Income Support Programs and
Labour Market Behaviour in Canada
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Abstract

Income support programs constitute an integral component of modern labour markets and represent significant fiscal commitments on the part of governments. This thesis examines two key income support programs in Canada and their impact on labour market outcomes, namely employment insurance (EI) and social assistance (SA). Together expenditures on EI and SA represented approximately 2 per cent of Canadian GDP in 1998-99 and influenced a range of labour market decisions relating to labour force participation, employment and unemployment spells.

The analysis in this thesis provides new evidence on the role of the EI and SA programs on labour market outcomes by examining the interface between the programs and labour market behaviour. An analysis of the take-up of SA amongst a sample of SA eligible individuals is also undertaken that provides new evidence on the determinants of participation in the SA program in Canada. The analysis in this thesis uses the 1997 Canadian Out of Employment Panel dataset, a unique dataset that provides detailed information on the use of income support programs and employment patterns, and detailed information on a rich set of personal and household characteristics.

The approach adopted in this thesis is to use a generalized probability transition model to examine the nature of the interface between income support programs and their effect on labour market outcomes. This approach allows the implications of changes in either program for use of the other program, and overall labour market outcomes, to be identified. The analysis of the SA take-up decision uses a discrete choice framework that explicitly takes account of the potential endogeneity of benefit levels available to the individual.

A number of conclusions can be drawn from the analysis undertaken in this thesis. First, when the generosity of the SA program is reduced, individuals decrease use of both the SA and EI programs. Conversely, reducing the generosity of the EI program results in an increase in the use, albeit relatively small, of the SA program. The results of the analysis of the take-up decision of the SA program point to the key role of benefit levels and previous use of the program as determinants of the likelihood that an individual takes up SA.

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Chapter 1 – Introduction

Income support programs constitute an integral component of modern labour markets. The design and parameters of these programs influence an array of decisions such as labour force participation and the choice of work and leisure patterns. Furthermore, the cost of these programs represents significant fiscal commitments on the part of governments.

This thesis examines a number of aspects of two key income support programs in Canada, namely employment insurance (EI) and social assistance (SA). Government outlays on these programs together represented approximately 2 per cent of Canadian GDP during the period 1998-99. The impact of these programs on a wide variety of labour market outcomes such as the length of employment and unemployment spells, the labour force participation decision and program participation has been identified in the literature.

The analysis in this thesis provides new evidence on the relationship between these programs and their impact on labour market behaviour and outcomes. The analysis has two broad components. First, an analysis is undertaken of the relationship between the two programs and their joint impact on labour market outcomes. Second, the decision to take-up SA by eligible persons is examined using a discrete choice framework.

The analysis in this thesis is made feasible through a unique dataset, the 1997 Canadian Out of Employment Panel (COEP) dataset. This dataset provides information on the use of income support programs and employment patterns following separation from employment and detailed information on a rich set of individual and household characteristics. This provides an opportunity to examine aspects of the relationship between income support programs and labour market outcomes that have previously received limited or no attention in the literature.

The thesis is organized into six chapters. Chapter two is a literature survey that examines previous analyses of the SA and EI programs in Canada. This survey highlights the limited knowledge of the interface between these two programs and their joint influence on labour market outcomes in Canada. Previous analyses have generally focussed on a single program and ignored the impact that changes in one program may have on use of the alternative program and overall labour market outcomes. This, it

is argued, represents a significant limitation on previous analyses, as it does not allow the identification of the overall impact of variation in a single program on labour market outcomes.

Chapter three explores the relationship between patterns of employment and the use of the EI and SA programs following separation from employment using the COEP dataset. The analysis examines patterns of program use at different points in time and over time in the periods following separation from employment. Transitions between alternative labour market states, including the receipt of income support, are also examined. The analysis highlights the importance of both programs in determining labour market behaviour and the potential nature of the interaction between the alternative income support programs. The identification of the importance of the SA program for income support purposes when EI is otherwise unavailable is a key finding of this analysis. This in turn suggests that variation in the generosity and availability of either program is likely to influence the use made of both programs.

Chapter four provides a more formal econometric analysis of the relationship between the SA program, EI program and overall labour market outcomes. A generalized transition probability model is estimated in which the determinants of spells in various labour market states following job separation are analyzed along with the determinants of transitions between states. The results of this analysis allow labour market behaviour under alternative policy scenarios to be simulated for policy analysis purposes.

A number of key results emerge from the analysis in chapter four. First, there is some evidence that although reductions in the generosity of one program may be offset by greater use of the other program, the programs can not be simply characterized as 'substitutes' for one another. When a reduction in the generosity of the EI program is modelled, the results of the simulation exercise points to greater use of the SA program and lower use of the EI program. This result is consistent with some earlier studies that have identified the importance of the SA program for individuals when benefits under the EI program are not otherwise available. Conversely, simulation of a reduction in the generosity of the SA program results in lower use of both the SA and the EI programs. The second key result is that variation in the EI program that makes eligibility for the EI program more difficult to establish has a more pronounced impact on the use of the SA program than those changes that curtail entitlement once eligibility has been established. This result is clearly significant from a policy perspective as it highlights an important avenue via which changes in one program influence the alternative program. This result is particularly important in light of the division of administrative and

fiscal responsibilities between federal and provincial governments for the EI and SA programs. Policy makers at both levels of government should be concerned about the total impact of changes in one program arising from the unilateral action of a single government.

Chapter five examines an aspect of the Canadian SA program not previously considered, namely the take-up of SA by those identified as SA eligible. Previous analyses have not been able to identify a set of SA eligible individuals in part because the SA program is designed to provide support for the household and analysis of the take-up decision requires information on household income and asset levels. The analysis in chapter five identifies the importance of benefit levels and recent use of the SA program for the take-up decision. The results are important for a number of reasons. First, for policy makers the response to changes in benefit levels is key to understanding the fiscal implications of varying SA benefit levels. Further, if SA programs are designed to assist those deemed needy, it is important to identify which characteristics, if any, influence the take-up of SA. This is significant for the design of programs and their delivery systems. The central importance of recent SA use on the take-up decision highlights the need to understand the process by which individuals initially enter the SA rolls.

Chapter six offers conclusions from this analysis.

Chapter 2 – The Canadian Social Assistance and Employment Insurance Programs

2.1   Introduction

Employment insurance (EI) and social assistance (SA) represent two of the most important income support programs in Canada. Over the past decade, however, the burgeoning use and cost of both programs has encouraged governments at the federal and provincial levels to make substantial changes to both programs (Barrett and Cragg, 1998). In light of these changes, various aspects of the impacts of both programs on Canadian labour market outcomes remain unresolved.

While both EI and SA programs can be used to provide financial support during periods when employment income is interrupted, the goals of the two programs differ substantially. As its name implies, EI is principally an insurance scheme designed for workers who suffer a loss of employment earnings for one reason or another. Social assistance, in comparison, is a universal needs-based income support program available to all 'in need' households irrespective of the source of hardship.

The fact that both EI and SA potentially provide income support during periods of no or little employment suggests that both programs will influence labour market behaviour. Decisions that may be influenced include the labour force participation decision, choice of hours of work and temporal patterns of employment. Previous studies of the EI or SA programs have tended to focus on a single program and excluded consideration of the alternative (Ham and Rea, 1987; Corak, 1994 and Christofides *et al.*, 1997). To the extent that both programs fulfil income support roles, there is reason to believe that both programs will jointly determine labour market outcomes. Furthermore, changes to one program may 'spill-over' or affect use of the alternative program. The joint influence of both programs on labour market behaviour is potentially important and is likely to have been heightened by recent changes that have limited their generosity.

This survey reviews studies of the impact of EI and SA programs on labour market outcomes in Canada. Such a survey serves two purposes: first to identify what we know of the impact of the programs currently and, second, to emphasize potential paths by which the programs may interact in labour market decisions. The structure of the review will be as follows. Initially a brief description of

the structure of both programs is presented. Next, the potential ways in which the two programs may interact is considered. Studies that have examined either the EI program or the SA program are then reviewed and significant findings of those studies discussed. Following this, the few studies that have considered both programs are examined. Finally some conclusions are drawn.

2.2 The Employment Insurance and Social Assistance Programs in Canada

Employment insurance (formerly unemployment insurance) and social assistance are key components of social policy in Canada. In 1998-99, EI and SA expenditures for these program amounted to approximately $12 billion and $11 billion respectively (Human Resources Development Canada 2000). Expenditure on these programs together represented approximately two per cent of Canadian GDP over that period.

Employment insurance, as its name suggests, is an insurance program in which payments are time limited, taxable, based on previous contributions, and in which eligibility depends on active labour force participation. Payments are not means tested but are capped by limiting the maximum amount of insurable earnings. The EI program is an insurance system designed to assist labour market participants during periods of non-employment, where non-employment may arise for a variety of reasons such as layoff or maternity. A description of the EI system and of recent changes to the program is set out in Nakamura and Diewert (1997).

Social Assistance or welfare programs, in contrast, represent assistance of last resort for those in need irrespective of the source of hardship. Access to benefits is needs-tested but is not dependent on labour market status, though the level of benefits may depend on the claimant's ability and willingness to undertake employment. Unlike EI, SA eligibility is not dependent on previous employment, benefit levels are not related to prior earnings and there is no limit on the time period over which benefits may be collected (Barrett *et al.*, 1996).

Rules governing eligibility for SA receipt vary across and in some cases within Canadian provinces, though the basic process remains the same. Applicants initially undergo a 'needs test' in which the budgetary needs of the household are compared to available assets and income. Fixed and liquid

assets are considered, and limits apply to both types of asset holdings. Household income from various sources is computed and a deficiency between assessed needs and income results in eligibility for assistance. The generosity of welfare programs has been substantially curtailed over the last decade resulting in benefit levels being reduced, eligibility rules tightened and more onerous employment search requirements placed on recipients deemed employable (Barrett and Cragg, 1998; National Council of Welfare, 1996, 1997a, 1997b, 2000a and 2000b).

An additional important distinction between the EI and SA programs is the 'unit of support'. Whereas in the EI system an individual's employment record determines his/her EI eligibility and entitlement, under SA programs it is the needs of the household that determine eligibility and benefit levels. The employability of members of the household and the structure of the household are also important determinants of support under SA programs (Barrett and Cragg, 1998; National Council of Welfare, 1997a).

In examining EI and SA, another relevant consideration is the jurisdictional responsibilities for the administration of the programs. The provincial governments administer SA programs with some funding assistance from the federal government. In contrast, EI is a federally administered program with funding derived from employer and employee contributions. The shared jurisdictional responsibility is important as it draws attention to a potential for cost shifting between levels of government by unilateral changes to the rules governing the EI and SA programs (Fortin, Lacroix and Thibault 1999). Vroman (1996, 1998) examines the possibility of this practice in the United States but finds little or no evidence of cost-shifting behaviour by state governments.

It is also pertinent to highlight an important difference between Canadian and United States welfare programs. Welfare in the United States consists of a variety of programs including Temporary Assistance to Needy Families (TANF, formerly Aid to Families with Dependent Children or AFDC), food stamps and Medicaid. Unlike Canada these programs are not universal and are principally targeted towards single-parent families (see Blank 1989; Blank and Hanratty 1993; Gustafson and Levine, 1998). It follows that analysis of United States experience with respect to the interaction of EI and welfare type programs, while instructive, may not be directly applicable to the more generous and differently structured Canadian programs.

2.3 Potential Interaction of Employment Insurance and Social Assistance Programs

Despite their dissimilarities, both the EI and SA programs can be expected to influence labour market behaviour and outcomes. For example, both programs may be expected to influence decisions relating to the choice of work-leisure patterns, labour force participation and job search activities while unemployed. In turn it may be hypothesized that variation in the parameters of either program will influence the use of both programs.

The interaction of the EI and SA programs may arise through a variety of behavioural and administrative mechanisms. One possibility is that individuals simply plan to use one or both programs together in their utility-maximizing choice of labour-leisure patterns. In this sense, individuals (and potentially employers) may factor in the availability of EI and SA in determining their temporal work-leisure patterns. Fortin, Lacroix and Thibault (1999) take such an approach in characterizing optimal work patterns and the use of EI and/or SA.[1]

The relationship between the SA and EI programs may also arise in a job search context with SA benefits used to subsidize search activities when EI payments are exhausted or otherwise unavailable. In this context, when faced with an unexpected loss of employment income, SA may be used to fund job search activities. The EI and SA programs in this context may be characterized as a non-stationary job search model. The period of EI receipt may be thought of as representing the initial time-limited period of benefit receipt and the period of SA receipt the terminal or stationary component of the individual's environment. A potentially complicating aspect of such a stylized characterization of behaviour is that between EI use and SA take-up individuals may be required to exhaust their asset holdings. Behaviour during this period may differ somewhat from that during periods of EI and SA receipt and the length of such a period will be endogenously determined (see Danforth 1974a, 1974b).

Interaction of the EI and SA programs may also result from purely administrative characteristics of the programs. For example, there is evidence that a number of individuals were shifted onto SA rolls while awaiting EI claims to be processed during the recession of the early to mid nineties (Barrett *et*

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[1] In a related context Fortin and Lanoie (1992) and Fortin, Lanoie and Laporte (1999) examine the possibility that workers compensation and EI benefits represent substitutes for workers in the Quebec construction industry. Fortin, Lanoie and Laporte (1999) find evidence that time spent recovering from workplace injuries is related to the generosity of the EI system.

al., 1996). Furthermore, individuals may time applications to programs to maximize potential pecuniary benefits during a spell of unemployment. There is some anecdotal evidence of individuals delaying EI applications to gain access to the SA program and thereby increase total benefits received over a spell of unemployment (National Council of Welfare, 1997a, p. 94). Recent administrative changes have limited this type of interaction between the programs.

Interaction between the welfare and EI programs may also arise from dynamic considerations. For example, Barrett *et al.* (1996) examines the EI spells of individuals conditional on their prior use of SA. The underlying hypothesis is that individuals who have used SA in the past may behave differently while collecting EI compared to those unfamiliar with the SA program. Hence, job search intensity may be affected while unemployed and receiving EI. Blank (1989) discusses similar mechanisms via which current welfare spells may influence future welfare use in the United States.

Empirical work examining programs providing income support during periods of unemployment has at times failed to identify all programs that potentially provide assistance to unemployed individuals. In turn, the presence of alternative programs and the relationship between programs has not always been accounted for in the analysis of the effects of programs on behaviour (Atkinson and Micklewright, 1991). In the Canadian context, although most studies recognize the limited time period over which EI benefits may be received, the role of SA payments for job search purposes has generally been ignored. For this reason, receipt of EI has been associated with periods of unemployment and periods on SA have been related to periods of need, not necessarily directly related to unemployment. Some of these studies are now discussed.

2.4   Canadian and Related Studies

2.4.1 The Employment Insurance Program

Early studies of the Canadian EI program used aggregate time series data to examine the impact of changes in the EI program on aggregate outcomes.[2] These macroeconomic studies aimed at determining the impact of changes to the EI program on the actual and natural rate of unemployment

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[2] Although previously called unemployment insurance (UI), the generic term EI is used to describe the insurance program to replace lost employment income in the present discussion.

proved somewhat sensitive to the econometric specification used. There are a number of such studies, some of which are summarized in Corak (1994). The results and implications of some more recent microeconomic studies are discussed below.

Studies of the role of EI on individual behaviour have generally exploited behavioural changes induced by major changes in EI policy parameters. The first significant examination of the Canadian system using microdata was a study by Ham and Rea (1987). They used the statutory changes in benefit rates and length of EI entitlement during the 1970s to estimate a model of unemployment duration with weekly EI administrative data covering the period 1975-1980. In this study, the length of EI entitlement corresponded to the number of weeks an individual could receive EI benefits over a spell of unemployment. The study examined the behaviour of males during spells of EI receipt.

Ham and Rea (1987) estimate a discrete time duration model controlling for a variety of variables including dummies in age, length of EI entitlement at any point in the jobless spell, entitlement squared, weekly benefit levels, previous wages and the unemployment rate. Duration dependence is captured by including duration in various formats including as a step function and as a sixth-order polynomial. The duration and entitlement of previous EI spells are also included to capture true lagged dependence or unobserved heterogeneity persistent across spells of unemployment. Finally, they account for unobserved heterogeneity by making alternate assumptions on the distribution of the constant term in the duration models. The study did not consider the role of the SA program on behaviour.

The results derived by Ham and Rea (1987) are consistent with similar United States studies in finding a positive relationship between the number of weeks over which EI benefits are available and the length of unemployment spell (see, for example, Meyer 1990). The results indicate that the length of the individual's EI entitlement has a significant and positive effect on unemployment duration and that in the absence of this entitlement effect the probability of leaving unemployment declines with duration.

Corak (1992) addresses similar issues to those of Ham and Rea (1987) using a sample of males and females. The results for males are similar to those derived by Ham and Rea (1987) in that changes in the EI benefit or replacement rate, the ratio of EI benefits to lost employment income, appeared to have little or no effect on behaviour. For females, though, Corak (1992) finds a significant positive effect associated with changes in benefit rates. An increase in the replacement rate from 60 to 65 per

cent increases the average spell of benefit receipt for women by around three weeks. Further, spell lengths are sensitive to aggregate employment conditions for males only. A four per cent increase in regional unemployment rates is found to increase average duration of benefit receipt for males by about one week. Near the point of exhaustion of EI benefits the behaviour of males and females is similar, both being far more likely to return to employment.

Studies that have examined unemployment durations more recently include those of Crémieux *et al.* (1995a and 1995b). In Crémieux *et al.* (1995b) the job search behaviour and labour market outcomes of unemployed individuals were analyzed using surveys of two cohorts of Canada Employment Centre clients who made use of the service between 1986 and 1988. Unlike Ham and Rea (1987), this study did not focus exclusively on EI recipients. Three aspects of job search were considered including job search intensity that was analyzed by regressing a weighted measure of search intensity against a set of 49 exogenous variables related to the macroeconomic environment and personal characteristics of the individual. A structural equation was also estimated for the search intensity equation by instrumenting unemployment duration with a set of exogenous variables. Two aspects of the results are of particular interest. First job search intensity does not appear to be affected by EI eligibility. Second, job search intensity falls after nine months of unemployment before flattening out at approximately 18 months.

This study is important partly because the data set includes information on the use of SA during job search. In estimating the job search intensity equation an indicator variable for SA as the main source of income since job loss is included as a regressor. Although the results suggest that SA is unimportant in determining job search intensity in the reduced form specification, when the structural equation is estimated SA is significant and increases search intensity (pp. 42-44).

The study also examined reemployment wages and job search duration. The results suggest that re-employment wages are lower for EI ineligibles and an increasing but non-linear function of EI entitlement. Job search duration was examined using a hazard framework and controlling for education, province of new job, reason for job loss, gender, household characteristics and EI eligibility. The results, in general, are in line with *a priori* expectations of the negative impact of EI benefits on re-employment probabilities. Separate analysis of EI eligible and EI ineligible groups suggest that the degree of heterogeneity is higher in the latter than the former.

Crémieux *et al.* (1995a) examines similar questions to those addressed in Crémieux *et al.* (1995b) but uses the 1993 Canadian Out of Employment Panel (COEP) dataset. This dataset consists of a set of individuals who suffer a loss of employment and hence experience a spell of unemployment, which is termed the 'COEP unemployment spell'. The 1993 COEP data set was a mix of administrative and survey information and contained a much richer set of variables than was available in the earlier study. Information on reservation wages, asset, debt and expense levels are all available, in addition to a wide variety of personal and household characteristics.

The analysis of search intensity was similar to that of the earlier study except that information on time spent searching was available for the analysis. In general, search behaviour by individuals ineligible for EI was not different from those who were eligible, and search intensity was not significantly affected by potential length of EI benefits. Unlike the earlier study, however, there is little evidence of search intensity falling off after nine months of unemployment.

The second part of the analysis examines reservation wages over the course of an unemployment spell. Consistent with *a priori* expectations, eligibility for EI benefits is found to raise reservation wages as does the individual's total assets. Reservation wages are also found to be positively related to unemployment duration, though this is partly due to simultaneity in the determination of both variables. The authors also examine the effect of EI on the probability of re-employment. The analysis suggests that EI eligibility and entitlement is associated with a lower probability of reemployment though the effects are generally insignificant. This is partly attributed to seasonal effects, in addition to the richness of the socio-economic characteristics of individuals and the labour market attachment of individuals. Tenure in previous jobs is highly correlated with EI benefit eligibility and hence the length of the unemployment spells.

The final part of the analysis examined an individual's EI history and his/her COEP spell of unemployment. Duration analysis of the probability of re-employment suggests a dichotomy in Canadian unemployment between individuals unemployed often but for relatively short periods, and those unemployed less frequently for longer periods. The users of EI who exhibit short spells but return to the program frequently are comprised, at least in part, of regular seasonal users of the program.

A study by Jones (1995) also used the 1993 COEP dataset to analyze the experience of job losers before and after Bill C-113, which reduced EI benefit levels and the length of EI entitlement. The

study examined a range of outcomes associated with unemployment spells including job search behaviour and the quality of new jobs. Jones (1995) estimates both non-parametric (Cox proportional-hazards) and parametric models using a Weibull specification for the hazard to re-employment. The results of the analyses contradict *a priori* expectations, with individuals receiving more generous EI (the pre Bill C-113 cohort of individuals) suffering *shorter* unemployment durations. Other aspects of unemployment spells considered were the search process and reservation wages. In general, these aspects of unemployment do not exhibit differences across cohorts. Notably, unlike the study of Crémieux *et al.* (1995a), job search intensity measured as either money or time spent on search activities does alter unemployment duration. Like Crémieux *et al.* (1995b), the role of welfare programs on unemployment duration is not explicitly considered.

2.4.2 The Social Assistance Program

A series of recent studies have also considered the influence of the Canadian SA system on labour market activity patterns. These studies have examined both the take-up of SA and spells of time on and off SA.

Allen (1993) was one of the first studies to examine the impact of SA parameters on SA use and labour force participation. The study employs the individual microdata files from the 1986 Census and uses a sample of females. Logit analysis points to a positive relationship between the probability of participation in SA programs and both the level of potential benefits and allowable liquid asset levels. Conversely, for the labour force participation decision and consistent with *a priori* expectations, the analysis indicates that the probability of participation is negatively related both to the level of SA payments and to allowable liquid assets.

Charette and Meng (1994), Christofides *et al.* (1997) and Dooley (1999) also consider the take-up of SA in Canada. The study by Charette and Meng (1994) uses Labour Market Activity Survey (LMAS) data from 1989 for female heads of household aged 17 to 64 years to estimate a probit model of participation in SA. A variety of personal characteristics and SA policy parameters are included in the analysis, and the estimates suggest that participation in SA programs is sensitive to both benefit levels and implicit taxes on employment earnings. The role of the EI system on the SA participation decision is alluded to but not considered empirically.

Christofides *et al.* (1997) extend Charette and Meng (1994) by examining the SA participation decision in conjunction with the labour force participation decision using a bivariate probit approach. Again, LMAS data from 1988-89 is used to estimate relationships relating to labour market and SA participation for single males and females, and lone fathers and mothers. The reduced-form model includes variables pertaining to SA program parameters (basic allowance levels and the imputed tax rate on employment earnings while collecting SA) and receipt of EI income. Results from the estimations indicate that the SA and labour force participation decisions are interdependent. In terms of EI receipt, the analysis suggests that receipt of EI income in the previous year reduces the probability of SA receipt for all groups except lone fathers. The proper interpretation of this result is, however, unclear.

Dooley (1999) uses the Survey of Consumer Finances between 1971 and 1991 to examine the use of SA by lone mothers. The analysis points to an increasing reliance on SA for lone mothers aged less than 35 coupled with a decreasing dependence for mothers aged over 35. The analysis in Dooley (1999) uses a single equation probit model to explore the reasons for use of SA. Besides demographic changes, he finds evidence that the use of SA is sensitive to levels of basic assistance and employment conditions.

A number of studies have examined the duration of SA spells in Canada including Fortin and Lacroix (1998), Duclos *et al.* (1998), Stewart and Dooley (1998) and Stark (1999). The Duclos *et al.* (1998) study uses a large representative sample of administrative data from the province of Québec covering the period 1979-93. They find that the majority of SA spells are short with over one third ending within six months of starting and a further third within the next six months. These aggregate rates, however, mask important differences between groups. Single parent families exhibit lower exit rates, and younger recipients (18-24 year olds) exhibit higher exit rates, as do individuals who are more educated. Significantly, some evidence is also presented which suggests that exit rates from SA are cyclical and fell during recessions of the early and late 1980s.

The Fortin and Lacroix (1998) study uses a natural experiment in the form of a major change in the Québec SA program in 1989 whereby the benefits payable to single individuals under 30 years of age were increased by a large discrete amount. Using the same data as Duclos *et al.* (1998) the analysis suggests that the exit rate from SA is heavily influenced by seasonal considerations. Further, a policy variable associated with the generosity of the EI system (the ratio of the number of weeks of EI entitlement to the minimum number of weeks of employment needed to establish eligibility for EI

benefits) was found to have a negative impact on the exit rate from SA. *A priori,* we might expect the generosity of the EI system to induce individuals to leave SA more rapidly if individuals exit SA in anticipation of EI receipt during future spells of unemployment. This result held for both men and women and may be explained by increased labour force participation by individuals who compete with SA participants for employment. When EI benefits are more generous, individuals may enter the labour force making the transition from SA less likely.

Stewart and Dooley (1998) also use administrative data to examine periods on and off SA for lone mothers in the province of Ontario over the period 1983-94. Most of the results from the analysis are consistent with expectations, with higher SA payments associated with a lower rate of exit from and a higher likelihood of returning to SA. Parameters characterizing the EI system were not included in the analysis.

Stark (1999) examines the receipt of SA in the context of unemployment spells using Labour Market Activity Survey data for the period 1988-90. The novel aspect of this study is its examination of the path leading to the take-up of SA following the loss of employment. A limitation of the study is that the data preclude the identification of EI take-up by unemployed individuals or, more generally, eligibility for EI. Stark (1999) used a range of covariates relating to personal characteristics of the individual in his estimation of a series of proportional hazard functions for movements into unemployment and conditional on unemployment having occurred, into employment and SA.

Stark (1999) finds that employment durations do not appear to be influenced by the time required to qualify for EI benefits, nor does potential EI benefit entitlement affect time until re-employment. There is, however, evidence that potential EI entitlement increases time to SA take-up, though in general, the analysis suggests that the covariates considered do not have economically meaningful impacts on the take-up of SA. These results may reflect data limitations or, alternatively, the limited influence of the parameters of the EI program on the process leading to an exit to the SA program.

Patterns of SA use have also been documented in a number of studies. Cragg (1996) and Barrett and Cragg (1998) described SA use in British Columbia from the early 1980s to the mid 1990s and sought to explain the sources of the observed increase in the SA caseload over that period. Using monthly administrative data, a number of noteworthy patterns emerge from the analyses. First, they identified an increase in the proportion of SA recipients who can be characterized as employable from 38 per

cent in 1980-82 to 64 per cent in 1991-92.[3] Second, over the same period the proportion of SA cases accounted for by single males increased by some 10 per cent. In a related context, Bruce *et al.* (1996) examined patterns of repeat SA use in British Columbia, finding that a large proportion of individuals return to SA and that single males represent approximately 50 per cent of returnees to income assistance.

In general, these studies point to a pattern where SA use in British Columbia has been increasingly associated with the use of the program by individuals classified as employable and without family responsibilities. Further it is found that a large proportion of SA spells are short, over 50 per cent are complete within three months of beginning, and SA users tend to exhibit a high rate of recidivism.

Finally, Barrett (2000) examines SA spells in New Brunswick over the period 1986 to 1993. Although the primary focus is the impact of education on the exit rate from SA, the analysis highlights the importance of the labour market conditions on SA exit rates for both men and women. The role of the EI program on SA exit rates is not considered.

2.4.3 The Social Assistance and Employment Insurance Programs

As noted previously, few studies have considered how the EI and SA programs interact or jointly influence labour market behaviour and outcomes. The paucity of studies examining the interaction of the EI and SA programs is in part attributable to the limited data available up to this point that details use of both programs by individuals. Nevertheless, recently a number of studies have sought to identify the nature of the interface between the two programs. These studies are discussed below.

Barrett *et al.* (1996) examines SA and EI recipients in five Canadian provinces in the 1986 to 1992 period. The analysis has two components. The first examines EI users in a given year and documents their pattern of SA use. In turn, SA users are examined and their use of EI is described. The second part of the analysis examines EI claimants in British Columbia and New Brunswick and separates claimants into those who used SA recently and those who did not. The two groups are then analyzed

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[3] At the time BC welfare users are classified as employable if they were not (i) 65 years or older, (ii) unable to work due to medical reasons, (iii) a single parent with one dependent child under six months of age or two or more children under 12 years of age, or (iv) a single parent required to stay at home to care for a disabled child.

with a hazard function framework to test whether the receipt of SA is associated with longer subsequent EI spells.

The results from the analysis are numerous, and only a few significant findings for British Columbia are reported here. For 1992, a majority of SA users (55 per cent) were single men and women, and most are classified as employable (89 per cent). Furthermore, like Barrett and Cragg (1998) most SA spells were found to be short; almost one-half of all SA spells ended within three months of beginning and two-thirds within six months.

In terms of EI-SA interaction, it is noteworthy that 44 per cent of British Columbian SA recipients in 1992 also had an EI claim open. This indicates that a sizeable proportion of SA users had sufficient attachment to the labour market to generate eligibility for the EI program. Although the annual results are heavily influenced by cyclical considerations, the general pattern provides some *prima facie* evidence that there are two distinct groups of SA users. The first is SA users who are marginally attached to the labour force, if at all, and experience relatively longer spells of SA receipt. The second group of SA users exhibit a reasonably strong attachment to the labour force and tend to experience somewhat shorter spells of SA receipt.

One noteworthy feature of the 1992 group of SA recipients is the large number of individuals who had an EI claim open in 1992 and who were characterized as having an EI pending claim. This represents a case of interaction of the EI and SA programs due to administrative reasons alluded to earlier.

Barrett *et al.* (1996) also considered EI recipients and categorized them in one of three ways: (i) having a concurrent EI and SA claim open; (ii) initiating an SA claim within one month of completing an EI claim or; (iii) no contemporaneous or immediately subsequent SA receipt. Note with the definitions adopted that individuals who took up SA more than one month after leaving EI, and those experiencing a spell of SA receipt prior to the EI receipt (possibly related to an earlier spell of EI use), fall into category (iii). Hence, the measure of interaction between the programs represents a lower bound of SA-EI interaction.

For the years 1986, 1989 and 1992, some seven to 15 per cent of EI recipients were either concurrent or subsequent welfare users. Although this suggests a significant overlap between the use of EI and SA programs, few users of both programs were classified as 'subsequent' SA recipients. These

figures are somewhat surprising as it suggests that few EI users exhaust EI claims and subsequently move on to SA. This in turn *may* indicate that few individuals are using SA to fund additional job search activities beyond EI exhaustion. One possible explanation for this counter-intuitive pattern may be that individuals wait a longer period than one month between EI exhaustion and SA take-up. This delay in the take-up of SA may in part reflect the need for liquid assets to be rundown prior to establishing a claim under the SA program.

The second part of Barrett *et al.* (1996) consisted principally of an examination of empirical hazard and survivor functions for EI users conditional on the recent use of the SA program. For both British Columbia and New Brunswick, it was found that individuals who had received SA in the two years prior to the EI spell remained on EI longer. After controlling for maximum potential benefits, however, it only in New Brunswick was the prior receipt of SA associated with longer spells on EI. The rationale offered was that individuals with knowledge of the SA and EI systems make greater use of both programs in setting work-leisure patterns, and their job search intensity during periods of unemployment is adjusted accordingly. The results provide some evidence of dynamic interaction between the programs as New Brunswickers with a recent history of SA use are observed to exhibit lower exit rates from EI and are more likely to remain on EI until benefits are exhausted. This finding is consistent with lower search intensity by individuals familiar with the SA program.

A study specifically examining the interaction of EI and SA programs is that of Browning, Jones and Kuhn (1995). The first part of the study used the 1993 COEP dataset to analyze the take-up of SA following job separations by individuals disqualified from EI by Bill C-113, namely, voluntary quitters (VQs) and those dismissed without cause. The study finds some evidence of substitutability between the EI and SA programs, with the lower number of EI recipients in the post Bill C-113 VQ population being almost completely offset by a higher take-up rate of SA.

