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Family Income Dynamics after a Job Separation

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Introduction

When a member of the family experiences a job separation, *ceteris paribus*, the income of the family in question declines immediately. However, the income of this family in the short-run (say 10 months after the job separation) and the medium term future (20 months later) is *a priori* unknown.¹ This lack of clear theoretical predication may be explained by the debate between the discouraged workers and additional workers hypotheses of the theory of labour force participation.² It may also be explained by the characteristics of North American labour markets and families. Many North American families have multiple-income earners per family or may have members who may enter the labour force if necessary. Although this provides the family unit more flexibility than the simple “additional worker” model (extra hours of work by employed members of the family as well as the “additional worker” may conceivably compensate for an income decline in the short-run), it makes testing of the additional worker hypothesis more difficult.

The “additional worker” effect, which is well known in the literature of the labour force participation, implies that if one member of the family becomes unemployed because of inadequate demand in the economy, then other family members may enter the labour force under the pressure of the temporary decline in family income. Past research on this hypothesis was based primarily on aggregate time series. While cyclical variations may be a key factor in explaining the observed additional workers phenomenon, aggregate time series are inadequate for settling this issue. First, if the spouse or other working-age members are already in the labour market, then the families in questions cannot possibly have more members entering the labour force. Thus the so called “additional workers” can, at best, be found in a limited number of families in today’s Canadian society. Second, the foundation of the additional-worker contention is primarily based on a micro

¹ For descriptive convenience, the term “short-run” and “medium-term” mean 10 months and 20 months after a job separation, respectively.

² See Long (1948), Strand and Dernberg (1964), Dernberg and Strand (1966) and Bowen and Finegan (1969).

information (the rise and fall of individual households' incomes, and what would the other members have done if a member of the family become unemployed?³) Since the aggregate time series cannot possibly provide the researcher with the micro family information, any attempt to settle this issue with aggregate time series alone is necessarily a futile exercise. In our opinion, only longitudinal micro data have the potential of shedding some light on this long-standing issue.

This topic also has certain policy implications. The government often provides temporary income support for job separators. The need for such a policy will depend on, among other things, the state of the economy and the flexibility of the labour market. If family income cannot rebound in a relatively short period, policy makers may wish to investigate this topic in the future.

In this paper, we examine the “family income after a job separation” topic with the data from the Canadian Out of Employment Panel (COEP) Survey. Because of its basic design, the COEP Survey provides us with a unique data set for investigating the dynamics of job separators' family incomes. In each quarter, the COEP interviews about 5000 individuals. The same individuals are interviewed twice, in about 10 and 20 months after job separations. The survey collects detailed information on respondents' dates in and out of employment, reasons for unemployment, job search activities, demographic characteristics of the respondents and his or her household members, the households' expenditures, liquid assets and total incomes. The fact that the same 5000 individuals are followed between the issuing dates of the Records of Employment (ROE) and 20 months after the job separations affords us an opportunity to investigate what happened to family income at a point in time as well as what happened over time. In the future, when more

³ For the remainder of this paper, the term “family” and “household” will be used interchangeably to denote the same micro concept. It refers to a group of two or more persons who live in the same dwelling and may or may not be related to each other by blood, marriage, common-law or adoption. This concept of “family” is slightly different from Statistics Canada's definitions of “economic family” and “census family”. An “economic family” refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law or adoption. A census family refers to a married couple (with or without never-married sons and/or daughters of either or both spouses), a couple living common-law

time and data are available, we may expand the analysis to cover many cohorts (different job separators from different quarters and years), and gain a more comprehensive perspective on family income for the pre and post EI (July 1996) periods.

The objective of this study is to search for factors that may plausibly explain family income dynamics in a short-run (10 months).⁴ Although the findings shed some light on the validity of the additional worker hypothesis, they have not been designed to test the additional workers hypothesis directly, and should not be inadvertently taken as the theme of this paper.

The remainder of this paper includes four sections. First, we present a brief discussion on the determinants of family income and our general approach for conducting the empirical work. In the following section, we present the findings from our empirical work, which consists of descriptive statistics, econometric estimates, and simple “what if” simulation results. Finally, we conclude with our thoughts and observations on the implications of this study’s results.

(with or without never-married sons and/or daughters of either or both partners) or a lone parent of any marital status, with at least one never-married son or daughter living in the same dwelling.

⁴ Because of data problems, we have not analysed the data from the second interview of Cohort 3.

Sources of Family Income

The income of a family for a period (a month or a year) is necessarily equal to the sum of the labour incomes and non-labour incomes (government transfers and non-human capital investment incomes) of all family members. Therefore, the underlying forces that drive family income are the endogenous and exogenous factors of the labour market (wages and employment), non-human capital market, and government policies. This suggests that if one knows how the economic system works, then he would also know the determinants of family income. Although this would be a formidable theoretical exposition by itself, it is still a static model and is incapable of answering many questions related to the change of family income. If the analytical unit is *family*, then it is reasonable to assume that a typical family in Canada is more interested in optimizing its income over a very long period (e.g., one generation) than maximizing its monthly (or annual) income. The model, therefore, must be extended to accommodate intertemporal elements and the requirements for optimization over time. This would be an interesting challenge to theorists and model builders in the future. However, given the existing longitudinal micro-data base and knowledge of family economics, this does not seem a fruitful approach for our endeavor to answer a simple question: “What happened to a family’s income in the short-run, after a member of the family lost his or her job?”

Although there exists a considerable amount of literature on family expenditures and the distribution of family income,⁵ few published papers have discussed the determinants of family income extensively. Most of the studies briefly mention the possible sources of family income, and then proceed directly to discuss the relationship between family expenditure and family income, or the evolution of family-income-distribution issues over time. In our survey of literature, we have found that only Miles (1997) is an exception, which has a fairly comprehensive discussion on the topic.

⁵ For Canadian literature, see Blackburn and Bloom (1993), Rashid (1994), Browning (1995), Hatfield (1996), Beach and Slotsve (1996), and Browning (1998). For American literature, see Altonji, Hayashi, and Kotlikoff (1992), Burtless (1993) Gottschalk (1993), Sloane and Theodossiou (1996), and Miles (1997).

Miles' paper is primarily a study of "consumption at the household level", but its author recognizes that household income should also be endogenously determined. Therefore, prior to estimating the household consumption equation, he devotes considerable space to discuss this topic.

