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**Employment Insurance and Family Response to Unemployment:
Canadian Evidence from the SLID**

The Earnings Supplement Project

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Abstract

The Employment Insurance (EI) program plays an important role in providing income support to workers when they experience periods of unemployment. The income replacement offered by EI benefits may play an important role in mitigating the need for other household members to increase their hours of work to compensate for this temporary reduction in the unemployed individual's income. By enabling individuals to maintain relatively normal consumption patterns while looking for work, EI helps families manage the loss of income when one family member becomes unemployed.

Using data from the Survey of Labour Income Dynamics (SLID) over the 1993 to 2001 period, this paper examines the spouse's labour supply adjustment in response to the primary income earner becoming unemployed, focusing on the effect that the primary income earner's eligibility for EI has on the spouse's response. Following the methodology outlined by Cullen and Gruber (2000), we find evidence that the male spouse's eligibility for EI benefits is associated with a lower propensity for the female spouse to work in response to the male's period of unemployment. The results show that this impact is more often seen as a female spouse moving out of unemployment into work rather than in a female spouse working more hours, suggesting that EI benefits may play an important stabilizing role in families facing unemployment. This is especially true in households where the job loss is due to non-seasonal factors and in households with young children.

Introduction

The Employment Insurance (EI) program plays an important role in providing income support to workers when they experience periods of unemployment. In particular, EI may provide important resources that allow families to maintain relatively normal consumption patterns while the unemployed individual seeks to re-enter the workforce. However, if EI benefits are too generous, they may provide disincentives for workers to make important changes, either through occupational or geographic mobility. Much of the research examining these disincentives has focused on the individual's time to return to work after becoming unemployed (Meyer, 1990; Jones, 2000), and the extent to which benefit receipt or generosity leads to future unemployment spells (Lemieux & MacLeod, 2000).

An important theoretical development in the literature has been to extend the analysis of unemployment from an individual to a family context. Central to this development is the notion of the "added-worker effect" (AWE), as developed by Ashenfelter (1980) and Heckman and MaCurdy (1980). The AWE suggests that when the family experiences a temporary reduction in income arising from a spell of unemployment of one spouse, the other spouse will increase his or her labour supply to offset the income loss and smooth consumption.

A number of authors have attempted to identify the presence of an AWE, but evidence of a significant labour market response by the female spouse to a spell of unemployment experienced by the male spouse has been mixed (e.g. Maloney, 1987, 1991; Davies, Elias, & Penn, 1992; Cullen & Gruber, 1996; Bingley & Walker, 2001; Stephens, 2002). One possible reason for failure to identify a robust AWE is that in the context of a lifetime earnings model, the AWE should be small, since temporary unemployment is likely to have a relatively small effect over an individual's lifetime (Heckman & MaCurdy, 1980). However, this result is contingent on an assumption of perfect capital markets, which may not be appropriate for those households most at risk of experiencing unemployment, or households that have fixed consumption patterns (for instance, mortgage payments) that require income to be maintained near pre-unemployment levels.

Another reason for a lack of evidence to support the AWE relates to the role that unemployment insurance may have in offsetting this effect. Specifically, if the unemployed spouse is eligible for unemployment insurance, the other spouse may be less inclined to increase his or her labour supply. The added worker effect is thus crowded out, to some extent, by unemployment insurance benefits. As unemployment insurance benefits become more generous, this crowding-out effect would be expected to become stronger. Kell and Wright (1990) find evidence of such crowding-out effect for a sample of married couples in the United Kingdom, while Giannelli and Micklewright (1995) have similar evidence for Germany. More recently, Cullen and Gruber (2000) extend the United States literature on the AWE by incorporating a role for unemployment insurance in mitigating the propensity of spouses of unemployed males to increase their labour force participation and/or hours of work. They find evidence of a sizeable crowding out effect: on average, spouses of unemployed males would work 30 per cent more hours if there were no unemployment

insurance benefits.¹ While there has been increasing interest in the issue of labour market outcomes and income support use in the context of family decision-making, there has been little consideration of these issues in Canada.

Identifying a true AWE and the related crowding-out effect of EI is intrinsically difficult, for a number of reasons. The first reason is the potential for “assortative mating” in tastes for work, suggesting that females with a strong inclination toward work will tend to partner with males who have a similar proclivity toward employment.² Another reason is related to the fact that since both spouses share the same economic conditions of the local labour market, the economic conditions that caused the male spouse to become unemployed may also dampen the female spouse’s ability to respond to these adverse circumstances. The female spouse may wish to increase her labour supply, but a lack of employment opportunities may limit her ability to do so. Maloney (1987) argues that a female spouse’s *actual* hours of work may be constrained by labour market conditions, despite an increase in *desired* hours of work.

The present paper follows the methodology outlined in Cullen and Gruber (2000) in estimating the effect of the male spouse’s EI eligibility on the female spouse’s labour supply decisions and applies it to a subset of data drawn from the Survey of Labour Income Dynamics (SLID). It presents Canadian evidence on the extent to which EI entitlement might have an impact on a female spouse’s labour supply in response to an unemployment spell of her spouse. Understanding how, and by how much EI affects labour market adjustment — either by those directly experiencing unemployment or the spouses of individuals who become unemployed — is critical to assessing the key program parameters of eligibility, duration, and generosity of weekly entitlements.

¹They also note that the spousal labour supply only provides, at best, partial replacement of the income loss following the unemployment spell of the other spouse.

²Zimmer (1992) finds evidence that female spouses emulate the non-work status of their spouses among a sample of low-income American married couples, in that increased incidence of job exit by the male is positively related to increased job exit by the spouse.

Data and Methodology

Data used in this study are drawn from the Survey of Labour Income Dynamics (SLID), an annual longitudinal survey that collects detailed labour market, income, and demographic information on a large sample of Canadian families. Families selected into the sample remain in the study for a six-year period. SLID data are available for the period 1993 to 2001.³

Following Cullen and Gruber (2000), we examine the female spouse's labour supply response over the duration of her spouse's unemployment spell, where the basic unit of analysis is a completed unemployment spell of a male who is the major income earner of a household.⁴ Using a spell-based approach has a number of advantages. First, it avoids the complexities of modelling the endogenous dynamic labour states of spouses as they evolve over the duration of an unemployment spell. Second, it avoids overweighting long spells of unemployment that might be relatively more reflective of greater Employment Insurance (EI) eligibility and generosity.

