
An Econometric Analysis of Poverty Dynamics in Canada

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Abstract. *While we know much about poverty (or “low income”) in Canada in a static context, our understanding of the underlying dynamics remains very limited. This is particularly problematic from a policy perspective and the country has been increasingly left out on an international level in this regard. The contribution of this paper is to report the results of an empirical analysis of low income (“poverty”) dynamics in Canada using the recently available “LAD” tax-based database. The paper first describes the general nature of individuals’ poverty profiles (how many are short-term versus long-term, etc.), the breakdown of the poor population in any given year amongst these different types, and the characterisation of poverty profiles by sex and family type. It then reports the estimation of various econometric models, starting with a set which specifies entry into and exit from poverty in any given year as a function of a variety of personal attributes and situational characteristics, including family status and changes therein, province of residence, inter-provincial mobility, language, area size of residence and calendar year (to capture trend effects). A set of proper hazard models then adds duration effects to these specifications to see how exit and re-entry probabilities shift with the amount of time spent in a poverty spell or after having exited a previous spell. A final set of specifications then investigates “occurrence dependence” effects by including past poverty spells first in an entry model and then with respect to the probability of being poor in a given year. Policy implications are discussed.*

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I. Introduction

While we know much about poverty in a static context – poverty rates and the characteristics of the poor at any given point in time – our understanding of poverty (or “low income”) *dynamics* in Canada remains very limited.¹

This is a serious shortcoming, as many of the most important aspects of poverty relate to its dynamic element. For example, to begin to fully understand the nature of the hardship associated with the poverty experience requires knowing whether it is typically a relatively brief or longer-term experience; to disentangle the proximate causes of entry into or exit from poverty we need to observe those events; to place specific poverty spells in a broader context relies on observing the actual income changes which occur at entry and exit, the rate at which individuals move back into poverty after escaping, and so on – and looking at poverty in a static framework tells us nothing of these.

The missing dynamic element is particularly problematic in a policy context. For example, a widespread incidence of shorter poverty spells generally implies fundamentally different policy prescriptions than does a greater concentration of longer-term spells amongst a smaller number of individuals – the former generally presumed to tilt policy choices towards relatively short-term income support programmes to help individuals get over a hump which they would likely soon manage on their own in any event, the latter typically shifting the emphasis towards more active measures focused on a core group of individuals who need help getting back on their feet, moving into the labour market, and finding a path towards greater economic independence. As another case, any understanding of the characteristics and events associated with

movements into and out of poverty could aid the development of specific policy measures aimed at reducing the former and speeding the latter. Other examples could be easily furnished.

Until recently, however, the sort of longitudinal data which follow individuals over time which is required for the study of income dynamics in general, and poverty dynamics in particular, has not existed in Canada – with the country increasingly standing out on an international level in this regard.² Fortunately, the recently developed Longitudinal Administrative Database (LAD), which comprises a large, representative sample of tax filers and provides information on income, taxes, and various socio-demographic characteristics, provides a new opportunity for studying poverty dynamics in this country.

The contribution of this paper is, then, to report the results of an empirical analysis of low income dynamics in Canada based on the LAD database. The paper – one in a series on the topic by the author (Finnie [2000a, b, c]) – first outlines the general nature of poverty profiles, including the documentation of how many individuals’ poverty experiences are long-term and how many are short-term, as well as the breakdown of the poor population in any given year amongst these different types.³

The bulk of the paper then reports the estimation of various econometric models, starting with a set which specifies entry into and exit from poverty in any given year as a function of a variety of personal attributes and situational characteristics, including family status and changes therein, province of residence, inter-provincial mobility, language, area size of residence and calendar year (to capture

trend effects). A set of proper hazard models then adds duration effects to these specifications to see how exit and re-entry probabilities shift with the amount of time spent in a current poverty spell or after having exited a previous spell. A final set of specifications then investigates “occurrence dependence” effects by including past poverty spells first in an entry model and then with respect to the probability of being poor in a given year.

The paper does not focus on any specific hypotheses in any concentrated fashion and the models are unabashedly *ad hoc*, not structural. Its goal is, instead, to exploit the LAD database to generate a first set of empirical estimates of the rates of entry into, exit from, and re-entry into poverty, and the underlying factors associated with these dynamics, in the hope that these findings will be interesting and useful for their own sake, while also providing a basis for future work on the topic. Those later undertakings might again employ the LAD, or perhaps other databases which have recently come into existence, including the SLID (Survey of Labour Income and Dynamics), which is much richer in terms of the variables available to be included in any analysis, but much smaller and thus limited in terms of the level of detail of analysis permitted. This paper is, in short, intended to be a first word – and hardly the last – on poverty dynamics in Canada.

II. The Data

II.1 A General Introduction to the LAD

The Longitudinal Administrative Database (“LAD”) is a ten percent representative sample of Canadian tax filers constructed from Revenue Canada tax files which follows individuals over time and

matches them into family units on an annual basis, thus providing individual and family-level information on incomes, taxes, and basic demographic characteristics in a dynamic framework. The first year of data is 1982 and the file ran through 1996 at the time this project was undertaken. Only the 1992-96 period is employed in this study, however, since social assistance (“welfare”) income, which represents an important income source for low income Canadians in particular, is not sufficiently well captured on the file in the earlier years.⁴

Individuals are selected into the LAD from the general set of tax files according to a random number generator based on Social Insurance Numbers and followed over time by the same identifier. The LAD’s coverage of the adult population is very good since, unlike some other countries (*e.g.*, the U.S.) the rate of tax filing in Canada is very high: higher income Canadians are required to do so, while lower income individuals have strong incentives to file in order to recover income tax and other payroll tax deductions made throughout the year and to receive various tax credits. Overall, the full sets of annual family files from which the LAD is constructed are estimated to cover from 91 to 95 percent of the target adult population (based on official population estimates), thus comparing favourably with other survey-based databases and even the Population Census in this regard. The LAD thus comprises a dynamic, largely representative sample of the adult Canadian population.

Furthermore, the large number of observations on the LAD (around two million in any given year) allows for a robust and detailed analysis. In this study, for example, models are estimated

separately by family type, which would be impossible with survey-based databases such as the SLID.

Finally, the income information (based on individuals' tax declarations) is excellent and – even allowing for false reporting – is probably superior to what is typically available with survey data where respondents provide the income information themselves.⁵

In summary, its representative nature, dynamic structure, and income information available make the LAD well suited to the study of income dynamics generally, and low income dynamics in particular.

II.2 The Unit of Analysis, the Income Measure, and the Low Income Cut-Off

This study focuses on the low income dynamics of individuals, although income is viewed in a family context, based on the usual assumption that families pool and share their incomes and that there are certain economies of scale for people living together.