His theoretical approach starts with an expected household utility function, which is assumed to be the sum of current and future utilities of the household. Current and future utilities are, in turn, defined as a function of current and discounted future consumption. The model consists of the maximization of an objective function (i.e., the utility function) over the life of the household, subject to the constraint that, for any given period, "a household's consumption = the household's after tax labour income + non-human capital income + change in wealth". Based on Skinner's solution⁶ to a similar optimization problem and some algebraic manipulations, Miles' consumption specification in a reduced form is a function of the household expected income (fitted value from an estimated income equation), income uncertainty, number of people in the household, number of workers in the household, etc. Since the theme of our study is not household consumption, we will not discuss the pros and cons of Miles' household consumption equation here.

Our interest is in his specification of the household income equation, which he uses to estimate the expected household income and income uncertainty required for explaining household consumption. Miles defines household income as the sum of the labour income and non-labour income of all family members. In the paper, only the source of labour income is discussed, and investment income (non-labour income) is implicitly assumed to be exogenous. Household labour income is specified as a function of a vector of personal attributes (age, marital status of household, sex of the head of household, number of working people in the household, number of adults in the household, number of children, occupation/employment status of head of household) and experience

(approximated by a quadratic function of age.)⁷ The chosen functional form (semi-log) and the included explanatory variables have not been fully explained in the text, but the author cites Mincer (1958) and Willis (1986) as the theoretical justification for such a specification.

In our study, we have used descriptive statistics as well as econometric estimation to see what happened to a family's income after a member of the family experienced a job separation. In the econometric work, a logistic model is used to estimate the probability of having a family's income "up/the same" or "down" 10 months after a job separation. The dependent variable is therefore "qualitative", which is largely dictated by the limitation of the COEP data.

The COEP Survey has 3 questions that may provide us with the necessary information for defining the dependent variable: (1) "Has your total household income gone up, down or stayed the same compared to the month before the Record of Employment (ROE) month?" (2) "By how much per month?" and (3) "In the past four weeks, what was the total income, before deductions, from all household members?" Questions (1) and (2) conceptually give us the same information, except that the answer to (1) is qualitative ("up", "down", or "the same"), and the answer to (2) is in terms of dollars. Mechanically, we may also calculate the total household income at ROE time. We have decided to model the answer of (1) rather than (2) or the level of total household income, because many surveyed individuals answered question (1) without answering (2) and (3).

In our econometric work, we use Miles' model as a rough guideline for specifying our estimating equation. However, because the dependent variable of our estimated equation is related to the "change in family income" whereas Miles' dependent variable is the level of household income, Miles' specification cannot be adopted without modifications. In our specification, the explanatory variables are similar to Miles' variables in concept but

⁶ See Skinner (1988).

⁷ This specification may trace its origin to Willis (1986), which present an extensive discussion and justification for a similar specification.

different in functional form. Where appropriate, we have converted the variables into the first difference forms. Furthermore, *a priori*, employment status at the time of the interview is the most important factor in determining the “up or down” of a family’s income after a job separation. This is beyond the scope of Miles’ model but is included as one of the explanatory variables in our specification.

“Transfer payments” from the government is another important source of household income that does not appear in Miles’ model. In our study, unemployment insurance (UI) benefits cannot enter the estimated logistic equation directly, because by definition UI benefit recipiency is negatively correlated with employment (in other words, if the person was employed at the time of the interview, he was not a UI benefit recipient or vice versa). Since we have employment status on the right-hand side of the equation, it is technically and conceptually incorrect to include UI benefits as an explanatory variable as well. The role of UI benefits on the family incomes for those who remained unemployed at the time of the interview is discussed in terms of descriptive statistics in the empirical section of this paper.

The next section consists of our presentation and discussion of descriptive statistics, the estimated logistic equation, and simulation results. The discussion focuses on the plausible factors that have significant impacts on the change in family income after a job separation.

What Did the Data Say?

The data

Since July 1995, a sample of about 5000 employment insurance claimants is randomly selected into the COEP Survey in each quarter. As discussed, the COEP Survey traces the same respondent twice, about 10 months and 20 months after the job separation. Information pertaining to the ROE date is collected using recall questions. The Survey contains detailed information about the respondent's employment history, job search activities, demographic characteristics of the respondents and his or her household members, household income, etc. We have supplemented this data set with the HRDC administrative data set to get general economic variables, such as the regional unemployment rate, as well as the dollar amounts of UI benefits received.

This study uses information contained in the first interview of cohort 3 (i.e., the group of individuals who experienced job separations during the 1st quarter of 1996). In the descriptive statistics section, 4062 observations are used. Eliminating 662 observations which have missing values, the regression analysis utilizes the remaining 3400 observations. We have restricted the data set to exclude all individuals who were unattached (no other household members) at the 1st interview.

For workers who are still unemployed 10 months after their job separation, supportive income from additional workers and government transfers, such as UI benefits, likely account for a significant proportion of household income. Although the employment status of other household members can be incorporated into the econometric model, the contribution of UI benefits to household income can only be analyzed with descriptive statistics. As discussed briefly earlier, in our econometric model the dependent variable is a binary variable representing whether the family income increased/remained unchanged or decreased since the job separation date (ROE date). If we include UI benefits on the right-hand side, this necessarily implies the individual is unemployed at

the time of the first interview, which is, *a priori*, correlated with the employment status variable. As long as the dependent variable refers to families whose job separators might or might not be employed 10 months after their initial layoffs, to include both employment status and UI benefits as explanatory variables in the equation is a technical and conceptual error. If a job separator's family income declines immediately after a layoff, then what happens to the family income after the same individual regains his employment status is clearly crucial to the theme of this paper. The answer to this question sheds light on the functioning of the labour market as well as the importance of employment and unemployment on family income in the post job-separation period. For this reason, we have selected employment status (not UI benefits) as one of the explanatory variables in the specification.

We analyze the data first with descriptive statistics to try to understand the household attributes as well as other factors' influences on family income. Then we verify some of these observations with a logistic model, incorporating the relevant control variables as described in the previous section.

Using the estimated model, various scenarios are simulated. To compare the results among different regions, a simulation that characterizes the typical family of each region (B.C., Prairies, Ontario, Quebec and the Maritimes) is constructed. A different simulation highlights the impact of the respondent's employment status variable, and another scenario is designed to illustrate the influence of the employment status of other household members. The main objective of these simulations is to provide the reader with a "quantitative feel" of the impacts of various factors.

Descriptive statistics

The gender breakdown of job separators was fairly even: 56.2% males and 43.8% females. Over 50% of the job separators had some secondary or had completed secondary school. 70.1% of all job separators were employed by the time of the first

interview, with median family income dropping slightly from the ROE to the 1st interview (10 months later) by about 3.4%. However, at the time of the first interview, 66 percent of the families reported that, compared to their pre-ROE incomes, their family incomes were up or remained the same. Apparently, the statistics for median income should be interpreted cautiously. They do not mean that most of the families in question experienced a decline in family income in the post job separation period.