The second part of the study examined the determinants of SA take-up following EI exhaustion. Patterns of SA receipt at different points in time after unemployment begun were examined along with the demographic profiles of EI exhaustees. A series of linear probability models were estimated to determine the relative importance of variables explaining observed labour market outcomes for EI exhaustees. In the analysis, a measure of imputed SA was used to characterize the attractiveness of taking up SA, and, previous wages and regional unemployment rates to reflect the attractiveness of returning to employment. Overall the results from the analysis were disappointing, with the insignificance of the estimated relationships attributed to poor SA data. In the analysis, the social

assistance benefit levels available to the individuals were proxied using a set of representative family types at the provincial level.

A paper by Fortin, Lacroix and Thibault (1999) sought specifically to analyze the impact of EI on the rate of entry into and exit from SA by single-parent households in Québec. A static labour supply model with a budget constraint incorporating both EI and SA programs was used to assess the likely impacts of changes in program parameters on the exit rate from SA. The empirical analysis employed administrative data on SA use by single parent households, predominantly headed by women, over the period 1980-93.

To assess the role of EI in influencing SA spells, a variable reflecting the relative generosity of the EI program was included in a set of estimated hazard functions. This EI generosity variable was calculated as the ratio of the maximum number of weeks of benefits an EI eligible claimant may receive to the minimum number of weeks of work required to qualify for EI calculated at the provincial level. Regional variation was incorporated into the model using local unemployment rates. As expected the estimated coefficient on the EI generosity variable suggests that a more generous EI program increases the exit rate from SA and reduces the probability of individuals returning to SA.

A limited number of United States studies have examined the relationship between welfare and unemployment insurance (UI) programs although, as noted previously, differences between the welfare programs make direct comparisons with Canada difficult. Analysis has largely focussed on the effect of recent reforms designed to encourage employment by welfare recipients. Gustafson and Levine (1998) and Vroman (1998) for example examine the possibility that following the time limits imposed on welfare participation, UI will represent a larger part of the social safety net. In general, these studies conclude that work patterns of former welfare recipients will disentitle the majority from receiving UI payments on becoming unemployed (Peterson 2000). Another United States study of interest is that by Levine (1991) which examines the spillover effect of the UI program between insured and uninsured job seekers. Levine (2000) finds some evidence of a spillover effect in aggregate state-wide data with a more generous UI program resulting in shorter spells of unemployment for uninsured individuals, though the overall effect on unemployment is approximately zero.

Programs resembling EI and SA have also been examined in the context of transition economies in former Eastern European economies.[4] The experience in a series of countries was that as transition occurred and long-term unemployment became more prevalent, social assistance type programs took on greater importance.[5] The evidence presented suggests that the programs provided an important social safety net for those previously employed but also generated adverse incentive effects and may have hindered structural adjustment in transition economies.

2.5   Conclusions

This review of the literature examining the Canadian EI and SA programs points to the need to identify the nature of the interface between programs so as to assess how overall labour market outcomes are influenced by variation in any one program. Ideally, such an analysis would utilize panel data with information on the labour market behaviour of individuals (employment spells and use of income support programs) over a period in which exogenous variation in the key parameters of the EI and SA programs occurred. Whereas a number of studies have used longitudinal information to examine behavioural responses to variation in program parameters (for example, Ham and Rea 1987, Duclos *et al* 1998), in general the analysis has been confined to use of a single program. Exceptions to this include the studies by Barrett *et al.* (1996) and Browning, Kuhn and Jones (1995). These studies, however, exhibit a number of limitations. The Barrett *et al.* (1996) study lacked information on patterns of employment and had only limited information on the personal attributes of individuals by virtue of the use of administrative data. The Browning, Kuhn and Jones (1995) analysis was limited by the poor quality of imputed SA data used.

The analysis in this thesis examines the relationship between the EI and SA programs using a panel dataset that contains detailed information on employment and use of income support programs for a set of individuals following the loss of employment. The data also contains comprehensive information on the personal characteristics of the individual and the household of which she is a member. This information is supplemented with information on the SA benefits available to the

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[4] A special issue of *Empirical Economics*, vol. 23(1/2) dealt with this issue. Papers of relevance include, among others, those by Jones and Kotzeva (1998), Earle and Pauna (1998), Mickelwright and Nagy (1998), Gora and Schmidt (1998), Ebenova, Stom and Terrell (1998), and, Lubyova and van Ours (1998).

[5] The programs were not always called 'Social Assistance'. Most have parameters that resemble the SA programs in Canada including asset and income tests and potentially allow the receipt of benefits for an unlimited period of time.

household specified at a fine level of aggregation. Further, the analysis undertaken in this thesis covers a period in which the Canadian EI and SA programs underwent a series of important changes. The replacement of the Canadian UI program with the EI program is discussed further in chapters three and four, as is variation in the level of benefits available under the SA program during this period.

The existing literature also highlights a number of aspects of the relationship between the income support programs and labour market behaviour. First, when analyzed separately the observed behavioural responses to variation in the parameters of either program generally accord with *a priori* expectations. The results of studies that have examined the EI and SA programs in isolation highlight the importance of program parameters on the labour market decisions and outcomes of individuals.

Given that both programs individually affect labour market choices, it is not surprising that there is overlap in the populations served by EI and SA. For example, there is evidence that the SA program is used extensively by employable individuals to provide income support during spells of limited income. Not surprisingly, use of the SA program by these individuals is influenced by both seasonal and business cycle considerations. Further, although EI remains the primary income support program for individuals experiencing loss of income because of job loss there is evidence that for some individuals spells of SA are interspersed with frequent spells of employment and EI receipt. These patterns point to the importance of both programs in determining overall labour market behaviour and outcomes.

Another key conclusion from the discussion above is that variation in the parameters of one program influences the use of the other program. Hence, there is evidence that removing access to the EI program is largely offset by greater use of the SA program. Similarly, there is evidence that greater generosity in the EI program is associated with a higher exit rate from and lower rate of return to the SA program. Our knowledge of this interface between the programs is, however, incomplete. Existing research has provided only limited insight into how variation in either program affects the use of the other program and patterns of employment more generally.

An understanding of the nature of the interface between various income support programs is essential for policy purposes. An appropriately designed income support regime will take into account the range of income support programs available, the nature of the interface between programs and their impact on labour market decisions. Further, from a policy perspective an understanding of the overall

fiscal implications of variation in either program requires that the interface between programs be clearly identified.

In the next chapter, further insight is provided into the patterns highlighted in this chapter by examining the use of EI and SA following the loss of employment by a set of individuals in Canada. This analysis will in turn help provide a framework for a more formal econometric analysis of the nature of the relationship between the EI and SA programs in Canada in chapter four.

CHAPTER 3 – Patterns of Social Assistance and Employment Insurance Use by Unemployed Individuals in Canada

3.1   Introduction

The literature review in the previous chapter highlighted the fundamental importance of both the employment insurance (EI) and social assistance (SA) programs in determining labour market behaviour. The aim of this chapter is to explore more fully the nature of the relationship between the programs and overall labour market outcomes. The key contribution of the analysis presented in this chapter is the use of the 1997 Canadian Out of Employment Panel (COEP) dataset to examine labour market behaviour and outcomes for a set of individuals who experience a job separation. Following the discussion in chapter two, emphasis will be given to examining the use of the EI and SA programs and movements between alternative labour market states, especially EI and SA receipt, by a sample of job separators. Although earlier versions of this dataset have been used to examine labour market behaviour, there has been only limited analysis of the interface of the EI and SA programs. The COEP dataset provides a unique opportunity to examine the relationship between income support programs and labour market outcomes as it provides longitudinal information on individual labour market behaviour and program use following the separation from employment.

The discussion in this chapter is set out as follows. First, key patterns of use of the EI and SA programs identified in previous analyses and described in chapter two are highlighted. Next, a brief overview of the 1997 COEP dataset is presented, after which patterns of EI and SA receipt and other labour market outcomes for a subset of job separators is discussed. Transitions between alternative labour market states are also examined to provide insight into dynamic patterns of behaviour following job separation.

A stylized form of the interaction between the EI and SA programs is then considered, namely, the use of SA by job separators who have failed to qualify for EI at the time of job loss due to insufficient employment. The patterns of income support program use and employment for this group of

individuals, termed EI ineligibles, is then compared to the patterns exhibited by EI eligible job separators in the COEP dataset. Finally, conclusions from the analysis are set out.

3.2   Patterns of Use of Income Support Programs in Canada

The discussion in the previous chapter pointed to a number of stylized facts about the relationship between EI, SA and labour market patterns in Canada. Two aspects of this relationship are of particular interest. First, there is evidence that the populations served by the two programs overlap to some extent and that employable individuals use the SA program to provide income support during periods of limited employment income. Second, there is evidence that variation in the parameters of one program affects the use of the alternate program, although not necessarily in a manner consistent with *a priori* expectations. Each of these aspects is examined briefly below.

The discussion in the previous chapter highlighted the extensive use of SA in Canada by a set of relatively young employable individuals (Barrett *et al.*, 1997; Barrett, 2000; Fortin and Lacroix, 1998). Given the universal nature of the SA program in Canada, this result is not unexpected. Following directly from this observation, there is evidence that conditional on the use of the SA program, individuals also make extensive use of the EI program (Barrett *et al.*, 1996). In comparison, SA use by individuals conditional on the use of the EI program is less common. This pattern reflects the role of the EI program as the primary source of income support during spells of unemployment and the supplementary role of SA for employable individuals. Nevertheless, there is clear evidence of overlap in the populations served by the two programs (Barrett *et al.*, 1996; Bruce *et al.*, 1996).

The relationship between temporal patterns of employment and income support program use are less clear. Studies that have examined SA, in particular, have not been able to identify the state individuals exit into following a SA spell and the use of time between SA spells (for example Barrett *et al.*, 1996; Fortin and Lacroix, 1998; Stewart and Dooley, 1998). This limited knowledge of temporal patterns of program use and employment behaviour has restricted the analysis possible about the movement between and use of income support programs in the context of overall labour market behaviour.

The second consideration of interest is the impact of changes in the parameters of one program on the use of the alternate program. There is some evidence that, over the long term, parameters of the EI program have influenced the use of SA, though not necessarily in a manner consistent with *a priori*

expectations (Fortin and Lacroix, 1998; Fortin, Lacroix and Thibault, 1999). The analysis in Charette and Meng (1994) suggests that recent use of EI may reduce the likelihood of SA use. There is also evidence that use of SA during an unemployment spell may influence job search intensity during the spell and hence the receipt of EI (Crémieux *et al.*, 1995a). Browning, Jones and Kuhn (1995) too provide some evidence that the EI and SA programs may represent close substitutes for one another and that a policy of denying access to EI benefits may be largely offset by higher use of SA.

These results are important as the availability and generosity of both the EI and SA programs have been limited in recent years, and restricting the availability of either program may adversely affect some individuals. Moreover, the interface between programs is important in the context of claims that changes in one program serve merely to move individuals between programs and therefore shift the cost of income support between the provincial and federal governments. Despite the importance of these considerations, earlier analyses of the SA and EI programs have provided only limited, and at times conflicting, insight into the nature of the interface between the programs. This chapter provides additional insight into that issue by examining program use and labour market behaviour for a set of job separators in the COEP dataset.

3.3   The Canadian Out of Employment Panel Dataset

The 1997 COEP dataset combines administrative data on an individual's use of the EI program and survey responses to a series of demographic and behavioural questions. The dataset consists of 10 cohorts of individuals who suffered an employment separation starting in the third quarter of 1995 (cohort one) and ending in the fourth quarter of 1997 (cohort ten). In the discussion that follows, this job separation is referred to as the ROE job or ROE separation.[6] For each cohort two reference periods are defined. The first reference period starts six months prior to the quarter in which the job separation occurs. This reference point is used in some of the statistics described below. The second reference period starts some 16 to 18 months after the first reference period begins. Alternately, the second reference period starts some ten to twelve months after the start of the quarter in which the job

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[6] When employment is terminated in Canada, employees are issued with a Record of Employment (ROE). ROEs are used in the administration of the EI program to determine eligibility and entitlement to EI benefits. The COEP dataset contains information on the ROEs issued to individuals over an extended period of time. The author wishes to gratefully acknowledge the provision of the COEP dataset used in the present analysis by Human Resources Development Canada. This dataset contains extensive administrative and personal information not contained on the public use file.

separation occurs. Individuals in the COEP dataset are interviewed twice. Generally, interview one occurs eight to twelve months after the ROE separation and interview two 17-23 months after the ROE separation. The dates of the references periods and interviews for each cohort and are shown in table 3.1.

The COEP dataset has a number of advantages for examining the interface of the EI and SA programs. First, the data contains longitudinal information that allows the analysis of temporal patterns of labour market behaviour and program use. Individuals are questioned about household and individual use of the SA program during the period after the start of reference period one. Detailed information on the use of the EI program is also available from the administrative files used to administer the EI program. Finally, individual respondents are asked a series of questions that provide detailed information on individual and household characteristics and labour market behaviour, including employment patterns, following the beginning of reference period one.

Earlier versions of the COEP dataset have been used to analyze the behaviour of individuals during job search and while in receipt of EI (Crémieux et al,. 1995a), and the potential interaction of the EI and SA programs (Browning, Jones and Kuhn, 1995). The 1997 COEP survey provides further insight into the questions examined in these earlier studies for a number of reasons. First, the dataset provides information on behaviour during a period of general improvement in the labour market. Secondly, the 1997 COEP covers a period over which major changes to the Canadian unemployment insurance (UI) system were implemented, namely, the introduction of the employment insurance (EI) system in 1997.

Significant changes relating to the introduction of the EI program were introduced progressively starting January 1, 1996. Changes to the program included a reduction in the maximum amount of income that could be insured, an increase in the time required to establish EI eligibility for some individuals and a decrease in the maximum number of benefit weeks for individuals in high unemployment regions. In addition, as of 1 January 1997 an hours-based system was introduced whereby every hour of insured employment could be used to establish EI eligibility. Under the UI program individuals could only use weeks with more than 15 hours worked to establish eligibility for benefits under the insurance program.

TABLE 3.1 – COEP reference period and interview dates

Cohort	Start Reference period 1	Start date quarter of job loss	Interview one date	Start reference period two	Interview two dates
1	Jan 1, 1995	July 1, 1995	June-August, 1996	July 1, 1996	March-April, 1997
2	April 1, 1995	October 1, 1995	October-Nov., 1996	October 1, 1996	June-August, 1997
3	July 1, 1995	Jan 1, 1996	Nov.-Dec., 1996	November 1, 1996	Oct.-Nov., 1997
4	October 1, 1995	April 1, 1996	Feb.-March, 1997	February 1, 1997	Jan.-Feb., 1998
5	Jan 1, 1996	July 1, 1996	May-August, 1997	June 1, 1997	March-April, 1998
6	April 1, 1996	October 1, 1996	Sep.-October, 1997	September 1, 1997	June-July, 1998
7	July 1, 1996	Jan 1, 1997	Nov.-Dec., 1997	November 1, 1997	October-Nov., 1998
8	October 1, 1996	April 1, 1997	Feb.-March, 1998	February 1, 1998	Nov.-Dec., 1998
9	Jan 1, 1997	July 1, 1997	May-June, 1998	May 1, 1998	March-April, 1999
10	April 1, 1997	October 1, 1997	Aug.-Oct., 1998	September 1, 1998	June-July, 1999

Benefits available under SA programs also vary over the period covered by the COEP dataset. The source of this variation is derived both from changes in the general price level and from discrete changes in benefit levels instigated by provincial governments. Governments in all provinces except Newfoundland and Alberta instituted discrete changes to benefit levels in the order of 10 per cent or more at various times during the period of analysis. These were either general reductions in the level of benefits for all recipient types (Ontario), or confined to specific groups such as recipients without dependent children (for example, British Columbia). In addition, the introduction of the Child Tax Benefit supplement in July 1998 resulted in all provinces except New Brunswick and Newfoundland reducing SA benefit levels for households with dependent children by the exact amount of the supplement. The value of the Child Tax Benefit Supplement was in the order of $84 per month for the first child and $28 per month for additional children. These changes provide substantial variation in the SA program that aid in the identification of the behavioural responses of interest in the analysis presented in chapters 4 and 5.

3.4   Use of Income Support Programs and Employment Patterns Following Job Loss

3.4.1 Characteristics and Behaviour of COEP Respondents

The full COEP sample consists of over 42,000 first interview respondents. The second interview response rate was 70-75 per cent. Although the COEP survey includes individuals who separate from employment for any reason, the analysis presented below includes only a sub-sample of respondents. There are a number of reasons for limiting the sample. First, an individual's use of the EI and or SA programs following job loss is likely to be sensitive to the reason for job separation. For example, individuals who exit to return to school are less likely to use either EI or SA. Moreover, an individual's access to programs may be dependent on the reason for job separation. For instance, an individual who voluntarily quits employment without just cause is unable to collect EI benefits or to use the employment spell to establish future EI eligibility (*Employment Insurance Act* 1996, s. 30). To focus on a relatively homogeneous set of individuals for whom the availability and parameters of the two programs are likely to be key to understanding their subsequent labour market behaviour, the analysis is restricted to those whose reason for job loss as reported on their ROE separation is layoff.

Further, individuals were omitted from the sample where they failed to respond to survey questions that were used in the analysis.

One possible complication arising from the decision to include all layoffs in the analysis is that employees and employers may agree to label an employee quit as a layoff for the purpose of the EI program. Such an action will ensure that the individual's access to the EI program is not impeded but, given the approach adopted in the present analysis, produce a sample of 'true layoffs' and quits labelled as 'layoffs'. Such a problem is potentially important in the Canadian EI program given the lack of experience rating for firms. Analysis of this phenomenon, however, suggests that relabelling of quits as layoffs is not a significant problem in the Canadian EI program (Kuhn and Sweetman, 1998). Therefore, the approach adopted in the analysis in this chapter should generate a sample of individuals for whom the parameters of the EI and SA programs are relevant from a behavioural perspective.

Table 3.2 shows characteristics of the full COEP sample and the layoff sub-sample for comparison purposes. Given that the COEP survey does not contain a representative sample of job separators, in all the empirical analysis undertaken in this chapter weights provided with the COEP dataset are used. An examination of table 3.2 shows that the layoff sample has a higher proportion of males, is slightly older, more likely to be married and less well educated than the full COEP sample. Given that job separation due to layoff is in general a prerequisite for eligibility to EI, the layoff sub-sample is likely to be representative of a group more likely to make use of the EI program. An examination of the province of residence at the time of ROE separation indicates that individuals in Québec and the Atlantic provinces are slightly more likely to be laid-off than individuals from other provinces. These patterns have been documented elsewhere and are consistent with these provinces traditionally exhibiting higher rates of unemployment and greater reliance on the EI program.

In terms of industry classification, the pattern of layoffs is largely consistent with *a priori* expectations. Individuals in the agriculture, logging, construction and transport industries are slightly more likely to separate from employment because of layoff, possibly reflecting a regular seasonal pattern of employment and EI use. Surprisingly, the government and education sectors are also more heavily represented among the layoff sub-sample. The former group, however, may represent the use of short-term contracts designed to provide sufficient employment to establish EI eligibility for seasonal workers, and thereby move them from the SA rolls.

TABLE 3.2 – Characteristics COEP respondents, full sample & layoffs

	Full COEP sample	Layoff sub-sample
No. observations	40,089	27,500
Male	0.53	0.57
Age	35.97	37.63
Household size	2.99	2.96
Married/ common law	0.58	0.61
Education		
Less than high school	0.22	0.25
Completed high school	0.27	0.28
Technical	0.26	0.24
Some or completed Uni.	0.23	0.21
Other	0.02	0.02
Province of sample selection		
Newfoundland	0.02	0.03
PEI	0.01	0.01
Nova Scotia	0.03	0.04
New Brunswick	0.04	0.04
Quebec	0.28	0.32
Ontario	0.32	0.29
Manitoba	0.04	0.03
Saskatchewan	0.03	0.03
Alberta	0.10	0.08
British Columbia	0.13	0.12
Two digit SIC		
Agriculture	0.02	0.03
Fishing & trapping	0.00	0.01
Logging & forestry	0.02	0.03
Mining	0.02	0.02
Manufacturing	0.17	0.18
Construction	0.11	0.14
Transport & storage	0.05	0.05
Comm. & other utilities	0.02	0.02
Wholesale trade	0.04	0.03
Retail trade	0.12	0.08
Finance & ins.	0.02	0.01
Real estate	0.01	0.01
Business services	0.06	0.05
Government. services	0.06	0.07
Education. services	0.07	0.09
Health & SS services	0.06	0.05
Accommod. & food services	0.08	0.07
Other services	0.06	0.06
Wage in ROE job ($ per hour)	12.76	13.39

TABLE 3.2 – Characteristics COEP respondents, full sample & layoffs (cont)

	Full COEP sample	Layoff sub-sample
Behaviour post ROE - separation		
Non-employment length (weeks)	14.23	14.05
Employed at 1ˢᵗ interview	0.70	0.71
Receipt EI by 1ˢᵗ interview	0.57	0.67
Receipt EI at 1ˢᵗ interview	0.17	0.21
Receipt SA by 1ˢᵗ interview	0.05	0.05
Receipt SA at 1ˢᵗ interview	0.02	0.02

The final set of figures in table 3.2 gives some insight into behaviour post ROE separation. The length of non-employment represents the average length of unemployment for individuals following the ROE separation at the time of the first interview with no adjustment for right-censoring of spells. The length of unemployment spell exhibited by the total COEP group and the layoff sub-group are approximately the same, as is the probability of employment at the time of first interview. As expected, the probability of EI receipt following the ROE separation is significantly higher among the layoff subgroup. So too is the probability of EI receipt at the time of the first interview.

To examine the seasonal pattern of behaviour and program use following the ROE separation, individuals are considered by cohort. Table 3.3 shows the use of the EI and SA programs for individuals as reported at both interview 1 and interview 2. Note that only second interview respondents were used in the construction of table 3.3. A number of seasonal patterns become evident by examining the cohort responses. First, the use of EI by the time of the first interview following the ROE separation is highest for those who have been laid off in the fourth quarter of each year (cohorts 2, 6 and 10). This pattern may be consistent with the use of EI by seasonal workers. The seasonal use of SA by first interview is not as pronounced as that for EI, though there does appear to an overall downward trend in the use of SA by the sample of layoffs over the period of the survey. Such a pattern is consistent with reports of declining SA caseloads over this period reported elsewhere and coincides with the improvement in the labour market over this period (Human Resources Development Canada, 2000a and 2000b).

Receipt of SA is significantly lower than that of EI for individuals, as might be expected. The EI program represents the primary source of income support for individuals participating in the labour

TABLE 3.3 – All layoffs by cohort, patterns of behaviour

Cohort	1	2	3	4	5	6	7	8	9	10
Sample size at 1st interview	1410	2208	2350	2588	2229	2082	2008	1946	2109	2117
Unemployment length as at 1st interview (weeks)	15.65	16.51	12.99	14.35	13.36	10.88	14.47	11.24	14.95	12.32
EI receipt between ROE separation & 1st interview	0.63	0.72	0.67	0.66	0.57	0.74	0.64	0.63	0.62	0.71
SA receipt between ROE separation & 1st interview	0.06	0.05	0.04	0.04	0.04	0.03	0.05	0.04	0.04	0.04
SA receipt, given EI receipt, by 1st interview	0.06	0.04	0.04	0.03	0.05	0.02	0.05	0.03	0.04	0.04
EI receipt, given SA receipt, by 1st interview	0.72	0.62	0.59	0.54	0.68	0.68	0.55	0.62	0.64	0.65
Reason for SA use by users of both programs at 1st interview										
EI pending	0.14	0.39	0.29	0.25	0.22	0.46	0.43	0.27	0.36	0.38
EI supplement	0.28	0.28	0.16	0.37	0.08	0.20	0.40	0.22	0.16	0.33
EI exhaustion	0.34	0.49	0.26	0.28	0.54	0.30	0.33	0.41	0.38	0.42
Interview two responses										
EI receipt between start ref period 2 & 2nd interview	0.42	0.44	0.43	0.42	0.38	0.51	0.40	0.43	0.43	0.48
SA receipt between start ref period 2 & 2nd interview	0.08	0.06	0.06	0.05	0.06	0.03	0.06	0.05	0.06	0.04
SA receipt, given EI receipt, by 2nd interview	0.06	0.05	0.05	0.04	0.07	0.02	0.05	0.03	0.06	0.03
EI receipt, given SA receipt, by 2nd interview	0.33	0.38	0.36	0.31	0.49	0.25	0.32	0.30	0.40	0.40
Reason for SA use by users of both programs at 2nd interview										
EI pending	0.36	0.16	0.13	0.14	0.17	0.11	0.09	0.18	0.13	0.14
EI supplement	0.30	0.32	0.11	0.13	0.15	0.27	0.11	0.39	0.18	0.27
EI exhaustion	0.69	0.31	0.77	0.30	0.29	0.48	0.50	0.52	0.37	0.34

force and this is reflected in the proportion of individuals in receipt of payments from the two programs. Note, however, that the reliance on the use of SA may be understated as SA payments accrue to the household rather than the individual. Individual receipt of SA is reported in table 3.3, but this may understate the individual's reliance on SA in the context of the household.

Two points need to be stressed about the aggregate use made of the SA program. Although the proportion of individuals who make use of the program is relatively low when compared to the EI program, it is still the case that some 3-6 per cent of individuals in any cohort report receipt of SA by the time of the first interview. For any given year, the number of layoffs Canada-wide represented in the COEP dataset is over 3 million. Hence, approximately 150,000 individuals report receipt of SA within the first 12 months following ROE separation, a not insignificant number. Moreover, the use of SA by individuals like those in the COEP dataset, that is, employable individuals, appears to be sensitive to business cycle conditions. The recession of the early 1990s was associated with a large increase in the number of individuals receiving welfare, many of whom had strong attachment to the labour force (National Council of Welfare, 1997a; Klassen and Buchanan, 1997). Hence, examining the use of SA by individuals during periods of improving labour markets is likely to understate the role of the SA program in providing income support over the course of the business cycle.

Moving from responses at the first interview to those at the second interview, a number of interesting patterns emerge. First, as expected for all cohorts the proportion of individuals reporting EI use between the start of the second reference period and the second interview declines. This pattern no doubt reflects the exhaustion of EI benefits for some individuals and successful job search by EI recipients. In comparison, however, SA use over the same period shows a different pattern. The proportion of individuals reporting SA receipt increases or remains steady between the two interviews for all cohorts. It remains the case that the change in the proportion of individuals reporting receipt of SA at the two interviews is generally small. Given the timing of the first and second interviews, this pattern may reflect both the use of SA by individuals who have exhausted their EI entitlement after the first interview, and, the exit from SA by individuals using SA to fund job search activities at the first interview.

Proportions of individuals who use SA or EI, given use of EI or SA respectively, are also presented in table 3.3. In general, the use of SA by EI users at the first interview tends to be marginally lower than the overall use of SA. In comparison, SA users are much more likely to have used EI by the time of

the first interview. For all cohorts, some 50-70 per cent of SA users have also used EI by the time of the first interview.

These figures are generally consistent with those derived in Barrett *et al.* (1996) described previously and highlight the intersection of the populations served by these two programs. Although the figures in that case were derived using a different criterion, the one noteworthy difference is that in Barrett *et al.* (1996) the comparable figures indicated that the proportion of EI users who also had a SA claim open in the same year was somewhat higher at 7-15 per cent. One reason for this difference can be readily identified. Employment conditions for the early 1990s considered in the Barrett *et al.* (1996) study were less advantageous than the period analyzed in the present study. In turn, EI pending claims were identified in that analysis as a significant source of the interaction between the two programs as individuals relied on SA while awaiting EI claims to be processed. Further, the figures reflect the primary role played by EI in providing income support during periods of unemployment. Nonetheless, it does highlight the use made of both SA and EI programs by a not insignificant proportion of job separators.

Similar numbers are reported for behaviour at the second interview. The pattern in this case is consistent across cohorts. Use of SA by EI users tends to be lower than overall SA use, and, use of EI by SA users is generally lower than overall EI use. As noted above, overall use of SA tends to increase at the second interview indicating more individuals using SA alone.

The final aspect of program use considered in table 3.3 is the reason for SA use by individuals who also used EI by the time of the relevant interview. It should be stressed that this group represents some 2-4 per cent of all job separators in any given cohort. Individuals were asked whether SA was received while awaiting EI benefits to be paid, to supplement EI benefits or following exhaustion of EI. Note that SA may have been received for a combination of reasons. The responses for the first interview indicate that no particular reason for the use of SA stands out. However, for many members of cohorts 6 and 7 the use of SA while awaiting an EI claim appears to be somewhat important. As noted previously the use of SA while waiting an EI claim may largely reflect administrative procedures rather than behavioural responses to the presence of the two programs. Interestingly, the use of SA to supplement EI is given as a reason for collecting SA by up to 40 per cent of users of both programs (cohort 7). Although documented previously, use of SA to supplement EI has not received significant attention in the literature examining program use in Canada to date (Barrett *et al.*, 1996).

For the second interview, use of SA for reason of EI exhaustion is far more important and is the single most important reason for the use of SA by EI users. This pattern is not surprising as for many individuals EI benefits are likely to have been exhausted around the time of the first interview. For some of these individuals, SA would not have been used prior to the start of the second reference period. It should be stressed, however, that this stylized pattern of EI use might be considered economically insignificant. Use of SA because EI is exhausted is a path followed only by 2-3 per cent of all EI users, and 1-2 per cent of all job separators. These figures are largely consistent with those derived in Barrett *et al.* (1996) and reflect the limited number of individuals who follow this stylized pattern of behaviour.

The behaviour of individuals following the ROE separation vis-à-vis the EI and SA programs are largely consistent with those of earlier studies. A key benefit of the COEP dataset is that its longitudinal nature allows the analysis of movements between programs and employment over time. Although some studies have examined patterns of use of SA over time (Barrett and Cragg, 1998; Fortin and Lacroix, 1998; Stewart and Dooley, 1998), or the use of EI over time (Corak, 1993), knowledge of how and if individuals move between programs is limited. To examine the nature of these movements a series of survivor functions are presented in figures 3.1-3.4. These figures use information from the beginning of reference period one to the time of the second interview to characterize the labour market behaviour of individuals in the COEP sample.

In figure 3.1, the rate of return to SA for the set of COEP layoff respondents is shown using a survivor function for time off SA. The survivor function in this context indicates the probability an individual who exits the SA program remains off SA over time. In turn, one minus the survivor rate indicates the probability an individual returns to SA in the months following an exit from the SA rolls. All SA spells in the data set are considered (including those beginning prior to the ROE separation but after the start of reference period one). Examination of figure 3.1 indicates that approximately 30 per cent of those at risk of returning to the SA program will have done so within 12 months of exiting the program, indicative of a high rate of recidivism among users of the SA program. Moreover, most of the recidivism occurs in the months immediately following an exit from SA. The high rate of repeat SA use and quick return to SA is consistent, though slightly lower, than the figures derived by Barrett and Cragg (1996) and Bruce *et al.* (1996). A survivor function for time off EI given an EI spell is presented in figure 3.3 for comparison purposes. Again, users of the

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Figure 3.1 - Survivor function, time off SA
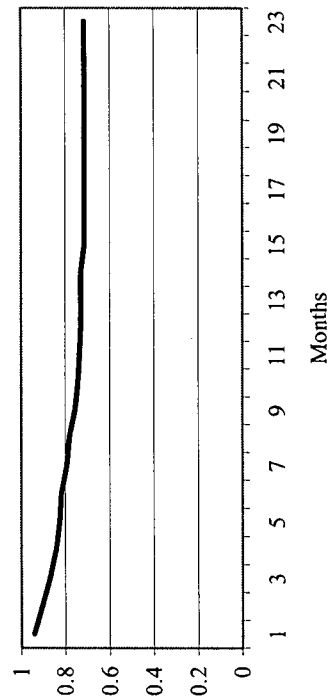
Figure 3.2 - Survivor function, exit to EI given SA spell
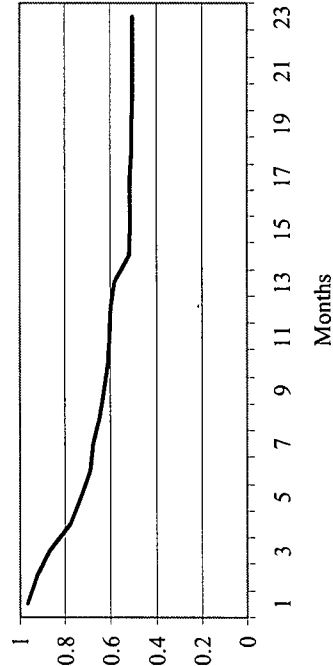
Figure 3.3 - Survivor function, time off U/EI
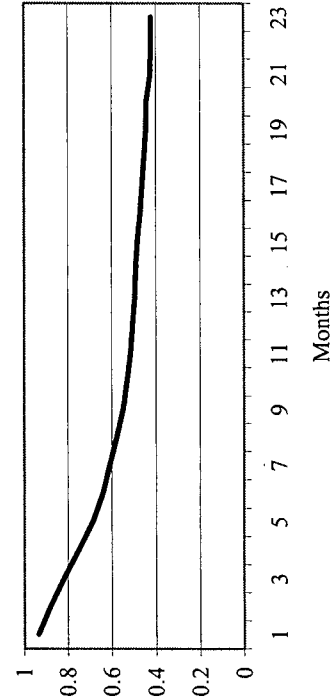
Figure 3.4 - Survivor function, exit to SA given EI spell
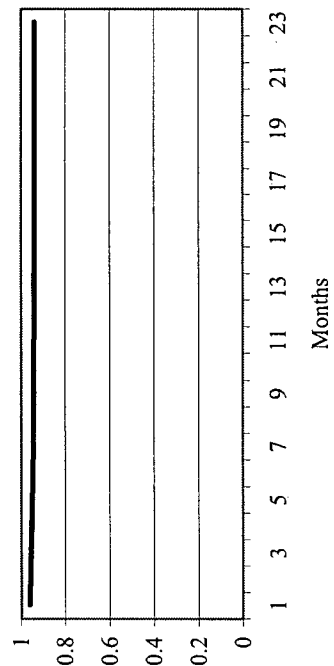
program exhibit a high rate of return to EI, with approximately 50 per cent having returned to EI within 12 months of an earlier spell of EI receipt having ended, and a full 60 per cent by 20 months. Again, this pattern of recidivism is consistent with earlier studies such as that by Corak (1993).

