

# Leaving and Coming Back to Canada

## Evidence from Longitudinal Data

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**Abstract.** *This paper exploits the unique strengths of Statistics Canada's Longitudinal Administrative Database ("LAD"), constructed from individuals' tax records, to shed new light on the extent and nature of the emigration of Canadians to other countries and their patterns of return over the period 1982-1999. The empirical evidence begins with some simple graphs of the overall rates of leaving over time, and follows with the presentation of the estimation results of a model that essentially addresses the question: "who moves?" The paper then analyses the rates of return for those observed to leave the country – something for which there is virtually no existing evidence. Simple return rates are reported first, followed by the results of a hazard model of the probability of returning which takes into account individuals' characteristics and the number of years they have already been out of the country. Taken together, these results provide a new empirical basis for discussions of emigration in general, and the brain drain in particular. Of particular interest are the ebb and flow of emigration rates observed over the last two decades, including a perhaps surprising turndown in the most recent years after climbing through the earlier part of the 1990s; how emigration and return rates vary with income level, but the lack of any change in this relationship in the 1990s; the data on the number who return after leaving, the associated patterns by income level, and the increases observed over the last decade.*

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## **I. INTRODUCTION**

There is now – as in certain other periods in the country’s history – considerable interest in the out-migration of Canadians’ to other countries. How many leave the country in a given year? What are their characteristics? How many come back – and who are they? *When* do they return? What are the trends over time?

These questions are interesting not only for academic reasons, but also for their implications regarding a number of important policy issues. The “brain drain” issue, in particular, has been the focus of a good deal of debate in terms of what it implies for Canadian tax policy, for what it might tell us about Canada’s economic performance in comparison to its major competitors, for what it suggests in terms of our major social programs which might make Canada a better place to live or, alternatively, push tax rates so high as to drive out our best and brightest, and so on.<sup>1</sup>

Previous research has, however, been limited by the unavailability of the sort of general and extended longitudinal database which is best suited to the topic of the emigration of Canadians and their return – or not – to this country.<sup>2</sup> The purpose of this paper is to exploit the unique strengths of Statistics Canada’s Longitudinal Administrative Database (“LAD”), constructed from individuals’ tax records, to shed new light on the extent and nature of the flows of Canadians to other countries and their patterns of return over the period 1982-1999.

After describing the data and describing the models and variables used in the paper, the empirical results are presented in two main sections. The first focuses on the patterns of Canadian emigration. This begins with a few simple graphs that summarize the overall rates of leaving over time, and then follows with the presentation of the estimation results of a model that essentially addresses the question: “who moves?”<sup>3</sup>

In this approach, the probability that a person leaves Canada in a given year is specified as a logit function of the individual’s demographic characteristics (age, family type, language), economic situation (income level, the receipt of U/E-I), and locational attributes (province, area size of residence). The models also include the provincial unemployment rate as a measure of current

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<sup>1</sup> See Finnie [2001] for a review of the recent empirical evidence and a discussion of the related policy issues.

<sup>2</sup> \*\*\*\*Provide a listing of previous research. pulling from my IRPP paper.

<sup>3</sup> A companion paper, Finnie [2002], offers a more detailed descriptive (i.e., non-econometric) analysis of emigration and return using these same data.

economic conditions, and a series of year variables to capture the trends over time regarding which there is so much debate. Separate models are estimated for men and women.

A second variant of the model adds a set of terms which allow for the relationship between the probability of leaving and the individual's income level to differ in the 1990s relative to the 1980s. This specification is used to test if the rate of leaving has risen for those at the higher end of the economic ladder relative to those at lower income levels over time – as one would presumably expect if there had been a worsening of the brain drain phenomenon. Taken together, these results should provide useful new evidence on the annual rates of emigration out of Canada over the last two decades.

