment from adequate employment from the rural sample is 18.36 per cent, if urban conditions applied the average transition probability would fall to 16.14 per cent.

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<sup>5</sup> For brevity, we have considered five regions, namely: British Columbia, Prairies, Ontario, Quebec and Maritimes. Regression using all 9 provinces was also undertaken (available upon request) and provided very similar results.

TABLE 4. Average predicted probabilities  
(Using Rural and Urban Coefficients for Rural Characteristics)

		<i>State Period t+1</i>		
		<b>Underemp</b>	<b>OK Emp</b>	<b>Out LF</b>
<b>OK Employment</b>	$b_{RXR}$	0.1836	0.7811	0.0352
	$b_{UXR}$	0.1614	0.7964	0.0421

To determine whether the effects of these covariates differ by residence, Model III is re-estimated separately for rural and urban residents. We present the results in Table 5, which includes significance tests for the differences in coefficients between the rural model and the urban one<sup>6</sup>. In general, across the two samples, the covariates have similar effects on the probability of making a transition to either underemployment or out of the labour force statuses. However, some results are worth mentioning. For example, if we concentrate on the transition into out of the labour force status, while women are more likely to get out of the labour force in both samples, the detrimental effect of gender appears to be slightly bigger in rural areas (although not significantly different).

TABLE 5. Residence-specific Multinomial Logistic Regression: Transition from adequate employment to underemployment and to not in the labour force statuses.  
(Relative Risk Ratios -  $e^\beta$ )

<i>Sample</i>	<i>Adequate employment t</i>			
	<i>Underemployed t+1</i>		<i>Not in Labour Force t+1</i>	
	Urban	Rural	Urban	Rural
<i>Variable</i>				
Age	0.838**	0.888**	0.631**	0.597**
Age squared	1.001**	1.001**	1.005**	1.006**
Married	0.903	0.705**†	1.146	0.774
High school only	0.807	0.688**	0.563*	0.645
More than high school	0.402**	0.458**	0.586**	0.720
Female	2.273**	2.351**	1.688**	2.079**
British Columbia	0.893	0.594**	0.988	0.910
Prairies	1.190	1.005	0.701*	0.671
Quebec	1.224*	1.036	1.053	0.976
Maritimes	1.793**	1.559**	0.971	1.986**††
Resource based activities	0.555**	0.620**	1.002	1.632
Manufacturing	1.059	1.001	0.463**	1.185††
Construction, Distribution and Transport	1.191	1.490**	0.667	0.959
No industry	2.120**	2.477**	0.856	1.508†
1995	0.767**	0.939	1.037	0.952
Sample size	12262	6286	12262	6286

\*\*  $p < 0.5$

\*  $p < 0.1$

† Coefficient significantly different from that for urban areas at  $p < 0.1$

†† Coefficient significantly different from that for urban areas at  $p < 0.05$

Omitted Categories: Less than High School, Ontario, Service and Financial sector.

6 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.

Alternatively if we look at those that move into underemployment, while being better educated generally reduces the risk of underemployment, the beneficial effect of having more than high school education is stronger in urban areas than in rural ones. Equally, women in rural areas have a slightly greater probability of sliding into underemployment than their urban counterparts. The effects of industry show how individuals working in the resource-based industry (i.e. agriculture, fishing, mining and logging) have a slightly stronger negative effect for urban dwellers. Nevertheless, neither of these differences are statistically significant.