Incomes are defined quite inclusively, including earnings, self-employment income, returns to investments, and all other private sources (except capital gains), as well as government transfers and tax credits. The appropriate deductions are then made (CPP, UI/EI, child and spousal support payments), after which post-tax (disposable) income is arrived at by subtracting tax payable.

Adjusted disposable family income is then calculated by summing net income over all family members and applying the increasingly widely used "square root" equivalence scale whereby a family's needs are assumed to rise in a decreasing

manner with the number of family members.⁶

The low income cut-off employed here is also based on an established international standard: 50 percent of median adjusted family income. For this analysis, the median was calculated in each of the years covered by the study (1992-96), with the average of these values, \$11,700, used as the (fixed) cut-off throughout. The measure is thus a relative one (derived as it is from the distribution of incomes in the underlying population in each year), but then fixed over the period of analysis in order to allow for the study of poverty dynamics over time around a constant threshold.⁷

II.3 The Selection of the Working Samples

The analysis is restricted to non-students aged 20 years and over who filed tax forms in all years 1992-96. The lower age cut-off is somewhat arbitrary, but should eliminate students and others in the earliest stages of the school-to-work (and home-to-independence) transitions, for whom poverty status – and poverty dynamics – have a rather different significance than for others. The student deletion, based on various tax deductions allowed for post-secondary studies, was implemented because it is difficult to know to what degree these individuals share in their families' incomes, and again due to the special nature of any poverty situation for this group, who tend to be measurably poor but only out of choice as they make major investments in their futures.

The filing status restriction is imposed largely of necessity, because although imputed records are created for individuals who do not submit tax forms if they

are implicitly (or explicitly) identified by a filer (e.g., a spouse), the Social Insurance Numbers of such individuals are not generally known, meaning that they cannot always be followed over time as required for this dynamic analysis, while the information on their incomes (in particular) is also generally less reliable. The restriction to those who were included on the database all five years also allowed for consistent samples to be used throughout the analysis, while also making the longitudinal verification of family status (see below) easier and more effective. Fortunately (as noted above), most Canadians do in fact file tax forms in every year, so this restriction is not as serious as it would be in the face of lower filing rates.

II.4 Family Status

Marital status and family composition are determined in the LAD based on the information given on individuals' tax files (Canadians file taxes as individuals), including imputations of non-filing family members (spouses and children) where appropriate. Individuals' declarations of common law marriage are treated as the equivalent of legal unions (with matches made in every case for such individuals), but individuals are also assumed to be in undeclared common law relationships based on address matches, names, ages, and the identification of any other individuals resident at the same address. For this study, individuals were ultimately classified as belonging to one of the following family types: single/unattached (*i.e.*, no spouse and no children), married with no children, married with children, lone parent, and "filing child", the latter being a smallish group consisting of unattached individuals over the age of 20 deemed to be living with their parents.

The procedures used to arrive at an individual's family status are based on

algorithms which have been developed at Statistics Canada over many years and which seem to be quite successful in achieving the goal of correctly matching couples and identifying the children in any household, with such a positive evaluation based on *apriori* assessments of the good sense which characterises the established algorithms, the inspection of micro records, and various checks with other data sources of the resulting totals.

There remains, nevertheless, an inevitable margin of error whereby some couples are not matched when they should be, others are matched where the indicated relationship does not actually exist, and the identification of children is similarly imperfect. In particular, the LAD has too many lone-parent families and too few husband-wife families relative to official estimates, especially in the earlier years.

On a cross-sectional basis, these matching errors are perhaps not so important. However, any longitudinal analysis based on tracking individuals across changes in family status is at much greater risk from these problems. For example, if a match were correctly made in one year, missed in the next year, and then made again in the third year, the man and the woman would each mistakenly appear to have first been married, then unattached, and then re-married, and the associated income dynamics which were observed would be false. Furthermore, with divorce and remarriage being a rare event in any given year, a small number of such errors on a cross-sectional basis could comprise a relatively large proportion of individuals who change status from one year to the next and thus have comparatively large effects in any associated dynamic analysis. This is especially true in a context where family structure is so critical with respect to the dependent variable (adjusted

family income) as well as one of the key variables of analysis (*i.e.*, poverty dynamics depend heavily on family status and changes therein).

These potential family status problems were addressed in this study by reflecting on the underlying concepts (*e.g.*, what exactly is “marriage” in an economic context?) and then conducting a detailed longitudinal analysis of the data to establish a series of editing rules by which the more problematic types of records were deleted. Specifically, individuals were dropped from the entire study if over the 1992-96 period they were observed to i) change family status more than two times (2.1 percent of the sample), ii) change spouse more than two times (.1 percent of the sample), iii) separate from and then get back together with the same partner unless the marital status code indicated separation or divorce in the in-between years (.5 percent of the sample), or iv) have been matched to a given individual in a particular year but not in either of the adjacent years (4.0 percent of the sample) in the case of those with no marriage declaration on their tax forms (*i.e.*, common law matches).

Not surprisingly, these procedures reduced the movement across family types in the working samples, and also changed the poverty rates and poverty rate dynamics to a significant degree – thus verifying the importance of carrying out such a longitudinal cleaning of the database for this particular analysis.

II.5 Other Variables Included in the Analysis – and Some Notable Exclusions

The variables which appear as regressors in the models include the individual’s age; province of residence (as of year end and

thus where taxes were payable); whether or not the individual moved from one province to another from one year to the next; language (French or English – corresponding to the tax form used by the individual), including a “minority language” indicator (anglophones in Québec, francophones in the rest of Canada); area size of residence (identified from the individual’s postal code); and a series of calendar year dummy variables to capture cyclical effects and more general time trends.

There are a number of notable omissions from this list. First, while it would certainly be interesting to include education in any analysis of poverty dynamics, the information is simply not currently available on the LAD database. Secondly, detailed job characteristics, including wage rates, hours of work, occupation, industry, and so on are similarly missing, precluding any detailed analysis of the role of labour market outcomes in this study. One can, therefore, imagine this analysis, which takes particular advantage of the LAD’s size and excellent income information as well as its basic longitudinal aspect, as being complementary to work which could be undertaken with other databases where this other information is available.

III. Longitudinal Poverty Profiles^a

III.1 Total Time in Poverty

Table 1a shows the number of years individuals spent in poverty over the 1992-96 period of analysis based on their family status in 1992. The most dramatic results are for female lone parents, with just 31.1 percent remaining out of poverty all years and a full 36.0 percent poor every year. At the other end of the spectrum, just over 80 percent of the those who were consistently attached (*i.e.*, with a

legal or common law spouse) never experienced a low income spell (focusing on the male figures), with similar rates for those with and without children (80.2 and 83.7 percent respectively).⁹ The never-poor rates rise even higher for filing children, to almost 90 percent. For unattached individuals, the poverty experience is considerably more widespread: just 60.2 and 66.3 percent of single men and women, respectively, were consistently non-poor, while 16.4 and 13.3 percent in poverty all years.