There was a significant increase in the percentage of households with more than one worker at the time of the first interview, by about 7.5%. For males, the increase was about 6.9%, while for females the increase was closer to 8%. Over 62.0% of all job separators were from Ontario and Quebec and 22.5% were from BC and Alberta.

Over 70% of all job separators were employed by 1st interview. However, while 62.2% were employed in the Maritimes, 74.5% were employed in Ontario. In particular only 55.5% of job separators in Newfoundland were employed by the 1st interview.

Close to half of the job separators (48.9%) were laid off due to business slowdown. Only 8.7% were actually at the end of their contract at the time of job separation. Other workers had quit, had left due to an injury or to family responsibilities, had returned to school, had retired, or had other reasons.

Seasonal workers made up about 32.3% of all layoffs. 9.2% of all layoffs were female seasonal workers, while 23.1% were male seasonal workers. Most of the job separators, 67.0%, were looking for either full-time or part-time work. Only 25.5% were exclusively looking for full-time work. 7.5% were looking exclusively for part-time work.

A digression: a statistical issue

Household income at the 1st interview was obtained directly from the Survey, and a recall question was used to ask the amount that the individual think his/her family income went

up (down) since the ROE. From this answer the level of income at ROE can be constructed. The sample distribution of monthly household income at both the ROE and the first interview is skewed to the left. Consequently, we will be looking at median income, in general.

Education: respondent and spouse

Limiting the sample to individuals with spouses allows a better understanding of the impact of the education level of both spouses on household income. In Figure 1, we see the change in monthly household income from ROE to 1st interview by education levels. In general, the ROE family income was considerably higher, the higher the level of joint education of the couple. For example the ROE median monthly family income was \$5000 if both spouses had some or completed their university education, versus \$2500 if both spouses had some or completed secondary school. Since the level of income at 1st interview for these households was higher than the others, and in some cases, higher than the ROE income of those with just secondary education, these households tended to experience more difficulty in returning to their ROE level of income.

On the other hand, couples with at least one person with secondary school education were generally able to return to their ROE income level, and even exceeded that level, possibly government transfers and the wages and salaries of additional working family members played an important role in determining this favourable result.⁸

Change in the number of household members

The unemployment of a key member of the family may prompt relatives of the family to join the household in order to “help out”, either by working and supplying income or by

⁸ In Cohort 3 of the COEP survey, the number of families with this class of educational attainment is not large enough for an econometric-multivariate verification, but this is an interesting topic that may be further investigated with other COEP data in the future.

supplying services as baby-sitter to enable another household member (often the spouse) to join the workforce. It is also possible that after a job separation, members of the family may leave the household to minimize the financial burden. This is more likely to happen in families with friends or extended family members living with them, or with families with adult children who can get reasonable jobs and “leave the nest”.

The data suggests, though, in most cases, about 76.5%, there were no changes in the household size. Therefore, in general, for the rest of our analysis, we may assume that there was no fundamental change in the size or composition of the household for Cohort 3. It is interesting to note that the drop in income for those households with at most 4 members was \$200 or 7.1%, significantly greater than of those households with more than 4 members, \$100 or 3.3%. Plausibly this was due to the additional worker effect, although descriptive statistics alone would not be sufficient to confirm this speculation.

Employment status of respondent

For those job separators who were employed by the 1st interview (about 70 percent of the sample), close to 78% of those households experienced an increase in income, while 59% of unemployed respondents experienced a drop in household income. The median level of household income at the 1st interview was significantly lower for unemployed respondents than for employed respondents (\$1972 versus \$3222).

Receipt of UI benefits

Among individuals who remained unemployed at the time of the first interview, 71.6% received UI benefits shortly after their job separation. Reciprocity dropped to 62.7% by the time of the first interview. This suggests that close to 10% of unemployed individuals exhausted their benefits by the time of the first interview. About 45 percent of the family income for an unemployed respondent was from UI benefits at the time of the first interview. The level of UI benefits provided an even stronger support for unemployed

single-earner families: UI benefits accounted for 57.1% of their total income by the time of the 1st interview. For those families that changed from single-earner to multi-earners, the level of benefits was lower and UI benefits accounted for 41.3% of total income. Similarly for unemployed multi-earner families with no additional workers, 40.4% of their total income was from UI benefits. The importance of UI benefits to this group of families was indisputable.

The correlation between household income at 1st interview and UI benefit reciprocity was small but definitely negative. This implies that low-income families were more likely to be receiving UI during the job separation. The correlation between the indicator for increased household income and UI benefit reciprocity was also negative.

Change in the number of family members working

In families where the respondent had a spouse, the expectation could be that as soon as a job separation occurred, the spouse would enter the workforce. At the time of the ROE, in most families (69.0%), the spouse was already employed. By the first interview, the overall percentage remained about the same. 18.4% of spouses, who were not in the workforce at ROE, were employed at the 1st interview. About 10.3% of the spouses, who were in the workforce at ROE, were no longer employed by the time of the 1st interview. For the total sample, the percentage of families with working spouses was about 69.7% at the ROE and dropped slightly by the first interview (about 2%). Among employed respondents, the percentage of families with working spouses remained about the same, while among unemployed respondents the percentage declined by approximately 6.9%. Surprisingly, among employed respondents, the percentage of spouses newly joining the workforce by the 1st interview was somewhat higher at 22.2%, while the percentage for unemployed respondents was much lower at 9.2%. The percentage of spouses leaving the workforce was very low for employed respondents (8.7%), while for unemployed respondents, the percentage was relatively high at 14.6%.

A priori, the number of workers in a family is necessarily one of the important factors in determining the total income of the family. If the number of earners in the family remained unchanged from the ROE to the first interview, the median and average family incomes *declined* by about 6.0%. In households with any additional workers by the time of the 1st interview, the median family income *increased* by about 4.6%.

If we separate the families into single-earner families at ROE and multi-earner families at ROE, we can see the dynamic effects more clearly. For families that started out as single-earner at the time of the job separation, 66.5% remained single earner by the 1st interview, while in 33.5% of all families had new members joining the workforce. Of those single-earner families who remained single-earner, 62.7% of them experienced an increase in income. Of those families who became multi-earner by the 1st interview, 71.2% (close to 10% more) of them experienced an increase in family income.

Of these single-earner families, the most significant effect of additional workers can be seen with those respondents who were unemployed at the 1st interview. If these families remained single-earner, the percentage of them experiencing an increase in income was 37.5%, much lower than the overall 62.7% in this category. If the single-earner families became multi-earner families, the percentage of them that experienced an increase in income was 53.4%--almost a 16% difference. For this sub-group, the benefit of additional workers was tremendous.