The next section analyses the rates of return for those observed to leave the country. This represents an even more original contribution to our understanding of emigration patterns, because – at least as far as this author is aware – there are no existing studies of the return phenomenon of this type (i.e., representing the general population, covering an extended period of time, etc.)<sup>4</sup> This dearth of evidence stems principally from the associated data requisites: to be able to follow given individuals over time, to be able to identify leavers, and – perhaps most challenging of all – those who return to the country, perhaps after an extended period of time. Furthermore, because emigration is a rare event, the underlying sample sizes must also be very large in order to be able to identify enough leavers to follow in the years after their departure. Finally, the data must have enough information on individuals to be able to probe the characteristics of who leaves and returns in a useful manner.

The LAD database meets these requirements, and allows the estimation of a hazard model of the probability of returning to Canada for those first identified as having left. A discrete logit model approach is used. The dependent variable is whether an individual already observed to leave the country returns to Canada in a given year. The explanatory variables include those mentioned above in the context of the exit models, including a series of calendar year variables to capture the trends over time. The model also includes dummy variable indicators of the elapsed number of years since the person left the country (one, two, three...) to capture the relevant duration effects: holding other factors constant, what is the probability of returning after one year, after two years, and so on. Specifying these effects without imposing any functional form turns out to be important, because the

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<sup>4</sup> \*\*\*\*Add discussion of the existing snippets of “return” literature.

duration terms wind up taking a slightly unusual form – although one that is not so surprising given the particular dynamic process in question (i.e., returning to Canada after leaving).

The final section of the paper summarizes and discusses the major findings and identifies avenues for further work.

## **II. THE DATA AND MODEL**

### ***The Longitudinal Administrative Database (“LAD”)***

The Longitudinal Administrative Database (“LAD”) is a twenty percent representative sample of all Canadian tax filers (and identified spouses) followed as individuals over time and matched into family units on an annual basis, thereby providing individual and family-level information on incomes, taxes, and basic demographic characteristics, including place of residence, in a dynamic framework. The first year of the LAD is 1982 and the file currently includes data through 1999, thus determining the period covered by this analysis.

The LAD is constructed from Revenue Canada tax files. Individuals are selected into the LAD according to a random number generator based on Social Insurance Numbers and followed over time by the same identifier. Individuals drop out of the LAD if they become non-filers, the principal reasons being that they have a low income and are, therefore, not required to file (and choose not to do so – see below), or have died. New filers (young people, immigrants, *etc.*) automatically refresh the database in the general twenty percent ratio.)

The LAD’s coverage of the adult population is very good since, unlike some other countries (such as 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 incentives to file in order to recover income tax and other payroll tax deductions made throughout the year and to receive various tax credits. The full set of annual tax files from which the LAD is constructed are estimated to cover upwards of 91 percent of the target adult population (official population estimates), thus comparing very favourably with other survey-based databases in this regard, and even rivalling (or surpassing) the census in this regard.<sup>5</sup>

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<sup>5</sup> It is worth noting how low income individuals, in particular, are essentially paid, in the form of tax credits, to submit a tax form. This is obviously not the case for the census.

Furthermore, given that most individuals file tax forms every year, attrition from the LAD is quite low, meaning that it remains representative on a longitudinal basis as well as cross-sectionally. This compares to the situation for survey databases, which typically have greater problems than administrative data in locating – or, in the case of longitudinal data, *following* – individuals, especially those who move, potentially resulting in serious sampling problems in the context of any study of mobility such as this one. In short, the LAD is a good performer in terms of its representativeness on both a cross-sectional basis and longitudinally.<sup>6</sup>

The large number of records available on the LAD (roughly four million per year) means that there are enough observations to investigate the exit and re-entry processes.

Individuals were included in the analysis if they were over the age of 18, Canadian citizens (in order to separate out immigrants who were basically just passing through the country), and had no missing data for the variables used in the analysis (resulting in very few deletions). Individuals could be included for certain years but not others, depending on their inclusion in the LAD and the years they passed these sample selection criteria.