We compute various measures of the female spouse's labour force outcomes and experiences during each completed spell of unemployment of the male spouse. These measures, which constitute the dependent variables, are expressed as a function of a set of explanatory variables that should reflect participation and hours-of-work decisions. These explanatory variables include both demographic and human capital characteristics, characteristics of the male spouse's job prior to the unemployment spell, local economic conditions, as well as the receipt and level of EI benefits.⁵ Differences in these individual and geographic characteristics allow us to identify the influence of male spouses' eligibility for EI on female spouses' labour supply responses.

As noted above, the basic unit of analysis is the male spouse's unemployment spell for which SLID data provide some basic information such as the exact start and end date of the spell, and whether or not any job search occurred during the spell. Using these data, we impose three restrictions on our sample of unemployment spells. First, we include only completed spells of unemployment that involved the male returning to employment. Second, we exclude completed spells of less than one month in duration, since the end of very short spells may be anticipated and involve limited financial disruption and, as such, may be unlikely to invoke a spousal labour supply response. Third, we include only those

³The first SLID panel began in 1993 (ending in 1998). A second panel began in 1996 (ending in 2001) while a third began in 1999 with data available up to 2001, providing two complete six-year panels of data and one incomplete three-year panel. A fourth panel began in 2002, but data are not yet available for analysis.

⁴Note that we restrict the study to households with male major income earners, although we test the sensitivity of the results to relaxation of this restriction. The majority of households that contain married and common-law couples identify the male as the "major income earner" or "head" and the female as "spouse."

⁵In keeping with the vast majority of the related literature, we implicitly assume that the male spouse's job characteristics prior to the unemployment spell are exogenous to the female spouse's labour market experiences, as is the incidence of job separation of the male that leads to an unemployment spell. An exception is Bingley and Walker (2001) who develop a model that allows for endogenous determination of the unemployment spell duration for both spouses. Papers that allow for female labour market outcomes to affect male employment and unemployment tend to find little evidence of such a link. For example, Zimmer (1992) finds that evidence of reverse dependence of the male spouse's labour market status on the female spouse's labour market exits is weak and imprecise.

unemployment spells where the male spouse actively searched for alternative employment, which allows us to assume that the unemployment spells were not planned time away from work, such as temporary layoffs, that may be associated with quite different labour supply responses. This restriction also allows us to exclude job separations arising from retirement from the labour force.

Using the person-job records in the SLID, we then identify the subset of unemployment spells that followed separation from a wage or salary job (as opposed to self-employment), thus restricting the sample to those individuals who had insurable employment. The person-job records also provide information on the reason for the job separation, which is an important determinant of potential EI eligibility.

As our interest in this paper is not the unemployment spell, per se, but the female's labour supply response during her spouse's spell of unemployment, we create a file detailing the female spouse's labour force status — employed, unemployed, or not in the labour force — during each month of her spouse's unemployment spell. We also collect details regarding usual hours of work per week and the number of weeks worked during each month of the male's unemployment spell. These data, as well as demographic information of each spouse, are obtained from the SLID individual records and linked to the male spouse's particular unemployment spell using the unique family identifier.

The central question examined here is the extent to which EI eligibility and receipt crowd out spousal labour supply. One option is to include variables reflecting actual receipt of EI benefits during the unemployment spell. However, actual EI benefit receipt would presumably reflect additional factors, such as the specific nature of the job separation, financial need, knowledge of the EI system, motivation, expected duration of unemployment, as well as the generosity of the EI benefits available to the male (as shown in Blank & Card, 1991). Since at least some of these factors might be endogenous in the female spouse's labour supply choices, actual EI receipt is also potentially endogenous. Further, the male's entitlement to EI income support (eligibility, duration of benefits, amount of benefits) might be an important determinant of spousal labour supply, and whether or not these benefits are subsequently taken up. Therefore, rather than estimating the impact of actual receipt of EI benefits, we examine the impact of the male's EI entitlement at the beginning of the unemployment spell. This allows us to assess by how much (if at all) a spouse, knowing the eligibility and generosity of the EI benefits that could be received, changes her labour supply.

In order to impute the male's EI entitlement at the beginning of the unemployment spell, we account for three main factors affecting EI eligibility: the amount of work leading up to the spell in the qualifying period (the shorter of 12 months or since the start of the most recent period of EI receipt), the labour market conditions in the prospective claimant's region of residence, and the reason for job separation.⁶ Beginning in 1993, people who quit their jobs voluntarily without just cause or who lost their jobs because of misconduct were not eligible for EI. However, the list of just causes for voluntary quits that could potentially

⁶If an individual is deemed to be a new entrant or a re-entrant to the labour market at the time of job separation, then he or she must work at least 910 hours to qualify for EI, regardless of region of residence. New or re-entrants are those individuals who had limited attachment to the labour market in the year prior to the 52-week qualifying period, where limited attachment is defined as having worked less than 490 hours. We do not account for this additional restriction on EI eligibility since it would require an additional year of data for each individual and therefore would significantly reduce the sample size.

allow for EI eligibility is quite broad. Just causes include major changes in work duties, reasonable assurance of another job in the immediate future, difficult relations with a supervisor, or having to provide care for a child or another family member. Because SLID does not provide information on whether the reason for job separation was a just cause in the case of voluntary job separations, we do not use stated reason for job separation in imputing eligibility, although we consider the sensitivity of the results by using sub-samples of the main sample defined by reason for job separation. Duration of benefits is a function of the individual's accumulated amount of work and local economic conditions, while the amount of benefit that can be received is a fixed proportion (currently 55 per cent) of the person's average weekly income, up to a maximum weekly amount (currently \$413 per week).⁷

Legislation regulating EI eligibility and weekly benefits changed several times over the sample period. Lin (1998) provided a detailed description of the major changes to the program, with the most significant change occurring with the conversion from a weeks-based system to an hours-based system in the 1996 EI reform. Since 1998, the changes to the EI program have been more modest, with the maximum weekly amount being first reduced, and subsequently frozen, and some penalties for frequent claimants introduced, and later repealed.