The analysis for multi-earner families yields similar results. Of those families that had additional workers join the workforce, a larger percentage of them experienced an increase in family income. For families that had multiple earners at the time of the ROE, the income levels were substantially higher, and were higher still, if after the job separation, additional family members joined the workforce.

Multivariate verification

Descriptive statistics provide us with a simple summary of what happened to the income of a family after one of its members experienced a job separation. However, over time (a 10 months period), many changes took place. What could be observed from descriptive statistics is necessarily confounded by these changes in a scrambled fashion. To distinguish the effects of these changes on family income, we need to account for a list of plausible factors simultaneously. The objective of this sub-section is to present some econometric evidence in this context.

As discussed briefly in the “Sources of Family Income” section of this paper, we have used the specification of Miles (1997) as a guideline for our work here. We have used a logistic model to investigate the relationship between the probability of improving (or the lack of) family income 10 months after a job separation and a vector of family attributes along with other external factors. The dependent variable (UP_DHY_1) is a binary indicator set to 1 if family income at the time of the first interview was “up or the same” as the income of the month prior to the ROE date, and set to 0 otherwise. Household income is defined as the sum of total gross income for all individuals in the family, including employment earnings, pensions, interest income, dividends, rents, net farm or business profits, welfare, UI benefits, etc.

Table 1 shows the estimated logistic equation. The list of explanatory variables include: the change in the employment status of other household members, the educational attainments of both the respondent and his/her spouse, the change in the number of people in the respondent’s household, the change in the liquid assets⁹, the employment status of the job separator at the time of the first interview, the economic climate¹⁰ (approximated by the unemployment rate of the UI region where the respondent resided), variables related to the nature of the respondent’s initial layoff, the size of the firm where

⁹ If job separators were unable to find sufficient income elsewhere (low-income individuals), they may convert their liquid assets into cash to make up some of the difference. So we may expect a positive relationship between the change in liquid assets and the dependent variable.

¹⁰ Since the dependent variable refers to the “change in family income over a 10 months period”, the EI regional unemployment rate at the time of the interview should also capture some seasonal effects.

he or she worked prior to the ROE date, and qualitative variables to approximate provincial differences.¹¹

The behaviour of the logistic estimation can be seen in the Classification Table (Table 2). The last column indicates the extent to which the predicted values (of the dependent variable) agree with the observed values. Therefore, 86.6% of the time, the equation correctly predicts the “Yes” or 1 value and 42.4% of the time, it correctly predicts the “No” or 0 value. Overall, the equation correctly predicts the observed values 71.7%.

The results of the estimated coefficients highlight the importance of the “employment status” variable. Re-employment of the individual is empirically the most important factors in maintaining or improving family income after a job separation. The estimated coefficient has the right sign, is more than twice the size of the next largest estimated coefficient, and is statistically highly significant. New employment of the spouse also has a strong positive impact on household income as well. However, once the employment of the spouse is accounted for, employment of additional family members (other than the spouse) from the household has positive but statistically insignificant impact on household income.

The level of education has a negative sign, and is significant—in some cases at the 1% level. One would expect that the higher the level of education, the more likely the individual would be able to regain his pre-ROE income level. However, the negative signs on the indicators for university, college and secondary relative to elementary/some secondary education are negative—implying the higher the level of education, the more likely that the income would go down after the job separation. In Figure 1, it can be seen that the level of family income for higher-educated couples is higher than for those couples with “lower” levels of education. Consequently, after a job separation, it would

¹¹ At the early stage of our econometric estimation, household type (i.e., respondent and spouse only; respondent, spouse, and children; etc.), marital status, and the ethnic origin of the respondent were also included in the list of explanatory variables. They were subsequently dropped because of their statistical insignificance and lack of influence on the estimated equation.

be more difficult for these families to regain quickly the pre-separation level of household income.

The change in the availability of liquid assets has a positive and highly significant coefficient, which is expected. If the individual's layoff is because of seasonal work rather than layoff due to other reasons (such as the company moved or went out of business, or other reasons), the results indicate that he/she would be more likely to experience an increase in income by the 1st interview. If the job separation is due to end of contract/term or business slowdown, the individual is likely to experience a decrease in income; the coefficient is negative and large and significant at the 5% level. The details about the firm, such as unionization and firm size are not significant. The provincial dummies are included to approximate provincial influences. The coefficients are not significant, and may be difficult to interpret. The coefficient for Newfoundland seems to suggest that a person who experiences a job separation here would have a better chance than his or her counterpart in Ontario in keeping the family income "up or remained the same" after a job separation. The real problem is that employment opportunity is scarce in Newfoundland. An unemployed person in Newfoundland would experience more difficulty in getting re-employed than an unemployed worker in Ontario. The sample indicates that in Ontario, 74.5% of individuals are able to find employment by the time of the 1st interview, in Newfoundland, only 55.4% of them are that lucky.

Table 1: Estimated Logistic Equation¹²

Dependent Variable (UP_DHY_1): Total family income at the first interview, up or the same=1, down=0
 Cases included in analysis: 3400

Variable	B	Standard Error	Wald	Significance
HSIZE_1-HSIZE_0	0.107	0.055	3.821	0.051
U	-0.671	0.154	19.038	0.000
COLLEGE	-0.442	0.127	12.092	0.001
SEC	-0.142	0.104	1.862	0.172
SOMEU	-0.320	0.175	3.358	0.067
SOMECOL	-0.511	0.163	9.780	0.002
SPOU_U	-0.041	0.151	0.075	0.784
SPOU_COL	-0.125	0.137	0.825	0.364
SPOU_SEC	-0.064	0.099	0.425	0.515
SPOU_UC	-0.041	0.156	0.070	0.792
ESPOU_1-ESPOU_0	0.697	0.114	37.064	0.000
(E_HTOT_1-ESPOU_1)- (E_HTOT_0-ESPOU_0)	0.073	0.092	0.634	0.426
LIQUID_1-LIQUID_0	0.238	0.068	12.158	0.000
LAYOFF_C	-0.525	0.208	6.386	0.012
LAYOFF_S	0.299	0.103	8.434	0.004
RECALL	0.133	0.086	2.380	0.123
AGE_U25	0.211	0.126	2.804	0.094
GENDER	0.096	0.083	1.340	0.247
ESELF_0	-0.541	0.233	5.401	0.020
FIRMS_SS	-0.058	0.098	0.354	0.552
FIRMS_S	-0.168	0.124	1.828	0.176
FIRM_M	-0.014	0.151	0.008	0.927
EPERM	-0.028	0.087	0.101	0.750
UNION_0	0.065	0.097	0.453	0.501
E_1	1.492	0.084	312.67	0.000
UR3_1	-0.006	0.014	0.193	0.661
QUE	0.049	0.168	0.083	0.773
NB	-0.138	0.171	0.646	0.421
PEI	0.245	0.218	1.267	0.260
BC	-0.049	0.160	0.940	0.759
NS	0.212	0.197	1.154	0.283
NFL	0.342	0.217	2.491	0.115
SASK	-0.204	0.170	1.441	0.230
MANITO	-0.074	0.165	0.199	0.656
ALBERTA	0.012	0.178	0.005	0.946
CONSTANT	-0.310	0.232	1.792	0.181

Table 2: Classification Table

Observed	Predicted		
	Family income up or the same		Percentage correct
	No	Yes	
No	485	660	42.4
Yes	302	1953	86.6
Overall percentage			71.7

¹² For the definitions of all variables, see Appendix A.