#### *Transitions from underemployment and out of the labour force*

Having examined downward mobility, we dedicate the remainder of the paper to the likelihood of moving both out of underemployment and out of the labour force statuses. Since our interest is on labour instability, special attention will be paid to the transitions into adequate employment from either of these previous statuses (upward mobility as opposed to the downward mobility examined earlier). So, the question to answer would be do rural underemployed or out of the labour force individuals have a harder time than their urban counterparts moving into adequate employment and if so, why? We have followed the same procedure as in the previous section. Thus, Model I in table 6 (columns 1 and 3) indicates that rural residents who are underemployed in year 1 are less likely to escape that state and move into adequate employment (25 per cent less likely) or into not in the labour force status (14 per cent less likely) than their urban counterparts. Model II adds the effect of several socio-demographic characteristics. First, let us look at the transition into adequate employment. As expected older individuals are more likely to move upward into adequate employment. Also, the higher the level of education increases the chance of moving into adequate employment and women have a lower chance than men to go up into adequate employment. If we consider transition to not in the labour force status, the picture is again very much as expected, married individuals, lower educated ones, and women are more likely to slide into this status from underemployment. The inclusion of these variables account for some of the disadvantage that rural individuals have in their likelihood to move upward but they are still 20% less likely than urban ones to slide into adequate employment other things equal. In relation to the transition into the out of the labour force status, no comments are worthy, as the rural dummy is not individually significant.

Model III includes variables capturing industry, region and time effect variables. Again as expected, individuals from the Prairies, Quebec and the Maritimes are less likely to move into adequate employment than those from Ontario or British Columbia, and also those in manufacturing, construction, distribution and transport are less likely to move into underemployment than those in the service sector. In relation to the transition into not in the labour force, the only significant result is that people from the Prairies are less likely to make the transition into out of the labour force than those from Ontario. Having said this, Model III suggests that, other things equal, being rural residents (an underemployed in t) decreases the predicted odds favouring a transition into adequate employment or into out of the labour force status. However, it is only in the not in the labour force category that the individual coefficient is significant (the joint significance test reports a p-value=0.1465). This suggest that controlling for demographic and socio-economic characteristics removes any residual affect in the transition into adequate employment and report a weak significant difference in the transition out of the labour force.

TABLE 6. Multinomial Logistic Regression: Transition from adequate underemployment to adequate employment and to not in the labour force statuses.

(Relative Risk Ratios -  $e^{\beta}$ )

Sample	Underemployment $t$					
	Adequate employed $t+1$			Not in Labour Force $t+1$		
	Model I	Model II	Model III	Model I	Model II	Model III
Rural Dummy	0.758**	0.800**	0.902	0.866 <sup>§</sup>	0.819 <sup>§</sup>	0.783*
Age		1.138**	1.137**		0.827**	0.822**
Age squared		0.998**	0.998**		1.002**	1.002**
Married		1.058	1.083		1.406**	1.564**
High school only		1.399**	1.399**		0.451**	0.466**
More than high school		2.388**	2.310**		0.632**	0.626**
Female		0.525**	0.496**		2.443**	2.679**
British Columbia			1.388**			1.272
Prairies			0.694**			0.674**
Quebec			0.719**			0.871
Maritimes			0.530**			1.174
Resource based activities			0.747			1.409
Manufacturing			0.740**			1.030
Construction, Distribution and Transport			0.618**			0.844
No industry			0.945			2.620**
1995			0.874*			1.017
Sample size	7623	7623	7623	7623	7623	7623
	IA= 0.48 (p-value=1.000)					

\*\*  $p < 0.5$

\*  $p < 0.1$

§ Likelihood ratio test of joint significance of the rural dummies in adequate employment and not in the labour force categories was undertaken systematically in all regressions. This symbol “§” indicates that the variables were significant at  $p < 0.1$

Omitted Categories: Less than High School, Ontario, Service and Financial sector.

Table 7 again reports the average predicted probability of moving into adequate employment for the rural sample using the estimated rural and urban coefficients. The results are consistent with those of Table 4, namely, the average rural probability of moving to underemployment would be slightly less if urban conditions were applied in the rural sample.