Two further survivor figures of interest are also shown. The first shows the probability of remaining off EI following a spell of SA receipt, excluding spells of SA that may be characterized as EI pending spells. For this reason, spells of EI that begin in the month immediately following an exit from SA are excluded from the analysis. The survivor function in figure 3.2 indicates that approximately 40 per cent of individuals who have used SA and are 'at risk' of using EI will in fact take-up EI within 12 months of leaving the SA program. This pattern points to an interesting aspect of program use not clear from earlier studies. Namely, SA may represent a transitory state for a number of individuals who return to employment prior to taking up EI later. More generally, it emphasizes the potential use of both SA and EI in setting work and leisure patterns over time. This pattern of behaviour is discussed later in the context of individuals who, upon becoming unemployed, are ineligible for EI because of insufficient employment during the relevant qualifying period. The final survivor function, figure 3.4, highlights the limited number of individuals who take up SA following an exit from the EI program. Although some 3 per cent of individuals exit to SA immediately following the exit from EI, only a further 2-3 per cent have done so within 20 months of exiting a spell of EI.

The analysis presented above is consistent with the findings of earlier studies that have examined the nature of EI and SA program use in Canada. Users of both programs exhibit a high rate of recidivism and individuals who use SA exhibit a high rate of EI use. What has been explored only in a limited manner previously is the temporal nature of movements between programs. The analysis above points to a number of possible paths by which individuals move between programs, including the characterisation of SA as simply a transitional state which may be used as a stepping stone to subsequent employment and use of the EI program. This path, among others, is now considered in the context of individuals for whom the interface between the SA and EI programs may be considered particularly important.

3.4.2 Employment Insurance Ineligibles

The importance of SA for unemployed individuals who cannot otherwise use EI has been identified in a number studies such as Browning, Kuhn and Jones (1995). That study examined the use of SA by individuals denied access to EI by virtue of a rule change that prevented quitters from using EI. The

findings of Browning, Kuhn and Jones (1995) suggest that SA offset the EI restrictions imposed on quitters and acted as a close substitute for EI in terms of income support following job separation.

An important institutional feature of the Canadian EI program is its entrance requirement. In short, individuals must work a sufficient number of hours (previously weeks) of EI eligible employment in the qualifying period prior to job separation (usually 12 months) to be eligible to collect EI benefits during a spell of unemployment. The entrance requirement has been examined by a number of authors for its impact on the tailoring of employment spells to meet EI eligibility requirements (Baker and Rea, 1998; Green and Riddell, 1997; Green and Sargent, 1998). The implications of the EI eligibility requirement for the use of the SA program has not, however, been explicitly examined. The analysis presented below represents the first step in filling that gap.

The importance of the EI eligibility requirement for the SA program can be readily understood intuitively. Following job separation, an unemployed individual who has not worked sufficient hours to qualify for EI benefits may use the SA program as a form of income support. In Canada, the universality of the SA program ensures that SA represents an important potential source of support during this period. Further, if the individual has accumulated some hours of EI eligible employment, he or she has a vested but unexecutable interest in the EI program. Potentially that entitlement may be used subsequently if a period of employment is followed by a further spell of unemployment. Some insight into this pattern is provided by figure 3.2, which suggests exits from the SA program are often associated with take-up of EI subsequently. One possible behavioural sequence is a spell of SA followed by a spell of employment that is used to satisfy the EI eligibility requirements, and then a spell of unemployment during which the individual collects EI.

Consider the group of individuals who have not accumulated sufficient weeks and/or hours of employment to establish a claim for EI at the time of the ROE separation as 'EI ineligibles'. To examine the potential interaction of the EI and SA programs for EI ineligibles, each member of the layoff sample used above was characterized as EI eligible or EI ineligible at the time of the ROE separation. This characterization was derived from the information contained in the Record of Employment and Status Vector administrative files that are used to administer the EI program and form part of the COEP database. The individual's EI eligibility status at the time of the ROE separation was established by first computing the amount of EI eligible employment they had accumulated in the qualifying period prior to the ROE job separation. This step required computing the number of weeks and/or hours worked in all employment spells prior to the ROE separation for a

period of up to 2 years. Using information on the level of unemployment in the individual's EI economic region at the time of the ROE separation, it was then possible to determine the individual's EI eligibility status at the time of the ROE separation. Approximately 13.5 per cent of individuals in the layoff sample were identified as ineligible for EI at the time of the ROE separation in this manner. The characteristics of the layoff sample, classified by eligibility status, are reported in table 3.4. All first interview respondents are used to generate the means reported in table 3.4 for the eligible and ineligible groups, giving a sample size of approximately 27,500 for the layoff sub-group.

A number of noteworthy patterns emerge from an examination of the characteristics of the eligible and ineligible populations. Compared to the eligible population, the ineligible population tends to be younger, have a greater proportion of females, is less likely to be married and better educated. Such a pattern is consistent with younger less attached individuals exhibiting more sporadic employment patterns, and therefore possibly being less likely to satisfy the eligibility requirements for EI at the time of job separation. In terms of geographical distribution, ineligibles are less likely to be located in the Atlantic provinces or Québec. In terms of industry composition, employees from the logging, manufacturing and construction industries are underrepresented in the ineligible population. These patterns may indicate tailoring of employment patterns in these industries and regionally to take advantage of seasonal employment opportunities and thence the EI program.

Note that the ineligible group had lower wages in their ROE job compared to the eligible group. As expected, EI ineligibles report a significantly lower rate of EI use by the time of the first interview compared to EI eligibles despite experiencing a longer spell of unemployment following the ROE job loss. Use of the EI program at the time of the first interview by ineligibles is possible as the individual may return to employment prior to the first interview, and upon suffering a later spell of unemployment, have sufficient hours or weeks of employment to be eligible for EI benefits. Some evidence of this is suggested by the fact that the difference in EI recipiency rates *at the time* of the first interview is significantly smaller for the eligible and ineligible groups. As expected, the ineligible group has a much greater rate of SA use by the time of and at the time of the first interview compared to the eligible sample.

TABLE 3.4 – Characteristics ROE layoffs, eligibles and ineligibles

	Eligibles	Ineligibles
No. observations	24,182	3,317
Male	0.58	0.50
Age	38.12	34.16
Household size	2.95	3.06
Married/ common law	0.62	0.48
Education		
Less than high school	0.26	0.19
Completed high school	0.29	0.23
Technical	0.24	0.25
Some or completed Uni.	0.19	0.32
Other	0.02	0.02
Province of sample selection		
Newfoundland	0.03	0.03
PEI	0.01	0.01
Nova Scotia	0.04	0.03
New Brunswick	0.05	0.04
Quebec	0.33	0.27
Ontario	0.28	0.34
Manitoba	0.03	0.03
Saskatchewan	0.02	0.03
Alberta	0.08	0.08
British Columbia	0.12	0.13
Two digit sic		
Agriculture	0.02	0.03
Fishing & trapping	0.01	0.00
Logging & forestry	0.03	0.01
Mining	0.02	0.01
Manufacturing	0.19	0.11
Construction	0.15	0.09
Transport & storage	0.05	0.05
Comm. & other utilities	0.02	0.02
Wholesale trade	0.03	0.03
Retail trade	0.07	0.12
Finance & insurance	0.01	0.02
Real estate	0.01	0.01
Business services	0.05	0.06
Government. services	0.06	0.10
Education. services	0.09	0.12
Health & SS services	0.05	0.05
Accomod. & food services	0.06	0.09
Other services	0.06	0.07
Wage in ROE job ($ per hr)	13.51	12.54

TABLE 3.4 – Characteristics ROE layoffs, eligibles and ineligibles (cont)

	Eligibles	Ineligibles
Behaviour post ROE separation		
Non-employment length (weeks)	13.81	15.73
Employed at 1ˢᵗ interview	0.71	0.65
Receipt EI by 1ˢᵗ interview	0.73	0.25
Receipt EI at 1ˢᵗ interview	0.22	0.10
Receipt SA by 1ˢᵗ interview	0.04	0.10
Receipt SA at 1ˢᵗ interview	0.02	0.06

The overall characteristics of the eligible and ineligible populations mask some important seasonal considerations. These are highlighted in table 3.5. The first thing to note is that the proportion of job separators classified as ineligible is seasonal, generally being higher in the third quarter (cohorts 1, 5 and 9). Cohort 8 represents an exception to this. In addition, the switch to the hours-based EI program appears to have generated an increase in the proportion of individuals classified as ineligible. Although comparisons are difficult because the hours-based system was introduced with a number of other changes, the proportion of ineligibles increases by approximately 2 per cent between 1996 and 1997, from 12.5 per cent of layoffs to 14.5 per cent.

Examining behaviour by cohort and eligibility status, a number of patterns emerge. As expected, EI use by the time of first interview for the eligible group is substantially higher than that for the ineligible group. Conversely, SA use for the ineligible group is 2 to 4 times higher than that of the eligible group depending on the cohort considered. That is, following Browning, Kuhn and Jones (1995), there is evidence that the SA programs represent an alternative source of income support during spells of unemployment for individuals for whom EI is not otherwise available. As expected for all cohorts the use of EI given SA use by first interview is higher among the eligible subgroup.

TABLE 3.5 – Eligibles and ineligibles by cohort, patterns of behaviour

Cohort	1		2		3		4		5	
Proportion of ineligibles	0.159		0.066		0.098		0.120		0.153	
	Eligibles	Ineligibles	Eligibles	Ineligibles	Eligibles	Ineligibles	Eligibles	Ineligibles	Eligibles	Ineligibles
Unemployment length as at 1st interview (weeks)	15.87	14.46	16.47	17.10	13.04	12.49	14.03	16.66	13.11	14.75
EI receipt between ROE separation & 1st interview	0.70	0.28	0.75	0.27	0.71	0.33	0.71	0.25	0.64	0.15
SA receipt between ROE separation & 1st interview	0.05	0.11	0.04	0.10	0.03	0.11	0.03	0.10	0.04	0.05
SA receipt, given EI receipt, by 1st interview	0.06	0.14	0.04	0.02	0.04	0.01	0.03	0.01	0.05	0.03
EI receipt, given SA receipt, by 1st interview	0.88	0.36	0.72	0.06	0.78	0.04	0.76	0.03	0.83	0.08
Reason for SA use by users of both programs at 1st interview										
EI pending	0.01	0.88	0.40	0.00	0.30	0.00	0.25	0.38	0.23	0.00
EI supplement	0.15	0.95	0.28	0.18	0.16	0.00	0.38	0.00	0.06	0.95
EI exhaustion	0.23	0.92	0.50	0.13	0.25	0.66	0.29	0.00	0.55	0.24
Interview two responses										
EI rec. between start ref period 2 & 2nd interview	0.44	0.28	0.46	0.17	0.45	0.23	0.45	0.22	0.41	0.18
SA receipt between start ref period 2 & 2nd interview	0.06	0.14	0.05	0.12	0.06	0.11	0.05	0.10	0.05	0.07
SA receipt, given EI receipt, by 2nd interview	0.04	0.19	0.05	0.19	0.05	0.07	0.04	0.00	0.07	0.07
EI receipt, given SA receipt, by 2nd interview	0.31	0.39	0.39	0.28	0.39	0.15	0.40	0.00	0.57	0.18
Reason for SA use by users of both programs at 2nd interview										
EI pending	0.21	0.65	0.17	0.00	0.13	0.17	0.14	.	0.17	0.16
EI supplement	0.02	0.88	0.36	0.00	0.12	0.00	0.13	.	0.09	0.93
EI exhaustion	0.59	0.89	0.29	0.51	0.82	0.14	0.30	.	0.31	0.06

TABLE 3.5 – Eligibles and ineligibles by cohort, patterns of behaviour (cont)

Cohort	6		7		8		9		10	
Proportion of ineligibles	0.101		0.131		0.151		0.148		0.115	
	Eligibles	Ineligibles	Eligibles	Ineligibles	Eligibles	Ineligibles	Eligibles	Ineligibles	Eligibles	Ineligibles
Unemployment length as at 1st interview (weeks)	10.39	15.23	13.85	18.57	10.90	12.87	14.70	16.42	12.18	13.37
EI receipt between ROE separation & 1st interview	0.78	0.39	0.69	0.30	0.72	0.20	0.69	0.20	0.77	0.28
SA receipt between ROE separation & 1st interview	0.02	0.08	0.04	0.13	0.03	0.07	0.04	0.08	0.04	0.07
SA receipt, given EI receipt, by 1st interview	0.02	0.12	0.04	0.06	0.04	0.00	0.04	0.06	0.04	0.07
EI receipt, given SA receipt, by 1st interview	0.73	0.57	0.74	0.14	0.95	0.00	0.84	0.15	0.74	0.27
Reason for SA use by users of both programs at 1st interview										
EI pending	0.47	0.42	0.46	0.12	0.27	.	0.32	1.00	0.40	0.11
EI supplement	0.21	0.19	0.38	0.60	0.22	.	0.10	1.00	0.27	0.89
EI exhaustion	0.18	0.65	0.28	0.88	0.41	.	0.34	0.96	0.46	0.00
Interview two responses										
EI rec. between start ref period 2 & 2nd interview	0.53	0.26	0.42	0.27	0.48	0.20	0.46	0.23	0.52	0.19
SA receipt between start ref period 2 & 2nd interview	0.03	0.08	0.05	0.16	0.04	0.08	0.06	0.08	0.04	0.05
SA receipt, given EI receipt, by 2nd interview	0.01	0.03	0.05	0.10	0.03	0.02	0.06	0.08	0.03	0.02
EI receipt, given SA receipt, by 2nd interview	0.30	0.12	0.39	0.17	0.42	0.04	0.44	0.23	0.46	0.07
Reason for SA use by users of both programs at 2nd interview										
EI pending	0.13	0.00	0.03	0.36	0.19	0.05	0.15	0.00	0.14	0.00
EI supplement	0.29	0.04	0.05	0.41	0.40	0.00	0.16	0.37	0.28	0.00
EI exhaustion	0.42	0.96	0.60	0.03	0.52	0.47	0.34	0.60	0.35	0.28

At interview 2, the proportion of eligibles reporting receipt of EI since the beginning of reference period 2 is approximately two-thirds that at interview 1. This pattern is consistent with *a priori* expectations as individuals return to employment and/or exhaust EI entitlement over time. The corresponding figures for the ineligible subgroup show a markedly different pattern. For cohorts 5 and 9 the proportion of individuals reporting receipt of EI at interview 2 actually increases compared to the corresponding figure for interview 1. For other cohorts the proportion is unchanged (cohorts 1 and 8) or the fall less dramatic than that exhibited by the eligible groups. This pattern too is consistent with a return to employment by those who are ineligible to use the insured weeks/hours accumulated prior to the ROE separation in a spell of future unemployment. That is, the individual may return to employment quickly and generate eligibility for the EI program, and thereafter experience a spell of EI eligible unemployment.

For SA use, the proportion of the eligible job separators reporting receipt of SA by the time of second interview actually increases for all cohorts. As discussed earlier, this pattern may reflect the use of SA by exhaustees of EI and is consistent with the reasons given at the time of the second interview by users of both programs when asked why SA was used.

The patterns described above are generally consistent with *a priori* expectations. Nonetheless, the temporal nature of employment and income support program use is difficult to assess purely on the basis of interview responses at a point in time. To gain further insight into the temporal nature of program use, an analysis was undertaken of the temporal patterns of program use and labour market behaviour following the ROE separation. Four mutually exclusive labour market states are specified for the months following the ROE separation. These are receipt of social assistance with or without simultaneous receipt of EI benefits (S); receipt of EI benefits without receipt of SA (U); employment without receipt of SA or EI (E); and non-employment without SA or EI receipt (N). These four states are used in the analysis described below.

The first set of figures (figures 3.5-3.8) shows the proportion of eligibles and ineligibles in each of the four states in the months following the ROE separation. As expected, eligibles are far more likely to be in the U state (figure 3.6) following the ROE separation and a distinct seasonal pattern is apparent for this group. The probability of collecting EI benefits increases approximately 12 months after the initial ROE separation, consistent with seasonal patterns of employment and EI use. One aspect of interest in figure 3.6 is the steady increase in the probability of being in the U state for ineligibles in

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Figure 3.5 - N state
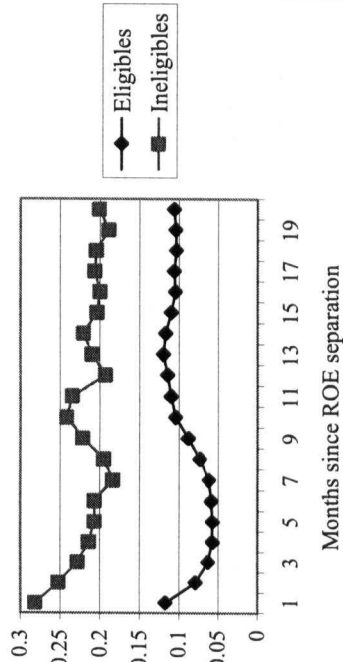
Figure 3.6 - U state
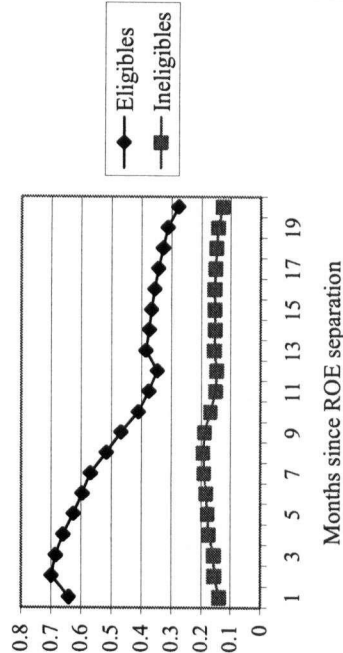
Figure 3.7 - S state
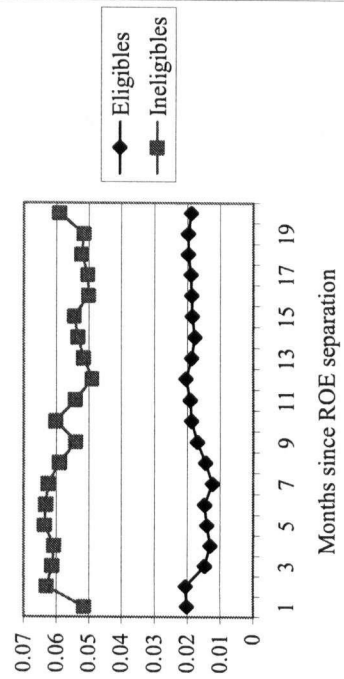
Figure 3.8 - E state
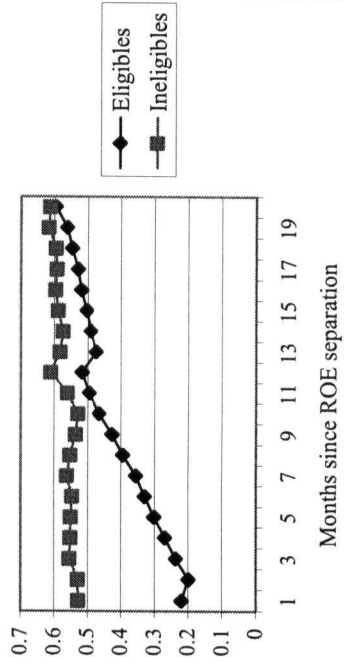
the months following ROE separation. In comparison, after month 1 EI eligibles exhibit a steady decrease in this probability over the same period.

The probability of collecting SA in any given month following ROE separation (figure 3.7) reflects *a priori* expectations. In any given month, the probability of ineligibles collecting SA is 2 to 4 times higher than that for the eligibles. For the eligible population the proportion in the S state increases after month seven, most likely reflecting take-up of SA by EI exhaustees. For ineligibles, on the other hand, the proportion in receipt of SA exhibits a marginal decline in the months following ROE separation.

Figure 3.8 shows the probability of being in the E state for the eligible and ineligible groups. As might be expected amongst a sample of layoffs, without the availability of EI the ineligible group exhibits a much higher probability of being in the E state in the months following the ROE separation. It is noteworthy, however, that by month 20 the two groups have similar probability of being employed. This convergence in the behaviour of the two groups is interesting as it may suggest a degree of homogeneity among the populations of eligibles and ineligibles in terms of attachment to the labour force with EI ineligibility representing a transitory state only.

A set of figures showing conditional transitions between the different states in the months following the ROE separation are also presented in figures 3.9-3.24. These transition rates represent the probability that an individual is observed to enter state $i(=N, U, S \text{ or } E)$ in month $(t + 1)$ following the ROE separation, conditional on being in state $j(=N, U, S \text{ or } E)$ in month t. In general the N to N transition (figure 3.9) for the ineligible group is higher than that for the eligible group, though increases steadily for both groups over the first 8 months following the ROE separation, before falling sharply. This pattern is repeated 12 months after the ROE separation most likely reflecting regular patterns of labour market behaviour. The N to U transition (figure 3.10) as expected is significantly higher for the eligible group for the first seven months following job separation, possibly pointing to the take-up of EI benefits over time following an initial period of unsuccessful job search. Conversely, the conditional probability of transiting into SA for the ineligible group (figure 3.11) is higher than that for the eligible group, though the pattern of transition is somewhat sporadic.

Figure 3.9 - N to N transitions
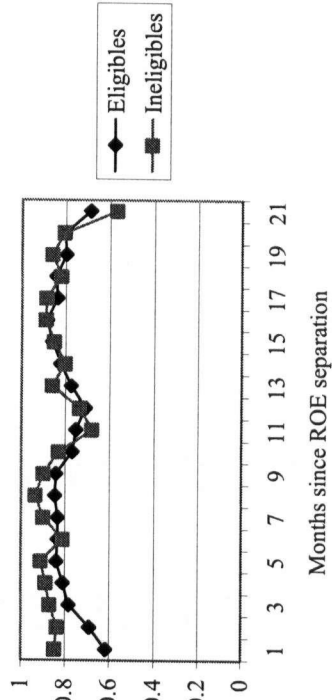
Figure 3.10 - N to U transitions
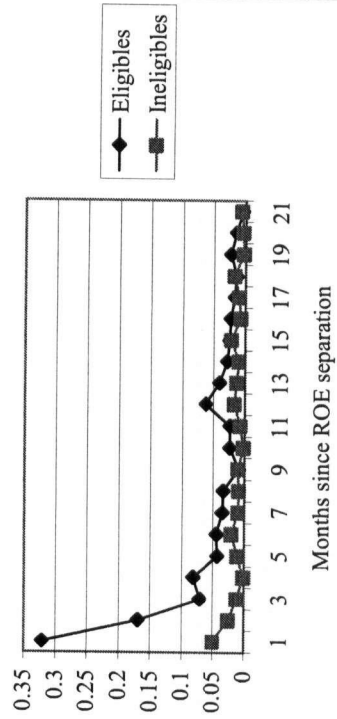
Figure 3.11 - N to S transitions
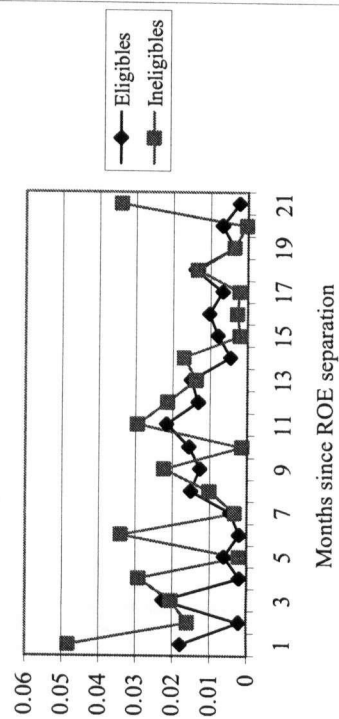
Figure 3.12 - N to E transitions

47
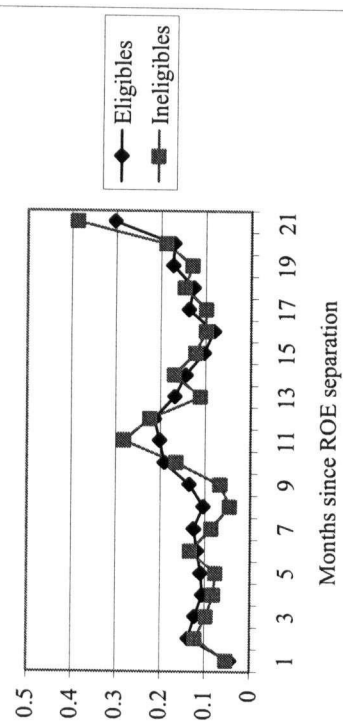
Figure 3.13 - U to N transitions
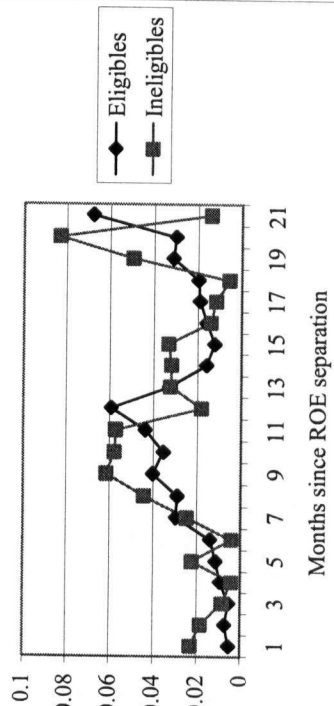
Figure 3.14 - U to U transitions
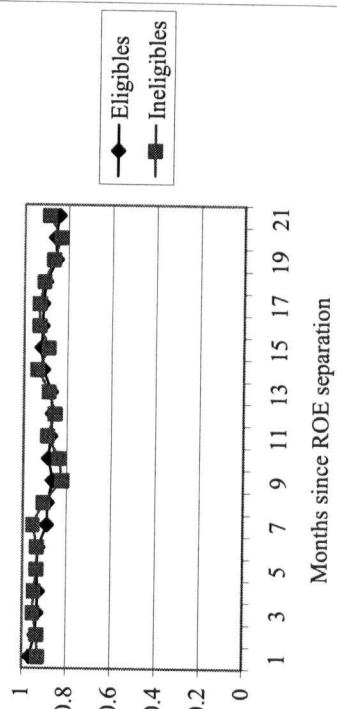
Figure 3.15 - U to S transitions
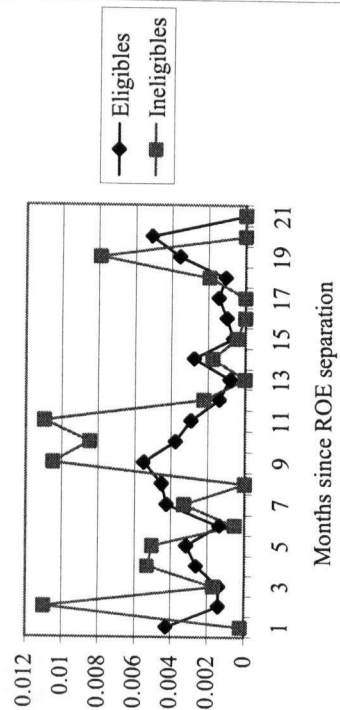
Figure 3.16 - U to E transitions

48
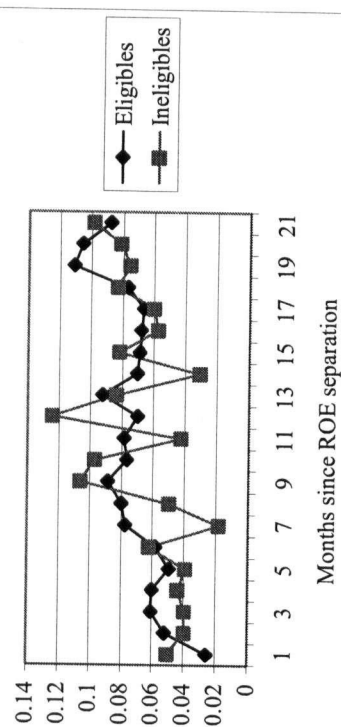
Figure 3.17 - S to N transitions
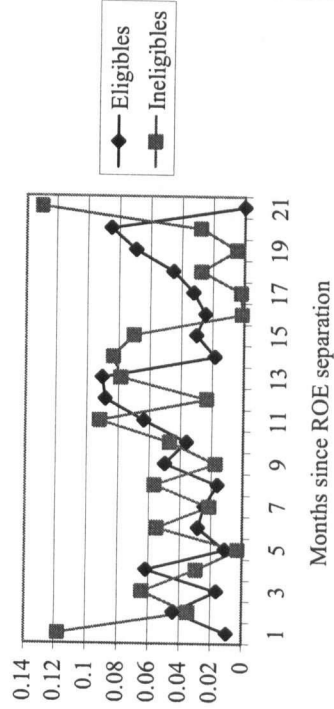
Figure 3.18 - S to U transitions
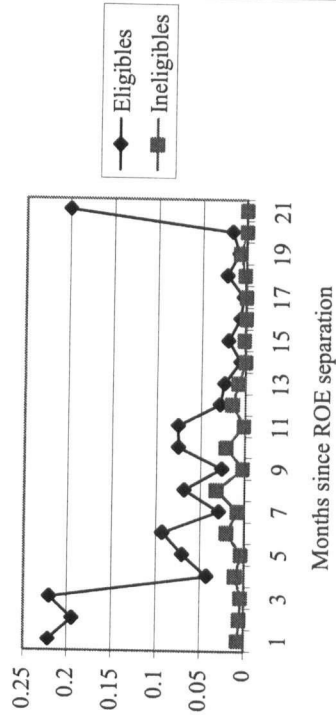
Figure 3.19 - S to S transitions
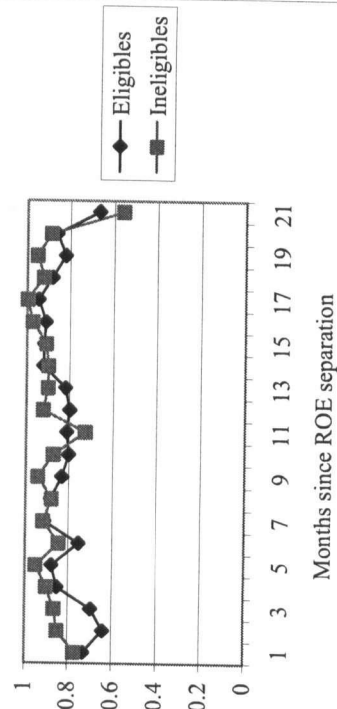
Figure 3.20 - S to E transitions

49
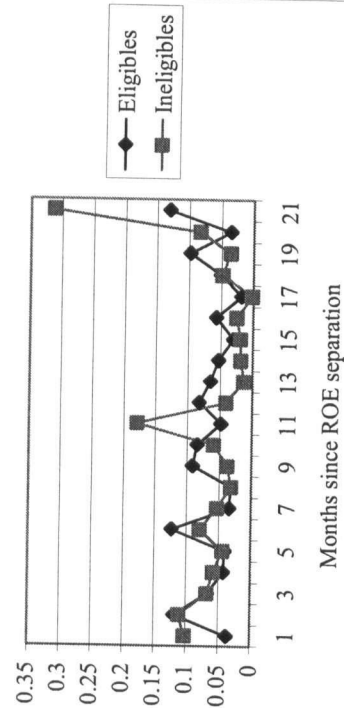
Figure 3.21 - E to N transitions
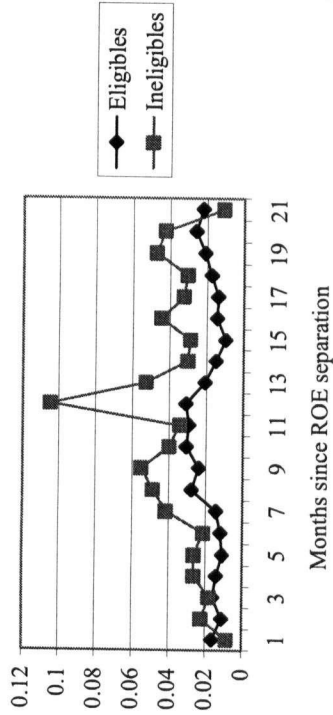
Figure 3.22 - E to U transitions
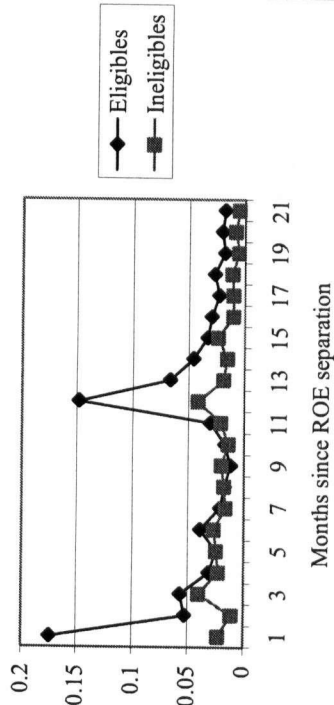
Figure 3.23 - E to S transitions
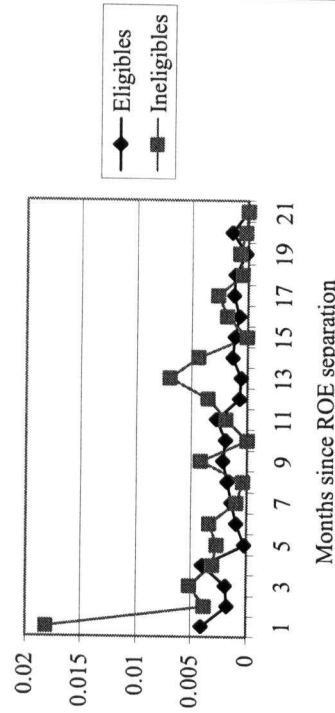
Figure 3.24 - E to E transitions
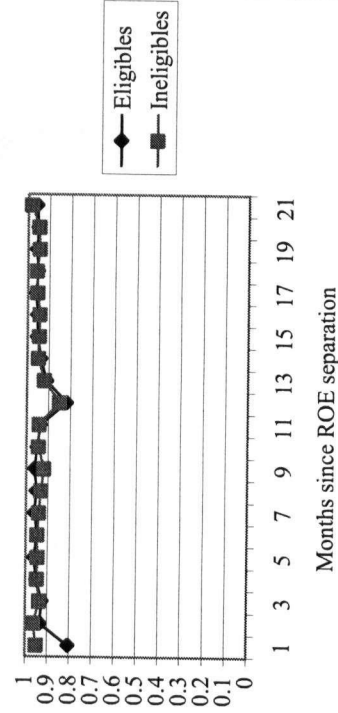
The N to E transition is shown in figure 3.12. This shows a distinct pattern opposite in nature to that for the N to N transitions. Around month 8 following the ROE separation, eligibles are more likely to re-enter employment from the N state. By month 11, however, the pattern is reversed and ineligibles are more likely to re-enter employment given they are in the N state. It is noteworthy that for the ineligible group a large increase in the transition from S to E also occurs in month 11 (figure 3.20). This may point to regular patterns of employment for this group, interspersed with the use of SA.