In short, when looked at in a dynamic framework, poverty has generally been relatively uncommon and only rarely chronic for most continually attached individuals and young adults living at home, has been considerably more widespread for singles, and has touched the great majority of those who were lone parents in every year at some point – with constant poverty actually more common than never being poor for lone mothers in particular.

The first row in the table indicates that of the entire population (in the working samples), approximately three-quarters were never in low income, 5.9 percent were in low income every year, and the remaining 20.5 percent were in low income between 1 and 4 years. By sex, a greater proportion of women experienced more years of poverty at every point, the difference being greatest for those in low income all years (7.0 percent for women versus 4.7 percent for men).

Looked at from another perspective, 26.4 percent of the sample population experienced a spell of poverty over the five years covered by the analysis, and almost exactly one-half of those individuals (50.2 percent) could be classified as long-run poor in the sense that they were

in low income more than half the time (three or more of the five years covered by the analysis).

III.2 Who Makes up the Poor in a Given Year?

Table 1b builds on these findings by showing the composition of the low income population in each calendar year in terms of individuals' longitudinal poverty profiles over the full 1992-96 period. Perhaps the most interesting finding is that whereas the chronically poor (i.e., low income all five years) make up just 5.9 percent of the sample population (Table 1a), they represent (on average) 39.9 percent of the poor population in any given year (Table 1b). By sex, the share of long-term poor is slightly higher for females than males.

At the other extreme, the "briefly poor" (poor one year out of the five) make up just 8 to 16 percent of the low income population in any given year (11.1 percent averaged over all periods). The rest of the poor population as seen on an annual basis is divided amongst those with 2, 3, and 4 years of poverty.

From a policy perspective, the "good news" here is that low income rates could be cut by an impressive two-fifths for all time (more or less) if the just approximately 6 percent of the population who are always poor could somehow be lifted out of poverty on a long-term basis, and the figure rises to 60 percent if those who are poor four out of the five years are included in the chronically poor group. The problem, of course, is that this is also the most challenging group from a policy perspective precisely because the consistent nature of their low income experiences presumably stems from quite fundamental causes.

III.3 Who Makes Up the Long-Run Poor Population?

Another set of calculations flips the perspective to show the breakdown of the always poor – as well as the never poor and the residual “sometimes poor” groups – with respect to individuals’ sex and family types. The results in Table 1c show that whereas unattached individuals and single parents make up just 26.2 percent of the sample population (the “All” column), they represent a greatly disproportional 60.5 percent of the always poor group – reflecting their much higher rates of long-run poverty. Male lone parents comprise a trivial share of this group, due of course to their small numbers. Perhaps more surprisingly, unattached women (single, no children) make up a larger component of the consistently poor population (23.9 percent) than do single mothers (17.4 percent), while single men make up another large component (17.9 percent). Also, while attached individuals have low *rates* of long-run poverty (seen above), the large size of the underlying population groups leaves them representing a significant 27.8 percent of the long-run poor (males and females taken together).

While, therefore, their high rates of chronic poverty might be good cause to direct policy measures at single mothers, delivering this group from long-run poverty even *in its entirety* would reduce the size of the overall always poor population by only about 16 percent, meaning that other groups would have to be helped in significant measure to diminish the number of long-run poor – and the poor in any given year – by any truly substantial amount.

With this overview of individuals’ longitudinal poverty profiles and these break-

downs of the poor population – on both long-term and annual bases – in hand, we now turn to the econometric analysis of entry, exit, and re-entry.

IV. The Annual Entry and Models

IV.1 The Specification of the Models

In this section, low income dynamics are analysed in an econometric framework which provides baseline probabilities of the entry into and exit from poverty plus the effects of various personal characteristics and situational attributes on these movements. In this approach, each pair of years over which an individual is observed over the 1992-96 period comprises an observation which enters the estimation models, with the dependent variables defined as the probability that a transition occurs from non-poor to poor for the entry models and from poor to non-poor for the exit models – depending on the situation of the person in the first year of the pair of years in question.

In each case, the regressors include the individual characteristics and other situational attributes listed above which hold in the first year of each observed pair of years (1992-93...1995-96). The models thus represent a relatively straightforward conditional expectation function of the probability of moving into or out of low income from one year to the next conditional on the earlier period attributes, estimated in a standard panel logit model framework using the stacked set of observations obtained from the longitudinal sampling scheme. The models are estimated separately for males and females of each family status separately in order to allow the full structure of the model to vary along these dimensions.

For each model, the results are presented in the conventional manner in the appendix tables, thus including the coefficient estimates and their standard errors and indications of which parameter estimates are “statistically significant” (*i.e.*, significantly different from 0 at the .05 and .01 confidence levels by two-tailed *t*-tests). The related probability effects shown here are calculated by first fitting a baseline probability for the transition in question for each equation. These represent the predicted probabilities when each of the regressors (all of which are categorical variables) are set to the omitted categories. The probabilities are then re-calculated with each of the regressors “turned on” one at a time, thus yielding the resulting shifts in the estimated probability of the transition in question associated with each variable.

IV.2 The Annual Entry Models The Baseline Probabilities

The probabilities for the models of entering low income in a given year, estimated for those currently out of poverty, are shown in Table 2a. The baseline probabilities given in the first row essentially represent the average rate of entering low income for individuals who did not change family status over the period in question and who had the other omitted/reference characteristics associated with the regressors included in the models: the (unchanged) family status indicated by the columns representing the different regressions (single, attached, *etc.*); had one child (in the case of the family types involving children), was 40 to 49 years old, was an English speaking resident of Ontario living in a large urban area, and did not move to another province over the relevant two-year period. The baseline results also pertain most directly to the 1992-93 period, as the calendar year dummy variables allow for

general shifts in the probability of entering low income over the other years covered in the data.

Controlling for the other variables included in the models, lone parents who remained in that state from one year to the next generally had the highest probability of entering low income from one year to another, with rates of about 8 percent for males and females alike. Singles come next, with rates in the 6 percent range. The predicted probability of attached individuals entering low income on a year over year basis was much lower, around the 2-to-3 percent mark.¹⁰

Changes in Family Status

The most dramatic results pertain, perhaps not surprisingly, to changes in family status, with the effects of becoming a lone parent the greatest amongst these, especially for women. Specifically, becoming a single parent (see the “to lone parent” row in the table) generally increased the probability of entering low income from 5.8 percent to 30.4 percent for women who were initially single (the baseline 5.8 percent plus the extra 24.6 percent indicated for that transition), from 2.9 to 34.8 percent for those who were originally attached and had children, and from 1.7 to 44.1 percent for those who were initially in couples with no children. Conversely (but consistently), a change in family status *from* lone parenthood to any other category (read down the “lone parent” column which represents the model results for those who were initially lone parents) *decreased* the probability of moving into low income, in most cases more than halving the rate relative to those who remained single mothers.