Post-estimation Calculations

To illustrate the relative importance of economic factors, four scenarios are investigated to see various factors' impacts on family income 10 months after a job separation. The base case is "taking all historical values of the explanatory variables as given". Using the historical data, the probability that income would increase 10 months after a job separation is about 66%.

The "what if" scenarios

In Scenario 1 (Figure 2), workers remained unemployed since the job separation (ROE), and the UI regional rates of unemployment remained unchanged since the ROE. The incomes of these families were necessarily supported by other income, from government transfers, earnings of other family members and liquid assets. By keeping the UI regional rate of unemployment unchanged, the ROE economic climate and seasonal effects were maintained. The simulation results indicate that, relative to the base-case scenario, the probability for the hypothetical family income to improve (i.e., family income greater than or equal to the income of the pre-ROE month) would have been significantly lower.

Scenario 2 (Figure 3) looks at the probability that the respondent was able to maintain or increase family income without additional support from other family members (the spouse or other household members' employment status remained unchanged) and there were no changes in liquid asset holdings. Such a scenario would have lowered the probability of family income improvement slightly (from 66% to 64%).

This seems to indicate that there is some support for the additional worker hypothesis. However, in Scenario 2a (Figure 4), when we keep the historical value on liquid assets as given and the remaining components identical to Scenario 2, there does not seem to be any difference between the hypothetical and historical scenario. We tentatively conclude that the impact on income seems to come entirely from the change in liquid assets. This by itself does not refute the additional worker hypothesis. It simply confirms that,

regardless of circumstances, most families did not have potential members who might enter the labour force.

In Scenario 3 (Figure 5), a typical household is created for each of the five major regions: Maritimes, Quebec, Ontario, Prairies and British Columbia. To each variable, we assign the values with the highest frequencies to construct a typical household. In this way, the typical household in each region is compared. The only variable that is left unchanged (i.e, identical to the historical value) is the employment status of the respondent, because it has too strong an influence on the household income. The unemployment rate is taken as the average of all the UI economic regions within each major region. The results show that, for these artificial (hypothetical) families, probability of family-income improvement is highest in Ontario, with Quebec as a close second, and British Columbia is last in the group.

Concluding Remarks

In this study, because of time and resource constraints, we have only analyzed the data from the first interview of Cohort 3 of the COEP Survey, which covers individuals (families) who experienced job separations in January to March 1996. In the near future, when more time and data are available, we may (a) extend the analysis to other cohorts, and (b) expand the scope of the analysis to cover issues untouched here (e.g., seasonal and cyclical effects, variations over the pre and post EI periods, etc.)

The limited data and preliminary nature of the analysis naturally render the messages from this study rather suggestive and tentative. Having said that, we may provide the reader with a few general observations:

- The Canadian labour market was quite flexible and seemed to serve most families with job-separation experiences well. Ten months after job separations, most of the families were able to bounce back and had family incomes that were greater than or equal to those of the pre-unemployment levels.
- In the short-run (10 months after a job separation), job separators with relatively high educational attainments, which also had relatively high family incomes prior to the initial layoffs, tended to have more difficulty than their counterparts of lower educational backgrounds in getting their families income back to their pre-ROE levels. This was apparent from the findings of descriptive statistics and the estimated logistic equation. In a longer timeframe, the story may be different. We have not used the data from the second interview, which took place twenty months after the job separation, to settle this issue. This is primarily because of the limitations of the data from the second interview. It has only one question to collect family income data: “In the past four weeks, what was the total income, before deductions, from all household members?” Many respondents left this question unanswered. This rules out the possibility of having a legitimate comparison of results for the two interviews. In the future, we will revisit this issue with data from the other Cohorts of COEP.

- Employment at the time of the first interview is the most important factor in determining family incomes in the post-job separation period. On the other hand, regional differences (apart from differences in economic climate) can hardly be considered an important factor.
- The estimated logistic equation and simple simulation calculations suggest that the empirical evidence is consistent with the contention of the proponents of the additional-worker hypothesis. However, the effect is quantitatively negligible. This is evident from the simulation results as well as the raw data, which show that only a small number of families had additional members working in the post job separation period.
- For job separators who had difficulty in obtaining gainful employment after the initial lay-off, UI benefits accounted for a relatively large portion of their family incomes. UI remained an important part of the Canadian social safety net for many families.