Our method to impute EI eligibility and entitlement for each male experiencing unemployment accounts for the individual's time- and region-specific parameters and work experience (in weeks or hours as relevant) in the qualifying period, and reflects the main changes to the EI program over the 1993 to 2001 period. For people identified as eligible for EI, we compute the amount of weekly benefits and weeks of eligibility to which the individual is potentially entitled.

There are two reasons to exercise particular caution in interpreting our results. First, our measures of imputed amount of weekly EI benefits are based on SLID data on wage and salary that are only available on a calendar year basis. More importantly, since our analysis explicitly controls for males' monthly earnings prior to unemployment in the regression specification (derived from annual income and monthly hours of work), the main source of variation in the imputed weekly EI benefit is from changes in the replacement rate and maximum weekly entitlement. Since these measures are constant across Canada and were not significantly modified during the sample period, there may be insufficient variation in the sample to capture the influence of program generosity on spousal labour supply responses.

Following the approach of Cullen and Gruber (2000), we assume that a female's labour supply response to her spouse's unemployment spell is affected by 1) the age, visible minority status and education of both spouses, 2) the male's occupation, industry, and earnings prior to job separation (to account for such factors as assortative matching that could lead to a correlation in preferences for work between spouses, or couple-specific heterogeneity), 3) the number of preschool and school aged children, and finally, 4) the local

⁷In the current EI system, there are variations in the way average weekly earnings are calculated that could potentially affect the benefit amount, such as the small weeks provision and the minimum divisor rule. It is not possible to model the former, as data on weekly earnings are not available in the SLID. We also do not account for the divisor rule as the number of individuals affected by this rule is likely to be small. The *EI Monitoring and Assessment Report 2002* (HRDC, 2003) indicated that only 3.1 per cent of EI claimants in 2001–02 had their benefits reduced as a result of the divisor rule. An individual living in a low-income household with dependant may qualify for the Family Supplement. For details on EI rules, see <http://www14.hrdc-drhc.gc.ca/ei-ae/ratesc.htm> (accessed March 3, 2004).

labour market conditions over the unemployment spell captured by the monthly economic region employment rate and a quarterly female age-specific provincial unemployment rate. All explanatory variables are measured as of the start of the male's spell of unemployment. We also restrict the sample to individuals between 24 and 55 years of age to exclude unemployment spells attributable to planned retirements or return to education and only include spells for which the individual reported some annual income, resulting in a final sample of 2,079 separate spells of unemployment experienced by male spouses.

The econometric analysis focuses on estimating the determinants of two measures of female spouse labour supply — participation in the labour market and hours worked — averaged over the duration of the male spouse's unemployment spell. As approximately 40 per cent of the unemployment spells in the dataset are repeat spells from the same individuals (in the sense that some people experienced multiple job separations followed by unemployment spells within the SLID survey period), we follow the Cullen and Gruber (2002) approach and weigh each spell by the inverse of each person's number of completed unemployment spells present in the dataset. We also allow for couple-specific unobserved heterogeneity across spells by reporting standard errors that have been corrected for potential correlation in unobservable variables across spells experienced by the same individual.

Descriptive Statistics

Table 1 presents descriptive statistics on unemployment spells experienced by male spouses. A high proportion (85 per cent) of the observed unemployment spells in our sample is predicted to qualify the male spouse for Employment Insurance (EI) benefits. In comparison, data from the recent Employment Insurance Coverage Survey (EICS) indicate that 84 per cent of those who are potentially eligible for EI had accumulated enough hours of paid work to qualify for EI benefits (Statistics Canada, 2004). Even though these two figures are obtained from two very different samples, the comparison gives us some confidence that our imputed measure of eligibility is, to some extent, reliable. The average weekly benefit for those who qualify for EI is \$286.93, which indicates that many of the individuals who do qualify for benefits are falling below the maximum amount of \$413.⁸ The average period over which EI benefits could be received is imputed to be approximately 37 weeks.

Table 1: Descriptive Statistics of Unemployment Spells, 1993–2001

	All Eligible Unemployment Spells	All Non-Eligible Unemployment Spells
Proportion of all unemployment spells	0.85	0.15
Number of weeks of EI eligible (average)	37.20	–
Average weekly benefit	\$286.93	–
Average duration of unemployment spells (months)	5.80	5.30
Proportion of first spells	0.47	0.33
Proportion of second spells	0.26	0.31
Proportion of three and more spells	0.27	0.36

Source: SLID, 1993–2001.

Table 1 shows that the average unemployment spell is 5.8 months for men who are eligible for EI, and 5.3 months for those who are ineligible. Also, almost 50 per cent of spells in the sample experienced by EI eligible men are first spells, while a third of spells experienced by ineligible men are first spells. Thus, ineligibility for EI seems associated, on average, with more frequent spells of unemployment.

Table 2 presents demographic characteristics of both spouses and conditions of their local labour market according to EI eligibility status, and shows few substantive differences in the reported characteristics. The demographic information reveals that males and females in the sample are in their mid-thirties, with females, on average, being two years younger than their spouses. The education variables suggest that the families in which the male spouse is experiencing unemployment tend to have low levels of educational attainment, with a relatively high proportion of men having less than a high school education. Women in the

⁸Dollar figures are adjusted to constant 1992 dollars using the Canadian Consumer Price Index. According to the 2001 Monitoring and Assessment Report (Annex 1, Table 1.4), average weekly benefits were \$305 in 2001–2002, which represents \$276 in constant 1992 dollars.

sample tend to have higher levels of education relative to the men, but still below the national average.

Table 2: Demographic Characteristics of the Sample, 1993–2001

	All Eligible Unemployment Spells	All Non-Eligible Unemployment Spells
Female spouse characteristics		
Visible minority	3%	6%
Age (average)	36.8	36.3
Educational attainment		
Less than high school	26%	25%
High school graduate	23%	23%
Some post-secondary	44%	48%
University graduate	7%	4%
Total individual income	\$12,106	\$12,889
Number of preschool aged children	0.45	0.38
Number of school aged children	0.86	0.89
Number of young adults	0.20	0.19
Male spouse characteristics		
Visible minority	4%	6%
Age (average)	39.0	39.0
Educational attainment		
Less than high school	31%	28%
High school graduate	17%	17%
Some post-secondary	45%	50%
University graduate	7%	5%
Total individual income	\$33,583	\$29,859
Labour market conditions		
EI region unemployment rate	12.6%	13.2%
Economic region female employment rate	54.7%	53.0%
Age-specific provincial female unemployment rate	9.2%	9.6%
Number of observations	1,754	325

Source: SLID, 1993–2001.