Figures 3.13-3.16 show the transition rates from the U state. The transition to the N state trends upward for both the eligible and ineligible groups, probably reflecting a combination of unsuccessful job search and exhaustion of EI benefits. The U to U transition (figure 3.14) indicates that movement between the EI benefit receipt state declines in the period following ROE separation. Again, this no doubt reflects successful job search and the exhaustion of benefits as time progresses. It is noteworthy though that for the ineligible group the U to U transition is generally higher than that of the eligible group in months 3 to 8 following ROE separation, before dropping off dramatically in months 9 to 10. This general pattern is repeated in the period 13 months after ROE separation. It is unclear why the sudden drop off in the U to U transition occurs for the ineligible group between months 9 and 10, though it may reflect the return to employment in order to ensure EI eligibility in the following year for seasonal workers.

The U to S transition rate is relatively low (figure 3.15), though it shows a slight upward trend for the eligible group consistent with the take-up of SA following exhaustion of EI benefits in the first 12 months following the ROE separation. The final transition from the U state to employment (E) (figure 3.16) shows a pattern reverse to that seen in the U to U transitions. As expected *a priori*, the transition increases over time for the eligible group as more EI recipients re-enter employment.

Figures 3.17-3.20 show the transition rates from the S state. A number of patterns are noteworthy. First, eligibles in general have a lower probability of remaining in the S state in any given month following the ROE separation (figure 3.19). The S to S transition trends upward between months 1 and 5 for the ineligible group, possibly pointing to some heterogeneity in the make-up of this group. The ineligible group may contain a set of individuals who have characteristics associated with a propensity to remain in SA for an extended period and who represent an increasing proportion of

individuals in the S state over time. The large drop in the transition probability around month 11 suggests a regular pattern of employment by individuals in the ineligible group and is consistent with the increase in the S to E transition in figure 3.20. The steep decline in the S to S transition in the period immediately following the ROE separation for the eligible group most likely reflects the use of S while waiting for EI claims to be processed.

There appears to be reasonable turnover in the SA population among the EI ineligible group. The S to S transition varies between 0.77 and 0.95 over the first nine months following the ROE separation. This suggests that within 9 months of entering SA only around 30 per cent of the original SA spells are continuing for this group. The primary exit state for ineligibles appears to be employment (E), suggesting that the use of SA is only a transitional state before the individual returns to employment. One interesting aspect of the transitions from S is the exits into the N state, which appear to be reasonably important for the ineligible group. This transition from the S state into the N state may simply reflect the use of SA for short-term emergency purposes by members of this group until the economic position of the household improves.

The final set of transitions to be considered is those from the E or employment state (figures 3.21-3.24). With respect to the E to E transitions (figure 3.24), two features are noteworthy. The first is the fall in the E to E transition rate for the ineligible group over the first nine months following the ROE separation. Although the decline is slight, the trend can be compared to the increasing trend for the eligible group over the same period. This may be consistent with a pattern of returning to and remaining in employment only for a period long enough to generate eligibility for EI benefits. This pattern is consistent with patterns of transitions into other states. Hence, exits into the U state from E are declining for the first five months after ROE separation for the eligible group, but increase between months 1 and 3 for the ineligible group. That is, those ineligible at the time of ROE separation become more likely to transit from the E state into EI benefits in the months following the ROE separation. Noticeably, by the fifth month after the ROE separation the conditional exit rate into the U state is approximately the same for both the eligible and ineligible groups.

The second noticeable aspect of the transitions from the E state into other states is the large jump in month 12 after the ROE separation. This jump in the transition rates is observed for both the eligible and ineligible groups, though the increase in transitions into U is more pronounced for the former group. This jump may reflect regular patterns associated with employment and use of the EI program.

Note that a similar pattern of exits into the S state are also evident for the ineligible group with an increase in the S to E transition rate approximately 12 months after the ROE separation.

To gain greater insight into the sequencing of spells in alternative labour market states, spell patterns in the months following the ROE separation were examined for the layoff sample by EI eligibility status. The states considered are a subset those discussed above (S, U or E), and the frequency of various observed spell patterns for the eligible and ineligible groups are reported in table 3.6. Note that in deriving these patterns, N spells of two months or less were ignored. For example, a spell of S interrupted by one or two months of N was simply treated as a single S spell. The reason for adopting this approach was to focus on the patterns of program use and employment spells experienced by individuals following job separation. In some sense, the N state represents a transitory state only between spells associated with program use or employment. If individuals are observed to remain in the N state for an extended period, however, this may reflect a conscious decision to withdraw from the labour force.

The first set of patterns in table 3.6 are those for individuals who exhibit no transitions between the S, U or E states in the period following ROE separation, that is, are in either S, U or E only for this period. A number of patterns emerge in examining these patterns. First, almost 28 per cent of ineligibles use neither the EI nor the SA program following ROE separation. That is, they remain only in the E state. In comparison, approximately 10 per cent of eligibles exhibit the same pattern. Some 10 per cent of eligibles collect EI over the period following the ROE separation, with no monthly employment interruptions. Although EI benefits are generally limited to less than 12 months, continued receipt for a longer period may be possible if individuals can mix months in which some EI is collected with periods of employment. Such months are recorded as months of EI receipt. Interestingly, 2 per cent of ineligibles use SA only over the period following ROE separation. Given that some 10 to 20 per cent of ineligibles in any given cohort report receipt of SA by the first interview (table 3.5), this would suggest that few spells of SA (less than 20 per cent) are ongoing for a period beyond 18 months for this group. This, along with the patterns of SA use described above, is consistent with earlier studies that have identified the use of SA by employables as one in which many users exhibit short spells of SA and high rates of recidivism.

TABLE 3.6: Spell patterns, eligible and ineligible layoffs

	Eligibles	Ineligibles
Single spells		
E	0.101	0.278
U	0.104	0.021
S	0.004	0.020
At least one transition		
EU	0.106	0.124
ES	0.003	0.026
SE	0.007	0.028
SU	0.011	0.003
UE	0.472	0.095
US	0.020	0.011
At least two transitions		
SES	0.001	0.014
SEU	0.002	0.004
SUE	0.006	0.001
SUS	0.002	0.002
USE	0.008	0.005
USU	0.005	0.001
UEU	0.199	0.042
UES	0.003	0.001
ESE	0.002	0.020
ESU	0.000	0.001
EUE	0.072	0.068
EUS	0.002	0.002

The second part of table 3.6 indicates the nature of transitions by individuals who make at least one transition following the ROE separation. For eligibles, a spell of EI followed by a return to employment is the single most likely path, exhibited by over 47 per cent of respondents. For ineligibles, however, a number of paths are important. The *EU* sequence, which can be characterized as a return to employment to generate eligibility for and then taking up EI benefits is more likely to occur among ineligibles (12.4 per cent) compared to the eligible group (10.6 per cent).

This is important, as it may point to an entitlement effect associated with the EI program as individuals attempt to preserve insured weeks or hours which cannot be used immediately but which can, however, be used to count towards EI eligibility in a subsequent spell of unemployment. Hamermesh (1979) has examined a similar phenomenon in the context of the United States unemployment insurance program.

Further, ineligibles are more likely to use SA followed by employment (the *SE*) path, compared to the eligibles (2.8 per cent and 0.7 per cent respectively). Again, this points to the use of SA as a surrogate form of employment insurance while job search activities occur, though clearly the SA program is not a perfect substitute for the EI program. As noted above, the *US* sequence, consistent with the exhaustion of EI benefits followed by the use of the SA program, is exhibited by approximately 2 per cent of eligibles.

The final part of table 3.6 provides details on individuals who make at least two transitions following the ROE separation. A number of patterns are noteworthy. First, ineligibles are much more likely to cycle in and out of SA (the *SES* path) than eligible individuals (1.4 per cent and 0.1 per cent respectively). In comparison, eligibles are far more likely to cycle in and out of EI (20 per cent and 4 per cent respectively). Interestingly ineligibles are 2 times more likely to follow a *SEU* sequence compared to the eligible job separators. This stylized path is discussed above and reflects the possible nature of SA as a transitory means of support that is used when EI benefits are not available. The individual may generate EI eligibility subsequently in an employment spell following the SA spell. Again, such a pattern reflects the entitlement effect of the EI program. It should be pointed out, however, that the proportion of either population following the *SEU* sequence is small.

3.5   Conclusions

The analysis in this chapter highlights a number of characteristics of the relationship between the EI and SA programs and labour market behaviour. First, examination of the COEP data points to the role of both income support programs in individually influencing labour market behaviour. For example, regular patterns of employment and program use are clearly apparent in the observed behaviour of COEP respondents. Although some of these patterns have been identified in the literature previously, the benefit of the COEP dataset is that it provides insight into the use of both programs and

employment behaviour following job separation. One important observation arising from the analysis in this chapter is that SA is not simply an absorbing state for individuals for whom there is little prospect of a return to employment in the future. Rather, for some individuals SA appears to represent an alternative means of income support in the absence of EI while job search is undertaken.

The joint role of the EI and SA programs on individual's behaviour has also been highlighted in this chapter. For example, there is evidence that individuals who are not eligible for EI benefits make use of the SA program for income support purposes while job search is undertaken. Receipt of SA among many COEP respondents, however, appears to represent a transitory state before returning to employment and/or the EI program. While not surprising given that the COEP dataset represents a set of individuals who were included in the sample by virtue of separating from employment, this may have important policy implications for the overall design and reform of income support programs.

The presence of two income support programs, like SA and EI, and their impact on labour market outcomes may be conceptualized using either a traditional job search model or a labour-leisure choice model. The exact nature of the interface of the programs will have important, albeit possibly different policy implications, depending on if and how individuals structure their behaviour in the presence of both programs. For example, consider the effects of policy changes if the programs can be used concurrently or in succession. Changes in EI benefit levels, for example, may not affect overall spell lengths of unemployment or employment if SA can be used to supplement EI. If individuals use EI and SA sequentially, however, a decrease in EI benefit levels may reduce both the use of SA and the length of unemployment spells. In this case, a decrease in the value of EI may be characterized as a reduction in the overall value of the 'non-employment' state. Conversely, variation in the length of time over which EI benefits are available may simply result in higher take-up of SA by EI exhaustees if the programs are used sequentially, but not affect the average duration of unemployment spells. Whether the length of unemployment spells is affected will depend on the precise nature of the interface between the programs and the substitutability of SA for EI.

The analysis in this chapter has also highlighted the behaviour of a group of EI ineligibles following job separation. Hamermesh (1979) has previously identified the entitlement effect associated with the presence of an EI program with an entrance requirement. In short, in the presence of an EI program that is dependent on participation in employment, the value of an employment spell also includes the benefits from EI that are available in the event of unemployment. Hence, transitions from the unemployed state will be influenced by future potential EI benefits. In Canada, this issue is

complicated by the presence of the universally available SA program that potentially provides support to unemployed individuals who do not have access to EI benefits.

The analysis of spell sequences (table 3.7) indicated that for the EI ineligible job separators, there is some evidence that employment and SA use patterns are consistent with the presence of an entitlement effect. That is, individuals return to employment to preserve the value of insured hours of employment in the event of future unemployment. As noted previously, eligibility for EI is, in general, based on the amount of employment in the 12-month period preceding the unemployment spell. An extended delay in returning to employment means that a spell of EI eligible employment may not be used for the purpose of establishing eligibility for the EI program in the future. The employment spell may effectively leave the moving window over which EI eligibility is determined in the event of future unemployment. As discussed above, the SA program is a potentially significant aspect of this pattern as it provides an alternative source of income support during spells of uninsured unemployment.

Two important implications follow from the patterns of employment and program use described in this chapter. First, policy reform of income support programs associated with spells of unemployment should explicitly recognize the availability and nature of alternative income support measures. If SA can simply be used in lieu of EI, then changes that curtail the generosity of the latter program may be simply offset by use of the former program. Similarly, a reduction in the generosity of the SA program may result in unemployed individuals in receipt of EI altering job search behaviour given that the terminal state (SA) is less generous. As noted previously, this has fiscal implications not only for the government undertaking the policy change, but also for governments responsible for alternative programs.

Second, the failure to take explicit account of the interface between the two income support programs highlights the limitations of previous research. To the extent that research has focussed on one program to the exclusion of the other, estimates of the impact of variation in one program on overall program use and labour market behaviour are likely to be biased and/or misleading. The availability of the COEP dataset and the information it provides allows a more comprehensive examination of these issues than has been done in the past.

In chapter four a more formal econometric analysis of some of the issues identified in this chapter is undertaken. Using a generalized transition probability model, the behaviour and labour market

outcomes of individuals following job loss are examined. In particular, an analysis is undertaken of the effects of variation in the parameters of the EI and SA programs on overall labour market outcomes.

CHAPTER 4 - The Impact of Income Support Programs on Labour Market Behaviour in Canada

4.1 Introduction

Governments around the world have increasingly expressed concern about the incentive effects and fiscal burden imposed by income support programs. In Canada, governments have responded to these issues in recent times by curbing the generosity of the financial support available to individuals under these programs. If the concern is to design an appropriate income support system, however, it is critical that the impact of programs on labour market behaviour and outcomes be correctly identified. Numerous studies have examined the impact of income support programs on various aspects of labour market behaviour such as the labour force participation decision, the length of employment spells and job search intensity while unemployed. In general these studies have focussed on a single program such as those specifically designed to compensate workers who experience a layoff from employment. Examination of the institutional structure of income support programs, however, indicates that individuals may receive financial assistance from a variety of programs each with its own rules governing eligibility and entitlement to assistance (Atkinson and Micklewright, 1991). This raises obvious concerns about estimates of the impact of variation in the parameters of any single program. If individuals use the programs that are available jointly in determining labour market behaviour, then identification of the true effect of variation in one program requires taking account of the interaction between programs. For example, individuals may offset a reduction in the time spent in any given program with increased use of an alternative program. In this case identifying the variation in time spent in the former program will overstate any changes in an individual's total reliance on income support mechanisms.

The nature of the interface between income support programs may also be important in a more general institutional context if different levels of government have fiscal and administrative responsibility for alternative programs. In this case, an incentive may exist for governments to shift the fiscal burden of income support by unilateral changes to programs for which they have responsibility.

In this chapter, the interaction of two key income support programs in Canada and their impact on labour market outcomes following the loss of employment is examined. The analysis follows the previous chapter's discussion of the patterns of EI and SA program use and transitions between alternative labour market states following the separation from employment. As noted previously, a number of earlier studies have examined how these programs individually influence labour market decisions relating to job tenure, search intensity while unemployed and labour force participation. Nonetheless, despite evidence that both programs are important in determining labour market behaviour, to date there has been limited analysis of how the programs interact.

Like the analysis in chapter three, this chapter uses the 1997 COEP dataset to examine program use and labour market behaviour following separation from employment. The approach taken in this chapter is to use a generalized probability transition model to estimate the determinants of time spent in different labour market states and conditional on exit from a given state, the determinants of the transitions between those states. Policy simulation experiments are then undertaken in which the results of this analysis are used to identify the effect of altering income support programs on labour market behaviour, including use of the alternative income support program.

The analysis in this chapter identifies a number of important results in relation to the EI and SA programs and their impact on labour market outcomes. First, I find that a simple characterization of the EI and SA programs as substitutes for one another is not correct. Although reductions in the generosity of the EI program result in increased use of the SA program, curtailing the generosity of the SA program reduces the use of both programs. A key result from a policy perspective is that changes that limit eligibility by increasing the entrance requirements for the EI program have a larger impact on the use of the SA program than reductions in the length of EI benefit entitlement, given that eligibility has been established. This suggests that policies that limit access to the EI program through more demanding entrance requirements should potentially represent a greater concern to governments responsible for the provision of SA. Nevertheless, the fiscal cost of additional SA use resulting from changes to the EI program simulated in the analysis may be considered small and economically insignificant.

This chapter is organized as follows. In the next section the institutional background associated with income support programs available to unemployed individuals in Canada is set out, along with the manner in which the programs may interact. Some discussion of earlier studies of the programs is also undertaken at this point. Next, a description of the COEP dataset used in the analysis is set out and the

specification of labour market states used in the analysis defined. This section builds on the discussion in chapter three by describing recent changes to the EI program that aid in the identification of the interface between income support programs and labour market behaviour analyzed in this chapter. Following this, a description of the methodology used is set out. After presenting the estimated relationships from the econometric analysis, the method used to simulate policy experiments is described along with the results of those simulation exercises. Finally, concluding comments and directions for future research are made.

4.2   Institutional Background and Interaction between Programs

The discussion in chapters two and three highlighted the central role of the EI and SA programs in providing income support in Canada. In that earlier discussion it was noted that whereas both EI and SA programs may provide financial support during periods when employment income is interrupted, the characteristics of the programs are substantially different. Further, our understanding of the implications of the structure and parameters of these programs for the nature of the interface between the programs and overall labour market outcomes is limited.

Employment insurance, as its name suggests, is an insurance program that replaces employment income for a limited period in the event of interruption to an individual's income stream. As EI is an insurance program, eligibility for benefits is conditional on contributions to the program while employed. An individual's eligibility for EI benefits depends on the amount of employment s/he has engaged in recently and the unemployment rate in his/her economic region. In general, eligibility depends on employment undertaken in the previous 12 months, though for re-entrants and new-entrants to the labour market a two-year period is used. There are 58 EI economic regions defined across Canada. The number of weeks of entitlement given that eligibility has been established is also a function of the amount of employment the individual has engaged in and the unemployment rate in his/her EI economic region. In general, a higher unemployment rate lowers the entrance requirement associated with establishing eligibility for EI benefits and increases the individual's weeks of entitlement once eligibility has been established. Although titled unemployment insurance prior to 1997, this thesis uses the generic term employment insurance to refer to both programs.

As noted in chapter two, SA represents assistance of last resort for households in need irrespective of the source of hardship. Benefits are needs-tested but the availability of benefits does not depend on

labour market status. Rules governing eligibility for SA receipt vary across and in some cases within Canadian provinces, though the basic process for determining eligibility is essentially the same across jurisdictions. A comparison is made of the budgetary needs of the household as defined under provincial welfare regulations to the household's available assets and income. A deficiency between the assessed needs of the household and income results in eligibility for assistance. It should be stressed that the level of benefits available to households varies substantially across provinces. In response to concern about burgeoning caseloads, the generosity of welfare programs have been significantly curtailed over the last decade. Benefit levels have been reduced, eligibility rules tightened, and more onerous employment search requirements placed on recipients deemed employable (Barrett and Cragg, 1998; National Council of Welfare, 1996, 1997a, 1997b, 2000).

The provincial governments administer SA programs with some funding assistance from the federal government. From 1966-67 to 1995-96, the Canada Assistance Plan (CAP) was the funding mechanism that the federal government used to contribute financially to the cost of provincial and territorial SA programs. In April 1996, the Canada Health and Social Transfer (CHST) program replaced CAP as the means by which the federal government contributed to the cost of SA programs. In moving from the CAP to the CHST the formula for federal contributions changed from federal-provincial cost-sharing (50-50) to a block grant that now includes health care and post-secondary education program costs.

The discussion in chapters two and three identified the availability of income support from both EI and SA programs during periods of no or little employment income as creating an environment where both programs will influence labour market behaviour jointly. Moreover, interaction between programs may occur if variation in the parameters of one program influences use of the alternative program. This interaction between the EI and SA programs may arise through a range of behavioural and administrative mechanisms.

From a purely mechanical perspective, variation in one program may result in altered use of the other program. For example, limiting access to EI either by making the entrance requirement more stringent or reducing the number of weeks benefits that may be claimed following the establishment of a claim may allow some individuals to claim SA who were previously excluded by virtue of receipt of EI payments. Alternatively, a reduction in EI benefit levels that allows individuals to receive SA and EI simultaneously may have a similar effect in that individuals simply make use of both programs at the same time.

The interface between the programs may also influence behaviour. For example, individuals may plan to use one or both programs together in their utility-maximizing choice of temporal labour-leisure patterns (Fortin, Lacroix and Thibault, 1999). Variation in the generosity of one program may affect behaviour while employed or not employed as the total value of the non-employed state is altered. In the context of a non-stationary job search model if the value of SA benefits is reduced, individuals may be less likely to exhaust EI benefits when the value of the terminal state has declined. The 'terminal state' being referred to here is the potentially unlimited period over which SA benefits may be collected. In a similar fashion if the generosity of the EI program is curtailed individuals may be less likely to leave SA given that the value of the employment, which includes the entitlement effect associated with the EI program, is lower.

The interface of the EI and SA programs may also arise from purely administrative characteristics of the programs and dynamic considerations. As noted in chapter two, there is evidence that a number of individuals were shifted onto SA rolls while awaiting EI claims to be processed during the recession of the early 1990s (Barrett *et al.*, 1996). Similarly, there is evidence of individuals timing applications to programs, especially EI, to maximize potential pecuniary benefits during a spell of unemployment (National Council of Welfare, 1997a, p. 94).

In the context of dynamic behaviour responses, Barrett *et al.* (1996) examine the EI spells of individuals conditional on their prior use of SA. Job search intensity for an individual who has used SA previously and is familiar with the program may be lower than that of an individual who has not previously used the program. Hence, labour market behaviour may be influenced by previous use of programs and variation in parameters of a program may affect use of both programs.

A review of the literature regarding the Canadian EI and SA programs was set out in chapter two and only a few salient points are emphasized here. As highlighted in chapter two, although previous empirical analysis of the Canadian EI and SA programs has recognized the limited time period over which EI benefits may be received, the use of SA payments for job search purposes has been given only limited attention. For this reason, receipt of EI has been associated with periods of unemployment, and spells on SA have been associated with periods of need, not necessarily directly related to unemployment. Most importantly from the perspective of the analysis undertaken in this chapter, there has been little analysis of the nature of the interface between the two programs despite evidence of the intersection of the populations served by the two programs.

In general, studies examining the effect of the EI program on behaviour have found results consistent with *a priori* expectations. For example, Ham and Rea (1987) and Corak (1992) both found a positive relationship between an individual's EI entitlement and the length of the unemployment spell. Further, both studies indicate that near the point of exhaustion of benefits individuals are far more likely to return to employment. The study by Crémieux *et al.* (1995b) examined the behaviour of unemployed individuals but did not focus exclusively on EI recipients and included information on the receipt of SA during spells of unemployment. The analysis indicated that job search intensity did not appear to be dependent on EI eligibility but did find some evidence of a positive relationship between SA benefits and search intensity (pp. 42-44).

A range of studies have considered the effect of the parameters of the Canadian SA program on labour market activity including the take-up of SA, spells on and off SA, and the impact of SA on labour force participation. Studies examining the decision to participate in the labour force have identified a negative relationship between participation and the level of SA benefits, as expected. Conversely, the probability of SA participation is in general positively related to the level of SA benefits (Allen, 1993; Charette and Meng, 1994; Christofides *et al.*, 1997; and Dooley, 1999). Studies examining the duration of SA spells have identified the central role of the business cycle (Duclos *et al.*, 1998) and seasonal considerations (Fortin and Lacroix, 1998) in explaining transitions out of SA. A number of stylized facts concerning patterns of SA receipt were also highlighted in chapter two. Studies by Barrett *et al.* (1996), Barrett and Cragg (1998), Cragg (1996) and Bruce *et al.* (1996) have documented a significant increase in the proportion of SA recipients who were classified as employable and without family responsibilities over the past two decades. Further, a large proportion of SA spells are short, and program users exhibit a high rate of recidivism.

Only a few studies have specifically sought to identify the nature of the interface between the SA and EI programs. A study by Barrett *et al.* (1996) used administrative data on the EI and SA programs and identified a number of key characteristics of the population served by the SA program. Although the annual results are heavily influenced by cyclical considerations, the general pattern identified in that analysis is of two distinct groups of SA users. The first group of SA users are marginally attached to the labour force, if at all, and experience relatively longer spells of SA receipt. The second group exhibits a reasonably strong attachment to the labour force and tend to experience somewhat shorter spells of SA receipt intermingled with spells of employment and EI. Browning, Jones and Kuhn (1995) identified the importance of the SA program as a means of income support following the

removal of access to the EI program. The consequences of varying the generosity of the EI program for the use of the SA program has also been examined but the results have proved inconclusive. A study by Fortin, Lacroix and Thibault (1999) found evidence that greater generosity of the EI program increases the exit rate from SA and reduces the probability of individuals returning to SA. Conversely, Fortin and Lacroix (1998) found evidence that greater generosity of the EI program was associated with a reduced likelihood of exiting a spell of SA.

The examination of the use of the EI and SA programs and employment patterns following loss of employment in chapter three has confirmed some of the patterns identified in the earlier studies and provided additional insight into the nature of the interface between the programs. First, like Browning, Jones and Kuhn (1995) job losers ineligible for EI benefits were found to be far more likely to use SA in the period following job loss than those for whom EI was available. Second, observed patterns of program use and employment provide some evidence of the use of the SA program as an intermediate measure before returning to employment and generating eligibility for the EI program.

The analysis described in the remainder of this chapter provides further insight into the nature of the interface between the EI and SA programs in Canada and their relationship to overall labour market outcomes. This analysis is possible by virtue of the COEP dataset, which provides information on program use and labour market behaviour following a separation from employment. This provides a significant advantage over previous analyses that could not identify the behaviour of individuals following an exit from the program of interest. The data used in the analysis is now set out and thereafter the methodology employed in this chapter is described.

4.3   The 1997 Canadian Out of Employment Panel Dataset

The 1997 COEP dataset was introduced in chapter three. This database combines administrative data on use of the EI program and survey responses to a comprehensive series of personal and behavioural questions following a job separation. This job separation is termed the Record of Employment (ROE) job or ROE separation. Earlier versions of the COEP dataset have been used to analyze a variety of labour market activity including the interaction of the EI and SA programs (Browning, Kuhn and Jones, 1995). The 1997 COEP dataset presents a unique opportunity to examine the interface between the EI and SA programs given its comprehensive information on program use and labour market

behaviour following job separation. Further, the 1997 COEP straddles the replacement of the Canadian unemployment insurance program (UI) with the EI program. The changes associated with the introduction of the EI program provide an important source of independent variation in the environment faced by individuals with which to identify the relationships of interest in the analysis presented below.

The replacement of the UI program by the EI program occurred over the period 1996-97 with a series of changes relating to the structure of benefits and requirements for eligibility for benefits. In general, benefits under both the EI and UI programs were set at a rate of 55 per cent of earnings, up to some maximum level of insurable earnings. From 1 July 1996, however, the benefit rate paid to individuals who had made repeat claims in the previous five years was reduced slightly. In calculating EI premiums Maximum Insurable Earnings (MIE) were decreased from $815 to $750 per week on 1 January 1996 and this figure was fixed for the years 1996 to 2000. For benefit calculation purposes, this lower MIE was not applied until July 1996. The eligibility or entrance requirements for new entrants and re-entrants (NEREs) to the labour force were also increased on July 1 1996. Whereas previously NEREs required 20 weeks of insured employment to qualify for EI benefits, in the future they required 26 weeks. The maximum period over which EI benefits could be collected was also reduced from 50 to 45 weeks. This change adversely affected individuals with longer spells of employment in EI regions with high unemployment rates.

Perhaps the most significant change was the introduction of an hours-based system on 1 January 1997. Whereas previously only weeks with more than 15 hours worked could be used to count towards UI eligibility, following the introduction of the hours-based system every hour of insured employment could be used to establish EI eligibility. As noted previously the number of weeks of benefits available to individuals under the EI program is a function of his/her recent work history and the unemployment rate in his/her EI economic region. Further, a higher unemployment rate lowers the entrance requirement associated with establishing eligibility for EI benefits and increases the individual's weeks of entitlement once eligibility has been established.

Under the UI program non-NERE individuals required between 12 and 20 weeks of insured employment in the previous 52 weeks to be establish eligibility for UI benefits. If the individual was eligible for UI at the time of job loss, s/he was usually entitled to between 14 and 50 weeks of benefits depending on the weeks worked and the unemployment rate. Following the introduction of the hours based system individuals required between 420 and 700 hours of insured employment to

establish eligibility for EI benefits. In general, the schedule setting out the relationship between weeks of EI benefit entitlement and hours worked under the EI program corresponded to that under the UI program, except that each *week* of insured employment under the UI program was considered equivalent to 35 *hours* of insured employment under the EI program. This change had a particularly marked effect on the eligibility for individuals working more than 15 hours but less than 35 hours per week.

These changes represent an important source of variation in the EI program for identifying the relationships of interest in the present analysis. For individuals working a non 35-hour week the introduction of the hours based system directly affected their access to EI benefits. For those working more than 35 hours, fewer weeks of work were required to qualify and earn a given entitlement of EI. Conversely, those working less than 35 hours per week required more weeks to qualify for benefits under the new program.[7] Moreover, individuals in regions with unemployment rates exceeding 10 per cent were directly affected by the reduction in the maximum number of weeks of entitlement from 50 to 45. These changes to the EI program aid in identifying the relationship between the SA and EI programs and employment outcomes that are of central concern in this analysis.