Having a spouse can thus be seen as the thread by which many women remain out of poverty, revealed here in a much more

direct and precise manner than previous static analyses which have looked only at current marital and poverty status. For men, the effects of becoming a single parent on the probability of moving into low income from one year to the next are also all statistically significant and substantial, but not anywhere near as strong as for females, and there are, of course, only a very small number of such cases.

Becoming single (see the “to single” row) also increased the probability of entering low income in most cases, especially for women. The greatest effect here is for those initially attached with children, for whom the probability of entering low income rose from 2.9 percent to 16.8 percent. The exception is the case of individuals (male or female) who were already lone parents in the initial year and then became single and were thus moving from a very high risk state to one generally not quite as bad.

The birth of a first child (the “to attached with children” set of effects) has had a moderately small influence in absolute terms on the probability of entering low income for both individuals who were initially single (who thus married over the period in question) and those who were initially members of childless couples. In the latter case, though, the probability of entering low income is more than twice as likely as for the baseline “no children” group (1.9 versus 4.2 percent for men and 1.7 versus 4.5 percent for women): that is, having a first child more than doubled the probability of entering poverty for couples. This event is, furthermore, relatively common, so the overall effect of starting a family on entry into low income is significant in terms of the number of individuals involved.¹¹

Moving from any other family status to being attached with no children is uni-

formly associated with declines in the probability of entering low income in a given year, reflecting the fact that this move is to the group with the lowest of all poverty rates (both the level rates in any given year and the entry rates) – for men and women alike.

Moving back into the parental home (“to filing child”) appears to have generally represented a form of economic refuge for the unattached, with this dynamic associated with significant declines in the probability of entering low income for singles and lone parents (although not significantly so for the latter).¹²

Interestingly, changing spouses over the relevant interval (“new spouse”) has been associated with considerably higher rates of entering low income than remaining with the same partner, especially when children are present. These effects are, however, over twice as strong for females as males (16 percent versus 7 percent). These results seem counter to any notion that individuals typically change spouses at least partly for economic reasons – but see the exit rates below.

The effects of the number of children in the household are generally (but not uniformly) monotonically positive, but although most are statistically significant, they are not particularly strong except for very large families. The exception is the case of single mothers, for whom the effects of each additional child are substantial.

Age Effects

The differences in entry rates by age are mostly statistically significant but fairly small, especially compared to the family status effects just discussed. It is, however, interesting to note the substantially higher rates of entry for the youngest

group (ages 20 to 29) of individuals with children, these effects being especially strong for single mothers, for whom the estimated entry rates are almost three times those of the baseline (“prime”) group: 21.9 percent versus 8.2 percent. The proportional effects are almost as strong for couples with children, but from much lower baseline probabilities, with the youngest group having a predicted rate of 4.9 percent, rather than 2.4 percent, in the case of males and 6.2, rather than 2.9 percent, in the case of females. These results have potential policy implications, especially given the evidence of significant duration and occurrence dependence reported below, since the high rates of entry amongst the younger groups may influence individuals’ low income experiences for many years to come.

Province, Language, and Area Size Effects

Except for Newfoundland, the province effects are mostly quite small, except for single parents. The results for this group are, however, somewhat surprising. For lone mothers, in particular, the coefficient estimates are uniformly significantly negative, meaning that holding other factors constant, the rates of entry into poverty have been higher in Ontario, the omitted category against which the other province effects are compared, than elsewhere. This finding seems to indicate that – in the context of its stronger labour market – the social assistance system in Ontario has been significantly less effective at preventing single mothers from falling into poverty than has been the case in other jurisdictions.¹³

The estimated minority language effects are mostly rather small, although the generally higher entry rates for anglo-

phones in Québec, especially for single mothers, are noteworthy.

Moving from one province to another (“mover”) has been fairly strongly associated with entry into low income for individuals of most family types, particularly lone parents. This finding is especially interesting – and to some degree puzzling – in the context of other work with the LAD which has generally found that moving has had a strong positive effect on individuals’ earnings, at least for men, as well as the corresponding exit effects reported below. On the other hand, a number of explanations for these effects are possible, including that the direction of causality may be suspect, with individuals who come up against difficult economic circumstances in a given year perhaps being more likely to move as a result of their difficulties.

The clearest results regarding area size of residence are that individuals in rural areas have had distinctly higher probabilities of entering poverty in a given year and that a fairly strong and more general inverse relationship exists between area size and the probability of entering low income for lone mothers. The latter result may reflect a reduced availability of social services, fewer jobs of the type most geared to this group, social isolation, and related factors in smaller cities, towns, and the countryside as compared to larger urban areas.

Calendar Year Effects

The only substantial calendar year effects indicated substantially higher rates of entering poverty in the two later years covered by the analysis for lone parents – despite the fact that they represent a period of economic recovery, albeit a rather sluggish and uneven one. This

deterioration presumably reflects the degree to which single parents are largely disconnected from the labour market in combination with the decreases in social assistance payments, UI/EI, and other government services and transfers upon which these families are so dependent over this interval.

These time trends, even though estimated over a fairly short period, are, in some cases, fairly substantial and potentially of long-term consequence. For example, the predicted rate of entry into low income for single mothers rose from 8.2 percent for the baseline 1992-to-1993 transitions to 12.5 percent and 11.2 percent for the 1994-to-1995 and 1995-to-1996 intervals respectively. If these changes represent a longer-term shift or if the trend has risen even further still – which seems possible in the face of continued spending cuts – higher poverty rates should be expected in the future as these extra entrants join the stock of the current low income population at faster rates than before.

IV.3 The Annual Exit Models The Baseline Probabilities

The results for the annual exit models are shown in Table 1b. The baseline probabilities represent individuals with the same characteristics as those of the baselines in the entry models: no change in family status over the period, one child (where relevant), age 40-49, English speaking resident of Ontario living in a large urban area who did not move to another province, as well as the 1992-93 calendar year period.