Table 3 reports female labour market participation before and during the male spouse's unemployment spell. Prior to the unemployment spell, male eligibility for EI is associated with a lower incidence of the female spouse working (21 per cent compared to 37 per cent), perhaps reflecting the stronger labour force attachment of the male (since eligibility for EI is based on the number of hours/weeks worked prior to the unemployment spell).⁹ However, female spouses of males eligible for EI that are working prior to the unemployment spell

⁹This is lower than one would expect to observe from a random sample of all working age females. We believe this is because the sample of spouses living with men who experience an unemployment spell are not representative of all women living with employed men—more likely to be in areas with poorer economic conditions. Also, the labour force participation rate is not the same as working in the three months prior to the spell of unemployment. Our figures would be higher if we determined the participation rate for the year—any work or search for work in the 12 months prior to the unemployment spell.

work approximately the same number of hours per month on average as women whose spouses are not eligible for EI (113 hours per month compared to 110 hours per month).

Table 3: Female Labour Supply and Participation During and Prior to the Unemployment Spell by EI Eligibility of Male Spouse, 1993–2001

Female Labour Force Participation	Prior to Unemployment Spell		During Entire Unemployment Spell		During the First Three Months of Unemployment Spell	
	Eligible	Not Eligible	Eligible	Not Eligible	Eligible	Not Eligible
Proportion who worked	21%	37%	59%	61%	63%	65%
Average monthly hours worked ^a	113.0	110.4	130.6	135.9	121.1	127.5

Source: SLID, 1993–2001.

Note: ^aExcluding those who do not work.

The third and fourth columns of Table 3 show that both the incidence of employment and average hours worked are higher during the male spouse’s unemployment spell compared to before the start of the spell, and this gives some indication of the added worker effect. Notwithstanding the EI eligibility status of the spouse, about two in three women worked during a spouse’s unemployment spell. Moreover, women tend to work the same number of hours per month, with women whose spouses are ineligible for EI working only six more hours per month on average than women whose spouses are eligible for EI. It should be noted that with the change in the incidence of women working, the sample of women working during the spell (on which average hours worked is based) is not the same as the sample of women working prior to the spell. Thus, those women who began working at the start of the spouse’s unemployment spell worked a substantial number of hours on average.¹⁰ The last two columns of Table 3 present the same results but focus on female labour force outcomes in the first three months of the spouse’s unemployment spell. It can be seen that the numbers are qualitatively similar to the average over the entire unemployment spell.

Table 4 provides more details on transitions in the labour supply pattern underlying the results presented in Table 3. Among women whose spouse is eligible for EI, 52.8 per cent of those who did not work prior to the start of the unemployment spell began working during the unemployment spell. For women whose spouse is ineligible, the comparable figure is around the same magnitude at 49.9 per cent. This suggests a strong labour supply response of these women to the onset of unemployment of their spouses, and this response does not appear to be any larger for women whose spouse is ineligible for EI. For women who did work prior to their spouse’s unemployment spell, approximately 80 per cent continue to work during the unemployment spell, regardless of EI eligibility of the male spouse. This suggests that if EI does crowd out female labour supply, the effect is either quite subtle or might already have occurred before the male spouse’s unemployment spell began.

¹⁰For those women who did not work prior to the unemployment spell but start work during the spell, average hours worked per month are 113.4 for women whose spouse is eligible for EI and 123.5 for women whose spouse is ineligible for EI. Comparable figures for women who did work prior to the unemployment spell are 135.3 hours and 131.4 hours respectively (figures not shown).

Table 4: Transition Probability Matrix of Female Labour Force Participation (Conditional Probabilities), 1993–2001

		Did Not Work in the Three Months Following Start of Male Unemployment Spell (%)	Worked in the Three Months Following Start of Male Unemployment Spell (%)
All spells (2,079 observations)	Did Not Work in the Three Months Prior to the Male Unemployment Spell (%)	47.6	52.4
	Worked in the Three Months Prior to the Male Unemployment Spell (%)	19.5	80.5
Spells where male spouse is eligible for EI (1,754 observations)	Did Not Work in the Three Months Prior to the Male Unemployment Spell (%)	47.2	52.8
	Worked in the Three Months Prior to the Male Unemployment Spell (%)	19.2	80.8
Spells where male spouse is ineligible for EI (325 observations)	Did Not Work in the Three Months Prior to the Male Unemployment Spell (%)	50.1	49.9
	Worked in the Three Months Prior to the Male Unemployment Spell (%)	20.8	79.2

Source: SLID, 1993–2001.

Table 5 presents the proportion of female spouses who indicated their main labour force activity for that month was work. This is broken down into different spell lengths to examine how labour supply changes throughout the spouse's unemployment spell. The table also reports average monthly hours of work. One interesting result is that in households where *ex post* there is a short spell (i.e. three or fewer months) there is a relatively high proportion of females in employment, and they tend to be working more hours than women whose spouses are experiencing longer spells. As the spell gets longer, there is a tendency for women to supply less labour, although this appears to level off after six months (for spells lasting at least this long).

Presumably for most unemployment spells, there is some uncertainty as to how long the spell will last, so differences in female labour supply at the beginning of the unemployment spell are notable. This might indicate that in regions where the prospects for male re-employment are better (as reflected by a short spell of unemployment), their spouses will find it easier to work more.¹¹

Table 5: Proportion of Wives in Employment and Average Monthly Hours Worked by Spell Length and Month

Spell Month	Length of the Spell							
	3 or Fewer Months		4 to 6 Months		7 to 9 Months		10 Months or More	
	Proportion in Employment	Hours Worked	Proportion in Employment	Hours Worked	Proportion in Employment	Hours Worked	Proportion in Employment	Hours Worked
Month 1	0.596	83.99	0.543	78.02	0.541	72.48	0.474	64.96
Month 2	0.587	80.42	0.537	76.47	0.513	71.30	0.476	64.67
Month 3	0.564	75.04	0.535	74.94	0.501	70.03	0.460	64.43
Month 4	–	–	0.541	74.63	0.474	68.16	0.460	63.54
Month 5	–	–	0.551	76.11	0.478	67.16	0.439	62.74
Month 6	–	–	0.519	69.48	0.479	66.43	0.439	62.06
Month 7	–	–	–	–	0.494	66.27	0.446	61.90
Month 8	–	–	–	–	0.457	65.35	0.425	61.58
Month 9	–	–	–	–	0.527	72.20	0.429	61.35
Month 10	–	–	–	–	–	–	0.438	61.34
Month 11	–	–	–	–	–	–	0.448	61.22
Month 12	–	–	–	–	–	–	0.429	54.70

Source: SLID, 1993–2001.