TABLE 7. Average predicted probabilities  
(Using Rural and Urban Coefficients for Rural Characteristics)

State Period $t$		State Period $t+1$		
		Underemp	OK Emp	Out LF
	$b_{RXR}$	0.651	0.284	0.069
<b>Underemployment</b>	$b_{UXR}$	0.635	0.286	0.078

The residence-specific models are presented in Table 8. We will concentrate in columns 3 and 4. There are some interesting residential differences in the determinants of the transition into not in the labour force (from underemployment). The negative effect of being female is much stronger among urban underemployed. Women in urban areas are much more likely than men to leave the labour force (as opposed to stay underemployed) than their rural counterparts. Contrary to the Table 5 results (columns 3

and 4), rural adequate women were more likely to leave the labour force than urban ones whereas now urban underemployed women are more likely to leave the labour force. Finally, the positive effect of having a high school education is significantly smaller the exit from the labour force transition

TABLE 8. Residence-specific Multinomial Logistic Regression: Transition from Underemployment to adequate employment and to not in the labour force statuses. (Relative Risk Ratios -  $e^{\beta}$ )

Sample	Underemployment $t$			
	Adequate employed $t+1$		Not in Labour Force $t+1$	
	Urban	Rural	Urban	Rural
Age	1.146**	1.094**	0.792**	0.912
Age squared	0.998**	0.998*	1.003**	1.001*
Married	1.072	1.137	1.692**	1.279
High school only	1.403**	1.312*	0.400**	0.698*†
More than high school	2.144**	2.842**	0.592**	0.722
Female	0.511**	0.442**	3.193**	1.768**††
British Columbia	1.337*	1.855**	1.216	1.921
Prairies	0.633**	0.905†	0.599**	1.031
Quebec	0.727**	0.723*	0.871	1.113
Maritimes	0.479**	0.649**	0.901	1.932**†
Resource based activities	0.971	0.598**	2.163	0.811
Manufacturing	0.805	0.555**	1.064	0.875
Construction, Distribution and Transport	0.645**	0.542**	0.977	0.515*
No industry	0.992	0.791	2.957**	1.873**
1995	0.900	0.796**	1.056	0.932
Sample size	4259	3364	4259	3364

\*\*  $p < 0.5$

\*  $p < 0.1$

† Coefficient significantly different from that for urban areas at  $p < 0.1$

†† Coefficient significantly different from that for urban areas at  $p < 0.05$

Omitted Categories: Less than High School, Ontario, Service and Financial sector.

Finally, let us repeat the same exercise for the transitions into adequate employment or underemployment for those out of the labour force and the different significance of residence. Model I shows that being rural resident (and out of the labour force in  $t$ ) increases the predicted odds favouring getting into underemployment in  $t+1$  and decreases the predicted odds of moving to adequate employment in  $t+1$ , the latter being statistically significant at 5% significance level. When adding socio-demographic characteristics in Model II, the results imply that rural people (who were out of the labour force in  $t$ ) are still more likely to move into underemployment and less likely to become adequately employed. However, in neither case are the underlying coefficient (individually or jointly  $-p$ -value=0.1158 for the latter) significantly different from zero, suggesting that controlling for socio-demographic characteristics removes any residual rural effect when aggregate labour force mobility is considered.

TABLE 9. Multinomial Logistic Regression: Transition from adequate not in the Labour force to adequate employment and to underemployment statuses.

(Relative Risk Ratios -  $e^{\beta}$ )

Sample	Out of Labour Force <i>t</i>					
	Underemployed <i>t+1</i>			Adequate employed <i>t+1</i>		
	Model I	Model II	Model III	Model I	Model II	Model III
Rural Dummy	1.150	1.224	1.166	0.734**§	0.900	0.923
Age		1.141**	1.225**		1.022	1.060
Age squared		0.997**	0.997**		0.998*	0.998**
Married		0.618**	0.575**		1.047	1.068
High school only		0.802	1.062		0.540**	1.062
More than high school		1.123	0.823		1.296	2.684**
Female		0.881	0.956		3.337**	0.538**
British Columbia			0.462**			1.129
Prairies			0.605**			1.081
Quebec			1.352*			0.619**
Maritimes			1.061			0.571**
Resource based activities			0.728			1.417
Manufacturing			1.202			0.890
Construction, Distribution and Transport			2.437**			1.123
No industry			0.254**			0.318**
1995			1.021			0.862
Sample size	5327	5327	5327	5327	5327	5327
			IA = -0.31 <sup>†</sup>			

\*\*  $p < 0.5$

\*  $p < 0.1$

Omitted Categories: Less than High School, Ontario, Service and Financial sector.