Fig. 1 Monthly Household Income (Median) By Education Level of Couples

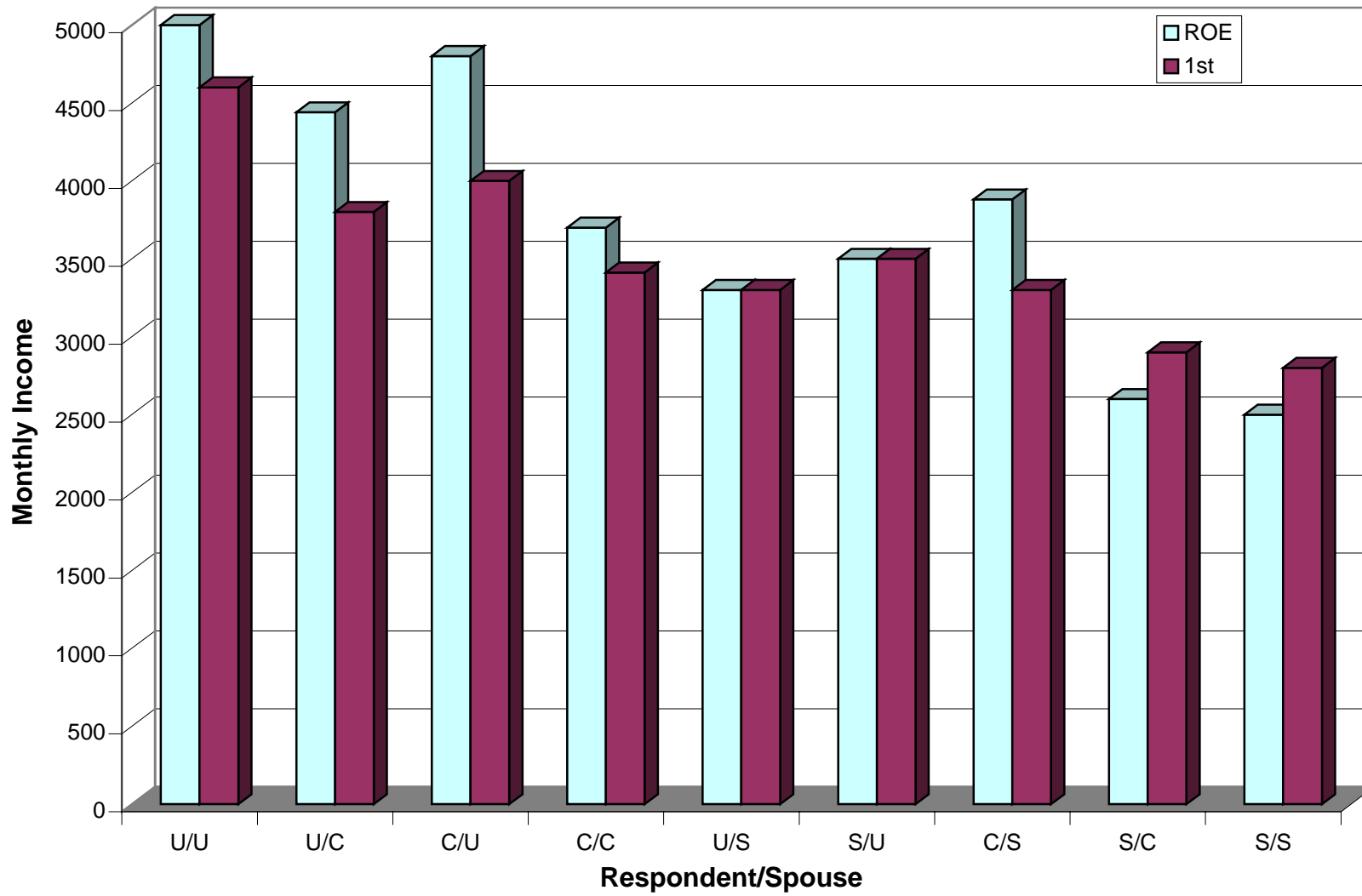
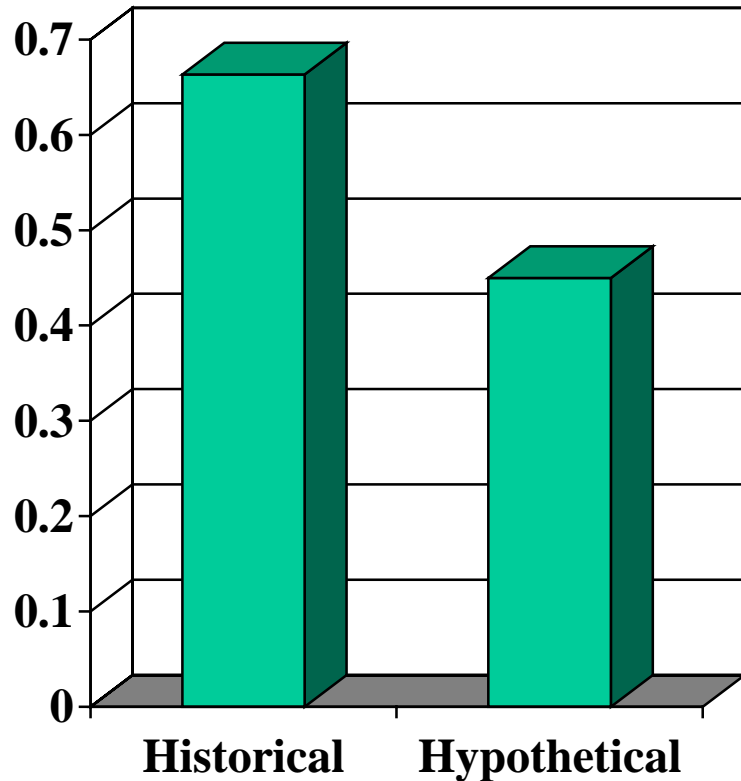
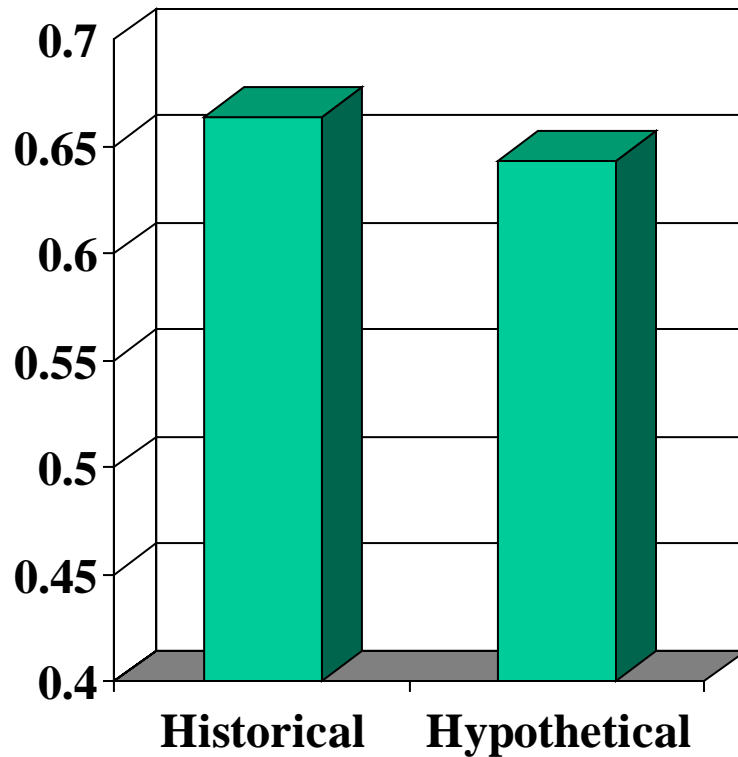


Figure 2: Hypothetical Scenario 1-- Probability of Having Household Income Gone up 10 Months Later, What If