In addition to the extensive set of personal information available, the principal advantage of the 1997 COEP dataset for the present analysis is that it provides a record of the individual's employment in the periods following the ROE separation. This information facilitates analysis of labour market behaviour, including EI and SA program use, in the periods following the ROE separation. As in chapter three, the present analysis proceeds by categorizing individuals as being in one of four mutually exclusive states in the weeks following the ROE separation. The four states used in the present analysis are the same as those defined in chapter three:

N – non-employment without SA or EI receipt

S – collecting SA with or without simultaneous receipt of EI benefits

E – employment without receipt of SA or EI benefits

U – receipt of EI benefits without receipt of SA

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[7] An exception to this was individuals working less than 15 hours per week. For those individuals hours worked now contributed to EI eligibility whereas under the weeks based UI program, these weeks of employment could not be used to count towards eligibility.

These four states form the basis for the analysis of labour market behaviour following the ROE separation. The analysis in this chapter uses only the subset of COEP respondents for whom the ROE separation represented an involuntary layoff. As discussed in chapter three the interaction with the EI and SA programs of those who quit employment, were dismissed without just cause or left employment due to retirement or pregnancy is likely to be somewhat different to those experiencing a layoff from employment. Missing responses to questions relating to variables used in the present analysis also required that some observations be dropped from the analysis. The analysis then proceeded with approximately 20,000 individuals who suffered a ROE separation in the period between mid 1995 and the end of 1997. This sample is smaller than that used in chapter three reflecting the different set of covariates used in the present analysis.

Prior to setting out the methodology used in the analysis it is worthwhile to consider the characteristics of the sample used. Covariate means for individual personal characteristics, along with counts of the number of spells observed in each state are set out in table 4.1. As the COEP sample is not a random sample of those who separate from employment during the period of sample selection, weights provided with the COEP dataset were used in the calculation of all means and the empirical analysis in this chapter.

The covariate means indicate that individuals from Québec and the Atlantic provinces (Newfoundland, Prince Edward Island, Nova Scotia and New Brunswick) are somewhat over represented relative to the Canadian population. This, however, partly reflects the higher than average unemployment rate in those provinces during the period of sample selection. The means in table 4.1 also point to the sample of job separators as having a relatively uniform distribution of education levels. Liquid assets available to the household to which the individual who suffered a job separation belonged at the time of the ROE separation were approximately $4,000. Further, the average hourly wage in the job from which the ROE separation occurred was approximately $14.70.

Note that the mean SA benefit level reported in table 4.1 is calculated using provincial administrative regulations that set out the maximum allowed benefits for employable SA claimants. The maximum benefit available to a claimant under these regulations varies across provinces and depends on the structure of the household. Characteristics of the household that influence the maximum level of benefits include the presence of a spouse and/or children and, in some cases, the age of the claimant and any dependent children. For each COEP respondent the maximum benefit level potentially available to the household he/she belonged to was computed for the period covered by the COEP

TABLE 4.1: Covariate means and spell counts

Variable	Mean
Male	0.58
Married	0.62
Education	
Less than high school	0.26
Completed high school	0.28
Non university post secondary	0.26
University	0.20
Minority	0.09
Province	
Newfoundland	0.03
Prince Edward Island	0.01
Nova Scotia	0.04
New Brunswick	0.05
Québec	0.34
Ontario	0.27
Manitoba	0.03
Saskatchewan	0.02
Alberta	0.08
British Columbia	0.12
Liquid assets at time ROE separation	4.23
Wage in ROE job ($/hour)	14.67
Age (years)	37.7
Unemployment rate (%)	11.4
Monthly maximum SA benefit levels ($)	789
Number observations	20,063

Spells in each state	Number spells	Mean length (wks)
N spells	31,608	9.19
Collection of EI (U spells)	56,822	7.85
Collection of SA (S spells)	1,936	20.69
Employment spells (E spells)	51,667	16.44

dataset taking into account the structure of the household to which s/he belonged at the time of the ROE separation. The approach adopted in this analysis results in imputed SA benefit levels at a substantially finer level of aggregation than that used in the Browning, Jones and Kuhn (1995) study. The figure reported in table 4.1 is the average SA benefit level at the time of the ROE separation. In the econometric analysis reported later SA maximum benefit rates were adjusted to reflect the size of

the household. That is, in the econometric analysis the measure of SA benefits used was maximum level of SA benefits divided by the number of adult equivalents in the household.

The figures presented in table 4.1 for the spells used in the present analysis indicate that spells collecting EI and employment spells were the most frequent experienced by COEP respondents. The EI spells are, however, substantially shorter than employment spells. Coupled with the large number of spells in the N state, these figures point to relatively dynamic labour market behaviour by the individuals following the ROE separation with movements into and out of the labour market states considered in this analysis.

4.4   Methodology

The following sets out the methodology used in this chapter to model an individual's labour market behaviour following the ROE separation. The approach represents a generalized probability transition model with two components. The first describes spells in a given state. The second component characterizes transitions between states conditional on exit from a state. The approach adopted represents a flexible framework that allows simulation of an individual's labour market behaviour following job loss for policy analysis purposes. The approach has been used previously to analyze the effect of welfare or SA type programs on non-marital births in the United States (MaCurdy, 2000).

Assume that the individual experiences his/her ROE separation at time $t=0$. In any period following the ROE separation an individual is observed to remain in the state s/he is in, or transit to an alternative state, where states are defined as N, U, S and E above. Let $P_t(i \rightarrow i \,|\, Z, \tau)$ represent the probability that the individual in state i at time $(t-1)$ is also observed in state i at time t conditional on the values of Z and τ. The vector Z includes factors that influence the individual's probability of remaining in state i, and τ represents the time spent in the current state. Note that t and τ do not necessarily correspond to each other. The vector Z includes personal characteristics of the individual in addition to a set of variables reflecting the economic environment faced by the individual and his/her status with respect to the EI and SA programs. Duration dependence associated with being in a state can be captured by τ, the number of periods for which the current spell has lasted.

The probability of observing a transition from state i to state j, conditional on the exit from state i, can be expressed in a similar manner. That is, define $P_t(i \to j \mid Z, \tau)$ as the probability that the individual transits from state i to state j at time t, $i \neq j$, conditional on a spell of length τ periods in state i and the vector Z. Again, the vector Z incorporates personal characteristics of the individual, aspects of his/her economic environment and policy parameters that may be considered to influence the individual's transition from state i to j. It is important to emphasize that transitions between states here are conditional on the individual's exit from state i.

It is now possible to define the duration distribution that defines the likelihood that an individual experiences a spell in a particular state. Assume that the individual enters state i at time t:

$$f_{i,(t+\tau)}(\tau) = S_{i,(t+\tau-1)}(\tau - 1)h_i(\tau) \tag{1}$$

with

$$h_{i,(t+\tau)}(\tau) = 1 - P_{ii,(t+\tau)}(Z, \tau) \tag{2}$$

and

$$S_{i,(t+\tau-1)}(\tau - 1) = \prod_{\omega=1}^{\tau-1} P_{ii,(t+\omega)}(Z, \omega) \tag{3}$$

where

$$P_{ii,(t+\omega)}(Z, \omega) = P_{(t+\omega)}(i \to i \mid Z, \omega) \tag{4}$$

Define $f_{i,(t+\tau)}(\tau)$ as the duration distribution for a spell in state i starting at time t lasting exactly τ periods for individuals whose experiences are characterized by the attributes Z from the beginning of the spell until time $(t + \tau)$. Likewise, the probability $P_{ii,(t+\omega)}(Z, \omega)$ indicates the likelihood that an individual remains in state i after being in state i for $(\omega - 1)$ periods conditioning on the covariates in Z given that the spell started at time t. The hazard rate $h_{i,(t+\tau)}(\tau)$ indicates the fraction of the population whom, having been in state i for $(\tau - 1)$ periods starting at time t and characterized by covariates Z, leave the state in the τth period of their spell. Note that

$P_{ii,(t+\omega)}$ $(Z,\ \omega\ )$ is equal to one minus the hazard rate. Finally, the survivor function $S_{i,(t+\tau-1)}$ $(\tau-1)$ represents the probability an individual remains at least $(\tau-1)$ periods in a state i for a spell starting at time t.

The basic building blocks of the model are provided by the probabilities $P_{ii,(t+\omega)}$ $(Z,\ \omega\ )$, and the probabilities describing transitions between states conditional on exit from a given state, the P_t $(i\rightarrow j\,|\,Z,\tau)$. Together these probabilities allow different spell patterns to be summarized in a tractable manner. Consider an individual who, on experiencing a job separation, uses SA for three periods before returning to employment for six periods and is then observed to remain in receipt of EI for six periods before the observation of him/her is censored. It is possible to express the likelihood of observing such a pattern as the product of a series of probabilities of observing the given spells (the $f_{i,(t+\tau)}$ (τ)), multiplied by the probability of observing a transition between the spells, given that an exit from a state occurs. The duration distributions can be derived directly from a set of hazard rates. Further, a transition between states requires that a series of conditional transition probabilities (transition from state i to state j, conditional on the exit from state i) be specified.

Given the specification of the hazard rates and the conditional transition probabilities, the path described above can be specified as follows:

$$f_{S,3}(3)\cdot P_3(S\rightarrow E\,|\,Z,3)\cdot f_{E,9}(6)\cdot P_9(E\rightarrow U\,|\,Z,6)\cdot S_{U,15}(6) \qquad (5)$$

where the components in equation (5) incorporate through the transition probabilities the determinants of the transitions via the Z vectors.

The duration distributions and survivor functions in (5) can be determined directly from an appropriately defined duration model. Similarly, the transition probabilities describing movements between states can be defined from an appropriately defined multinomial choice model. The parameterization of the duration distributions and transition probabilities that are used to construct the likelihood that any particular spell pattern is observed in the empirical analysis are now considered.

4.4.1 Parameterizing the Duration Distributions

Recall that the within-state transition rate can be expressed as one minus the hazard rate, where the hazard rate is the conditional probability that a spell in a given state is observed to end. The analysis in this chapter proceeds by first specifying and estimating a series of duration models to describe spells in each of the four labour market states identified previously. To allow maximum flexibility in the shape of the hazard function, a proportional hazard model similar to that applied in Meyer (1990) and discussed in Lancaster (1990, pp. 172-208) is estimated to describe the hazard of exiting from a given state. Hence, a proportional hazard model of the following form is specified for spells in each of the four labour market states, N, U, S and E:

$$h_n(\tau) = h_0(\tau) \exp\{z_n(\tau)'\beta\} \tag{6}$$

where $h_n(\tau)$ is the hazard rate for person n, $h_0(\tau)$ is the 'baseline' hazard common to all individuals, $z_n(\tau)$ is a vector of observable characteristics that may vary with time, and β is a vector of parameters to be estimated.

Following Meyer (1990) the baseline hazard can be estimated non-parametrically as a piece-wise constant function. The time axis is divided into a finite number of intervals and a separate baseline hazard parameter is estimated for each segment. Assuming that $z_n(\tau)$ does not vary within a given interval, the contribution to the log likelihood function for the nth spell in state i ($=N, U, S$ or E) is given by:

$$l_n^i(\tau_n / z_n, \gamma, \beta) = \lambda_n \log[1 - \exp(-\exp[\gamma(\tau_n) + z_n(\tau_n)'\beta])] \\ - \sum_{k=1}^{\tau_n - 1} \exp[\gamma(k) + z_n(k)'\beta] \tag{7}$$

where τ_n is the observed length of the nth spell, $\gamma(\tau)$ is the baseline parameter corresponding to the τth period, and λ_n equals one if the spell ends before being censored. The likelihood function for any given set of observed spells in state i in can be characterized as the sum of all terms like (7).

In the empirical analysis four such likelihood functions are specified, one for each of the N, S, E and U processes. Although the determinants of the hazard rate for each of the states will be peculiar to each process, given the aim of this analysis it is important to capture the role of the EI and SA programs on the probability of exiting a given state. Previous analysis, for example, has highlighted the importance of EI eligibility on the probability that a spell of employment is observed to terminate (Green and Sargent, 1998). Hence for the E process, eligibility and the approach of eligibility for EI is captured by a series of time-varying covariates reflecting the individual's status vis-à-vis the EI program during the employment spell. Similarly, there is evidence that the exit from the EI program depends on the individual's remaining entitlement (Ham and Rea, 1987; Meyer, 1990). Therefore, for the U process a series of dummy variables reflecting the approach of benefit exhaustion is included as time-varying covariates. The complete set of covariates used in the duration models is set out below.

4.4.2 Parameterizing the Transitions between States

The duration or hazard models allow spells within a given state to be characterized. Characterizing the history or behaviour of an individual following the ROE separation, however, requires that transitions between spells, conditional on exit from a given state, also be modelled. The second component of the analysis in this chapter specifies a set of transition probabilities associated with the transition from one labour market state to another labour market state, conditional on exit from the original labour market state.

Transitions between states can be parameterized using the multinomial logistic framework (Dick, Garber and MaCurdy, 1992; Gritz and Theobald, 1995; and Gritz and MaCurdy, 1992, 1997). Given an exit from state i there will be a maximum of three possible alternative destination states (j) the individual can be observed to exit to. The multinomial logistic specification requires that the parameters associated with one of the alternatives be set equal to zero. The contribution to the likelihood function characterizing transitions from state i to state j in the multinomial logistic specification can be specified as follows:

$$P_t(i \to j \mid Z, \tau) = P_{ij,t}(Z, \tau) = \frac{e^{\left(x_i' \beta_{ij}\right)}}{\sum\limits_{j=0,\ j \neq i}^{3} e^{\left(x_i' \beta_{ij}\right)}} \tag{8}$$

where $i, j = 0, 1, 2$ *or* 3 *and* $i \neq j$, and x_i' is a vector that incorporates the parameters in Z and τ. The log likelihood function can then be written as the sum of all terms like (8).

To characterize the processes determining the transition between states correctly, the specification of the likelihood function should reflect the nature of the processes being modelled. Four processes are to be modelled corresponding to transitions from each of the four states identified previously, to an alternative state. The set of available transitions, however, will be dependent on the individual's EI status in any given period. That is, transition to the U state is possible only for those individuals who are eligible to take-up EI in the following period. For those ineligible in the following period, the probability of transiting into the U state is zero. The likelihood functions for the processes associated with transition between states are specified with this constraint in mind.

For any given observation at time t, let $\delta_{t,n}$ denote the nth individual's eligibility status. Moreover, let $\delta_{t,n} = 1$ if the individual is eligible to use EI in period $(t+1)$, and $\delta_{t,n} = 0$ otherwise. The log likelihood function for the transition between states, conditional on exit from a given state (denoted by i), using a set of logistic probabilities can be specified as follows:

$$\log L_i = \sum_{t=0}^{T} \sum_{j=0, j \neq i}^{3} \sum_{n=1}^{N} \left[\delta_{t,n} \cdot y_{ij,t,n} \cdot \left(P_{ij,t} \mid \delta_{t,n} = 1\right) + \left(1 - \delta_{t,n}\right) y_{ij,t,n} \cdot \left(P_{ij,t} \mid \delta_{t,n} = 0\right) \right]$$

$$\ldots\ldots\ldots(9)$$

where $y_{ij,t,n} = 1$ if alternative j is observed to be chosen by individual n in state i at time t, and $y_{ij,t,n} = 0$ otherwise. The estimated value of the transition probabilities (the $\left(P_{ij,t} \mid \delta_{t,n} = 1\right)$ and $\left(P_{ij,t} \mid \delta_{t,n} = 0\right)$) from (9) may in turn be used as the building blocks in equation (5) to determine the

likelihood of observing any particular spell pattern following the ROE separation. Note that these probabilities are also functions of the vectors Z and τ as described in equation (8). Effectively two multinomial logistic models are estimated for transitions from the N, S and E states. One model is estimated for those eligible to receive EI in the following period and one for those ineligible to receive EI in the following period.

Furthermore, the fact that individuals who are not eligible for the EI program cannot be observed to exit to that state should also be reflected in the specification of the probabilities ($P_{ij,t} \mid \delta_{t,n} = 1$) and ($P_{ij,t} \mid \delta_{t,n} = 0$). Put another way, the states an individual can transit into are conditional so that only three alternative states can be transited into by individuals ineligible to receive EI in the following period, namely $j = N$, S & E. Let the U state be represented by $j = 3$ and let N, S and E be represented by $j = 0, 1$ *and* 2 respectively. Then for each of the four processes associated with transitions between states N, S, E and U, the transition probabilities conditional on the eligibility status of an individual at time t can be expressed as follows:

$$\left(P_{ij,t} \mid \delta_{t,n} = 1\right) = \frac{\exp(x_i' \beta_{ij})}{\left[\sum_{j=0,i\neq j}^{3} \exp(x_i' \beta_{ij})\right]} \tag{10}$$

and

$$\left(P_{ij,t} \mid \delta_{t,n} = 0\right) = \frac{\exp(x_i' \tilde{\beta}_{ij})}{\left[\sum_{j=0,i\neq j}^{2} \exp(x_i' \tilde{\beta}_{ij})\right]} \tag{11}$$

As noted previously, in the multinomial logistic framework the probabilities are normalized by equating one set of the βs and $\tilde{\beta} s$ to zero.

As was the case for the duration models, determinants of the transitions between states will be specified as a function of the individual's personal characteristics and his/her status vis-à-vis the EI program. A description of the set of covariates used in both the duration models and the multinomial

logistic models is set out in the next section where the results of the empirical analysis are presented. Following this, the simulation exercise is described and discussed.

4.5   Empirical Results

The results of the duration models are set out in table 4.2 and those of the multinomial logistic models describing transitions between states in tables 4.3 to 4.6. Four duration models are estimated, one for spells in each of the states identified. Duration models for the N, S and U states use a random subset of all spells in those states. Each of the duration models has a set of common covariates including gender, marital status, minority status, education variables, a series of age dummy variables and a series of province dummy variables. In addition, models describing spells in the S and U states include a variable indicating the liquid assets available to the household that the individual belonged to at the time of the ROE separation. The duration model describing employment spells includes a covariate indicating the individual's wage in his/her job. In some job search models of employee-employer matching, the wage in an individual's job is related to her tenure in the job. For the purpose of this analysis, however, the individual's wage is assumed exogenous and not to reflect tenure in the employment relationship.

To capture the role of the SA program on behaviour, each of the duration models also incorporates the maximum real monthly SA benefit level applicable to that particular individual, adjusted for household size, as a time-varying covariate. Variation in this parameter is derived from both changes in the value of SA due to changes in the Consumer Price Index and discrete changes in benefit levels that occurred in a number of provinces over the period covered by the analysis. The nature and magnitude of these changes have been discussed previously in chapter three. The unemployment rate for the individual's EI region is also included as a time-varying covariate.

Given the focus of this analysis, it is important that the role of the EI program be captured in any analysis of labour market behaviour. To this end, the process describing employment spells includes a time-varying covariate reflecting the eligibility of the individual to collect EI in any period during the employment spell. This variable is equal to unity in periods in which the individual can collect EI and zero otherwise. Further, a series of dummy variables reflecting the approach of EI eligibility are also included in the specification. Three such dummy variables are included indicating the week prior to

TABLE 4.2: Covariate effects in duration models

Variable	N spells	U spells	S spells	E spells
Male	0.1535*	0.0993*	0.0279	-0.0552
	(0.0417)	(0.0396)	(0.1188)	(0.0542)
Married	0.0513	0.0670**	0.3763*	0.0244
	(0.0446)	(0.0395)	(0.1138)	(0.0573)
Less than high school	0.1595*	0.0360	-0.2398*	0.5704*
	(0.0601)	(0.0620)	(0.1179)	(0.1007)
High school	0.1005**	0.0514	-0.2848*	0.5577*
	(0.0595)	(0.0598)	(0.1303)	(0.0953)
Technical	0.1530*	0.1214*	-	0.5066*
	(0.0606)	(0.0610)		(0.1004)
Minority	-0.0998**	-0.0109	-0.0446	0.0278
	(0.0583)	(0.0596)	(0.1409)	(0.1014)
Newfoundland	-0.0219	-0.1307**	-0.0543	0.1339
	(0.0868)	(0.0784)	(0.2456)	(0.1221)
PEI	0.1797*	-0.2070*	0.1363	0.1628**
	(0.0677)	(0.0575)	(0.1717)	(0.0877)
Nova Scotia	0.0335	-0.0656	-0.0721	0.1522
	(0.0666)	(0.0618)	(0.1819)	(0.1000)
New Brunswick	0.1159	-0.1670*	-0.3254**	0.2398*
	(0.0770)	(0.0699)	(0.1944)	(0.1014)
Quebec	0.1432*	0.0164	-0.3328*	0.0733
	(0.0602)	(0.0565)	(0.1631)	(0.0813)
Ontario	-0.0283	0.0288	-0.2069	-0.3529*
	(0.0585)	(0.0627)	(0.1607)	(0.0868)
Manitoba	-0.0415	-0.1272**	-0.0026	-0.2353*
	(0.0629)	(0.0685)	(0.1747)	(0.0841)
Saskatchewan	-0.1164**	-0.0676	-0.2162	-0.3833*
	(0.0658)	(0.0553)	(0.1758)	(0.0933)
Alberta	-0.1178*	-0.1092	-0.0193	-0.3662*
	(0.0589)	(0.0683)	(0.1658)	(0.0941)
Liquid Assets at ROE ($'000s)	-	0.0007	0.0177	-
		(0.0013)	(0.0117)	
Wage ($ per hr)	-	-	-	0.0035
				(0.0032)
Age 25-29	0.2110*	0.0688	0.1927	0.1102
	(0.0689)	(0.0846)	(0.1898)	(0.1068)
Age 30-34	0.0761	0.1118	-0.2858	0.0744
	(0.0700)	(0.0759)	(0.2086)	(0.1096)
Age 35-39	0.2266*	0.1442**	-0.1512	0.0647
	(0.0729)	(0.0765)	(0.1985)	(0.1022)

TABLE 4.2: Covariate effects in duration models (cont)

Variable	N spells	U spells	S spells	E spells
Age 40-44	0.2038* (0.0688)	0.1463** (0.0765)	-0.1622 (0.2130)	0.1383 (0.1088)
Age 45-49	0.1515** (0.0824)	0.1822* (0.0793)	-0.2152 (0.2217)	0.0929 (0.1068)
Age 50-54	0.1731* (0.0811)	0.1494** (0.0858)	-0.5252** (0.2697)	0.1990** (0.1190)
Age > 54	-0.2410* (0.0906)	-0.0168 (0.0891)	-0.2605 (0.3236)	0.2799* (0.1146)
Unemployment rate	0.0027 (0.0058)	-0.0075 (0.0053)	-0.0150 (0.0172)	0.0329* (0.0080)
SA benefit level ($'00s per month)	-0.0057 (0.0207)	-0.0409* (0.0191)	-0.1853* (0.0513)	0.0091 (0.0280)
EI exhaustion in 5-9 weeks	-	0.3839* (0.0609)	-	-
EI exhaustion in 2-4 weeks	-	1.0160* (0.0904)	-	-
EI eligibility in 5-9 weeks	-	-	-	-0.8450* (0.3663)
EI eligibility in 2-4 weeks	-	-	-	-0.4548 (0.3245)
EI eligibility in 1 week	-	-	-	-1.3948* (0.5917)
Eligible to collect EI	-	-	-	1.1089* (0.2042)
Number of observations	11,072	11,422	1,936	7,788
Mean value of likelihood fn.	-581.637	-596.366	-641.016	-605.122

Notes to table 4.2: Standard errors are shown in brackets below the estimates. * indicates significance at the 5% level and ** significance at the 10% level. In each case the base case is a single female with university education, a non-minority and living in British Columbia. For the S process, however, the omitted education category is technical or university education.

the establishment of eligibility, and 2-4 weeks and 5-9 weeks prior to the establishment of eligibility. In a similar fashion, the U process includes a series of time-varying covariates reflecting 2-4 weeks of EI entitlement remaining and 5-9 weeks of entitlement remaining.

In terms of the non-policy related covariates a number of patterns are evident. First, males exhibit shorter N, U and S spells than females, *ceteris paribus*. Although the estimates indicate that the hazard rate from the E state is lower for males than that for females, the effect is insignificant. As expected, in general less educated individuals exhibit shorter N, U and E spells but longer spells collecting SA. For less educated individuals the shorter N, U and E spells point to a pattern of dynamic labour market behaviour with movement into and out of the various labour market states and greater reliance on the SA program.

The provincial dummy variables indicate that, as expected, individuals in the Atlantic provinces experience longer spells collecting EI. Conversely, employment spells are shorter for individuals from these provinces, *ceteris paribus*. These results may indicate a tendency to string short spells of employment together with spells collecting EI in those provinces. This pattern may reflect regular seasonal employment patterns and use of the EI program. Examination of the age and marriage dummy variables indicates that SA spells are in general shorter for younger and married individuals. For married individuals this most likely reflects the potential earning capacity of the spouse and the opportunities it presents for the household to exit the SA program. Surprisingly, the estimates indicate that for employment spells all age groups exhibit greater hazard rates than the youngest group or omitted category, individuals less than 25 years old. In general, however, these results are not significant.

The results indicate that the length of spells spent receiving income support (the U and S processes) are negatively related to the level of liquid assets available at the time of the ROE separation. That is, the level of liquid assets increases the hazard rate for those spells. Although not significant for either spell type, the results may nonetheless point to an underlying person type such that greater thrift on the part of the individual is associated with lower reliance on income support programs.

Of specific interest in the current study is the effect of the individual's economic environment and parameters associated with the income support programs on his or her behaviour. For the process describing spells in the N state the results indicate that the unemployment rate increases and the SA benefit level decreases the hazard. In both cases, however, the result is statistically insignificant. The exact interpretation of these results is unclear as the N state may reflect a transitory state prior to the return to employment or collection of benefits under the EI or SA programs. *A priori* then, it is unclear what sign these terms should take.

For the model describing spells collecting EI (the U state) there is clear evidence consistent with earlier studies that the hazard rate describing the exit from the EI program increases as benefit exhaustion approaches. The covariates on both EI exhaustion variables are positive and highly significant. Such a result is consistent with earlier studies such as those by Ham and Rea (1987) and Meyer (1990). Further as expected higher unemployment rates and higher SA benefits increase the length of spells collecting EI, though only in the latter case is the result significant. With respect to the level of SA benefits, this may reflect a greater willingness on the part of individuals to exhaust EI benefits when SA benefits are higher. In turn, job search intensity while collecting EI may be lower with the implication that the hazard rate from the EI program is lower when SA benefits are higher. For the process describing spells collecting SA, as expected higher SA benefit levels and higher unemployment levels both tend to reduce the hazard rate from SA. Again though, only the coefficient on the SA benefit level variable is significant.

For the model describing employment spells (E spells), a number of clear patterns emerge consistent with *a priori* expectations. First, the hazard rate from employment increases with both the unemployment rate and the level of SA benefits. Moreover, there is evidence that individuals tailor employment spells to the availability of EI, with the EI eligibility variables in general being highly significant. The baseline hazard rate for this process is effectively tripled by an individual's eligibility to collect benefits under the EI program, *ceteris paribus*. Further, a significant decline in the hazard occurs in the week prior to the establishment of EI eligibility. These results are consistent with those reported in other studies that have examined the role of the EI program on the length of employment spells such as Green and Sargent (1998).

The results from the multinomial logistic models describing the transitions between states are set out in tables 4.3-4.6. The covariates included in the multinomial logistic models in general correspond to those in the spell duration models described previously. An additional variable indicating the length of the spell in the state from which a transition is recorded is included in each specification.

For models describing transitions from the N, S or E state (tables 4.3, 4.5 and 4.6 respectively) two sets of results are reported. The first set corresponds to transitions associated with individuals who are eligible to collect benefits under the EI program. The second set represents the transitions for which the individual was ineligible to collect EI benefits. In the former case, three possible destination states

TABLE 4.3: Multinomial logistic results for transitions from the N state

	Eligible transitions		Ineligible transitions
	S destination	E destination	S destination
Male	-0.3206* (0.1142)	-0.0904* (0.0289)	0.4425* (0.1371)
Married	-1.5432* (0.1252)	0.0041 (0.0311)	-1.2528* (0.1439)
Less than high school	0.5668* (0.1728)	-0.5054* (0.0433)	1.5516* (0.2392)
High school	0.0191 (0.1767)	-0.4700* (0.0411)	1.3611* (0.2272)
Technical	-0.1360 (0.1800)	-0.4387* (0.0415)	0.7770* (0.2388)
Minority	-0.1733 (0.1920)	-0.1974* (0.0490)	0.5511* (0.1889)
Newfoundland	-1.9139* (0.4880)	-0.5579* (0.1038)	-1.0056* (0.4839)
PEI	-0.9535 (0.5869)	-0.3300* (0.1388)	-0.9084 (0.6915)
Nova Scotia	-1.0387* (0.3670)	-0.3155* (0.0842)	-1.0797* (0.4620)
New Brunswick	-1.1565* (0.3733)	-0.5260* (0.0883)	-0.8949* (0.4439)
Quebec	-0.5393* (0.1761)	-0.3503* (0.0484)	-0.2469 (0.2092)
Ontario	0.0807 (0.1697)	0.2170* (0.0459)	-0.7317* (0.2032)
Manitoba	-0.5882 (0.4459)	0.3175* (0.0842)	-0.8253* (0.4185)
Saskatchewan	0.1762 (0.3800)	0.1842** (0.0995)	-0.2178 (0.4112)
Alberta	-0.6893* (0.3322)	0.2731* (0.0625)	-1.1142* (0.3162)
Age 25-29	0.2193 (0.1919)	-0.2608* (0.0507)	0.4803* (0.2278)
Age 30-34	0.5064* (0.1912)	-0.5784* (0.0541)	1.0454* (0.2305)
Age 35-39	-0.0222 (0.2014)	-0.4012* (0.0505)	1.1164* (0.2307)
Age 40-44	0.1119 (0.2113)	-0.2041* (0.0519)	0.6317* (0.2949)

TABLE 4.3: Multinomial logistic results for transitions from the N state (cont)

	Eligible transitions		Ineligible transitions
	S destination	E destination	S destination
Age 45-49	0.0209 (0.2132)	-0.5869* (0.0568)	0.5691* (0.2792)
Age 50-54	-0.2941 (0.2571)	-0.7547* (0.0622)	1.0811* (0.2982)
Age > 54	-1.1559* (0.3415)	-0.6243* (0.0624)	0.7100* (0.3062)
Unemployment rate	0.0758* (0.0145)	-0.0167* (0.0045)	0.0567* (0.0214)
SA benefit level ($'00s per month)	0.0485 (0.0606)	-0.0048 (0.0180)	0.0437 (0.0789)
Spell length	0.0307* (0.0051)	0.0133* (0.0017)	-0.0060 (0.0041)
Constant	-4.0641* (0.4200)	0.3818* (0.1198)	-3.6644* (0.5489)
Number of observations	25,086		2,743
Pseudo R^2	0.0446		0.1338

Notes to table 4.3: For the eligible transitions, the omitted category is the U destination. For ineligible transitions, the omitted category is the E destination. Standard errors are shown in brackets, * and **indicates significance at the 5 and 10% level respectively. In each case the base case is a single female with university education, a non-minority and living in British Columbia.

TABLE 4.4: Multinomial logistic results for transitions from the U state

	N destination	S destination
Male	0.0831* (0.0198)	-0.3759* (0.1139)
Married	-0.0757* (0.0210)	-1.5346* (0.1241)
Less than high school	-0.1055* (0.0317)	-0.0913 (0.1704)
High school	-0.0979* (0.0309)	-0.3794* (0.1688)
Technical	-0.0735* (0.0314)	-0.5533* (0.1749)
Minority	0.2003* (0.0350)	0.4433* (0.1634)
Newfoundland	0.0633 (0.0615)	-0.6617** (0.3861)
PEI	-0.0652 (0.0873)	0.2480 (0.3559)
Nova Scotia	-0.2496* (0.0546)	-0.1499 (0.2642)
New Brunswick	-0.2816* (0.0547)	-0.8462* (0.3136)
Quebec	-0.1533* (0.0336)	-1.1403* (0.1916)
Ontario	-0.0836* (0.0342)	0.1572 (0.1616)
Manitoba	-0.1279** (0.0667)	-0.2371 (0.3484)
Saskatchewan	-0.1127 (0.0759)	0.1140 (0.3538)
Alberta	0.0914** (0.0482)	-0.2870 (0.2708)
Liquid assets at ROE ($'000s)	0.0049* (0.0007)	-0.1822* (0.0378)
Age 25-29	-0.3639* (0.0379)	-1.0132* (0.1851)
Age 30-34	-0.1971* (0.0382)	-1.0229* (0.2153)
Age 35-39	-0.3131* (0.0368)	-0.5138* (0.1678)

TABLE 4.4: Multinomial logistic results for transitions from the U state (cont)

	N destination	S destination
Age 40-44	-0.4553*	-1.0073*
	(0.0384)	(0.2062)
Age 45-49	-0.3604*	-1.0549*
	(0.0394)	(0.2150)
Age 50-54	-0.1295*	-0.6679*
	(0.0421)	(0.2234)
Age > 54	0.0090	-0.7268*
	(0.0436)	(0.2544)
Unemployment rate	-0.0351*	-0.0065
	(0.0030)	(0.0174)
SA benefit level ($'00s per month)	-0.0055	0.0349
	(0.0117)	(0.0546)
5-9 weeks EI entitlement remaining	-0.2528*	0.3300**
	(0.0353)	(0.1739)
2-4 weeks EI entitlement remaining	-0.2306*	1.1674*
	(0.0479)	(0.1659)
Spell length	0.0347*	0.0301*
	(0.0010)	(0.0049)
Constant	-0.0563	-2.6041*
	(0.0827)	(0.3884)
Number of observations	52,899	
Pseudo R^2	0.0382	

Notes to table 4.4: The omitted category is employment (E). Standard errors are shown in brackets, * and

**indicates significance at the 5 and 10% level respectively. In each case the base case is a

single female with university education, a non-minority and living in British Columbia.