¹¹ Table 1 indicates that the average completed duration of unemployment is 0.5 months shorter when the male is ineligible for EI, and Table 3 indicates that the spouses of these men are marginally more likely to supply labour during the unemployment spell. There is no reason *a priori* to expect eligibility for EI to be negatively correlated with economic conditions, since eligibility requirements reflect these local economic conditions. This is supported by figures reported in the EI Monitoring and Assessment Report (2003), which indicates that the proportion of paid workers that would be eligible to EI benefits had they lost their job is very similar in all regions of Canada.

Econometric Results

The estimation results of a series of different econometric specifications are presented in Table 6. We follow the same approach taken by Cullen and Gruber (2000) and present a range of common techniques to give some sense of the sensitivity of the results and provide bounds on the different treatments of the fact that an important proportion of women reported hours equal to zero as they do not work.¹²

Table 6: Female Labour Force Response to Male Spouse's Unemployment Spell, 1993–2001

Dependent Variable	Hours Worked per Month						Worked During the Unemployment Spell	
	OLS		Tobit		Heckman Selection		Probit	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Marginal Effect	Standard Error
Characteristics of male spouse								
Eligible for EI	-11.878**	5.158	-18.258**	8.889	-9.663*	5.028	-0.065**	0.033
Age	1.226	3.317	0.791	5.801	2.743	3.503	-0.002	0.024
Age squared	-0.015	0.041	-0.014	0.072	-0.025	0.043	0.000	0.000
Visible minority	-25.936*	14.671	-37.108	24.324	-14.570	13.957	-0.128	0.112
Educational attainment								
Less than high school	-9.792	6.143	-17.133*	10.224	-4.983	5.998	-0.066	0.043
High school graduate	–	–	–	–	–	–	–	–
Some post-secondary	-4.711	5.797	-8.721	9.327	-4.557	5.317	-0.024	0.040
University graduate	-17.221	11.049	-23.488	18.801	-5.885	11.796	-0.135*	0.080
Characteristics of female spouse								
Age	3.461	3.368	5.039	5.881	2.029	3.731	0.021	0.024
Age squared	-0.059	0.043	-0.085	0.075	-0.041	0.047	0.000	0.000
Visible minority	33.689**	16.359	44.042*	26.571	34.334**	15.258	0.087	0.103
Educational attainment								
Less than high school	-23.328***	6.091	-42.668***	10.704	-6.317	7.328	-0.184***	0.042
High school graduate	–	–	–	–	–	–	–	–
Some post-secondary	2.904	5.333	3.736	8.243	-1.037	5.179	0.032	0.035
University graduate	-5.535	10.312	-7.665	16.577	-4.673	9.746	-0.022	0.068

(continued)

¹²In each model, standard errors are robust to possible unobserved heterogeneity across different unemployment spells for the same male spouse. In addition to the approaches reported here, we also estimate a fixed effects model to control for unobservable characteristics (such as motivation) that might be associated with preferences for work, with average hours of work as the dependent variable (results not shown). While we expect that the fixed effect model captures the unobserved heterogeneity that exists in the data, identifying the effect of EI eligibility on hours worked, in this approach, is difficult as there are only 191 cases where an individual has one spell that is EI eligible, and a second spell that is ineligible.

Table 6: Female Labour Force Response to Male Spouse's Unemployment Spell, 1993–2001 (Cont'd)

Dependent Variable	Hours Worked per Month						Worked During the Unemployment Spell	
	OLS		Tobit		Heckman Selection		Probit	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Marginal Effect	Standard Error
Family composition								
Number of preschool aged children	-17.202***	3.316	-24.719***	6.141	-12.422***	3.881	-0.086***	0.025
Number of school aged children	-6.963***	2.191	-9.680**	3.813	-7.152***	2.356	-0.028*	0.015
Number of young adults	5.677	4.450	8.994	7.368	2.783	5.013	0.036	0.029
Newly born	2.635	9.397	-3.523	17.135	26.395**	11.059	-0.112*	0.062
Labour market conditions								
EI region employment rate	0.585	0.366	1.266**	0.639	0.381	0.386	0.002	0.003
Provincial female unemployment rate	-0.308	1.438	-0.282	2.505	-0.943	1.471	0.002	0.009
Sample size	2079		2079		2079		2079	
R-squared/ Pseudo R-squared	0.1418		–		–		0.1142	
Pseudo Log-likelihood	–		-8376.15		-8388.68		-1215.84	
Instrumental variables methods								
Actual receipt of EI	-90.491	63.928	-100.798	93.354	–	–	-0.438	0.255
Proportion of months of EI receipt	-99.974	121.444	-134.510	163.992	–	–	-0.817	0.848

Source: SLID, 1993–2001.

Note: One asterisk indicates statistical significance at the 10 per cent level, two asterisks at the 5 per cent level, three asterisks at the 1 per cent level. Estimations also include a 10-point spline in the male's usual average monthly income prior to job loss, indicator variables for his occupation and industry prior to job loss, province and community size dummy variables, and year dummy variables.

The first two columns report the ordinary least squares (OLS) estimation results for the average monthly number of hours that the female worked during her spouse's completed unemployment spell. We find that females in households where the male experienced unemployment worked, on average, 12 fewer hours per month if the spouse was potentially eligible for EI benefits compared to those where the spouse was not eligible. In economic terms, this is not a quantitatively large effect, since the average monthly hours of work for females who work during their spouses' unemployment spells is 122.11 hours of work (76.64 hours for all female spouses).

One limitation of the OLS model in this context is that it does not take into account the fact that a significant proportion of the women in the sample do not work at all during their spouse's period of unemployment. To account for this, we estimate a Tobit model. The results in Columns three and four indicate a marginally larger negative effect of potential EI eligibility on hours worked: females in households experiencing unemployment work, on average,

18 fewer hours per month if their spouse is potentially eligible for EI benefits compared to those where the spouse is not eligible.