Controlling for other factors, annual exit rates were highest for attached individuals (28 to 41 percent), and lowest for singles (19 and 20 percent for men and

women respectively) and lone parents (28 and 29 percent for men and women).¹⁴

Family Status

The initial focus is again on the family status effects, and the strongest and most important of these once more pertain to lone mothers. For individuals initially in this status (see the “lone parent” column), *any* change in family status has been associated with a large increase in the probability of exiting poverty (relative to the omitted group representing those who remain single mothers). Becoming attached with children (*i.e.*, marrying) has increased the predicted exit rate from 29.3 to 84.1 percent, the increase has been even greater for those who became attached but no longer had children, stronger yet for those who became a “filing child”, and has been quite significant for those who went completely on their own (*i.e.*, single: no partner, no children, and not back in their family’s home). The effects for single fathers have been of the same general type but not as strong (except for the very small group who became filing children).

On the other side of this particular family status dynamic, *becoming* a lone parent (see the “to lone parent” row) is associated with strongly negative effects on the probability of exiting low income (except for a statistically non-significant effect for males who were originally in childless couples – a rare dynamic). For women, the probabilities of exiting low income were generally lower for those who moved from some other status to become lone mothers than they were for those who were lone mothers to start with and remained in that state, again indicating that the point of entry into single parenthood generally represents a particularly difficult period – a sharp cusp point – for women.

Similar effects to those for lone parents hold for individuals who were single in the initial year, for whom becoming attached (with or without children) or becoming a filing child has been strongly associated with exiting low income. The effects are again stronger for women than men except for the “filing child” case. These results reflect the fact that such individuals have been moving from a family status for which poverty rates are generally high (single) to ones where it is much lower.

An important difference for the single status relative to lone parenthood, however, is that for those who were already poor, *becoming* single has had positive effects on the probability of leaving low income, especially for men. The exit rate is, for example, 27.7 percent for the baseline men in childless couples who remained in that state but 43.8 percent for those who became single, while the analogous rates are 36.5 and 47.7 percent for those initially in couples with children. In short, the end of a relationship appears to be one route out of poverty, especially for men, but also for women (the effects for the latter are 5 and 4 percent, respectively, for those with and without children).¹⁵

A change in spouse for individuals who remained married has also been related to much higher probabilities of leaving low income, a result that is especially interesting in a context where spouse-changing was previously seen to be positively related to the *entry into* low income. That is, it seems to have been a positive influence on both entering and leaving low income. Here, though, it is consistent with the preceding result that ending a relationship to become unattached increases exit rates.

A change from being attached with children to being attached with *no* chil-

dren has had a positive effect on exiting low income; presumably the typical situation is that of children leaving the parental home, thus diminishing the family’s income needs.

The effects of the *number* of children represent the mirror image of those observed for the entry models discussed above: exit rates have generally declined with the number of children, pointing to longer-run poverty amongst larger families. The effects here are, however, typically about as strong for couples as for single parents, which was not the case for the entry models.

Age Effects

Younger singles and childless couples (ages 20 to 29 and 30 to 39), are of the family types that depend most on earned income and at the point in the life cycle most strongly characterised by upwards earnings mobility (Finnie [1997a, b, c], Finnie and Gray [1998], Beach and Finnie [1998]), and these individuals have had considerably higher probabilities of exiting low income on an annual basis than have the prime age reference groups (ages 40 to 49) of these same family types. Putting these results together with the higher entry rates for these younger age groups seen above points to a generally more volatile situation for these individuals – that is, higher rates of both entry into and exit from low income. Older singles and couples (ages 60 to 69 and 70 and over) are, however, also more likely to exit poverty than individuals in the middle-aged group, presumably reflecting the effectiveness of public and private pension programmes and other government transfers in helping these groups.

For couples with children and single parents, on the other hand, the younger groups have had *lower* rates of leaving

low income than the corresponding prime age groups (and others), presumably reflecting a combination of reduced labour market opportunities (less mobility?) and the limited effectiveness of the social assistance and related transfer programmes on which these groups often depend in delivering them from poverty. Note that young couples with children thus have both higher rates of entering low income (seen above) and lower rates of leaving than do older ones – more “total” poverty stemming from both sides of the underlying dynamics.

Province, Language, and Area Size Effects

Exit rates across most provinces have, not unexpectedly given the differences in underlying economic performance, been mostly significantly lower than for baseline Ontario, with only Alberta showing a more mixed pattern. The magnitudes of these effects are, furthermore, in many cases quite large, with the 5 to 10 and even larger percentage point effects shifting the baseline exit rates down by a quarter, a third, or even more.

Moving from one province to another has had rather mixed effects, but its strongly positive influence on exiting low income for single men is perfectly consistent with related research (also using the LAD) on the effects of inter-provincial mobility on individuals’ earnings, which are estimated to be strongly positive for young male singles who are also the most likely to move (Finnie [1998a, b]). The strong negative effects of inter-provincial mobility on exiting low income for lone mothers seems to merit further study; for example, does moving tend to drive these women into poverty, or do they move *after* tumbling into straitened circumstances?¹⁶

Most of the minority language effects are not individually statistically significant, but unattached anglophones in Québec have generally exited poverty at slightly higher rates than their francophone compatriots, perhaps due to the former’s more enhanced sets of options to move elsewhere, out of the province. In contrast, anglophone couples with children and lone mothers have done worse than the majority francophones, while (minority) francophones in the rest of the country have done worse than their anglophone neighbours, perhaps reflecting a diminished availability or effectiveness of related services, more limited job market opportunities, various selection processes, or other factors – that is, similar problems to the minority anglophones in Québec.

The clearest effect with respect to area size of residence is that exit rates have been, in most cases, significantly lower in rural areas (the mirror image of the entry rate patterns), and especially so for lone parents. The underlying factors once again presumably including different labour market structures, the reduced availability of services, social isolation, and so on. For some other groups, though – couples with and (especially) without children in particular – exit rates are higher in the smaller urban areas and towns than the large urban centres (the omitted category).

Calendar Year Effects

Finally, the calendar year effects point to clear improvements over time for one group of individuals – attached men with no children – versus more neutral or negative trends for all sex-family groups. The greatest deterioration is again seen for attached couples with children and, especially, single parents, with the exit rates of the latter group generally falling

from 5 to 7 percentage points on baseline levels of just under 30 percent for the 1992-to 1993 reference interval – thus indicating relative decreases in the rate of exiting poverty in the 20 percent range.

The source of these trends is – like the increase entry rates seen above – presumably the major cut-backs in social assistance, UI/EI coverage and benefits, and other transfer programmes which were not sufficiently offset by any positive earnings effects associated with the rather soft recovery that characterised the Canadian economy over this period. The net effects of the maintenance of those cuts, along with additional reductions on a smaller scale, versus the stronger economic recovery render any assessment of how the situation has evolved over the more recent period rather difficult and one that only further, more up-to-date, empirical analysis will be able to resolve.