§ Likelihood ratio test of joint significance of the rural dummies in adequate employment and not in the labour force categories was undertaken systematically in all regressions. This symbol “§” indicates that the variables were significant at  $p < 0.1$

<sup>†</sup> Hausman Test for independence of the underemployment alternative. As is common the finite sample covariance matrix associated with this test was not found to be positive semi-definite and therefore the test statistic can be negative. The evidence (Hausman and McFadden, 1984, pp.1226) suggests that such cases can be interpreted as supporting the non-rejection of the null hypothesis of independence of the alternatives.

## 6. Summary and Conclusions

This paper has analysed the labour force dynamics of rural residents by comparing the rural and urban samples of individuals drawn from the Survey of Labour and Income Dynamics (1993-1996). The principal objective of this is to determine whether the wide research on the extent of rural disadvantage is also obvious in year to year transition across labour force states. More specifically, are adequately employed rural individuals more likely to become underemployed or move out of the labour force, and do rural individuals have a harder time finding adequate employment?

Descriptive analysis found statistically significant differences between the rural and urban samples. First, rural underemployed are more likely to remain being so and have a harder time moving into adequate employment than urban ones. Second, rural individuals out of the labour force had also harder time moving into adequate employment than urban ones, and were also more likely to slide into underemployment or remained out of the labour force. Last, rural adequate employed were more likely to

move into underemployment than urban ones and were not so persistent to remain adequately employed than their urban counterparts.

We devoted the rest of the paper to explore how far rural/urban differences can be accounted for by differences in observed characteristics (i.e. socio-demographics, industry, and region). We find that compared to their urban counterparts, rural individuals are significantly more likely to move from adequate employment into underemployment and less likely (not significantly though) to exit once they become underemployed (Tables 3 and 6). For either upward or downward transitions, there are penalties to being female, unmarried, and less educated, or reside in economically disadvantaged areas. These covariates, however, do not account for the rural disadvantage in employment transitions (particularly from adequate employment into underemployment). One potential explanation for the rural disadvantage may be in the greater availability of jobs in urban areas. Having comparatively fewer employment options could raise rural workers' risks of becoming underemployed. Models estimated separately by residence find more similarity than difference in the determinants of transitions into or out of underemployment (Tables 5 and 7) with no apparent significant coefficient differences.

We also find that after controlling for other observable characteristics, rural adequately employed individuals are significantly less likely to move out of the labour force and less likely too (not significantly though) to go back to adequate employment afterwards, compared to urban individuals. One possible answer to this observed persistence may be the fixed employment costs, e.g. job search costs (Boothby; Heckman and Willis; Nakamura and Nakamura 1985, 1994; Shaw). In 'thinner' rural labor markets, there is evidence of higher occupational mismatch that does suggest less efficient job matching and consequently greater job search costs (Lichter and Constanzo), which may be expected to reduce mobility into the rural labor force. Once again models estimated separately by residence do not show apparent significant coefficient differences between the rural and urban subsamples.

Finally, we find that compared to urban dwellers, rural underemployees are significantly less likely to move out of the labour force (after controlling for other characteristics) and more likely (not significantly though) to come back to underemployment.

A number of caveats and limitations of the analysis should be emphasised. First, we have to be aware of the higher number of non-reported employment status in rural areas especially among women (farmers' wives). Second, the definition of 'working poor' is arbitrary, and further sensitivity analysis of the results to this definition is desirable.

Overall, however our findings seem to corroborate the apparently more precarious position of rural individuals in terms of labour market instability, which should be taken into account when evaluating employment hardship in rural Canada.

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