TABLE 4.5: Multinomial logistic results for transitions from the S state

	Eligible transitions		Ineligible transitions
	N destination	U destination	E destination
Male	-0.2495	0.1338	0.1361
	(0.1967)	(0.1588)	(0.2975)
Married	-0.3622**	-0.2076	-0.3006
	(0.1992)	(0.1602)	(0.3555)
Less than high school	0.3933**	0.3440**	-0.1104
	(0.2248)	(0.1855)	(0.3484)
High school	-0.2510	0.1612	-0.1631
	(0.2268)	(0.1819)	(0.3628)
Minority	-0.2012	-0.1786	-0.8606*
	(0.2489)	(0.2059)	(0.4166)
Newfoundland	-0.2387	0.8071	-0.0103
	(0.6570)	(0.5152)	(1.2271)
PEI	0.3753	1.4902*	1.0846
	(0.7862)	(0.6261)	(1.2365)
Nova Scotia	-0.3265	0.9845*	0.6899
	(0.5589)	(0.3863)	(0.9387)
New Brunswick	-0.3561	0.3454	2.7884*
	(0.5485)	(0.4085)	(0.9043)
Quebec	0.3360	0.5871*	0.4733
	(0.2763)	(0.2295)	(0.5028)
Ontario	0.4047	0.2470	0.6637
	(0.2575)	(0.2174)	(0.4866)
Manitoba	0.6017	0.8071**	1.1501
	(0.5603)	(0.4555)	(0.8830)
Saskatchewan	0.4780	0.9567**	1.0304
	(0.6932)	(0.5236)	(0.8388)
Alberta	-0.6924	0.2946	1.6015*
	(0.5182)	(0.3482)	(0.6570)
Liquid assets at ROE	-0.0446**	-0.0070	0.4533*
($'000s)	(0.0233)	(0.0094)	(0.1338)
Age 25-29	0.5673**	-0.4980*	0.0056
	(0.3104)	(0.2400)	(0.4560)
Age 30-34	1.6535*	-0.3134	-0.5285
	(0.3122)	(0.2783)	(0.4491)
Age 35-39	0.5875**	-0.1747	-1.1574*
	(0.3118)	(0.2370)	(0.5203)

TABLE 4.5: Multinomial logistic results for transitions from the S state (cont)

	Eligible transitions		Ineligible transitions
	N destination	U destination	E destination
Age 40-44	0.3915 (0.3336)	-0.9115* (0.2716)	0.3302 (0.4724)
Age 45-49	-1.4215* (0.5937)	-0.4925** (0.2756)	-0.0115 (0.6299)
Age 50-54	0.1330 (0.5411)	0.2446 (0.3641)	0.2516 (0.5545)
Age > 54	-0.0292 (0.5422)	0.3537 (0.3581)	0.7612 (0.6682)
Unemployment rate	0.0756** (0.0246)	0.0535** (0.0213)	-0.0570 (0.0512)
SA benefit level ($'00s per month)	0.1009 (0.1038)	0.1088 (0.0870)	0.2413 (0.2132)
Spell length	-0.0340* (0.0078)	-0.0390* (0.0073)	0.0087 (0.0064)
Constant	-2.1549* (0.6818)	-1.0836** (0.5492)	-2.0459 (1.3545)
Number of observations	1119		335
Pseudo R^2	0.0991		0.1557

Notes to table 4.5: For the eligible transitions, the omitted category is the E destination. For ineligible transitions, the omitted category is the N destination. Standard errors are shown in brackets, * and **indicates significance at the 5 and 10% level respectively. In each case the base case is a single female with university or technical education, a non-minority and living in British Columbia.

TABLE 4.6: Multinomial logistic results for transitions from the E state

	Eligible transitions		Ineligible transitions
	N destination	S destination	S destination
Male	0.0385	0.1137	-0.5923
	(0.0287)	(0.1309)	(0.5537)
Married	-0.0188	-0.9343*	-4.7490*
	(0.0297)	(0.1245)	(0.7380)
Less than high school	-0.5927*	0.3331	1.9481*
	(0.0439)	(0.2083)	(0.8582)
High school	-0.4981*	-0.3256	2.1529
	(0.0418)	(0.2184)	(0.7861)
Technical	-0.4904*	0.2445	1.2044
	(0.0421)	(0.2051)	(0.7732)
Minority	0.1699*	0.6431*	-2.1844*
	(0.0480)	(0.1610)	(0.9105)
Newfoundland	-0.4025*	-2.8645*	-7.7269
	(0.0934)	(0.4481)	(5.2167)
PEI	-0.2518*	-1.6766*	-4.3841
	(0.1250)	(0.4995)	(3.1489)
Nova Scotia	-0.5848*	-1.8453*	-6.8416
	(0.0787)	(0.3134)	(4.6237)
New Brunswick	-0.6724*	-2.1910*	-1.5924
	(0.0785)	(0.3649)	(1.3099)
Quebec	-0.4615*	-2.1534*	-3.5795*
	(0.0465)	(0.1892)	(0.9819)
Ontario	0.1110*	-0.8090*	-0.0152
	(0.0456)	(0.1601)	(0.7176)
Manitoba	0.1294	-1.0280*	-2.5813
	(0.0842)	(0.3663)	(1.6346)
Saskatchewan	-0.0419	-1.0621*	-3.1060
	(0.0998)	(0.4550)	(2.1109)
Alberta	0.0672	-0.5449*	-7.6528*
	(0.0655)	(0.2569)	(3.4057)
Wage	-0.0033*	-0.1081*	-0.0434**
	(0.0016)	(0.0132)	(0.0236)
Age 25-29	-0.2604*	-0.0192	1.1290
	(0.0508)	(0.2098)	(0.7900)
Age 30-34	-0.2848*	0.6395*	3.5998*
	(0.0541)	(0.2064)	(0.9568)
Age 35-39	-0.3006*	-0.0284	3.0651*
	(0.0509)	(0.2162)	(0.9087)

TABLE 4.6: Multinomial logistic results for transitions from the E state (cont)

	Eligible transitions		Ineligible transitions
	N destination	S destination	S destination
Age 40-44	-0.2877* (0.0519)	0.4597* (0.2044)	3.0064* (1.1908)
Age 45-49	-0.3998* (0.0551)	-0.5524* (0.2663)	3.5169* (1.0008)
Age 50-54	-0.2783* (0.0609)	-1.3531* (0.4603)	5.0493 (1.0519)
Age > 54	-0.0677 (0.0613)	-0.7184* (0.3596)	-2.5390 (4.8783)
Unemployment rate	-0.0295* (0.0044)	0.0721* (0.0177)	0.1305 (0.0811)
SA benefit level ($'00s per month)	-0.1010* (0.0169)	0.0867 (0.0639)	-0.8014* (0.3922)
Eligibility for EI in 5-9 weeks	-	-	-0.4098 (0.4783)
Eligibility for EI in 2-4 weeks	-	-	-1.5378* (0.7030)
Eligibility for EI in 1 week	-	-	-4.3182 (2.9641)
Spell length	0.0530* (0.0011)	0.0420* (0.0042)	-0.1192* (0.0487)
Constant	-0.0096 (0.1199)	-3.3155* (0.4816)	1.1851 (2.2945)
Number of observations	37,953		767
Pseudo R^2	0.1122		0.4467

Notes to table 4.6: For the eligible transitions, the omitted category is the U destination. For ineligible transitions, the omitted category is the N destination. Standard errors are shown in brackets, * and **indicates significance at the 5 and 10% level respectively. In each case the base case is a single female with university education, a non-minority and living in British Columbia.

are possible. In the latter case, only two destination states are possible as transition to the U state is not possible. In each model covariates for one of the destination states are set equal to zero as is required for estimation of the multinomial logistic model.

In general, the coefficients from the multinomial logistic model are not readily interpreted and the marginal effects of the covariates on the probabilities do not necessarily have the same sign as the coefficients on the regressors (Greene, 1993, pp. 666-68). Nevertheless, for models in which only two alternative outcomes or destination states are observed the estimated coefficients do have the same sign as the marginal effects of the regressors on the probabilities. Hence the discussion below is limited to the ineligible transitions from the N, S or E states.

A number of patterns emerge from an examination of ineligible transitions from the N state (table 4.3). First, lower levels of education are associated with a greater probability of transiting to SA rather than employment. Further, males are more likely and married individuals less likely to transit to SA rather than employment. This is consistent with the use of SA by unattached individuals noted earlier and the presence of alternative income sources in households where a spouse is present, limiting the need to rely on SA. As expected, the probability of transiting to SA is positively related to both the unemployment rate and the SA benefit level. Only in the former case, however, is the result statistically significant.

For ineligible transitions from SA (table 4.5), as expected the probability of transition to employment is negatively related to the unemployment rate, albeit insignificantly. It is noteworthy too that the probability of transiting to employment is positively related to the level of liquid assets. Again, this pattern possibly reflects underlying individual characteristics associated with greater thrift and propensity to work.

A number of patterns are evident for transitions from employment for individuals ineligible to collect EI (table 4.6). First, as expected transition to SA is less likely for married individuals and more likely for less educated individuals. These results are consistent with the use of SA by unattached and poorly educated individuals noted previously. Contrary to *a priori* expectations, the probability of transition from employment to SA is negatively related to the level of SA benefits. One interesting aspect of the results relates to individuals as they approach EI eligibility. The coefficients on the EI eligibility variables indicate that the probability of transition to the S state is significantly less likely as EI eligibility becomes imminent. This may reflect unwillingness on the part of individuals to initiate a SA claim when an additional relatively short spell of employment will allow an EI claim to be established.

4.5.1 Simulation and Policy Analysis

Although informative in themselves, the duration and multinomial logistic analyses give only a limited insight into the interface between the EI and SA programs. The benefit of the methodology adopted in this chapter is that the estimated relationships from the duration and multinomial choice models can be used for policy analysis purposes by simulating the experiences of a set of individuals following the ROE separation. The exercise of creating a set of synthetic labour market histories under alternative policy scenarios is described below.

A 10 per cent random sample of individuals used in the analysis (approximately 2,000) was taken and their characteristics and labour market state (N, U, S or E) in the week immediately following the ROE separation was identified. The information on the individual's personal characteristics was used in conjunction with the estimated hazard and multinomial logit models to simulate the subsequent labour market history of each individual. Based on their initial state, the duration models were used to determine the probability of remaining in that state conditional on the spell in that state having lasted one period. For example, the likelihood that an individual in state $i(=N, U, S \ or \ E)$ for one period exited that state was calculated as the value of the estimated hazard function for state i at period one, and, compared to a random number drawn from a uniform distribution on the [0, 1] interval. If the probability of exit calculated according to the hazard function exceeded the random number drawn from the [0, 1] interval, the individual was considered to have 'exited' state i. Otherwise, s/he was considered to have remained in state i. For an individual 'observed' to remain in state i the process is repeated with the conditional probability of exit from state i after two periods in state i (the hazard) calculated and compared to a new random number drawn from the [0, 1] interval. While the individual is observed to remain in state i the process is repeated with the probability of exit being successively updated using the estimated values of the hazard rate for subsequent periods.

If the individual is 'observed' to exit state i at any point in time during the spell s/he is assigned to an alternative state (j) based on the transition probabilities calculated using the coefficients from the multinomial logistic analysis. For example, an individual observed to 'exit' the E state and who is eligible for EI is allocated to one of three possible alternative destination states ($j = N, U$ or S) based on the probabilities from the multinomial logistic analysis for eligible transitions from the E state (table 4.6). A spell in the j state is thereby initiated. For this spell in the j state, the process

described above was used to determine whether the individual remained in or exited the state in subsequent periods.

The procedure described above allows the construction of synthetic labour market histories for the sample of approximately 2,000 randomly chosen individuals. For each individual their history consists of a sequence of spells in different labour market states. The length of a spell in any given labour market state is derived using the estimates from the duration models. Conditional on a spell being 'observed' to end, the new labour market state is identified using the results from the multinomial logistic models.

The process described above generates a simulated history of length 80 periods following the ROE separation for each individual in the sample. In undertaking the simulation exercise, this process was repeated a number of times to build up a picture of labour market behaviour and program use following the loss of employment. The first time the simulation process was conducted, the parameters used were those from the estimated duration models (those reported in table 4.2) and transition models (tables 4.3-4.7). Subsequent runs of the simulation process used parameters created from the coefficients of the estimated models and the variance-covariance matrixes associated with those estimates. These new parameters were generated by taking the product of a vector of random numbers drawn from normal distribution and the Cholesky decomposition of the variance-covariance matrix, and adding them to the actual estimates of the parameters. This effectively gives a new 'draw' on the set of parameter estimates for the duration and transition models using information from the estimated relationships. Hence, a series of parameter vectors for the duration and transition relationships, centred on the actual estimates reported in tables 4.3 to 4.7, are thereby created. Each set of parameters so constructed are then used in the simulation process described previously.

The simulation process was undertaken 100 times with a new draw on the parameter estimates for each run of the simulation process. Hence, approximately 2,000 labour market histories (one for each individual in the 10 per cent random sample) were created 100 times. At each stage in the simulation exercise the individual's personal characteristics at the time of ROE separation, including relevant SA benefit levels, were used to calculate the hazard rate and transition probabilities. Furthermore, during the simulation exercise the individual's work history and status vis-à-vis the EI program was continuously updated. In this way both the establishment of EI eligibility and exhaustion of EI entitlement were specifically allowed for in accordance with the rules governing the program in Canada.

By incorporating key features of the SA and EI programs in the duration and multinomial logistic models it was possible to simulate labour market histories under a range of policy scenarios. A number of policy experiments were conducted in this manner and the results are reported in table 4.7. For each policy scenario the proportion of time spent in each state is reported as a summary measure of the effect of the policy change on labour market behaviour and outcomes. These numbers, reported in table 4.7, represent 'averages of averages'. For example, for each policy scenario approximately 2,000 histories are generated 100 times, once for each draw on the parameters. For each set of 2,000 histories, the average proportion of time spent in each state by all individuals is calculated. This gives 100 sets of four numbers, where each number gives the average proportion of time spent in states N, U, S and E. An average in then taken of these 100 'averages' to give the figures in Table 4.7. The standard errors reported in Table 4.7 represent the standard error of these 100 averages.

Initially, a 'base case' simulation was run that reflects the status quo with respect to the level of SA benefits faced by the individual at the time of the ROE separation and the parameters of the EI program. Five policy experiments were then conducted. Two experiments relating to changes in SA are undertaken. The first represents a 'modest' reduction in real monthly SA benefit levels adjusted for household size of 10%. A more drastic reduction of 20% is then considered. The latter change is broadly in line with the change in SA levels instituted in Ontario in 1995.

Three simulations relating to parameters of the EI program are then considered. In the first, the entrance requirement for the program is increased to 20 weeks for all individuals. Such a policy affects those individuals in economic regions with unemployment rates higher than 6% where the entrance requirement is as little as 420 hours or twelve 35-hour weeks. Two reductions of EI entitlement, given that eligibility has been established, are then considered. The first is a pro-rata reduction in the entitlement of all individuals by 20 per cent. Next a more drastic reduction is imposed which limits the entitlement of individuals to a maximum of 26 weeks. Although such a change affects all individuals, the impact is most severe for individuals with a large number of weeks of employment and/or those in high unemployment regions. The 26-week entitlement was chosen to mirror the rule that generally applies in the United States that limits EI entitlements to 26 weeks. It should be pointed out, however, that in the United States this limit can be extended in regions when the unemployment rate is sufficiently high.

Prior to examining the results of the simulation exercise, a number of *caveats* regarding the interpretation of the simulation results should be highlighted. The estimates from the hazard and transitions models represent reduced form estimates of the determinants of spells in alternative states and, conditional on an exit from a state, the determinants of the destination of an alternative state. In each case, identification of the effects of the SA and EI program parameters relies on exogenous variation to those programs discussed previously.

The simulation exercise represents an aggregation exercise that allows the results of the duration and logit estimates to be summarized in a tractable manner while incorporating variation in the key parameters of the EI and SA programs from a policy perspective. In interpreting the results of the simulation exercises, however, one must be mindful of the assumed constancy of the parameters defining the duration and transition relationships. The standard Lucas critique of policy simulations in a reduced form setting apply to the exercise conducted here. Similarly, it is implicitly assumed that demand for labour is perfectly elastic at the individual's going wage rate and that the individual can freely transit to employment at his/her wage rate. Notwithstanding these considerations, the simulation exercises provide a useful technique with which to examine the nature of the interface of the EI and SA programs and their impact on labour market outcomes.

The results of the changes to the SA program indicate that, as expected, the proportion of time spent collecting SA falls following reductions in the SA benefit levels. It is also noteworthy for these simulation exercises that the time spent in the U state also declines compared to the base case. In each case when the value of SA is reduced the reduction in total time spent in the income support programs is offset by increases in time spent in both the N and/or E states. Although the overall decline in the proportion of time spent in the S state is modest, a decline from 1.78% to 1.68% for the 20% reduction in SA benefit levels, the decline represents a 5.6% reduction in the time spent in the S state relative to the base case. Correspondingly, the total proportion of time spent in employment increases by almost 0.3%, compared to the base case, when a 20% reduction in SA benefit levels is simulated.

The decrease in the time spent in U following decreases in the value of SA benefits may be interpreted as reflecting, in part, the lower overall value of the non-employed state following the reduction in the value of SA. Given the lower value of non-employment, individuals may in turn exhibit a lower tendency to exit the E state or a higher probability of returning to employment. The

TABLE 4.7 – Results of the simulation analysis

Policy experiment	% time spent in N state	% time spent in U state	% time spent in S state	% time spent in E state
Base case	6.50	14.27	1.78	77.45
	(0.12)	(0.04)	(0.06)	(0.14)
10% reduction in SA	6.44	14.12	1.74	77.70
	(0.12)	(0.03)	(0.05)	(0.12)
20% reduction in SA	6.63	13.95	1.68	77.74
	(0.05)	(0.04)	(0.05)	(0.16)
Common entrance requirement (20 weeks)	7.33	11.93	2.03	78.70
	(0.14)	(0.03)	(0.06)	(0.15)
20% reduction in entitlement	6.71	12.25	1.81	79.23
	(0.12)	(0.03)	(0.06)	(0.12)
Maximum 26 weeks entitlement	6.69	11.96	1.93	79.42
	(0.12)	(0.03)	(0.06)	(0.13)

Notes to table 4.7: standard errors are shown in brackets.

lower use of both SA and EI following a reduction in the level of SA benefits points to complementarity in the use of these programs. Moreover, it suggests that both provincial and federal governments may reap a fiscal dividend from a reduction in the level of SA benefits. Such an outcome contradicts the fear, generally expressed by provincial governments with respect to reductions in the generosity of EI that curtailing the generosity of one program results in greater use of the alternative program.

The changes in the EI program present a number of interesting results. First, as expected the reductions in the generosity of the EI program reduce the total proportion of time spent collecting EI by between approximately 2% and 2.34%. As a proportion of the time spent collecting EI in the base case, this reflects a reduction of between 14.2% and 16.4%. The reduction of the time in the U state is offset by increases in all other states. The increase in the time spent in SA is consistent with the result in Browning, Jones and Kuhn (1995) where limiting the availability of EI was observed to result in greater take-up of the SA program. In that study the decrease in the number of EI recipients was almost entirely offset by an increased number of SA recipients. The results of the simulation exercise here, though, suggest that the overall increase in the time spent collecting SA is modest.

Relative to time spent collecting SA in the base case there is an increase of between 1.7% and 14% of time spent in the S state following the curtailment of the generosity of the EI program. Most of the reduction in the time collecting EI is offset by increased time in the E state. Interestingly, the imposition of the common entrance requirement has a similar effect on the time spent in the U state as the imposition of the 26 week maximum entitlement. It is also true that the increase in time spent collecting SA is largest for the policy change associated with the imposition of the common entrance requirement.

These patterns highlight two important aspects of the nature of the interface between the EI and SA programs. First, consistent with previous empirical evidence, it highlights the limited tendency of individuals to exhaust EI and then subsequently take-up SA. Despite the large decreases in the proportion of time spent collecting EI when entitlements are reduced, the increase in time spent collecting SA is relatively small. Second, the patterns identified from the simulation exercise suggest that SA is an important program for those individuals who are ineligible for EI following job loss. Hence, more restrictive entrance requirements for the EI program will exert proportionately greater impacts on the use of the SA program relative to the changes in the EI program than reductions in EI entitlements.

The results from the simulation exercises allow the 'cost' of program changes to be approximated subject to the constraints associated with the interpretation of the simulation exercises discussed previously. For example, the imposition of a common 20 week entrance requirement increases the total proportion of time spent in the SA state by approximately 0.25%. Given the number of annual layoffs in Canada of approximately 3,000,000 for the period covered by the 1997 COEP and an average monthly value of SA benefits of $789 (table 4.1), this suggests that additional SA costs arising from the imposition of a common entrance requirement in the order of around $71 million annually. In the context of expenditure on the SA program of approximately $11 billion in 1998-99 such a figure can be considered economically insignificant.

The results from the simulation exercise highlight a number of important policy implications from the analysis in this chapter. First, the exercise points to a pattern whereby changes to the EI program that make EI eligibility more difficult to establish have a more pronounced effect on the use of SA relative to the use of the EI program, than changes that limit the entitlement of those who have established eligibility for EI. Provincial governments have pointed to increased SA caseloads resulting from reductions in EI generosity, either from a decrease in the length of entitlement or changes that make

generating EI eligibility more difficult. The results of the simulation exercises suggests that these fears have some foundation and that limiting access to the EI program should represent a concern to those provincial policy makers. Nevertheless, the fiscal impact for provincial governments from changes to the EI program is arguably small and insignificant in the context of a program that costs upward of $10 billion per annum.

4.5   Conclusions

In this chapter, an important aspect of income support programs that has received limited attention to date has been analyzed. The existence of more than one program implies that labour market behaviour will reflect the range of available programs. In turn, variation in any one program will influence labour market outcomes including use of alternative programs. Failure to recognize the potential interface between programs means that the total effect of program changes on labour market outcomes is likely to be misidentified. Further, recognizing how programs interact is relevant from an institutional point of view if different levels of government share responsibility for the income support function. In this case, governments may shift the fiscal burden of that function by unilateral changes to the rules of a single program.

This chapter has examined the relationship between two income support programs in Canada, namely employment insurance and social assistance. The analysis has been facilitated by the 1997 COEP dataset that contains comprehensive information on the individual's program use and labour market activity following the loss of employment. A generalized transition probability model has been estimated that allows for spells in various labour market states, and transitions between those states, to be characterized. In turn, the results of this estimation have been applied in policy simulation experiments in which the relationship between alternative income support programs and overall labour market outcomes can be identified.

The results of the duration analysis and multinomial logistic analyses are in general consistent with *a priori* expectations. For example, the duration model describing spells in the employment state point to the tailoring of employment spells to meet the requirements of eligibility for the EI program. Further, the analysis indicates that the hazard rate describing the probability of exiting the EI program rises as benefit exhaustion approaches. Both of these results are consistent with patterns of behaviour

observed in earlier studies. Further, the lengths of spells collecting SA are positively related to the level of SA benefits available.

The results of the duration analysis and multinomial logistic models are then used to simulate labour market histories under a series of alternate policy scenarios. The results of the simulation exercises indicate that reductions in the generosity and availability of the EI program are associated with an increased in the use of the SA program. On the other hand curtailing the generosity of the SA program reduces the total use made of both programs. This result highlights the nature of the interface between the programs and how they are used jointly in the determination of labour market behaviour. Rather than simply being characterized as substitutes for one another, the impact of variation in one program on the use of the alternative program depends on which program is varied.

Significantly, the results indicate that changes that limit eligibility for the EI program have a more pronounced impact on the use of the SA program relative to their impact on EI use than those that reduce entitlement, once eligibility has been established. Such a pattern is consistent with the results of earlier studies that find few individuals exhaust EI entitlement prior to resorting to SA. This represents a key finding of this analysis with respect to the relationship between the EI and SA programs. A fear that individuals using SA upon exhaustion of EI will simply offset reductions in the length of EI entitlement is not borne out by the analysis. Rather, changes that limit the eligibility of individuals for the EI program have more pronounced effects on SA usage relative to changes in EI. Notwithstanding these findings, the results of the simulation exercise indicates that the higher fiscal cost of the SA program associated with limiting access to the EI program or reducing the length of EI benefit entitlements is relatively small.

The framework adopted in this chapter is flexible enough to allow a number of extensions that would potentially enrich the analysis. Foremost, additional labour market states could be readily defined to allow additional programs, such as training programs, to be incorporated into the analysis. Further, longitudinal data spanning a greater period such as the Survey of Labour Income and Dynamics may provide greater insight into the role of income support programs on labour market behaviour. Such a dataset provides information on a representative sample of the Canadian population, rather than simply job separators, for a period of up to six years. This could potentially be used to analyze additional decisions such as those relating to entry and exit from the labour market in a similar framework to that adopted here.

Chapter 5 - The Take-up of Social Assistance Following Job Separation

5.1   Introduction

A number of studies that have examined means-tested social programs have noted that take-up by those who are eligible for a payment is less than 100 per cent. For example Blank and Ruggles (1996) point to research that indicates the take-up rate of the principal means-tested income support program in the United States, Aid to Families with Dependent Children (AFDC), was approximately 75 per cent in the mid 1980s. Moffitt (1983) cites research indicating an even lower level of take-up of AFDC among the eligible population during the 1970s. Take-up rates of other social programs were lower again, with participation in the food stamp program by eligible individuals less than 50 per cent. Similarly in the United Kingdom, Blundell, Fry and Walker (1988) report take-up rates of means tested housing benefits of around 60 per cent. Riphahn (2001) reports that less than half of the households eligible for payments under the German social assistance program actually claimed their benefits.

To date though there has been no analysis of the take-up by eligible individuals of the most important means tested income support program in Canada, namely social assistance (SA) or welfare. Although participation in the SA program has been examined in a range of studies, it has not been possible to identify the SA eligibility status of individuals in the sample (Allen, 1993; Charette and Meng, 1994; Christofides, 2000; Christofides *et al.*, 1997 and Dooley, 1999).

In both Canada and the United States there has been some analysis of participation in the non means-tested (un)employment insurance (UI) program. In the case of the United States, Blank and Card (1991) report that during the 1970s and 80s less than 30 per cent of unemployed workers received unemployment insurance (UI) benefits. Among those who are eligible only two-thirds are actually observed to take-up UI benefits. Blank and Card (1991) also pointed to a decline in the proportion of unemployed workers receiving UI benefits during the 1980s. This trend was not associated with a drop in eligibility for benefits under the UI program, but rather a decline in the take-up rate by those who were eligible for benefits. There is some evidence that part of the reason for the decline in the

take-up rate is associated with changes that reduced the after-tax value of benefits (Anderson and Meyer, 1997).

In the Canadian context Storer and Van Audenrode (1995) have examined the take-up of UI benefits by unemployed individuals and have estimated the take-up rate of benefits by those eligible for benefits to be in the range 70 to 83 per cent. One possible explanation for the failure of 15 to 30 per cent of individuals to take-up UI benefits is associated with the two-week waiting period before benefits could be claimed following the loss of employment. If individuals returned to employment quickly following job loss then it is possible that they would not be observed to take-up UI despite having worked a sufficiently long period to establish eligibility. The analysis by Storer and Van Audenrode (1995), however, suggested that a rapid return to employment could not explain the behaviour of non-UI users among those who were eligible. Sargent (1998) has also examined the take-up of UI benefits in Canada by considering the 'BU ratio', that is, the ratio of unemployment insurance beneficiaries to the unemployed. Between 1987 and 1997, the BU ratio fell from 75 per cent to 42 per cent. Sargent (1998) attributes around 40 per cent of the decline of the ratio over the 1990s to an increase in the proportion of unemployed individuals who have never been eligible for benefits. The remainder, however, is due to a decline in the proportion of potential beneficiaries actually receiving benefits, that is, a decline in the take-up rate among potential beneficiaries.

The non-take-up of benefits poses the obvious question of why individuals would fail to accept benefits that appear to offer 'something for nothing'. There are, however, a number of reasons why those who are eligible to receive income support payments under a means-tested program may fail to do so. First, there may be a stigma or disutility associated with use of the program in question. Moffitt (1993) has examined this possibility for the AFDC program in the United States and found evidence of a stigma effect associated with being in receipt of benefits. Alternatively, non-take-up of benefits may simply be a result of individuals being unaware of the availability of the program or a belief that the cost of applying for the program exceeds any potential benefits available.

Whatever the motivation for the non-take-up of social programs, the issues it raises are important for a variety of reasons. First, the implications of non-take-up are important if the take-up rate is systematically related to the level of benefits available under the program. If this is the case, then changes to benefit levels will have fiscal implications for the cost of the program beyond the fact that existing recipients may receive more. Potential beneficiaries who previously did not participate in the program may do so in the future if benefits are set at a higher level. Understanding the determinants

of take-up is also important if benefit or rule changes affect the entitlement levels of diverse groups differentially. Further, given that income support programs are generally established to enhance the position of disadvantaged groups in society, we should be concerned about the welfare of those individuals who choose not to make use of the programs that are available. If particular groups of individuals consistently fail to make use of a program, this may indicate a need to examine the structure and/or the way the program is delivered to potential recipients.

The aim of the analysis in this chapter is to identify the take-up rate and determinants of the take-up decision for the social assistance (SA) program in Canada by a set of individuals who separate from employment. As an integral part of the social safety net in Canada, a greater understanding of the participation decision in this means-tested program is important for the reasons set out above. Moreover, in the context of any modifications to the program, an understanding of who is making use of the program is central to correctly designing changes to the program. As with the analysis presented in chapters three and four, the 1997 COEP dataset is used in the analysis presented in this chapter.

The remainder of this chapter is set out as follows. The next section presents a description of the Canadian SA program, including the administrative process for determining eligibility for SA payments. Next, the relevant features of the 1997 COEP dataset that are used to identify the set of individuals eligible for SA are described. A discussion of the procedure for determining SA eligibility status is also presented. The determination of the SA eligibility status of COEP respondents requires a number of assumptions about the measurement of household income and the period over which eligibility status is measured. For this reason, the results from the SA eligibility status exercise under a range of alternative assumptions are detailed. Following this, a discrete choice framework for analyzing the SA take-up decision, taking into account the endogenous nature of the level of benefits available under the SA program, is set out. The results of the empirical analysis are then detailed and conclusions set out. In general, the analysis indicates the importance of the level of SA benefits and recent use of SA on the take-up decision of those who are eligible for SA benefits.

5.2   The Canadian Social Assistance Program

5.2.1 Determining Eligibility for the Social Assistance Program

As discussed in chapters two and four, social assistance (SA) or welfare is a provincially administered program so that the rules relating to eligibility are province-specific. Consequently, SA benefit levels or rates vary by both province and household structure, and, are determined by a range of household characteristics. These include the employability of the claimants and the number, age and relationship of any dependants. Notwithstanding the variability in SA benefit levels across provinces and person types, the process for determining eligibility is similar in all provinces.

First, applicants must fall within one of the categories defined by the relevant legislation to be eligible for welfare. Age limits apply to the availability of SA and in general full-time students are not eligible for assistance. Given the applicant falls into a group for whom SA is available, the welfare department then applies a 'needs test' in which the budgetary requirements of the applicant and any dependants (the household) are compared to the assets and income of the household. When assessing the households' resources, not all income and assets are counted as some sources of financial support are considered exempt from the application of the means test. In general, assistance is granted when a household's non-exempt resources do not meet the cost of recurrent needs that are considered acceptable by the welfare department using a 'budget deficit' method.