V. Hazard Models: Duration Effects

V.1 The Samples and Specifications

In this section, a hazard model framework is employed to estimate the rates at which individuals i) exit current low income spells on a year-by-year basis from the point of entry, and ii) re-enter another spell of low income after a previous exit. These models thus permit the estimation of the underlying duration effects – the relationship between the amount of time already spent in (or out of) low income and the probability of exiting (or re-entering) in a given year – which comprise important and policy relevant aspects of the low income dynamic.

The estimation approach adopted here, which is consistent with standard hazard model methods, consists of first identify-

ing the beginning of any low income spell observed over the 1992-to-1996 period covered by the data. The probability of exiting that state from one year to the next over the course of those spells for as long as they last is then estimated as a function of the various time-varying personal characteristics and situational attributes included in the annual exit models seen above *plus* the elapsed time spent in the spell, captured by a series of dummy variables indicating the current spell length (in years). In effect, once the event-based samples are constructed (*i.e.*, when they include only observations related to spells where the entry into poverty is observed), the models much resemble those that were used in the annual exit models (including their logit specifications) except that the duration terms are now added to the specification. The approach thus represents a hazard model specification that corresponds to the annual nature of the data and allows for the inclusion of time-varying covariates and a very flexible form for the duration dependence terms.¹⁷

A similar approach is used to estimate the probability of re-entering low income after an individual has completed a previous spell. These models are based on samples consisting of the years following any observed exit out of low income (thus identifying the beginning of the period where the individual is at risk of re-entering) and the duration effects correspond to the elapsed time spent out of poverty since the exit. The models thus estimate the evolution of the probability of falling back into low income after a previous episode.

No effort is made to separate the effects of unobserved heterogeneity and state dependence (“pure” duration effects) with

respect to the duration terms in these models using the methods suggested by Heckman and Singer [1984], largely because such procedures are very cumbersome and rely on untestable hypotheses regarding the general structure and specific stochastic properties of the underlying distributions. Instead, the results are interpreted as representing a combination of the two influences.

The findings are again presented in a probability framework and only the baseline probability, duration term, and year effects are shown here, as the results for the other variables generally resemble those for the annual entry and exit models seen above. (See Finnie [2000a] for a more complete set of findings and the full regression model parameter estimates.)

V.2 The Hazard Exit Models

As just noted, the samples used in the hazard models differ from those employed in the annual exit models seen above in that only observations for which the start of the low income spell is observed are included (*i.e.*, left-censored spells are deleted). In particular, individuals who were continually in low income over the sample period are excluded from the estimation samples. As a result, the baseline exit probabilities reported in Table 3a are considerably higher than those derived from the more general exit models precisely because the most chronically poor are excluded. Both sets of results are meaningful and simply represent different perspectives of the low income exit dynamic: the hazard model results represent the probability of leaving low income at each point in time over a given spell for *a representative sample of low income spells* (as generated by the selection of all observations related to spells which began over the 1992-to-1996 period), while the annual models

represent the exit rates for *the representative stock of individuals in low income in a given year*.

The key duration terms generated in the hazard models indicate that the probability of exiting low income has declined substantially with the length of time the person has spent in that state, the probabilities declining 16-to-27 percentage points after four years across the various groups. In relative terms, the rate at which individuals exited low income fell between 40 and 57 percent compared to the baseline rates which represent exit rates after just one year. These are large effects by any standard.¹⁸

The fact that the magnitudes of the duration effects are roughly the same across the various models is important as it implies that exit rates have not generally “crossed”; the groups that have had higher (or lower) rates of exiting poverty after one year generally have had higher (or lower) exit rates after a greater number of years as well.

The specific shapes of the duration effects are also interesting, with the hazard rates generally declining quite steeply at first but then largely flattening out by the final year, suggesting that the probability of exiting poverty declined most rapidly over the first few years of a spell, and then remained at a more or less constant annual rate. The five years of LAD data used here thus appear to provide a good indication of the full shape of the relevant hazard profiles over time – a fortunate outcome in analytical terms.

The calendar year effects largely correspond to those already seen for the annual exit models except that the exit rates dropped off more sharply for single mothers – 10.5 points on a baseline of 42,

a decline of a full 25 percent over this short period. The expected length of new poverty spells thus increased especially significantly for single mothers over these years.

V.3 The Re-Entry Models

The baseline probability, duration, and year effects for the hazard re-entry models are shown in Table 3b. As with the exit models, the baseline rates differ substantially from those of the annual entry rate models, and again primarily due to the differences in the samples used in the two approaches. More specifically, the re-entry rates seen here are much higher than the more general annual entry rates seen above, reflecting the fact that those who had already experienced (and exited) a low income spell over the period covered by the data were more likely to begin another spell than were the general population of non-poor individuals in a given year.

The extent of these baseline differences is itself interesting, as it begins to give us an idea of the importance of occurrence dependence (as opposed to the duration dependence focused on in these hazard specifications) – a topic pursued further below. Thus, the annual entry models previously seen had baseline rates ranging from under 2 percent to around 8 percent, whereas the hazard specifications seen here generate rates that vary between 18 and 36 percent. In short, entering low income in a given year has been at least several times more likely for individuals who had just completed a spell than for the general population.

As with the exit models, the duration terms are strong, here indicating that the rate of re-entering low income has declined significantly with the number of years spent out of that state after a

previous spell. More specifically, comparisons of the baseline rates (which implicitly represent individuals who had been out of poverty just one year) to those that obtain after three full years spent out of low income indicate that re-entry rates dropped 41 to 59 percent (in relative terms) across the different groups. Also of interest is that the greatest declines again came initially, although the hazard rates still fell from two to three years out, suggesting that further declines might have been observed had the data been more extended.

There are, however, some notable differences in the extent of the declines of the hazard rates across the models, with single parents (especially males) declining the least, and these smaller declines coming on top of baseline re-entry rates that were already the highest. The risk of re-entering poverty thus varied to a considerable degree over an extended period of time for different types of individuals.

Turning to the calendar year variables, these are almost all statistically significant and, in some cases, quite strong (attached females with no children are the only clear exception) and point to significant increases in the probability of re-entering low income over the period covered by the analysis for most groups. These shifts presumably again reflect the cut-backs in social assistance, unemployment insurance, and other social programmes implemented by provincial and federal governments over these years, while also indicating that the underlying economic recovery did not extend to those individuals most at risk of (re-)entering poverty.

The shifts vary in magnitude but are as much as around 10 percentage points for single mothers, thus representing relative

increases of as much as over 44 percent for the 1994-to-1995 interval over the baseline 1993-to-1994 period. Not only, therefore, did given spells of low income increase in expected length over the sample period (as seen in the exit models just above), but so too did the probability of re-entering a subsequent spell.