Columns five and six contain results from the estimation of a two-step Heckman selection model in which the determinants of the female's employment participation are estimated in the first stage, and then the results are used in the estimation of hours worked, conditional on working at all.¹³ The estimated coefficients in Column five correspond to the second stage estimation. (First stage results are not reported, but are very similar to what is reported in the final column of Table 6.) The magnitude of the potential EI eligibility effect falls to around 9.6 fewer hours worked per month and remains significant.

Columns seven and eight report the marginal effects from the estimation of a discrete choice model employing a Probit specification where the dependent variable indicates whether the female worked at all during the spouse's unemployment spell. The result suggests that potential EI eligibility reduces the probability of the female working by 6.5 per cent, and is statistically significant.

The direction of the effect of other explanatory variables is generally consistent across all specifications, although relatively few estimates are individually significant. The presence of young children at home tends to reduce the female spouse's average hours worked and probability of working. The presence of school-aged children at home is also associated with lower hours of work and probability of working, but to a lesser extent. As well, compared to women who have a high school diploma, women without a high school education are less likely to work during the male's spell of unemployment. Women who are members of visible minorities are predicted to work more hours, compared with non-visible minority women, although this is only significant in the Heckman selection model results.

Male educational attainment also appears to have a significant effect on female work patterns. Compared to male spouses who have a high school diploma, having less than a high school education or having a university degree for male spouses has a negative impact on the female spouse's number of hours worked and probability of participation in the labour market. The latter may reflect better prospects for more rapid re-employment of males with higher education levels, while the former may reflect the possibility that males with lower education levels have limited employment stability and, thus, their unemployment spells may be anticipated more often, which may allow families to incorporate expected periods of reduced income into their consumption patterns.¹⁴ Finally, both macroeconomic indicators have the correct sign but only the economic region employment rate is significant (and this is only true for the Tobit specification).

To control for correlation across spouses in labour force attachment and other socio-economic outcomes that might otherwise be reflected in EI eligibility, we include a set of industry and occupation variables that correspond to the job the male spouse held before the unemployment spell, as well as a measure of usual average monthly earnings from his main

¹³The Heckman selection model allows for correlation in unobservable variables in the determinants of the employment participation and hours of work decisions, and therefore accounts for the possibility that women who work during their spouses' spell of unemployment might not be a random sample of all females whose spouses experience unemployment.

¹⁴The relationship between low education levels of the male and lower work hours of the female might also be reflecting "assortative mating" in which there is unobserved correlation between spouses that leads to a correlation in labour market outcomes. See Giannelli and Micklewright (1995), and Bingley and Walker (2001) for an additional discussion.

job.¹⁵ Though not reported here, industry and occupation variables are generally poorly determined, as are individual terms of the income measure. However, not surprisingly, a test of the joint significance of the earnings terms indicates that overall, male earnings are a significant determinant of the female labour response to a male unemployment spell.¹⁶ The estimated models also included controls for province of residence, household size, and year.

The bottom part of Table 6 indicates the effect of actual rather than predicted EI benefit receipt by male spouses on female spouses' labour market responses. The potential endogeneity of EI receipt in a model of female hours and participation choices requires the use of an instrumental variable method. One possible instrument for the actual receipt of EI benefits is the measure of potential EI eligibility. Two alternative measures of EI receipt can be used as instruments: whether the male received EI at all during the unemployment spell, and the proportion of months of unemployment in which EI was received. Magnitudes of the effect of EI receipt on hours of work and probability of work are substantially larger than for potential EI receipt. While the direction of effect in each case is negative — suggesting that the receipt of EI reduces hours of work and probability of work — the results are poorly determined as none of the coefficients are statistically different from zero.

Table 7 shows the estimated impact of the male spouse's EI eligibility on female labour market participation at various points in time. (The regressions are specified identically to the models presented in Table 6.) In examining the labour supply in the three months prior to the male spouse becoming unemployed, the magnitude of the estimated effects of male spouse's EI eligibility is substantially larger than those reported in Table 6 for the entire unemployment spell. This could suggest that when families can anticipate the male spell of unemployment, the spouse will begin to increase labour supply — either by moving into employment or taking on more hours in current jobs — in anticipation of the unemployment spell. If the male is likely to be eligible for EI, the female is less likely to increase her labour supply and in households where EI is unlikely to be received, the female is more likely to increase her labour supply. However, the result might also be consistent with the presence of unobserved heterogeneity among couples.

During the first month of the male's unemployment spell, male EI eligibility does not appear to have a significant influence on the female spouse's hours of work, but it seems to exert a significant negative influence on her probability of working. This may suggest that employed females do not respond by increasing their hours of work immediately after their spouse becomes unemployed, but there is a significant, albeit economically small effect, as EI eligibility reduces the probability of working by 7.5 per cent.

¹⁵Specifically, we include a 10-point spline with nodes starting at the 5th and ending at the 95th percentiles of the distribution.

¹⁶The lowest point on the spine is omitted as the reference category and the trend is for coefficients to be increasingly negative as income increases, suggesting that higher male income is associated with lower female labour supply. However, it should be noted that none of the individual coefficients are well determined.

Table 7: Impact of EI Eligibility on Female Labour Participation Prior to and During Male Spouse's Unemployment Spell, 1993–2001

Dependent Variable	Hours Worked per Month						Worked During the Unemployment Spell	
	OLS		Tobit		Heckman selection		Probit	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Marginal Effect	Standard Error
Three months prior to unemployment spell								
Eligible for EI	-17.081***	4.095	-54.811***	11.833	-0.138	6.759	-0.153***	0.033
Sample size= 2,079								
First month of unemployment spell								
Eligible for EI	-9.025	5.542	-18.663*	11.113	0.841	4.763	-0.075**	0.038
Sample size = 2,079								
First three months of unemployment spell								
Eligible for EI	-10.974**	5.281	-19.363**	9.720	-5.644	6.007	-0.071*	0.036
Sample size = 2,079								
Last month of unemployment spell								
Eligible for EI	-7.813	5.489	-14.975	10.903	-2.088	4.744	-0.057	0.037
Sample size = 2,079								

Source: SLID, 1993–2001.