When considering an applicant's resources, the welfare department examines his or her fixed and liquid assets. Generally fixed assets such as a principal residence, furniture and clothing are not considered to be part of the household's available resources and are exempted from the needs test. Most provinces and territories also exempt the value of a car, as well as property and equipment required for employment. A portion of liquid assets such as cash and bonds readily convertible to cash are also treated as exempt with the amounts varying by province, household size and the employability of household members. Fixed and liquid assets that are considered non-exempt must be used to meet the needs of the household before welfare is made available to the household.

As part of the needs test, any income available to the household is also assessed by the welfare department. Like the examination of the households' assets, some income is deemed exempt when determining SA eligibility. For example, payments such as the basic federal Child Tax Benefit,

available to households with dependent children, and the federal GST credit are typically considered exempt when determining eligibility for welfare. Income from other sources such as employment, pensions and employment insurance is considered either fully or partially available for the support of the household.

Finally, welfare departments subtract all non-exempt income from the total needs of the household to define the budget deficit for the household. The total needs of the household are set out in the provincial regulations governing the SA programs and are defined with reference to various basic requirements such as food, shelter and clothing. As noted previously the needs of the household are defined taking into account the number of individuals in the household, their age and employability status. Applicants qualify for welfare if their households' needs exceed the household's available resources, that is, if there is a 'budget deficit' for the household. The level of SA benefits available to the household is then equal to the value of the budget deficit. Note that these 'calculated benefits' are generally no greater than the statutorily defined maximum level of benefits which are set out in provincial welfare regulations. If the household has some special needs such as those relating to medical requirements then payments over the maximum level of benefits may be available.

5.2.2 Determining the Social Assistance Eligibility of COEP Respondents

The 1997 COEP dataset provides a unique opportunity to examine the take-up of SA in Canada for a variety of reasons. As described in previous chapters, the COEP dataset is a sample of individuals who separated from employment between mid 1995 and the end of 1997. Central to the analysis undertaken in this chapter, the dataset contains extensive information on the survey respondent's household. This information includes the number and age of household members and the income and asset holdings of the household. As outlined above, welfare programs in Canada are based on household rather than individual characteristics and needs, so this information is integral in determining eligibility for the SA program.

A number of limitations apply to the use of the COEP dataset for the analysis in this chapter. First, COEP respondents are a sample of job separators so that the population for which the question of take-up can be examined is limited and does not cover the entire population for which Canadian SA programs potentially provide income support. Nonetheless, previous research has indicated that this is an important group of SA users (Barrett *et al.*, 1996), so that insight into the take-up behaviour of this group is valuable from a policy perspective. Moreover, given the COEP respondents have been

actively engaged in the labour force, a comparison may be made between their use of SA and the take-up of (un)employment insurance by individuals who are eligible for that program (Storer and Van Audenrode, 1995). Next, the questions asked in the COEP survey are not necessarily those that are asked by welfare departments in assessing eligibility for the SA program. Despite these limitations, the COEP dataset provides an opportunity to gain some insight into the SA take-up decision.

The full COEP sample consists of around 42,000 individuals who suffered a separation from employment between mid 1995 and the end of 1997. As in earlier chapters, this employment separation is termed the 'ROE separation'. Job separators were interviewed twice, with the first interview occurring approximately nine months after the ROE separation. In the present analysis only a subsample of COEP respondents are used. Cohort 1 individuals (individuals who separated from employment between July 1995 and September 1995) are not included in the analysis as they were not asked a question that identified household income at the time of the ROE separation. This reduces the sample by around 2,700 people. Additional details of this are set out below. Finally, throughout the exercise some respondents were dropped from the sample because of non-response to questions. The effect of this was to reduce the sample to around 22,500 first interview respondents who suffered a separation from employment between October 1995 and December 1997.

The 1997 COEP dataset permits determination of SA eligibility status at two points in time, namely, the time of the job separation and the time of the first interview. In determining eligibility status, however, a number of assumptions concerning income and asset holdings are required. Social assistance eligibility status will be sensitive to these assumptions and the approach taken in this study is to present a series of eligibility measures derived under alternative assumptions. The basic approach to establishing eligibility remains the same in all cases and is described below.

First, a series of questions allows the 'liquid asset' holdings of the household at the time of the ROE separation and the time of the first interview to be determined. Although the COEP measure of liquid assets does not necessarily correspond exactly to the measure used in the determination of eligibility for SA, it nevertheless provides a proxy for the readily disposable assets available to the respondent's household at the time of ROE separation and the first interview.[8] Further, reference to the 'household'

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[8] Respondents in the COEP sample were specifically asked about the "liquid assets of anyone in the household, for example money in the bank, savings bonds or RRSPs that are cashable, but not including fixed assets such as cars, boats or houses".

in the COEP survey may or may not correspond strictly to that used in the determination of SA eligibility by provincial welfare departments. Notwithstanding these considerations, as a first step in identifying the SA eligibility status of the COEP respondent, the level of household liquid assets reported at the time of the ROE separation is compared to the allowable level of liquid assets under provincial welfare legislation. Allowable liquid asset levels vary by province and the make-up of the household. In the present analysis they were computed taking into account household structure and province at the time of the ROE separation.

The second step in the process of determining the COEP respondent's SA eligibility status required the identification of total household earnings or income. A series of questions allowed this to be determined for the household the individual belonged to at the time of the ROE separation. For the analysis in this chapter, the total income of this household was identified both at the time of the ROE separation and at the time of the first interview. With respect to income at the time of the first interview, respondents were asked directly about household income at that time. Household income at the time of the ROE separation, however, was determined using the steps described below.

First, for respondents in the COEP sample it was possible to establish total earnings in the month prior to the ROE separation from survey questions relating to employment spells. By using survey responses to identify earnings in this manner, all jobs held in the period between 2 and 6 weeks prior to the ROE separation were used, not just the job for which the ROE separation occurred. COEP respondents were also asked what proportion of total household income came from their own personal earnings during this time.[9] The answer to this question was given as a series of bracketed responses such as 'more than one quarter but less than one half'. The median value of the brackets was taken to represent the proportion of household earnings derived from the COEP respondent, thereby allowing total household earnings in the month prior to the ROE separation to be calculated.

To arrive at a measure of monthly earnings for the household at the time of the ROE separation, total household earnings *in the month prior to* the ROE were reduced by the amount of earnings from the job associated with the ROE separation. This gives a figure for monthly household income *at the time of* the ROE separation.

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[9] Individuals were asked: "In the month before the {ROE separation}, how much of total household income came from your own earnings?" Respondents in cohort 1 were not asked this question, necessitating their removal from the analysis.

As noted above, however, some income and monetary payments do not impinge on the household's ability to collect SA. For example, some earned income from employment and various sources of government support such as the Child Tax Benefit are not counted as part of the households' available resources. A difficulty arises in part because the types and level of earnings that are deemed exempt varies by province and is dependent on the household's structure and financial position. For example, although the Child Tax Benefit (though not in general the Child Tax Benefit Supplement) is considered exempt when determining eligibility for SA, receipt of the Child Tax Benefit is itself a function of income for an earlier period.

The income exemptions that are applied to the household's income measured at the time of the ROE separation will clearly influence the results of the SA eligibility determination exercise. In the absence of precise information on the exemptions to apply, the approach taken in this chapter is to establish eligibility under alternative assumptions regarding the correct income exemptions. To take account of this, two approaches are adopted in the analysis. The first is to ignore any exemptions that may be available to the individual. This approach is the least generous and assumes that any income the household has at the time of the ROE separation or first interview is non-exempt for determining SA eligibility. An alternative more generous approach would be to reduce the household's income at the ROE separation and the first interview as calculated above by all the exemptions potentially available to the household under provincial welfare legislation. A midway approach is adopted in this chapter by applying the two major exemptions available to households, namely the value of the monthly-earned income exemptions and the Child Tax Benefit (National Council of Welfare, various years). Under this alternative measure of household income at the time of the ROE separation or first interview, the household's total income is reduced by the earned income exemptions and the payments available under the Child Tax Benefit. The amount of the Child Tax Benefit varies in accordance with the number and age of children in the household. Earned income exemptions also vary by household structure, employability status and province. This approach effectively reduces the amount of monthly income or resources available to the household to a minimum of zero and increases the number of households potentially eligible for SA benefits.[10]

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[10] The federally funded Child Tax Benefit is not the only payment available to households with children. Both Quebec and New Brunswick introduced a series of provincial child tax benefits during 1997. Both of these are similar to the federal Child Tax Benefit in terms of eligibility, and for both provinces the amount of these benefits were also applied in unison with the Child Tax Benefit exemption when determining SA eligibility status (National Council of Welfare, 1999; Clark, 1998).

One source of income always considered non-exempt when determining SA eligibility status is EI income. After establishing the EI eligibility status of the individual at the time of the ROE separation and the amount of EI that would be available to those who are eligible, a measure of the individual's potential EI income at the time of the ROE separation was calculated. Adding this measure of potential EI income to the estimated level of household income at the time of the ROE separation gives an alternative measure of household income that includes EI benefits.

The procedures described above provide several measures of household income at two points in time, namely the time of the ROE separation and the first interview. Household asset holdings at the time of the ROE separation and first interview are also identified. It was then possible, using the income and asset measures, to determine SA eligibility status at one or both points of time using a variety of income measures. Household income was compared to the needs of the household as defined in various provincial regulations setting SA benefit rates. If a budget deficit existed, essentially the statutorily defined needs of the household being greater than non-exempt household income, then the household was determined to be eligible for SA based on inadequacy of income. If the household met the SA eligibility criteria for both income and assets, then it was deemed eligible for SA at the time of the ROE separation and/or the first interview. The level of SA available to the household or the 'calculated level of benefits' was then defined as the difference between total household income less any exemptions and the needs of the household as set out in provincial regulations. The calculated level of benefits is equal to the level of the 'budget deficit' for the household, and a positive amount reflects eligibility for SA.

The approach described above allowed household SA eligibility status to be established under a series of alternative assumptions regarding household income. Moreover, by requiring SA eligibility at the time of the ROE separation and/or the first interview the measure of SA eligibility was made more or less stringent. In table 5.1 below the results of the eligibility determination procedure are set out under a variety of assumptions with respect to the appropriate measure of income, timing of eligibility status and length of unemployment following the ROE separation.

Prior to examining the results of the eligibility determination process in table 5.1, a number of *caveats* are in order about the determination of eligibility at the time of the ROE separation. First, if the individual had more than a single job that contributed to household earnings, but lost more than one job in the month of the ROE separation, the determination procedure described above will tend to overstate household earnings at the time of the ROE separation. Individuals who are classified as

ineligible because household income is too high may in fact have a lower level of household income than that calculated according to the above procedure. Further, if the individuals' earnings were not stable then the loss of household earnings in the month of the ROE may be under-stated or over-stated. The procedure also implicitly assumes that the household took no other shock to earnings in the ROE month other than the loss of earnings reported by the COEP respondent. In addition to the loss of the COEP respondents' earnings in the month of the ROE separation, it may be the case that other household members suffered a loss of earnings or household earnings from other sources were affected, in the month of the ROE separation.

The final problem with the eligibility determination procedure has been identified above. This is the necessity to make assumptions about the appropriate income exemptions that should be applied to the household. These exemptions are highly individualized amounts that influence the household's eligibility for SA and for which a set of rules must be established. The approach adopted in this paper is to identify different sets of potentially eligible individuals under alternative assumptions about income exemptions that are applicable. Each measure will in turn capture different sets of individuals or households that may potentially receive benefits from the SA program.

The reasons for and possibility of receiving SA benefits may depend on the income measure or time-frame that is used. For example, measures that ignore potential EI income will include as eligible those for whom the SA eligibility window is potentially narrow, possibly consisting only of the two-week waiting period prior to the establishment of an EI claim.

The results of the assessment of the eligibility status are set out in table 5.1, with eligibility criteria ranging from the broadest or most generous measures to more narrowly defined measures. The proportion of individuals identified as SA eligible ranges between 38 per cent (measure 1) and 5 per cent (measure 7). The variation in the proportion of individuals SA eligible reflects the impact of the assumptions on the appropriate income exemptions to apply and the point(s) in time eligibility for SA is measured, as discussed above. There are a number of noteworthy patterns in table 5.1. First, the figures in table 5.1 highlight the importance of EI income on SA eligibility. Moving from measure 1 to 2, approximately 12 per cent of individuals are excluded from SA eligibility by the inclusion of potential EI income available to the household. For this set of individuals, SA eligibility may be

TABLE 5.1 – Proportions of SA eligible individuals

		Eligibility Measure								
	1	2	3	4	5	6	7	8	9	10
Criteria for establishing SA eligibility										
Eligible for SA at time job separation	✓ or	✓ or	✓	✓	✓	✓ and	✓ and	✓ and	✓ and	✓ and
Eligible for SA at time of first interview	✓	✓	✗	✗	✗	✓	✓	unemp. ≥1 mth	unemp. ≥3 mth	unemp. ≥6 mth
Include earned income exemptions[a]	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
Potential EI income[b]	✗	✓	✗	✗	✓	✗	✓	✓	✓	✓
Results of the SA eligibility determination procedure										
Proportion of SA eligibles	0.38	0.26	0.32	0.28	0.18	0.07	0.05	0.08	0.07	0.06
Take-up rate among SA ineligibles	0.01	0.02	0.04	0.04	0.05	0.04	0.05	0.05	0.05	0.05
Take-up rate among SA eligibles	0.15	0.21	0.13	0.14	0.17	0.41	0.46	0.26	0.27	0.29
Eligible users as a proportion of all users	0.87	0.81	0.60	0.56	0.44	0.41	0.33	0.31	0.27	0.24

Notes to table 5.1.

a. 'Include earned income exemptions' refers to the reduction of total household income by the amounts of earned income exemptions and Child Tax Benefit payment allowed under provincial regulations. Doing so effectively reduces the resources that are considered to be available to meet household needs when determining eligibility for SA.

b. 'Potential EI income' refers to the inclusion of potential EI income available to the household when calculating resources available to meet the needs of the household.

confined to the narrow window while and EI claim in being processed. The smaller proportion of individuals eligible for SA when a narrower criterion for establishing eligibility is applied (measures 6 to 10) underlies the secondary role of SA as a means of income support for individuals participating in the labour force.

The patterns in table 5.1 are generally consistent with *a priori* expectations with more restrictive eligibility criteria resulting in smaller sets of individuals classified as SA eligible. It is also true that the more qualified the eligibility criterion the greater is the observed rate of take-up among the eligible sample. It should be highlighted that SA recipiency in table 5.1 refers to the use of SA by the individual and/or someone in his/her household in the period between the ROE separation and first interview. The figures in table 5.1 indicate that the take-up rate among the individuals identified as SA eligible varies between 13 per cent (measure 3) and 46 per cent (measure 7). These figures are somewhat lower than the EI take-up rates reported for Canada and the United States (Storer and Van Audenrode 1995; Blank and Card 1991). They are also lower than the take-up rates reported for means-tested income support programs in the United States and other countries (see, for example, Moffitt 1983 and Riphahn 2001). Further, the much higher take-up rates reported by SA eligibles under measures 6 to 10 highlights the importance of SA for individuals and households with protracted periods of need.

Given that the COEP sample is drawn from the population of job separators, it is not surprising that the figures highlight the importance of the EI program for the SA eligibility of the sample. The inclusion of potential EI income when measuring the resources available to the household has a significant impact on the proportion of individuals identified as SA eligible. This suggests that for this sample the individual's eligibility for EI will be central to their behavioural responses to the SA program and the SA take-up decision.

In table 5.1 measures 6 to 10 represent more narrowly defined eligibility criteria and thereby identify a set of individuals whose potential need for SA is more acutely defined. The empirical analysis described below will concentrate on a narrowly defined set of SA eligibles. There are a number of reasons for adopting such an approach. First, focussing on a set of SA eligibles defined using a narrow criterion facilitates analysis of a group of 'in need' individuals for whom the parameters of the SA program are likely to be particularly important from a behavioural perspective. Further, by focussing on a narrowly defined group of eligibles the impact of the EI program for this group of job separators is minimized. It is possible, for example, that by ignoring potential EI income in

determining SA eligibility status, individuals whose window of SA eligibility is very narrow may be included in the sample of SA eligibles. For these individuals SA may only be available for as little as a two-week period while awaiting an EI claim to be established. It is possible that the decision to take-up SA for these individuals will be determined by a different set of factors than those for whom the need is more acute and long lasting. Finally, the results may be more readily compared to U.S. and Canadian studies that have examined the take-up of AFDC and UI respectively.

Although the focus of the analysis will be on a narrowly defined set of SA eligibles, the take-up behaviour of eligible individuals defined under a range of criteria is presented for comparison purposes.

5.3   Modelling the Social Assistance Take-up Decision

Following a number of earlier studies, the SA take-up decision can be modelled in a discrete choice framework. Assume that the calculated benefits the household is entitled to is given as follows:

$$B^c\left(y, z^*\right) \tag{1}$$

where y is the household's non-exempt non-welfare income, both earned and unearned; and z^* is a set of characteristics that determine benefit entitlement including province and household structure. Further, the household's level of utility when SA is received is given by:

$$U\left[y + B^c\left(y, z\right), z\right] \equiv U_T \tag{2}$$

where z is a vector of household characteristics that are believed to influence the decision to take-up SA. The utility level in the absence of SA receipt is similarly given as follows:

$$U[y, z] \equiv U_0 \tag{3}$$

Take-up of SA entails some disutility that may be characterized as the stigma or disutility of receiving SA. Let this be represented by the following:

$$C(z)\tag{4}$$

The ith household will be observed to collect SA ($P_i = 1$) if the net level of utility while collecting benefits exceeds that when not collecting benefits. That is:

$$
\begin{aligned}
P_i &= 1 && \leftrightarrow && U_T - C - U_0 > 0 \\
P_i &= 0 && \textit{otherwise}
\end{aligned}
\tag{5}
$$

If linear functional forms are chosen for the utility and cost functions, then U_T, U_0 and C can be expressed as follows:

$$U_T \equiv U\left[y + B^c\left(y, z^*\right)\right] = a_0 + a_1(y + B^c) + a_2'z + e_T \tag{2a}$$

$$U_0 \equiv U\left[y, z\right] = a_0 + a_1 y + a_2'z + e_0 \tag{3a}$$

$$-C(z) = b_0 + b_2'z + u \tag{4a}$$

where the e_T, e_0 and u represent unobservable household characteristics that determine the values of U_T, U_0 and C respectively. Take-up of SA by the household can then be expressed as follows:

$$P_i = 1 \leftrightarrow b_0 + a_1 B^c + b_2'z + v_1 > 0 \tag{5a}$$

or put another way, the probability of observing take-up can be written as:

$$\Pr(P_i = 1) = \Pr\left[U_T - C - U_0 > 0\right] = \Pr\left[v_1 > -(b_0 + a_1 B^c + b_2'z)\right] \tag{6}$$

$$= 1 - \Phi\left(-b_0 - a_1 B^c - b_2'z\right) = \Phi\left(b_0 + a_1 B^c + b_2'z\right) \tag{7}$$

where $v_1 = (e_T + u - e_0)$ is assumed to be distributed $N(0,1)$, and $\Phi(\cdot)$ is the cumulative distribution function of the standard normal.

The model as it is written now assumes that B^c, the calculated level of benefits available to the household, is exogenously determined. In fact, B^c is the difference between the maximum level of benefits available to the household under provincial welfare regulations and its non-exempt income. Intuitively B^c is likely to be correlated with the unobservable characteristics of individuals that influence the decision to take-up SA and is therefore endogenously determined.

Rewriting equation 5(a) to take account of the potential endogeneity, we can write the model as follows:

$$y_1^* = b_0 + a_1 B^c + b_2' z + v_1 \tag{8}$$

$$P_i = 1 \leftrightarrow y_1^* \geq 0$$
$$= 0 \leftrightarrow y_1^* < 0 \tag{9}$$

$$B^c = \gamma_0 + \gamma_1 x + \gamma_2' z + v_2 \tag{10}$$

The level of calculated benefits is modelled as an endogenous variable where B^c is a linear function of the variables that determine SA take-up (z), a set of other exogenous variables x and an error term v_2. Wooldridge (2002) proposes two procedures for dealing with an endogenous variable in the probit framework considered in this chapter. The approach adopted in this chapter is a conditional maximum likelihood procedure. Assume that v_1 and v_2 are distributed bivariate normal with zero mean and covariance Σ where:

$$\Sigma = \begin{bmatrix} 1 & \rho\sigma_2 \\ \rho\sigma_2 & \sigma_2^2 \end{bmatrix}$$

The contribution to the likelihood function for the ith individual can be expressed as follows (Evans, Oates and Schwab, 1992):

$$\log L_i = P_i \ln \Phi(\omega) + (1 - P_i)\ln[1 - \Phi(\omega)] -$$
$$.5\ln(2\pi\sigma_2^2) - .5\left(\frac{1}{\sigma_2^2}\right)\left(B^c - \gamma_1 x - \gamma_2' z\right)^2 \tag{11}$$

where:

$$\omega = \frac{b_0 \quad +a_1 B^c \quad + \quad b_2^{'}z \quad + \quad \left[\left(B^c - \gamma_1^{'} x - \gamma_2^{'}z \right) \rho / \sigma_2 \right]}{\left(1 - \rho^2 \right)^{0.5}}$$

The log likelihood function is given by the sum of all terms like (11) and is maximized to provide estimates of b_0, a_1, $b_2^{'}$, $\gamma_1^{'}$, $\gamma_2^{'}$, ρ and σ_2. A discussion of the sample used and choice of instrument is now set out.

5.4 Empirical Analysis

5.4.1 Data and Choice of Instrument

Following the earlier discussion, the sample of eligible individuals on whom the empirical analysis is primarily focussed are those identified as eligible by measure 7 in table 5.1. This measure identifies a group with a clearly defined need for income support following the separation from employment. Although measure 7 identifies a sample of approximately 1,000 individuals who are members of households that are eligible for SA, a further exclusion was made of individuals who were observed to be using SA in both the month prior to the ROE separation and the month of the ROE separation. For these individuals it is not clear that use of SA between the ROE separation and first interview represents 'take-up', as they are more accurately characterized as continuous users of SA. This leaves approximately 750 COEP respondents who are classified as SA eligible using measure 7 as the criteria that the empirical analysis focuses on.

The exclusion of continuous SA users effectively omits some individuals with prior knowledge of the SA program for whom the take-up decision is potentially interesting. Hence, for comparison purposes the results of some analysis including the set of continuous users of SA are also set out below. Finally, examination of the SA take-up decision was also undertaken for a series of groups of individuals identified as eligible under alternative eligibility criterion. The results of the analysis for these alternatively defined eligible groups are also discussed later.

Means of the variables used in the analysis for the sample of individuals identified as eligible by measure 7 are set out in table 5.2 broken down by SA recipiency. This reveals a number of patterns consistent with *a priori* expectations. First, the calculated level of SA benefits available to recipients exceeds that available to non-recipients. This is consistent with greater use of SA when the pecuniary rewards from doing so are greater. Around one-third of the sample report use of SA by the time of the first interview and one-quarter are receiving at the time of the first interview. Note that this figure is substantially lower than the EI take-up rate identified by Storer and Van Audenrode (1995). Approximately 20 per cent of the sample report recent use of SA (that is, use of SA in the six to nine months prior to the ROE separation) with a much higher rate of recent SA use among the SA recipients. As expected, SA recipients were less likely to be in a relationship at the time of the ROE separation. The absence of a partner removes a potential source of income and increases the probability that the individual will need to rely on SA. For those who were partnered at the time of the ROE separation, the presence of a working partner was significantly less likely among the group of SA recipients.

The recipient and non-recipient samples have a geographical distribution similar to that of the Canadian population, although Ontario is slightly over-represented and Quebec under-represented in the non-recipient sample. The hourly pay of the SA recipients is slightly lower than that of non-recipients though the former group reports a significantly longer spell of unemployment at the first interview. Finally, SA recipients had a much lower expectation of being recalled to their former employer, either with or without a fixed date of recall.

Estimation of the take-up relationship taking account of the potential endogeneity of the calculated benefit variable requires the choice of an appropriate instrument. The instrument used in the empirical analysis is the maximum level of benefit available to the household under provincial regulations. In the discussion that follows this is referred to as the 'regulated' level of benefits. That is, consistent with the model set out above it is hypothesized that the actual monetary benefits available when an individual initiates an SA claim will determine whether an eligible individual is observed to take-up SA benefits. Further, the statutorily defined maximum regulated value of benefits provides an exogenous source of variation in the level of calculated benefits available to the individual. Although higher statutorily defined maximum benefits will be associated with higher calculated benefits *ceteris paribus*, it is the latter that determines the individual's SA take-up decision. Variation in the maximum level of regulated benefits arises from changes in the real value of benefits due to

TABLE 5.2 – Means of covariates used in the analysis

	Full sample	SA recipients	Non SA recipients
Calculated monthly benefits ($'00s)	6.03	6.67	5.72
Maximum monthly benefits ($'00s)	8.46	8.12	8.63
Receive SA by first interview	0.33	1.00	0.00
Receive SA at first interview	0.25	0.77	0.00
Recent SA receipt	0.18	0.38	0.07
Male	0.40	0.45	0.37
Age	34.67	34.32	34.85
Married/ Common-law	0.39	0.29	0.44
Partner worked at time separation	0.12	0.03	0.16
Number of kids	0.97	0.90	1.00
Job separation to return to school	0.05	0.01	0.06
Job separation due to illness	0.08	0.11	0.07
Presence of work limit. disability	0.16	0.26	0.11
Visible minority	0.03	0.02	0.03
Native	0.12	0.13	0.11
Immigrant	0.12	0.09	0.14
Education			
Less than High school	0.26	0.29	0.25
High school	0.33	0.31	0.34
Technical	0.21	0.19	0.22
University	0.17	0.20	0.15
Other	0.03	0.00	0.05
Province			
Newfoundland	0.03	0.02	0.03
PEI	0.01	0.01	0.01
Nova Scotia	0.03	0.04	0.03
New Brunswick	0.03	0.03	0.02
Quebec	0.25	0.29	0.23
Ontario	0.38	0.34	0.40
Manitoba	0.03	0.03	0.03
Saskatchewan	0.03	0.03	0.04
Alberta	0.10	0.09	0.11
British Columbia	0.12	0.13	0.11

TABLE 5.2 – Means of covariates used in the analysis (cont)

	Full sample	SA recipients	Non SA recipients
Hourly pay ($) in ROE job	9.89	9.58	10.05
Household liquid assets at time ROE ($)	97.80	74.68	109.23
Eligible for EI at ROE	0.68	0.58	0.74
Unemployment length at first interview (weeks)	23.31	28.91	20.54
Unemployment rate	10.29	10.49	10.19
Expected recall	0.43	0.33	0.48
Expected recall with date	0.19	0.11	0.22
Sample size	755	268	487

changes in the general level of prices over time and discrete changes in rates instituted by various provincial governments over the period of analysis. The source and magnitude of the variation in maximum SA benefit levels over the period has been discussed previously in chapter three.

5.4.2 Empirical Results

The results of the estimation are presented in tables 5.3 to 5.6. Tables 5.3, 5.4 and 5.5 contain the results of the estimation for groups identified as SA eligible using measure 7 from table 5.1. Table 5.6 contains the results for groups of SA eligibles identified by alternative measures of eligibility status. Tables 5.3 and 5.4 set out the results for the maximum likelihood procedure. In table 5.3 the variables in the take-up equation (8) along with an estimate of ρ, the correlation co-efficient between the error terms is presented. Table 5.4 shows the first stage results from the maximum likelihood estimation. Table 5.5 presents the marginal effects of the covariates on the probability of an individual taking up SA for the specifications in tables 5.3 and 5.4.

In table 5.3, the significance of the coefficient on ρ provides support for the rejection of the null hypothesis that the measure of SA benefits used in the take-up equation, namely the level of calculated benefits, is exogenous. The negative value of the co-efficient on ρ indicates a negative

correlation between the unobservable characteristics of individuals that determine the level of calculated benefits and the characteristics that influence the probability of SA take-up. The negative coefficient on ρ also reflects the relationship between unobserved characteristics of the individual and other variables, especially eligibility for EI, included in the estimated specifications.

Tables 5.3 to 5.5 also contain results of two additional specifications useful for comparison purposes. In column (5a), results of the specification in column (5) are reported when all individuals, including those classified as continuous users of SA and therefore excluded from the analysis reported in columns (1)-(5), form part of the sample. In column (6) results of a probit model without the use of instruments, that is, without correcting for the endogeneity of the level of calculated benefits, are set out.

The first stage results of the maximum likelihood estimation are set out in table 5.4 and, in general, are consistent with *a priori* expectations. Hence, the maximum level of benefits available to the household is positively related to calculated benefits in a significant way for all specifications reported in table 5.4. Other characteristics of the household that influence the level of calculated benefits by altering the financial resources available to the household are also observed to affect calculated benefits in the expected manner. For example, the presence of a partner who works and eligibility for EI benefits at the time of the ROE separation both reduce the level of calculated benefits. Also important in this relationship is whether the individual experienced a lay-off from the employment relationship. As this will affect the individual's access to EI, this too is important in specifications that control for the reason for separation from employment.

Examining the results in table 5.5 that show the marginal effects of the covariates on the probability of take-up, a number of patterns emerge. The presence of a partner (specifications 1-5) and the partner's work status at the time of the ROE separation (specifications 2-5) are entered as discrete variables and interacted with the benefits variable. As expected, the presence of a partner is associated with a lower probability of SA take-up. Similarly, the work status of the partner at the time of the job separation is also important for the take-up of SA as reflected in the significance of the interaction term for this variable (specifications 2-5). These results are consistent with *a priori* expectations and reflect the fact that the SA program looks at the resources available to the household to determine eligibility to SA. The presence of a partner, especially one who is working at the time of the ROE separation, will increase the resources available to the household and reduce the likelihood of

TABLE 5.3: Maximum Likelihood Estimation results[*]

	(1)	(2)	(3)	(4)	(5)	(5a)	No endogeneity correction
Calculated monthly benefits ($'00s)	0.209* (0.094)	0.229* (0.087)	0.176* (0.076)	0.201* (0.073)	0.184* (0.077)	0.145* (0.075)	0.030 (0.045)
Benefits*male	-0.010 (0.051)	-0.047 (0.053)	-0.058 (0.059)	-0.079 (0.057)	-0.063 (0.057)	-0.020 (0.050)	-0.050 (0.063)
Benefits*married	0.033 (0.046)	0.060 (0.052)	0.074 (0.058)	0.082 (0.056)	0.079 (0.056)	0.063 (0.052)	0.070 (0.061)
Benefits*(partner works)	-	-0.119** (0.067)	-0.127* (0.067)	-0.135* (0.065)	-0.129** (0.066)	-0.167* (0.066)	-0.143* (0.070)
Male	0.040 (0.324)	0.222 (0.324)	0.311 (0.346)	0.383 (0.340)	0.244 (0.342)	0.218 (0.337)	0.211 (0.366)
Age	0.054 (0.060)	0.065 (0.061)	0.066 (0.060)	0.044 (0.061)	0.057 (0.061)	0.149* (0.053)	0.081 (0.058)
$(Age)^2$	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.002* (0.001)	-0.001 (0.001)
Married/ Common law	-0.565** (0.316)	-0.730* (0.361)	-0.750 (0.395)	-0.806* (0.381)	-0.836* (0.388)	-0.935* (0.390)	-0.609 (0.409)
Partner worked at time ROE	-	0.477 (0.450)	0.252 (0.452)	0.377 (0.434)	0.354 (0.447)	0.517 (0.455)	0.060 (0.471)
Number of children	-0.204* (0.093)	-0.208* (0.098)	-0.206* (0.111)	-0.205** (0.107)	-0.201** (0.109)	-0.216** (0.112)	-0.056 (0.082)
Visible minority	0.142 (0.449)	0.157 (0.426)	0.006 (0.434)	-0.057 (0.446)	-0.029 (0.433)	1.003* (0.485)	-0.037 (0.449)
Native	0.399 (0.281)	0.377 (0.277)	0.455** (0.276)	0.492** (0.272)	0.472** (0.265)	0.555* (0.234)	0.375 (0.271)
Immigrant	0.000 (0.332)	0.028 (0.341)	0.059 (0.355)	0.171 (0.348)	0.017 (0.350)	0.104 (0.277)	0.112 (0.365)
High school	0.147 (0.249)	0.118 (0.247)	0.243 (0.221)	0.206 (0.222)	0.246 (0.222)	0.209 (0.193)	0.374* (0.214)
Technical	-0.102 (0.253)	-0.112 (0.258)	-0.082 (0.279)	-0.199 (0.282)	-0.092 (0.279)	-0.151 (0.258)	-0.226 (0.272)
University	-0.398 (0.314)	-0.405 (0.314)	-0.315 (0.341)	-0.396 (0.333)	-0.303 (0.336)	-0.100 (0.237)	-0.428 (0.335)
Other	-1.163 (0.760)	-1.195** (0.692)	-1.184 (0.726)	-1.105 (0.691)	-1.311* (0.733)	0.483 (0.574)	-1.114 (0.705)
School	-	-	-0.062 (0.343)	0.051 (0.357)	-0.133 (0.341)	-0.978* (0.489)	-0.134 (0.401)
Illness	-	-	0.148 (0.328)	0.532** (0.320)	0.243 (0.347)	-0.010 (0.333)	0.128 (0.365)
Work limiting disability	0.498* (0.208)	0.482* (0.209)	0.621 (0.218)	0.612* (0.217)	0.579* (0.214)	0.558* (0.199)	0.523* (0.237)
Eligible for EI at ROE	-0.189 (0.304)	-0.204 (0.319)	-0.198 (0.324)	0.044 (0.320)	-0.136 (0.330)	0.061* (0.343)	-0.596* (0.210)

TABLE 5.3: Maximum Likelihood Estimation results (cont)[†]

	(1)	(2)	(3)	(4)	(5)	(5a)	No endogeneity correction
Recent SA	1.053* (0.305)	1.015* (0.290)	1.044* (0.248)	1.036* (0.259)	1.037* (0.252)	1.593* (0.199)	1.200* (0.220)
Log hourly pay	-0.615* (0.208)	-0.586* (0.203)	-0.519* (0.219)	-0.484* (0.215)	-0.443* (0.218)	-0.651* (0.194)	-0.466* (0.224)
Layoff	-	-	0.533 (0.389)	0.814* (0.374)	0.577 (0.395)	0.202 (0.335)	-0.082 (0.228)
Expected recall	-	-	-	-0.681* (0.191)	-	-	-
Expected recall with date	-	-	-	-	-0.577* (0.237)	0.143 (0.187)	-0.456 (0.236)
Unemployment rate	0.025 (0.024)	0.020 (0.022)	0.019 (0.024)	0.019 (0.023)	0.017 (0.024)	0.028 (0.025)	0.024 (0.025)
Liquid assets at ROE ($'000s)	-0.169 (0.168)	-0.154 (0.178)	-0.070 (0.173)	-0.125 (0.164)	-0.075 (0.169)	-0.564* (0.186)	0.042 (0.168)
Constant	-1.684 (1.136)	-1.789 (1.110)	-2.051** (1.159)	-1.584 (1.176)	-1.886 (1.169)	-3.152* (1.091)	-1.340* (1.197)
ρ	-0.544** (0.293)	-0.581* (0.265)	-0.390* (0.180)	-0.420* (0.177)	-0.396* (0.184)	-0.259 (0.196)	-

[†] standard errors are in parenthesis. The specification also included a full set of province and month dummy variables. * indicates significance at the 5% level, ** at the 10% level.