VI. Occurrence Dependence

VI.1 The Specifications

To what degree are entry into poverty and current poverty status related to an individual's past low income record? The notion of occurrence dependence is investigated here with two different models. The first is a variant of the annual entry models seen above where only the 1995-to-1996 interval (the last one covered by the data) is covered and the regressors include the number of years the individual spent in low income 1992-94.¹⁹ The second is a simple logit specification of low income status in 1996 where the number of years spent in low income 1992-95 enter as explanatory variables.²⁰ The results are again presented in terms of the related probability effects and once more restricted to the baseline probabilities and the variables of focus: in this case the number of previous years in poverty. (The results for the other variables again resemble those of the entry models presented earlier and may be found in Finnie [2000a]).

VI.2 Past Low Income Experiences and Current Entry into Low Income

The findings for the 1995-96 entry models are shown in Table 4a. The baseline hazards are generally lower than those found in the general annual entry models, principally because – in the context of the 1995-to-1996 entry dynamic being modelled and the presence of the poverty experience regressors

included (one, two, and three years) – they implicitly represent the situation for individuals with *no* previous low income spells over the observed interval, as well as all other particularities of the specific 1995-to-1996 period, including, for example, the general shifts in entry rates indicated in the relevant calendar year variables included in the earlier specifications.

With respect to the past poverty variables, the results show the anticipated strong relationship between the number of years previously spent in low income and the probability of entering low income between 1995 and 1996 (obviously *re*-entry for those who had had previous spells). Thus, for individuals who were never in low income 1992-94 (and who possessed the models' baseline characteristics), the probability of entering low income from 1995 to 96 was 1.4 to 9.1 percent, depending on the particular family type and sex, whereas for those who were in low income all three of the earlier years (but were not poor in 1995), entry rates ranged from 20.6 to 46.8 percent. Across the various groups, the entry rates of the "always poor" thus ranged from 5 to 15 times those of the "never poor" with the smaller differences being for the lone parent families, which had relatively high entry rates to begin with. Individuals' past low income records are, therefore, powerful predictors of the probability of entering poverty in a given year.

VI.3 Past Low Income Experiences and Current Low Income Status

The relationship between an individual's past low income record and his or her current low income *status* (poor versus non-poor) is shown in Table 4b. The effects of previous years spent in low income are

even stronger here than in the entry models just seen, primarily because those other models were necessarily estimated for individuals who were non-poor in 1995, thereby excluding those with the most chronic low income profiles. Thus, whereas the baseline low income rates vary from 1.5 to 10.7 percent, effectively representing the poverty rates of individuals with no previous years of low income, they immediately jump to 17 to 35 percent for individuals with one previous year of low income, and soar as high as 75 to 90 percent for those who were in low income all four previous years. The general result, then, is again that individuals' past low income records are powerful predictors of their current or future low income status.

VII. Conclusion

In presenting for the first time a general analysis of poverty dynamics in Canada, these findings have a wide range of policy implications, large and small, broad and specific. A few important general ones are now discussed.²¹

First, with almost one-half of those who ever experienced a spell of poverty over the five years covered by the analysis in that state more than half the time and hence classified here as being long-run poor, this study shows the existence of a very sizeable group for whom policy measures should presumably provide assistance of a rather fundamental nature, such as developing basic labour market skills, making work a profitable and feasible option (wage subsidies, child care, etc.), helping with job search, and so on. Furthermore, with just 6 percent of the general population in low income in all years studied but this group comprising approximately 40 percent of the low income population in any year, the analysis makes clear that any truly significant

reduction in low income rates would have to include a focus on the chronically poor and involve the sorts of activist measures just mentioned – as opposed to simple stop-gaps or short-run interventions – on a commensurately large scale.

On the other hand, the analysis has also shown that there is another substantial group – the other half of those who are ever poor – for whom poverty is more of a passing experience and, therefore, where less fundamental poverty-fighting measures, such as short-term income support, the re-tooling of existing job skills, a little extra help with job search, and the like, would probably be more appropriate.

Secondly – and related – the analysis has also shown that various observable attributes, such as sex, family status, age, province, language, and area size of residence, represent good indicators of who is likely to enter poverty and the amount of time a person will spend in a current or subsequent poverty spell. Such information could, therefore, be used to classify individuals in terms of the policy initiatives which would be most appropriate to their specific cases, and other analyses with the LAD or other databases could probably provide additional information of this type.

In like vein, the results also point to the powerful nature of the amount of time an individual has spent in a current poverty spell or has remained non-poor after a previous exit (the relevant duration effects), as well as the overall number of years recently spent in poverty (occurrence effects) for predicting poverty status at any point in time, the probable length of a given poverty spell, and the likelihood of entering another period of low income, meaning that individuals' current and past poverty records could

also be very helpful for targeting policy measures.

Third, the finding that the rate of exiting poverty tends to decline substantially with the amount of time a person has spent in a current poverty spell and that the rate of re-entry similarly decreases with the number of years an individual has spent out of poverty after an exit point to the importance of early interventions for speeding people out of poverty once they have entered it and for preventing re-entrance after they escape (although the relative contributions of unobserved heterogeneity and pure duration dependence to this dynamic remains an outstanding question).

On a slightly different track, this study has also identified certain specific *events*, rather than personal or situational attributes, that are associated with high rates of entry or re-entry into poverty or low rates of exit from that state and that thus point to other sorts of policy initiatives. Lone-motherhood is perhaps the best example in this regard. The evidence reported here on the high incidence of entering poverty at the point of becoming a lone mother, the relatively long poverty spells experienced by these women, the importance of marriage to their leaving poverty, and their high rates of re-entering poverty after a previous exit have effectively rendered much more explicit and precise what cross-sectional studies have previously only intimated in a blunted manner about the poverty experiences of lone mothers, and have reaffirmed the need to focus attention on this group in terms of anti-poverty policy from a much more informed perspective. On the other hand, the analysis has also shown that most of the poor in any given year – and the large majority of the long-run poor (around 83 percent) – are in fact

not single mothers. With unattached individuals being the largest single group and couples representing another substantial part, policy initiatives clearly need to be directed at these others if overall poverty rates are to be reduced in any significant number.

Another implication of these findings derives from the provincial differences in poverty dynamics identified, these perhaps pointing to the need for national-level programmes. In particular, the significantly lower rates of exiting poverty for individuals in certain provinces, especially those of Atlantic Canada and the Prairies, point to higher numbers of longer-term poor requiring special measures in those jurisdictions. The fact that lone mothers tend to be particularly characterised by such differences is especially worth noting. The analysis suggests that special initiatives for minority language groups – anglophones in Québec and francophones in the rest of Canada – might also be appropriate. The substantial effects of living in a rural area – generally lower exit rates but also higher entry rates (in the case of lone mothers in particular) – suggests that a focus along this dimension might be called for as well. In other cases, large urban areas are identified as problem areas.