Note: One asterisk indicates statistical significance at the 10 per cent level, two asterisks at the 5 per cent level, three asterisks at the 1 per cent level. Regressions also include a 10-point spline in the male's usual average monthly income prior to job loss, indicator variables for his occupation and industry prior to job loss, province and community size dummy variables, and year dummy variables.

During the first three months of the unemployment spell, the male spouse's eligibility for EI is associated with the female spouse's lower labour market participation when the model is estimated using the OLS and Tobit specifications. This could indicate that as the unemployment spell lengthens (as compared to the first month following a male spouse becoming unemployed), females tend to increase their labour supply, but this effect is dampened (by 11 hours in the OLS specification and 19 hours in the Tobit specification) if the male is eligible for EI benefits. This may also reflect that it takes time to adjust labour supply in terms of finding new employment or additional hours of work with current employers. It should be noted that the EI eligibility coefficient in the Heckman selection model is not significant at conventional levels, which suggests that we need to treat the OLS and Tobit results with caution. Finally, the EI eligibility negative coefficient in the Probit model suggests a reduction in the probability of the female working at all by 7.1 per cent if the unemployed male is eligible for EI. Evaluated in conjunction with the strong effects in the OLS and Tobit, and a non-statistically significant effect in the Heckman model, this suggests that male spouse's EI eligibility has more of an impact on the female spouse's probability of working rather than on her hours of work, conditional on her working. It is also

notable that the magnitude of the EI eligibility effect is marginally larger in the first months of the unemployment spell than the average over the entire spell, which may reflect expiration of benefits.

To determine whether the EI eligibility effect dissipates as the unemployment spell progresses, we estimate average hours of work in the final month of the unemployment spell. While the estimated coefficients are negative, none are significant at conventional levels. Thus, it appears that the crowding-out effect is strongest just before the start of the male's unemployment spell, and weakest at the end of the spell. If the results for eligibility reflect heterogeneity via assortative matching, it seems unlikely that the eligibility effects would weaken as the duration of unemployment increases.

Table 8 provides estimates for sub-samples defined according to the stated reason for job separation. For those males who became unemployed due to seasonal reasons, potential eligibility for EI has no significant impact on the number of hours worked and the labour force participation of the female spouse. This suggests that because the timing of job loss can be predicted with more certainty in the case of a seasonal job loss than a job loss due to permanent layoff or plant closure, couples expecting to experience periodic layoffs may already have adjusted savings or consumption in anticipation of income loss.

Table 8: Female Labour Force Response to Male Spouse's Unemployment Spell by Reason for Job Separation 1993–2001

Dependent Variable	Hours Worked per Month						Worked During the Unemployment Spell	
	OLS		Tobit		Heckman Selection		Probit	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Marginal Effect	Standard Error
Seasonal job separation								
Eligible for EI	15.686	10.523	22.128	20.024	-3.492	13.613	0.120	0.092
Female spouse has less than a high school diploma	-27.939***	9.344	3.627	13.622	-9.975	10.714	-0.229***	0.071
Number preschool aged children	-26.381***	5.583	-37.610***	9.926	-28.123***	6.783	-0.118**	0.047
Sample size= 730								
Other involuntary job separation								
Eligible for EI	-17.534***	6.079	-24.769**	9.900	-9.955	180.376	-0.091**	0.040
Female spouse has less than a high school diploma	-21.306***	8.056	-39.530***	14.000	2.764	368.718	-0.168***	0.054
Number of young children in the household	-16.503***	4.275	-25.047***	7.743	-3.652	209.097	-0.107***	0.032
Sample size= 1,177								

Source: SLID, 1993–2001.

Note: One asterisk indicates statistical significance at the 10 per cent level, two asterisks at the 5 per cent level, three asterisks at the 1 per cent level. Regressions also include a 10-point spline in the male's usual average monthly income prior to job loss, indicator variables for his occupation and industry prior to job loss, province and community size dummy variables, and year dummy variables.

The bottom panel provides estimates for a sub-sample that excludes seasonal job separations and other spells of unemployment attributed to job separations for personal or family reasons, retirement, or education. The OLS results suggest that women whose spouse is potentially eligible to receive EI will work 17.5 hours less than women whose spouse is not eligible. The Tobit specification suggests a stronger effect, with EI eligibility reducing by 24.8 hours the hours worked by women whose spouse is eligible for EI. However, these results have to be interpreted with caution, as the Heckman estimations indicate that the EI eligibility effect is not significant, once we account for unobserved heterogeneity between female spouses who are working some hours and those not working at all. The Probit estimation does suggest that male EI eligibility reduces the probability of taking on any work by 9.1 per cent, and this is statistically significant at the five per cent level. Thus, it appears that the main crowding-out effect is in terms of the incidence of working rather than in terms of intensity of work.¹⁷

What role does EI play in households with young children, and are the estimated EI eligibility crowding-out effects more pronounced in those households? In the main estimations, the presence of young children is negatively associated with hours of work (Table 6), but this does not explicitly reflect the influence of EI on families with young children. Table 9 provides separate results for families with preschool aged children, with school aged or younger children and families without children.

In comparing these results, the coefficients tend to be similar, with the EI eligibility crowding-out effect being larger for families with young and school aged children. In the combined sample, EI eligibility following the male spouse's unemployment spell tends to be associated with lower female spouse's hours of work, ranging from a reduction of 16.5 hours in the OLS estimation to 23.7 hours for the Tobit model. In contrast to the earlier results, the EI eligibility coefficient is negative and statistically significant in the Heckman estimations, which suggests an additional effect even after accounting for unobserved heterogeneity in prior work patterns.

In the bottom panel of Table 9, the effects of EI eligibility are seen to be considerably closer to 0 for households without children, with the EI eligibility coefficients not approaching statistical significance at conventional levels in any specification. This adds an important dimension to understanding the added-worker effect and the role EI plays on crowding-out labour supply, since it seems that much of the crowding-out effect is driven by households where there tends to be larger returns for non-market activities, such as care for children.

¹⁷It should be noted that the factors that cause husbands to lose their jobs may make it difficult for females to find new work, and we attempt to control for this so-called discouraged worker effect by using indicators of local labour market conditions.