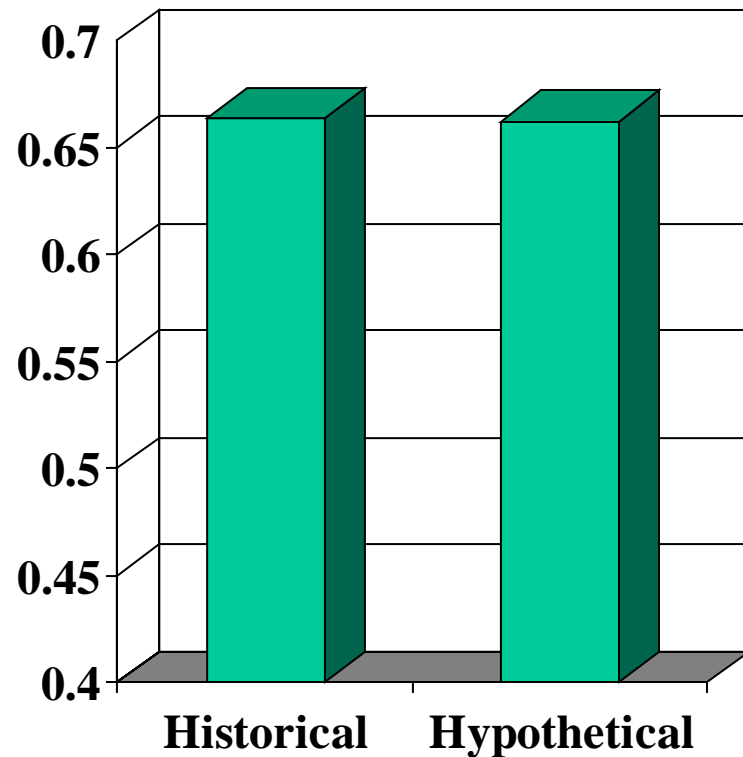
- Workers remained unemployed since job separations
- UI regional rates of unemployment remained unchanged since the ROE time

Figure 3: Hypothetical Scenario 2 -- Probability of Having Household Income Gone up 10 Months Later, What If



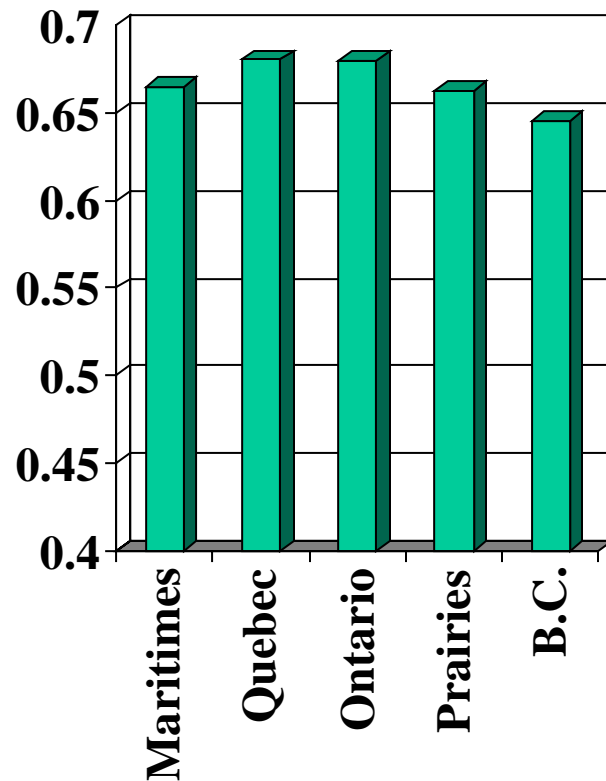
- No changes in household sizes
- Spouses' employment status unchanged
- Other household members' employment status unchanged
- No changes in liquid assets holdings

Figure 4: Hypothetical Scenario 2a -- Probability of Having Household Income Gone up 10 Months Later, What If



- No changes in household sizes
- Spouses' employment status unchanged
- Other household members' employment status unchanged

Figure 5: Hypothetical Scenario 3 -- Typical Household by Region --
Probability of Having Household Income Gone up,
10 Months after a Job Separation



- No change in household size: All regions
- Job separator completing high school: Maritimes, Ontario, Prairie, and B.C. The average job separator in Quebec left high school before graduation
- Spouse completing high school: All regions
- No change in spouse's employment status: All regions
- No change in other household members' employment status: All regions
- No change in household's liquid assets: All regions
- Layoff for reasons other than company closing or seasonal work: All regions
- Expecting a recall: All regions
- Age over 25: All regions
- Male: All regions
- Working for a small firm: All regions
- Permanent employment: Quebec, Ontario, Prairies, and B.C. only
- Union membership: No for all regions
- Employment status: As recorded
- Unemployment rate: Average of EI regions

General Characteristics of Job Separators

Table 3: Male/Female Respondents¹³

Job Separator	% of all job separators	% Employed at 1 st Interview	Median Income Level at ROE (Mean)	Median Income Level at 1 st Interview (Mean)
All	100.0	70.1	\$3000 (3401)	\$2900 (3168)
Male	56.2	69.5	\$3180 (3525)	\$3000 (3233)
Female	43.8	70.9	\$2779 (3245)	\$2800 (3083)

Table 4: Male/Female Respondents

Job Separator	% of all job separators	Median Level of UI Benefits (Mean)	At ROE, % of HH with No. Workers>1	At 1 st , % of HH with No. Workers>1	% Seasonal Worker
All	100.0	\$420 (591)	62.2	69.7	32.3
Male	56.2	\$496 (664)	59.4	66.3	23.1
Female	43.8	\$331 (488)	65.9	74.0	9.2

Table 5: Employed vs. Unemployed at 1st Interview

Job Separator	% of all job separators	Household Incomes Increased	Median (Mean) Income at ROE	Median (Mean) Income at 1 st
All	100.0	66.7%	\$3000 (3401)	\$2900 (3168)
Unemployed at 1 st Interview	30.0	40.8%	\$2500 (2945)	\$1972 (2190)
Employed at 1 st Interview	70.1	77.7%	\$3400 (3657)	\$3222 (3565)

Table 6: Importance of UI benefits for Unemployed

Job Separator	Mean Household Income	UI Benefit Reciprocity Between ROE & 1 st	UI Benefit Reciprocity At 1 st Interview	Mean Level of Benefits	Mean UI Benefit/ Income Ratio ¹⁴
All	\$3168	60.4%	35.3%	\$591	0.244

¹³ For all the tables, unless stated otherwise, the data is weighted.

¹⁴ Outliers where the UI Benefit/Income ratio was greater than 1 were not included in calculating the mean. There were not many outliers in the sample.

Unemployed	\$2190	71.6%	62.7%	\$945	0.452
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Table 7: Change in Household Size from ROE to 1st Interview

Number of Additional Members	-2	-1	0	+1	+2
Total	2.9%	11.9%	76.5%	6.25%	1.25%
Households with at most 4 members¹⁵	4.6%	16.1%	73.8%	4.6%	0.0%

Table 8: Household Income-- Median (Mean)

Household Size	At most 4 members	More than 4 members
ROE	\$3000 (3384)	\$3100 (3536)
1st	\$2800 (3147)	\$3000 (3308)

¹⁵ At ROE, about 86.3% of all households had at most 4 members.