TABLE 5.4: Maximum Likelihood Estimation, first stage results[*]

	(1)	(2)	(3)	(4)	(5)	(5a)
Regulated monthly benefits ($'00s)	0.465* (0.138)	0.467* (0.137)	0.807* (0.121)	0.801* (0.120)	0.802* (0.117)	0.837* (0.105)
Male	0.711 (0.448)	0.423 (0.425)	0.410 (0.358)	0.424 (0.354)	0.543 (0.360)	-0.070 (0.297)
Age	0.029 (0.121)	0.031 (0.112)	0.112 (0.083)	0.134** (0.080)	0.123 (0.082)	0.051 (0.084)
$(Age)^2$	-0.001 (0.002)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.001)
Married/ Common law	-0.494 (0.545)	0.459 (0.612)	-0.151 (0.419)	-0.141 (0.415)	-0.069 (0.412)	0.134 (0.364)
Partner worked at time ROE	-	-2.458* (0.582)	-1.940* (0.485)	-1.982* (0.480)	-2.030* (0.480)	-2.167* (0.452)
Number of children	-0.164 (0.312)	-0.095 (0.310)	-0.444 (0.281)	-0.456 (0.280)	-0.462** (0.269)	-0.440** (0.247)
Visible minority	-1.634** (0.838)	-1.071 (0.769)	-0.291 (0.612)	-0.218 (0.606)	-0.234 (0.595)	-0.338 (0.761)
Native	0.063 (0.673)	-0.249 (0.628)	-0.647 (0.465)	-0.667 (0.456)	-0.650 (0.447)	-0.154 (0.403)
Immigrant	0.599 (0.701)	0.505 (0.626)	0.518 (0.459)	0.374 (0.447)	0.542 (0.451)	0.309 (0.546)
High school	0.825** (0.482)	0.882* (0.445)	0.531 (0.325)	0.543** (0.329)	0.530** (0.322)	0.326 (0.318)
Technical	-0.128 (0.620)	-0.198 (0.598)	-0.615 (0.462)	-0.510 (0.456)	-0.563 (0.457)	-0.301 (0.389)
University	0.288 (0.606)	0.403 (0.582)	-0.455 (0.472)	-0.400 (0.474)	-0.457 (0.463)	-0.074 (0.395)
Other	0.890 (0.997)	1.348 (0.918)	1.272 (0.699)	1.144** (0.668)	1.385** (0.725)	0.970 (1.162)
School	-	-	0.423 (0.658)	0.295 (0.664)	0.573 (0.659)	0.221 (0.597)
Illness	-	-	-0.544 (0.482)	-0.857** (0.485)	-0.663 (0.477)	0.551 (0.477)
Work limiting disability	-0.010 (0.590)	0.042 (0.536)	-0.656** (0.383)	-0.612 (0.379)	-0.554 (0.375)	-0.227* (0.308)
Eligible for EI at ROE	-1.544* (0.412)	-1.628* (0.415)	-3.019* (0.370)	-3.197* (0.350)	-3.082* (0.362)	-3.322* (0.299)
Recent SA	-0.118 (0.512)	-0.273 (0.507)	0.449 (0.349)	0.460 (0.350)	0.465 (0.343)	0.084 (0.271)
Log hourly pay	0.973* (0.492)	0.793** (0.462)	0.271 (0.383)	0.236 (0.383)	0.158 (0.381)	0.208 (0.358)
Layoff	-	-	-4.395* (0.313)	-4.545* (0.310)	-4.411* (0.304)	-3.966* (0.303)

TABLE 5.4: Maximum Likelihood Estimation, first stage results (cont)[†]

	(1)	(2)	(3)	(4)	(5)	(5a)
Expected recall	-	-	-	0.566* (0.270)	-	-
Expected recall with date	-	-	-	-	0.838* (0.322)	-0.193* (0.395)
Unemployment rate	0.013 (0.058)	-0.009 (0.054)	0.012 (0.035)	0.013 (0.035)	0.016 (0.035)	-0.013 (0.041)
Liquid assets at ROE ($'000s)	0.770* (0.312)	0.817* (0.313)	0.576* (0.247)	0.607* (0.242)	0.562* (0.237)	0.507* (0.257)
Constant	-1.040 (2.707)	-0.244 (2.568)	-0.671 (1.998)	-1.156 (1.947)	-0.970 (1.961)	-3.301** (1.971)

[†] standard errors are in parenthesis. The specification also included a full set of province and month dummy variables. * indicates significance at the 5% level, ** at the 10% level.

TABLE 5.5: Marginal effects on take-up decision[†]

	(1)	(2)	(3)	(4)	(5)	(5a)	No endogeneity correction
Calculated monthly benefits ($'00s)	0.081* (0.037)	0.088* (0.036)	0.070* (0.029)	0.080* (0.028)	0.074* (0.031)	0.054* (0.021)	0.010 (0.016)
Benefits*male	-0.004 (0.020)	-0.018 (0.021)	-0.023 (0.023)	-0.031 (0.023)	-0.025 (0.023)	-0.008 (0.018)	-0.017 (0.022)
Benefits*married	0.013 (0.018)	0.023 (0.020)	0.029 (0.023)	0.032 (0.023)	0.032 (0.022)	0.023 (0.020)	0.024 (0.021)
Benefits*(partner works)	-	-0.046** (0.027)	-0.050** (0.027)	-0.054* (0.026)	-0.051** (0.026)	-0.062* (0.028)	-0.050* (0.024)
Male	0.016 (0.124)	0.082 (0.119)	0.123 (0.135)	0.151 (0.132)	0.096 (0.134)	0.084 (0.128)	0.075 (0.129)
Age	0.021 (0.023)	0.025 (0.024)	0.026 (0.024)	0.018 (0.024)	0.023 (0.024)	0.055* (0.025)	0.028 (0.020)
$(Age)^2$	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001* (0.000)	0.000 (0.000)
Married/ Common law	-0.222** (0.121)	-0.284* (0.133)	-0.265** (0.140)	-0.278* (0.139)	-0.299* (0.140)	-0.257** (0.137)	-0.239 (0.156)
Partner worked at time ROE	-	-0.099 (0.159)	-0.186 (0.148)	-0.162 (0.152)	-0.185 (0.153)	-0.139 (0.141)	-0.215 (0.168)
Number of children	-0.079* (0.037)	-0.080* (0.039)	-0.082* (0.043)	-0.082** (0.042)	-0.080** (0.044)	-0.080* (0.034)	-0.019 (0.029)
Visible minority	0.054 (0.165)	0.059 (0.153)	0.003 (0.173)	-0.023 (0.175)	-0.012 (0.173)	0.382* (0.158)	-0.014 (0.170)
Native	0.143 (0.099)	0.134 (0.096)	0.178** (0.106)	0.192** (0.104)	0.181** (0.102)	0.217* (0.092)	0.127 (0.097)
Immigrant	0.000 (0.128)	0.011 (0.130)	0.024 (0.142)	0.068 (0.138)	0.007 (0.140)	0.039 (0.106)	0.041 (0.130)
High school	0.056 (0.096)	0.044 (0.094)	0.097 (0.088)	0.082 (0.088)	0.097 (0.089)	0.080 (0.074)	0.127 (0.091)
Technical	-0.040 (0.099)	-0.044 (0.101)	-0.032 (0.111)	-0.078 (0.111)	-0.037 (0.111)	-0.054 (0.095)	-0.087 (0.104)
University	-0.158 (0.123)	-0.160 (0.123)	-0.122 (0.133)	-0.151 (0.127)	-0.119 (0.132)	-0.036 (0.088)	-0.167 (0.130)
Other	-0.418** (0.214)	-0.430* (0.195)	-0.366* (0.187)	-0.347** (0.182)	-0.406* (0.184)	0.189 (0.230)	-0.416** (0.219)
School	-	-	-0.025 (0.136)	0.020 (0.142)	-0.053 (0.136)	-0.264 (0.172)	-0.051 (0.154)
Illness	-	-	0.059 (0.131)	0.207** (0.121)	0.096 (0.135)	-0.004 (0.123)	0.047 (0.130)
Work limiting disability	0.174* (0.077)	0.167* (0.075)	0.237* (0.084)	0.235* (0.084)	0.218* (0.083)	0.218* (0.080)	0.169* (0.091)
Eligible for EI at ROE	-0.075 (0.121)	-0.080 (0.126)	-0.077 (0.128)	0.018 (0.127)	-0.054 (0.131)	0.023 (0.126)	-0.234* (0.079)
Recent SA	0.305* (0.127)	0.293* (0.121)	0.364* (0.102)	0.365* (0.103)	0.349* (0.111)	0.536* (0.115)	0.297** (0.157)

TABLE 5.5: Marginal effects on take-up decision (cont)[†]

	(1)	(2)	(3)	(4)	(5)	(5a)	No endogeneity correction
Log hourly pay	-0.238* (0.087)	-0.225* (0.085)	-0.206* (0.087)	-0.192* (0.086)	-0.177* (0.087)	-0.241* (0.094)	-0.162* (0.078)
Layoff	-	-	0.207 (0.150)	0.302* (0.143)	0.218 (0.151)	0.077 (0.123)	-0.031 (0.085)
Expected recall	-	-	-	-0.243* (0.079)	-	-	-
Expected recall with date	-	-	-	-	-0.218* (0.085)	0.054 (0.073)	-0.178** (0.096)
Unemployment rate	0.009 (0.009)	0.008 (0.008)	0.008 (0.010)	0.007 (0.009)	0.007 (0.010)	0.010 (0.010)	0.009 (0.009)
Liquid assets at ROE ($'000s)	-0.066 (0.064)	-0.059 (0.068)	-0.028 (0.069)	-0.050 (0.065)	-0.030 (0.067)	-0.209* (0.082)	0.015 (0.058)

[†] standard errors are in parenthesis. The specification also included a full set of province and month dummy variables. * indicates significance at the 5% level, ** at the 10% level. Marginal effects for the continuous variables are calculated at the mean of the continuous variable and by setting all discrete variables equal to zero. Marginal effects for the discrete variables are determined by setting the value of the continuous variables equal to their means, and calculating the change in the probability of take-up when the variable is changed from zero to 1. For the means of the 'Partner worked at time separation' variable, however, the Married/Common-law variable was set equal to one when calculating the marginal effect.

TABLE 5.6: Marginal effects on take-up decision by alternative eligibility criteria[†]

	SA eligibility criterion				
	1	2	5	7	10
Calculated monthly benefits ($'00s)	0.010* (0.004)	0.038** (0.021)	0.020** (0.012)	0.074* (0.031)	0.004 (0.036)
Benefits*male	0.000 (0.001)	-0.005 (0.008)	-0.004 (0.008)	-0.025 (0.023)	-0.005 (0.020)
Benefits*married	-0.001 (0.001)	0.011 (0.009)	-0.002 (0.009)	0.032 (0.022)	-0.003 (0.024)
Benefits*(partner works)	0.000 (0.001)	-0.015 (0.010)	0.008 (0.010)	-0.051** (0.026)	0.047** (0.027)
Male	0.012 (0.026)	0.030 (0.050)	0.102 (0.077)	0.096 (0.134)	0.036 (0.134)
Age	-0.002 (0.009)	-0.006 (0.009)	0.007 (0.010)	0.023 (0.024)	0.017 (0.021)
(Age)^2	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Married/ Common law	-0.087* (0.029)	-0.121* (0.055)	-0.069 (0.050)	-0.299* (0.140)	-0.259* (0.131)
Partner worked at time ROE	-0.145* (0.053)	-0.157* (0.068)	-0.107 (0.074)	-0.185 (0.153)	-0.466* (0.200)
Number of children	0.022 (0.021)	-0.028 (0.026)	0.002 (0.024)	-0.080** (0.044)	-0.006 (0.059)
Visible minority	-0.031 (0.052)	-0.043 (0.058)	-0.089 (0.060)	-0.012 (0.173)	-0.392* (0.154)
Native	0.171* (0.054)	0.193* (0.071)	0.080 (0.076)	0.181** (0.102)	0.259* (0.100)
Immigrant	-0.014 (0.034)	0.069 (0.053)	0.129** (0.075)	0.007 (0.140)	0.234* (0.095)
High school	0.025 (0.029)	0.007 (0.033)	-0.001 (0.030)	0.097 (0.089)	0.068 (0.088)
Technical	0.006 (0.032)	-0.067** (0.041)	-0.019 (0.033)	-0.037 (0.111)	-0.008 (0.099)
University	-0.057** (0.032)	-0.091** (0.049)	-0.053 (0.041)	-0.119 (0.132)	0.039 (0.113)
Other	0.169 (0.113)	-0.019 (0.117)	-0.048 (0.064)	-0.406* (0.184)	0.269 (0.180)
School	-0.034 (0.060)	-0.099 (0.070)	-0.096 (0.065)	-0.053 (0.136)	-0.238 (0.146)
Illness	0.225* (0.072)	0.055 (0.063)	0.037 (0.049)	0.096 (0.135)	0.051 (0.115)
Work limiting disability	0.104* (0.052)	0.141* (0.063)	0.087 (0.062)	0.218 (0.151)	-0.018 (0.118)
Eligible for EI at ROE	-0.069** (0.037)	0.025 (0.049)	-0.011 (0.048)	-0.054 (0.131)	-0.151 (0.115)
Recent SA	0.306* (0.083)	0.377* (0.081)	0.379* (0.113)	0.349* (0.111)	0.493* (0.184)

TABLE 5.6: Marginal effects on take-up decision by alternative eligibility criteria (cont)[†]

	SA eligibility criterion				
	1	2	5	7	10
Log hourly pay	-0.067 (0.059)	-0.075* (0.036)	-0.095 (0.059)	-0.177* (0.087)	-0.139** (0.074)
Layoff	0.125* (0.045)	0.106* (0.046)	0.157** (0.083)	0.218* (0.083)	0.355* (0.099)
Expected recall	-	-	-	-	-
Expected recall with date	-0.029 (0.025)	-0.034 (0.034)	-0.008 (0.027)	-0.218* (0.085)	0.091 (0.086)
Unemployment rate	0.001 (0.004)	0.000 (0.004)	0.006 (0.005)	0.007 (0.010)	0.028* (0.010)
Liquid assets at ROE ($'000s)	0.017* (0.006)	0.001 (0.004)	0.044** (0.026)	-0.030 (0.067)	0.056 (0.057)

[†] standard errors are in parenthesis. The specification also included a full set of province and month dummy variables. * indicates significance at the 5% level, ** at the 10% level. Marginal effects for the continuous variables are calculated at the mean of the continuous variable and by setting all discrete variables equal to zero. Marginal effects for the discrete variables are determined by setting the value of the continuous variables equal to their means, and calculating the change in the probability of take-up when the variable is changed from zero to 1. For the means of the 'Partner worked at time separation' variable, however, the Married/Common-law variable was set equal to one when calculating the marginal effect.

requiring SA. Contrary to expectations, the probability of SA take-up decreases with the presence of children. This result may reflect some unobserved personal characteristics of individuals with larger numbers of children that tend to reduce the probability of take-up.

The results of the estimation indicate that neither minority status nor immigrant status affect the probability of take-up. Minority status is significant, however, in the specification that includes continuous users of SA (column 5a). This result may reflect the make-up of the sample that includes continuous SA users with minority status being correlated with other factors that influence the take-up decision. Conversely, being native is associated with a higher probability of SA take-up that is significant in specifications (3)-(5). Somewhat surprisingly, education levels do not in general affect the probability of SA take-up in a significant manner. The signs on the education variables do have the expected pattern, however, with higher education levels associated with a lower probability of SA take-up. As expected, having a work-limiting disability increases substantially the probability of SA take-up. This outcome is consistent with other studies that have examined participation in the Canadian SA program (Christofides *et al.*, 1997; Christofides, 2000).

Specifications (3)-(5) include variables indicating the reason for the separation from employment, namely, layoff, separation due to illness and separation to return to school. Although each of these variables generally has the expected sign, only the layoff and illness variables enter into specification (4) in a significant manner. The probability of SA take-up is negatively related to the individual's ability to collect employment insurance at the time of the ROE separation, albeit in an insignificant manner. The insignificance of this variable may reflect the fact that even when households of which the individual is a member has access to EI benefits, the household has a low level of resources at its disposal given that the individual is eligible for SA. In turn, access to EI benefits does not affect the likelihood of SA take-up.

The results in specifications (4) and (5) indicate that when the individual has an expectation of recall to his or her ROE job the probability of subsequently taking up SA is significantly reduced. It is noteworthy that the lower level of uncertainty associated with an expectation of recall coupled with a date of recall (specification (5)) has a slightly smaller impact on the probability of SA being taken up. With no recall date specified, individuals may hold off initiating an SA claim in the hope of returning to employment soon. It is noteworthy too, that in the specification that includes continuous SA users the recall variable is insignificant. The insignificance of this variable possibly reflects an employment relationship at the time of the ROE separation for those who are also collecting SA at that time that is

less permanent than others in the sample. In addition, higher liquid assets at the time of the ROE separation are associated with a lower likelihood of SA take-up and a higher unemployment rate with a higher likelihood of SA take-up. Both variables, however, enter the specifications in an insignificant manner.

The main variables of interest in the present analysis are those capturing the impact of benefit levels on the probability of SA take-up. Interaction terms of the benefit level with the gender, married and work status of partner dummy variables were included in each specification to allow for differences in responses to benefit levels between these groups. As noted previously, in specifications (2)-(5) the coefficients on the interaction terms indicate that individuals with partners working at the time of the ROE separation exhibit a smaller response to increased benefits levels. The interaction terms for the gender and married dummy variables, however, are insignificant in all specifications.

As expected, higher benefits increase the probability of observing SA take-up in a significant manner. The benefit level variable indicates that an increase in the calculated benefits available to the individual by $100 per month will raise, *ceteris paribus,* the probability of take-up amongst the eligible population by between 7.0 and 8.8 per cent. The increase is somewhat smaller for individuals who had a partner working at the time of the ROE separation. For the sample including continuous users (column 5a) the response is slightly lower, approximately 5.5 per cent. Given their familiarity with the SA program, the size of SA benefits may not be so important in determining SA use post ROE separation for the group of continuousd SA users.

At the mean of the calculated level of benefit the results in column (5) implies an elasticity of SA take-up of approximately 0.45. Direct comparison with other studies that have examined participation in the Canadian SA program are difficult because of differences in samples and the derivation of the marginal effects of changes to the benefit level. Nonetheless, the positive relationship between benefit levels and participation in the SA program is consistent with that found in studies such as Charette and Meng (1994) and Christofides (2000).

A comparison can also be made between the results from specification (5) and those from a probit specification that takes no account of the endogeneity of the calculated benefit level variable (specification (6) in tables 5.3 to 5.5). In general, the coefficients on the variables in specification (6) are of the same sign and similar magnitude to those in specification (5) (tables 5.3 to 5.5). The coefficient on the benefit level variable, however, is substantially smaller and insignificant in the

probit model without the adjustment for the potential endogeneity of the calculated benefit level variable. The correlation measure ρ in specification (5) is negative and significant (table 5.3), indicating that the error terms in the equation that explains calculated benefit levels and the equation describing the likelihood of taking up SA are negatively correlated. Failure to take account of the endogeneity of the calculated benefit variable biases downward the estimated coefficient for this variable.

The estimates in table 5.5 also emphasize the importance of recent SA use on the post ROE separation use of SA. The results in table 5.5 indicate that recent use of SA is associated with a large increase in the probability that the individual returns to SA, *ceteris paribus*. The effect of recent use of SA is to increase the probability of take-up by approximately 30 to 35 per cent (columns (1)-(5)). As expected, this is higher again in the specification that includes the continuous users of SA. This is consistent with a pattern that has been identified previously in the analysis of SA use in Canada, namely, the high rate of recidivism among users of SA (Barrett and Cragg, 1996; Bruce *et al.*, 1996). The importance of recent SA use for subsequent use is also consistent with the finding in Christofides (2000). One interpretation of the 'recent SA use' variable is that it captures the stigma effect associated with SA use, with recent use of SA resulting in a lower stigma cost and greater familiarity with the program, and therefore a greater tendency to use SA. Given the sizeable impact of recent SA use on the take-up of SA, however, it is likely that this variable is capturing other unobservable characteristics of the individual that influence the take-up decision. Clearly, additional information on and analysis of the initial use of SA would be particularly useful in the examination of the take-up decision.

For comparison purposes, the analysis undertaken for the set of individuals identified as SA eligible by measure 7 was repeated using alternative eligibility criteria. In table 5.6 the results of this analysis are reported using specification (5) from table 5.5 for individuals identified as SA eligible by the criteria 1, 2, 5 and 10 described in table 5.1. In each case, a progressively smaller group of individuals are identified as SA eligible. For the broadly defined groups of SA eligibles (measures 1 and 2) the level of SA benefits affects the probability of SA take-up in a positive and significant manner. The magnitude of the effect, however, is smaller than that for the SA eligibles identified by measure 7. This result probably reflects the less well-defined need for assistance among these groups as the eligibility criteria applied required that they be eligible for SA at either the time of the ROE separation *or* the time of the first interview. In the case of eligbles identified by measure 1 for example, potential EI income at the time of the ROE separation is not included when determining SA

eligibility status. A number of individuals may be classified as SA eligible even though their ability to collect SA is limited to the short period (generally two weeks) while waiting for their EI claim to be processed. Individuals with only a limited period over which they can claim benefits may not find it worthwhile to do so even with high SA benefits.

The results for the SA eligibles identified by criterion 10 in table 5.5 indicate that SA benefit levels do not affect the take-up decision except for individuals with partners who work. This result most likely reflects the criteria used to identify the eligible population here, namely, as SA eligible at the time of the ROE separation and unemployed for at least six months. For this group, the presence of a partner and his or her work status at the time of the ROE separation are key determinants of the take-up decision. The response of the household when the individual is unemployed for an extended period, especially the work status of a spouse, is more important to the take-up decision than the level of benefits *per se*. Recent use of SA is also a very important determinant of SA take-up for this group.

5.5   Conclusions

The empirical analysis in this chapter has examined the SA take-up decision for a set of job separators. The novel aspect of this study has been the examination of the take-up decision by individuals identified as SA eligible, an analysis made possible by the unique features of the COEP dataset. This issue is important for a number of reasons. If income support programs such as SA are established to assist those deemed needy, then an understanding of which factors affect the take-up decision is relevant to ensure that delivery systems for SA and related income support programs are appropriately designed. Further, an understanding of the take-up decision is important for the design of labour market policies more generally given the central role played by income support programs like SA on the labour market decisions of individuals.

Knowledge of the relationship between SA benefit levels and the rate of take-up is also important for understanding the fiscal implications of changes to SA programs. Variations in benefit levels change the costs of the SA program in three distinct but related ways. An increase in benefit levels will have a direct influence on the cost of the program by changing the level of payments for existing users. Further, changes in benefit levels will alter the size of the SA eligible population. Finally, variation in benefit levels will influence the take-up of benefits among the population eligible for benefits.

Identifying the size of each of these relationships will provide greater insight into the fiscal ramifications of changes to SA benefit levels.

The empirical analysis in this chapter leads to a number of conclusions. First, benefit levels and recent use of SA are identified as key determinants of the take-up decision. The results indicate that an increase in benefit levels of $100 per month increases the take-up rate by approximately 7.5 per cent among the SA eligible population. Furthermore, recent use of SA is associated with a substantially higher probability of take-up of SA when the individual is eligible. The magnitude of recent use on the take-up decision points to a need for further investigation into why individuals and/or households initially enter the SA program. Recent use of SA, at least in the present analysis, is likely to be reflecting some underlying unobservable characteristics of individuals that increase their propensity to use SA when available. Finally, the COEP dataset is limited to a set of individuals who have some recent attachment to the labour force. Analysis of a set of individuals more representative of the population for whom SA potentially provides income support would be a useful avenue to pursue in future research.

Chapter 6 – Conclusions

This thesis has examined two important income support programs in Canada and their influence on labour market behaviour and outcomes. The contribution of this thesis to our understanding of the role of employment insurance (EI) and social assistance (SA) programs on labour market outcomes in Canada is two-fold. First, an analysis has been undertaken of the nature of the interface between these two income support programs and their joint impact on labour market outcomes. Second, the factors determining the take-up of SA following job separation by those who are eligible for SA have been investigated.

Both of these issues are important for policymakers with responsibility for the design and/or delivery of income support programs. The initial design, or reform of an existing income support program, should reflect the environment faced by individuals including the range of alternative sources of income assistance potentially available. Where more than a single program influences labour market behaviour and outcomes, an understanding of the nature of the interface between programs is central to understanding total labour market responses when any given program is varied. From an institutional perspective in Canada, where administrative and fiscal responsibilities for the programs is shared, policy makers at both levels of government should be concerned with the nature of the interface between programs. Unilateral action on the part of a single government that alters either program will have potentially implications for the use and cost of both programs.

In chapter two, previous analyses of the EI and SA programs in Canada were examined. This discussion highlighted not only the importance of the programs on labour market outcomes individually, but also the implications of the interface between these two income support programs for overall labour market outcomes. Whereas previous analyses had identified the potential interaction between programs, they had provided only limited insight into how individuals used both programs when setting overall labour market behaviour. If both programs affect labour market outcomes, then identification of the policy implications of changing a single program requires that the nature of this interface be correctly identified.

The analysis in chapter three explores the interface between the EI and SA programs by examining labour market behaviour and program use following job separation among COEP job separators who

lost employment due to a layoff. The analysis points to a number of patterns of behaviour including the seasonal use of both income support programs. Moreover, for individuals for whom EI was not otherwise available, SA clearly provides an important alternative source of income support in the period following the loss of employment. Analysis of spells of employment and program use following job separation pointed to the EI and SA programs being used jointly to set overall labour market behaviour. This result was particularly important for individuals for whom EI was not otherwise available at the time of the ROE separation.

Chapter four examined the patterns identified in chapter three using a generalized transition probability model. The approach required characterizing spells in alternate labour market states following the separation from employment and identifying the determinants of transitions between different labour market states. The results of the analysis were then used to conduct policy experiments in which labour market histories under a variety of alternative policy scenarios were simulated.

A number of key results emerged from the analysis in chapter four. First, there was evidence that both programs were important from the point of view of labour market behaviour and outcomes. The results of the simulation exercises indicated that variation in the parameters of one program affected the use of the both programs and employment patterns. Following a reduction in the generosity of either income support program the simulation exercises indicate an increase in the proportion of time spent in employment. Reductions in the generosity of the EI program were also 'observed' to result in reduced use of the EI program and greater use of the SA program. Conversely, reduced generosity of the SA program resulted in lower time spent in both programs. Hence, the income support programs could not be characterized simply as substitutes for one another. It also suggests that a simple story of fiscal offloading, in which curtailing the generosity of one program is offset by greater use of the other program and thereby shifts the fiscal burden of the income support function between governments, is not necessarily correct. This is an important observation in the Canadian environment, where the fiscal responsibility for funding income support programs is shared by different levels of government.

The analysis in chapter four also indicated that changes tightening EI eligibility requirements had a greater impact on the use of the SA program relative to changes reducing EI entitlement, given that EI eligibility had been already been established. Although the increase in the use of SA in both cases was relatively small, the drop in the use of EI was much larger in the latter case. Nonetheless, the

fiscal impact of changes in the EI program on the overall cost of the SA program is relatively small and may be considered as economically insignificant. This suggests that the fears of provinces that federal government changes to the EI program simply represent fiscal downloading of the income support responsibility may be overstated.

In chapter five the take-up of SA by those eligible for the program was examined, an aspect of the SA program in Canada not previously explored. Using a discrete-choice framework that took account of the endogeneity of the benefit variable that determines the take-up decision, this analysis identified the importance of SA benefit levels and recent SA use as key determinants of the SA take-up decision. Identifying the reasons for SA take-up is important for a number of policy related reasons. First, identifying how individuals respond to benefit levels is relevant for understanding the fiscal implications of changes to SA programs. Hence, the analysis pointed to an increase in the probability of take-up of approximately 7.5 per cent following an increase of $100 in the level of monthly SA benefits. More generally, if income support programs like SA are established to help alleviate those deemed needy, then understanding the reasons for take-up are important for correctly designing and delivering such programs. The importance of recent use of SA for the take-up decision pointed to the need for further analysis of the reasons why individuals initially enter the SA program.

The analysis in this thesis has been possible because of the 1997 COEP dataset. The dataset provides information on program use, labour market behaviour, and a range of household and personal characteristics not previously available. This information has facilitated the examination of the interface between the alternative income support programs and the decision to take-up SA following the separation from employment.

The analysis in this thesis contributes to our understanding of the relationship between the income support programs and labour market behaviour in Canada. In doing so, it has highlighted a number of areas where additional analysis may prove worthwhile. The analysis of the interface between EI and SA programs could be readily generalized to incorporate the range of programs that provide pecuniary or other labour market support to individuals. For example, the effects of training programs on labour market transitions may be incorporated into the framework used in chapter four. Similarly, decisions relating to entry to and exit from the labour force may also be examined. In each case, the generalized transition probability model may be extended by creating additional labour market states to those used in chapter four. Further, behaviour over an extended period of time could be examined using a dataset that contains longitudinal data spanning a greater length of time and a sample of

individuals more representative of the Canadian population than those in the COEP dataset. The Survey of Labour Income and Dynamics (SLID) provides a promising candidate for such analysis.

The analysis in chapter five highlighted the importance of understanding the process by which individuals initially enter the SA program. Further, given the universal nature of the SA program in Canada, a sample of individuals representative of those for whom the program is available for income support purposes would prove useful in examining the take-up decision. Again, the COEP dataset provides limited ability to do this, and administrative data and/or the SLID may be useful in gaining additional insight into these issues.

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