Table 9: Impact of EI Eligibility on Female Labour Participation According to Family Composition, 1993–2001

Dependent Variable	Hours Worked per Month						Worked During the Unemployment Spell	
	OLS		Tobit		Heckman Selection		Probit	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Marginal Effect	Standard Error
Presence of young children								
Eligible for EI	-15.549	10.109	-22.695	15.921	-16.971 ^a	10.617	-0.061	0.068
Female spouse has less than high school diploma	-21.970*	11.324	-42.758**	19.982	-4.406 ^a	11.858	-0.216***	0.080
Sample size= 626								
Presence of young or school age children								
Eligible for EI	-16.511***	6.060	-23.733**	10.411	-12.332*** ^a	6.129	-0.086**	0.041
Female spouse has less than high school diploma	-20.978***	7.160	-38.556***	12.395	-6.684 ^a	8.026	-0.164***	0.049
Sample size= 1,470								
No children								
Eligible for EI	-0.964	9.759	-4.576	15.431	-7.436	8.606	0.002	0.072
Female spouse has less than high school diploma	-28.861**	11.308	-50.353***	18.944	-3.074	12.547	-0.230***	0.082
Sample size= 609								

Source: SLID, 1993–2001.

Note: One asterisk indicates statistical significance at the 10 per cent level, two asterisks at the 5 per cent level, three asterisks at the 1 per cent level. Regressions also include a 10-point spline in the male's usual monthly income prior to job loss, indicator variables for his occupation and industry prior to job loss, province and community size dummy variables, and year dummy variables.

^aIndicates that the second stage equation failed to converge, so reported results are based on an OLS estimation conditional on hours worked being greater than zero.

It is of course still possible that even with this range of explanatory variables to control for unobserved heterogeneity, couple-specific correlations in labour market outcomes might still be present, perhaps in terms of motivation and preferences for work. In another sensitivity analysis, the same set of specifications is estimated for all spells of unemployment experienced by female main income earners, looking at the effect of the female's eligibility for EI benefits on the labour market response of the male spouse (who is not the main income earner). The results are reported in Table 10. Interestingly, the coefficient on eligibility is now positive and occasionally significant, in stark contrast to earlier results. Such an asymmetry in results is further evidence against the notion that unobserved heterogeneity is driving the results presented above.

Table 10: Impact of Female EI Eligibility on Male Labour Participation, 1993-2001

Dependent Variable	Hours Worked per Month						Worked During the Unemployment Spell	
	OLS		Tobit		Heckman Selection		Probit	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Marginal Effect	Standard Error
Eligible for EI	23.985*	13.357	35.402**	16.253	-10.243	12.899	0.150***	0.007

Sample size= 374

Source: SLID, 1993–2001.

Note: One asterisk indicates statistical significance at the 10 per cent level, two asterisks at the 5 per cent level, three asterisks at the 1 per cent level. Regressions also include a 10-point spline in the male’s usual average monthly income prior to job loss, indicator variables for his occupation and industry prior to job loss, province and community size dummy variables, and year dummy variables.

Following the approach of Cullen and Gruber (2000), we added one final dimension to the analysis and examined the generosity of EI benefits and their influence on labour supply decisions. This is done by restricting the analysis to only spells of unemployment eligible for EI and (separately) including measures of the (imputed) amount of benefits received and weeks of benefits to which the claimant is entitled as explanatory variables for female hours of work. Using a similar set of explanatory variables to those described in Table 6 (although the results are not shown here), the relative generosity of EI has no significant influence on female labour supply. This is in contrast to Cullen and Gruber’s (2000) results for the United States who find that the generosity of unemployment insurance benefits has a significant crowding-out effect. Identifying these effects using Canadian data is difficult, however, since the program is national in scope and offers few regional differences that can be exploited to capture a true generosity effect. In contrast, unemployment insurance in the United States varies in generosity by state, which provides an exogenous source of variation in benefit generosity that helps identify any crowding-out effect. The only exogenous variation in benefit generosity in Canada (after controlling for local economic conditions) comes from policy changes to the national program in terms of weeks of entitlement and benefit level over the sample period of 1993 to 2001. There may be insufficient variation in these dimensions of the EI program to allow any crowding-out effects to be identified.

Conclusion

Over the past decade, a number of studies have examined the impact of Employment Insurance (EI) from a variety of perspectives, with a general focus on labour market adjustment and the extent to which EI benefits facilitate or impede workers returning to employment. An area that has received a much less thorough examination is the broader effect that EI has on family decisions. Understanding how families respond to an unemployment spell of one of its members is important, because these economic shocks can have severe effects on families, and not just on the individual who ceases to be employed. This paper investigated the extent to which EI eligibility dampens or crowds out the female labour supply in response to an unemployment spell of the male spouse.

In contrast to Cullen and Gruber's (2000) results based on United States data, this study finds weaker evidence that eligibility for EI benefits crowds out the female labour supply in response to the spouse becoming unemployed. The results suggest that EI eligibility has a small and negative effect on the probability of the female spouse being employed, and on the number of hours worked as measured over the entire unemployment spell. This finding is robust across various approaches to modelling labour.

Alternatively, the results suggest that in the absence of EI benefits, female spouses would work more in response to their spouses becoming unemployed. This also confirms the more general point that EI influences the labour market behaviour of other members of the household besides the potential claimant. That EI has an effect beyond the individual beneficiary is perhaps not surprising, and it should be stressed that the outcome is not necessarily a negative one from a social welfare perspective: If EI is discouraging able individuals who are in a position to take on more (or any) work, this may suggest EI is having an adverse effect. In contrast, if it is allowing individuals to maintain current family obligations and providing income security to young families, then this may be quite beneficial.

The overall conclusion is that there is evidence that qualifying for EI benefits crowds out some female labour supply. Across a range of estimation techniques and alternative parameterizations of the dependent variable, we find a consistently negative relationship between potential eligibility for EI and female labour supply. Decomposing the data in various ways reveals that EI crowding-out is most pronounced in households where the reason for unemployment is non-seasonal and in families with children. The main channel of effect appears to be through the decision for the female to work when the spouse becomes unemployed, rather than adjustment in hours worked, with EI eligibility reducing the likelihood that the female starts working. The underlying suggestion is that there is an added worker effect (mitigated by EI eligibility) that is driven by employment incidence rather than hours of work. This is interesting since it seems reasonable to think that hours of work might be adjusted more easily than securing new employment. This is clearly an important avenue for further research.

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