Table 9: Percentage of Families with Income Increased/ Stayed the Same--with/without Additional Workers by 1st Interview

	No Additional Workers 0	Additional Workers >0	All Households
Percentage of Households With	74.7%	17.9%	100.0%
All Job Separators	67.4	71.8	66.7
Unemployed at 1st	40.8	51.2	40.8
Employed at 1st	79.1	78.1	77.7

Table 10: Single Earner-Families at time of ROE (37.8% of All Job Separators)

	No Change in Workers by 1st Interview 0	With Additional Workers at 1st Interview >0
Total Percentage	66.5%	33.5%
% of Total Families whose Income Increases	62.7%	71.2%
% of Families whose Income Increases—Unemployed at 1st	37.5%	53.4%
% of Families whose Income Increases--Employed at 1st	78.4%	76.2%
At 1st Interview		
HH Income^t Median (Mean)	\$1800 (2096)	\$2800 (3150)
UI Benefits Median (Mean)	478 (640)	203 (421)
UI / Income Ratio Overall Median (Mean)	0.2265 (0.3165)	0.0 (0.1271)
UI / Income Ratio for Unemployed Median (Mean)	0.5623 (0.5713)	0.3686 (0.4130)
UI / Income Ratio for Employed Median (Mean)	0.0 (0.1211)	0.0 (0.0572)

Table 11: Multiple Earner-Families at time of ROE: (62.7% of All Job Separators)

	No Change in Workers by 1st Interview 0	With Additional Workers at 1st Interview >0
Total Percentage	79.7%	20.3%
HH Income Increases	69.9%	73.3%
HH Income Increases Unemployed at 1st	43.3%	46.8%
HH Income Increases Employed at 1st	79.4%	83.3%
At 1st Interview		
HH Income Median (Mean)	\$3420 (3754)	\$4000 (4374)
UI Benefits	\$413 (587)	\$320 (605)
UI / Income Ratio Overall	0.1400 (0.2175)	0.1230 (0.1837)
UI / Income Ratio for Unemployed	0.4286 (0.4039)	0.2034 (0.2159)
UI / Income Ratio for Employed	0.0100 (0.0965)	0.0818 (0.1072)

Appendix A: Definitions of Variables

UP_DHY_1: Dependent variable; equal to 1, if, compared to the month before the job separation [i.e., the Record of Employment (ROE) month], the respondent's total family income was up or the same, otherwise equal to 0.

HSIZE_1-HSIZE_0: Family size at the time of the first interview minus family size at the time of ROE.

U: Equal to 1, if the respondent completed university or teacher's college, otherwise 0.

COLLEGE: Equal to 1, if the respondent completed community college, technical college, CEGEP or nurse's training, otherwise 0.

SEC: Equal to 1, if the respondent completed secondary school, otherwise 0.

SOMEU: Equal to 1, if the respondent had some university or teacher's college education, otherwise 0.

SOMECOL: Equal to 1, if the respondent had some community college, technical college, CEGEP or nurse's training, otherwise 0.

SPOU_U: Equal to 1, if the spouse of the respondent completed university or teacher's college, otherwise 0.

SPOU_COL: Equal to 1, if the spouse of the respondent completed community college, technical college, CEGEP or nurse's training, otherwise 0.

SPOU_SEC: Equal to 1, if the spouse of the respondent completed secondary school, otherwise 0.

SPOU_UC: Equal to 1, if the spouse of the respondent had some university, community college, technical college, CEGEP or nurse's training, otherwise 0.

ESPOU_1-ESPOU_0: "Equal to 1, if spouse was working at the time of the first interview, otherwise 0" minus "equal to 1, if spouse was working the time of ROE, otherwise 0".

(E_HTOT_1-ESPOU_1) – (E_HTOT_0-ESPOU_0): "Excluding the respondent and spouse, number of family members who were working at the time of the first interview" minus "excluding the respondent and spouse, number of family members who were working at the time of ROE".

LIQUID_1-LIQUID_0: “Equal to 1, if the family had some liquid assets at the time of the first interview, otherwise 0” minus “equal to 1, if the family had some liquid assets at the time of ROE, otherwise 0”.

LAYOFF_C: Equal to 1, if the main reason the respondent’s ROE was issued because of the end of contract, end of term or business slowdown, otherwise 0.

LAYOFF_S: Equal to 1, if the respondent’s layoff was because of the seasonal nature of work, otherwise 0.

RECALL: Equal to 1, if the respondent expected to return to work for the same employer at the time of ROE, otherwise 0.

AGE_U25: Equal to 1, if the respondent was under 25 at the time of the interview, otherwise 0.

GENDER: Equal to 1, if the respondent was male, otherwise 0.

ESELF_0: Equal to 1, if the respondent was self-employed at least once between July 1995 and November 1996 (reference period for the first interview of Cohort 3), otherwise 0.

FIRMS_SS: Equal to 1, if the respondent was employed by a firm of less than 20 workers prior to the ROE time, otherwise 0.

FIRMS_S: Equal to 1, if the respondent was employed by a firm of 20 to 99 workers prior to the ROE time, otherwise 0.

FIRMS_M: Equal to 1, if the respondent was employed by a firm of 100 to 499 workers prior to the ROE time, otherwise 0.

EPERM: Equal to 1, if the respondent was a permanent employee prior to the ROE time, otherwise 0.

UNION_0: Equal to 1, if the respondent was covered by a union contract or collective agreement prior to the ROE time, otherwise 0.

E_1: Equal to 1, if the respondent was employed at the time of the interview, otherwise 0.

UR3_1: The unemployment rate of the UI region where the respondent resided at the time of the interview.

QUE: Equal to 1, if the respondent was a resident of Quebec, otherwise 0.

New Brunswick: Equal to 1, if the respondent was a resident of New Brunswick, otherwise 0.

PEI: Equal to 1, if the respondent was a resident of Prince Edward Island, otherwise 0.

BC: Equal to 1, if the respondent was a resident of British Columbia, otherwise 0.

NS: Equal to 1, if the respondent was a resident of Nova Scotia, otherwise 0.

NFL: Equal to 1, if the respondent was a resident of Newfoundland, otherwise 0.

SASK: Equal to 1, if the respondent was a resident of Saskatchewan, otherwise 0.

MANITO: Equal to 1, if the respondent was a resident of Manitoba, otherwise 0.

QUE: Equal to 1, if the respondent was a resident of Quebec, otherwise 0.

ALBERTA: Equal to 1, if the respondent was a resident of Alberta, otherwise 0.

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