Finally, the situation of the most dependent groups – couples with children and especially lone parents – was observed to deteriorate over the 1992-to-1996 interval, despite the economic recovery that occurred over this time. This dynamic points to the underlying dependency of these groups on government sources for direct income support and their vulnerability to the cut-backs that were implemented over this period and in subsequent years. It also indicates that a strong economy alone is not likely to be

sufficient to raise these most vulnerable groups out of their straitened circumstances and that other interventions are probably required.

Further on this, a particular contribution of this dynamic analysis focussing on entry, exit, and re-entry rates is that it points to a deterioration of the longer-run poverty situation in a way that cross-sectional (annual) data could not, with *further* implications for *future* poverty rates as these effects gradually work their way through the system and slowly but surely drive up poverty rates in a way that the more traditional data sources and annual poverty measures would be slow to capture and unable to predict in anything like the same way. In thus providing a more sensitive measure of the underlying dynamics, this analysis also provides the opportunity for addressing the associated problems before poverty rates rise too high or the longer-run poor get too stuck in their disadvantaged situations.

Regarding future work, it is a cliché to say that a particular project has raised more questions than it has answered, but it can be said that in providing an initial survey of the situation, this study has at least provided a first view of poverty dynamics in Canada and thus constitute a useful starting point for future work.

Notes

¹Recent cross-sectional (i.e., static) studies of family incomes in general, as well as those which focus on poverty *per se*, include Beach and Slotsve [1996], Blackburn and Bloom [1994], Dooley [1994], Hatfield [1996], Love and Poulin [1991], McWatters and Beach [1990], Sharif and Phipps [1994], and Zyblock [1996a, 1996b]. The few dynamic analyses to date include Economic Council of Canada [1992], Finnie [1993,

1994, 1995, 1997d, and 2000], and Picot *et al* [1999]. See Finnie [2000] for more details.

²Atkinson *et al* [1992] and OECD [1998], for example, comprise comparative studies of earnings and income dynamics from which Canada was excluded. The LAD was, in contrast, the source of Canada's inclusion in Antolin, Dang, and Oxley [1999], a project in which the author participated.

³The present paper is taken from Finnie [2000a], while Finnie [2000b] covers some of the same material in a different way.

⁴Social assistance has been a separate item on individuals' general T-1 tax return form and has entered various calculations (and has thus been verified by Revenue Canada) and the corresponding "T-5 SA" forms sent out to individuals only since 1992. The social assistance data on the LAD would appear to cover 80-90 percent of all such payments, thus comparing favourably with other Canadian survey databases in this regard.

⁵In this context, it is noted that in recent Canadian surveys, such as the Survey of Income Dynamics ("SLID"), Statistics Canada has worked at obtaining respondents' permission to use their tax files as the source of income information, attesting to the quality of these data.

⁶This is, for example, the equivalence scale which has been used in recent OECD work in this area (e.g., OECD [1996], Antolin, Dang, and Oxley [1999]). An unattached individual provides the baseline value of 1, the income of a two-person family is divided by the square root of 2 (approximately 1.41), the income of a three-person family is adjusted by the square root of 3 (1.73), and so on. The major findings pertaining to poverty levels and poverty dynamics reported below appear to hold across various other equivalence scales,

including the Low-Income Cut-Offs (“LICOs”) and the Low Income Measures (“LIMs”), the latter being especially close to the square root adjustments.

⁷In practice, the low income cut-offs calculated in each year were relatively constant over the period covered, being \$11,700, \$11,800, \$11,700, \$11,800, and \$11,600 (rounded to the nearest \$100) from 1992 through 1996.

⁸More extended treatments of the material presented in this section can be found in Finnie [2000a, b, c].

⁹The male figures are more typical of the situation of couples because the most significant bias of the LAD is an under-representation of older married females (see Finnie [2000a]).

¹⁰These baseline rates line up quite well with the simple entry rates by family status (Finnie [2000a, b, c]).

¹¹The effects of the child may simply be to increase the family’s measured needs, but may also include income changes, such as those associated with one spouse (typically the woman) cutting back on labour market participation.

¹²Individuals who moved home *with a child* are classified simply as single parents, corresponding to the classification of such individuals in the LAD.

¹³These results do not, however, explicitly identify the separate influences of labour market outcomes and government transfers on entry into low income, and potential composition effects might be at play as well (*e.g.*, individuals who are out of poverty and therefore susceptible to entry into it in any given year may comprise a rather different group in Ontario).

¹⁴The different rates for attached males and females stem largely from the fact that men and women of a given couple tend to have certain different characteristics, such as the men being older. Furthermore, as mentioned earlier, older women who are attached with no children tend to be generally under-represented in the LAD and the counts are particularly low amongst those at lower income levels and having higher poverty rates at any point (Finnie [2000a, b, c, Table 2 in each case]), thus affecting poverty exit rates as well (Table 3 in each of those references). Restricting the models to those aged 20-59 brings the male and female baseline probabilities to within 4 percentage points of each other.

¹⁵See the author’s earlier work on divorce and child support (see references previously) for further discussion of the relevant issues.

¹⁶Recall the very strong positive effects of mobility on *entry* for single mothers as well; inter-provincial mobility seems to be a connected set of dynamics for this group.

¹⁷This general approach is used by Huff-Stevens [1994, 1995] to analyse poverty dynamics, by Gunderson and Melino [1990] to model strike durations, and by Ham and Rae [1987] to analyse jobless durations, while Keifer [1990] shows that the likelihood function for this model corresponds to that of the standard logit model specification.

¹⁸More specifically, the probability of exiting low income in a given year falls from a baseline rate of 34.2 percent to 17.5 percent after four years in the case of single men (holding other factors constant), from 48.8 to 27.7 percent for attached men with children, from 43.8 to 24.3 percent for attached men with no children, and from 38.2 to 19.2 percent for single fathers. For

women, the results are qualitatively similar, with exit rates falling from 34.3 percent to 14.9 percent for singles, from 53.2 to 32.1 percent for those attached with children, from 54.9 to 28.3 percent for those attached without children, and from 42.0 to 24.2 percent for single mothers. The declines in the exit rates after four years are, therefore, in percentage terms: 49.3, 43.2, 44.5, and 48.2 percent for the four male groups (in order), and 56.5, 39.7, 48.5, and 42.4 percent for the female groups.

¹⁹To be at risk of entering low income in the 1995-to-1996, the individual obviously must have not been in low income in 1995, leaving the low income record over the preceding three years to be entered as regressors in the model.

²⁰These are very simple *ad hoc* descriptive models. See Finnie [2000] for further discussion.

²¹See Finnie [2000a, b, c] for more extended discussions of the policy implications of these findings.

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