### ***The Model Specifications***

Two different logit models are employed, one for exits, the other for return. In the first, the endogenous variable is whether or not the individual leaves the country from one year to the next for any given pair of years. More specifically, the tax files allow us to identify individuals who left Canada over the course of a given year in that they are observed to reside in Canada the end of year  $t$ , but then declare their departure from the country, or are otherwise observed to leave (see below), in year  $t+1$ . Each pair of years passing the selection criteria enumerated above contributes an observation in the estimation of the model. The regressors are meant to capture the various costs and benefits of emigrating, and are entered in terms of the values holding as of the first year (the “pre-move” year) for each pair of years that comprises an observation.

The model is an *ad hoc* specification, since it reduces a dynamic process to looking at what happens from one year to the next at any given point in time. This is largely because trying to specify a proper hazard model, in particular, would require including only individuals observed from

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<sup>6</sup> Atkinson *et al* [1992] and OECD [1996] discuss the typically better coverage and lower attrition of administrative databases over survey databases. See Finnie [1998a] for evidence on attrition from the LAD and the relationship of this attrition to migration behaviour over selected intervals.

the point at which they become at risk of moving – which could be considered to be the age of 18 – which would greatly restrict the analysis.

It is also a purely descriptive model in that it does not develop a proper utility maximization framework, such as specifying the income streams an individual would likely face in Canada and abroad and assuming the person chooses the one which is highest. There is not enough information in the LAD database to support such an approach.

In any event, the model employed is quite intuitive, makes good use of the data available, should do a good job of identifying the relationships between emigrating and the explanatory variables included, and should be sufficient for the purposes of identifying the time trends that are subject to such debate. In short, the simple logit model of moving used here should do a reasonably good job of making the best of the data available to improve our understanding of the emigration phenomenon.

The return model, in contrast, represents a proper hazard specification. It resembles the exit model, turned on its head, in that the dependent variable is the probability of returning to Canada from any given year to the next. But what is different is that individuals are tracked from the year they are observed to leave the country in a precise year-by-year fashion, and the model includes a set of dummy variables representing the elapsed number of years the person has been out of the country to capture the duration effects. This type of hazard (or a duration) model 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. The likelihood function for the hazard model is equivalent to the likelihood function for the logit approach (Keifer [1990]).

One special feature of this model is that we effectively track individuals over a period we do not observe them – when they are out of the country. We *do*, however, observe them if and when they return – the event in question. The individual's characteristics as of the point of departure are included in the model. We are thus able to observe the rate of return based on those attributes – which are in many ways the most relevant in terms of understanding the return phenomenon from a Canadian perspective. For example, how do return rates vary by age at departure, the province from which the individual left, the income level in the year prior to leaving, and so on?<sup>7</sup>

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<sup>7</sup> Return rates need to be adjusted for the fact that individuals who die while out of the country would no longer be at risk of returning and should be censored at that point. This is done by applying age-specific mortality rates and censoring individuals' records at the time they are deemed to die by this probabilistic assignment. In fact,

### ***The Endogenous Variables: Leaving and Returning***

Leaving is defined in one of three ways, and returning in two. Definition “A” of leaving is where an individual essentially declares the departure on his or her tax form, thus cleanly severing ties with the country. Definition “B” includes those declared departures, but adds those who are observed to have a declaration of non-residence in Canada (for tax purposes). Definition “C” is broader still, and includes those observed to have a foreign mailing address, even though they still have a legitimate tax province and have not declared a departure.

No single definition is perfect – and it is in fact somewhat challenging to think of the appropriate definition at even the conceptual level; after all, what does “leaving Canada” mean? Fortunately, most of the findings are similar across all three definitions – except, that is, for the general levels *and* some of the basic trends over time. Rather than attempting to identify which definition is “best”, the approach adopted here is to report the results for all three definitions in order to tell a fuller story of emigration patterns and trends.

Similarly, there are two definitions of return. Definition “A” is the obverse of the first leaving definition, in that it depends on an individual returning to the country and declaring this return on his or her tax form. Definition “B” expands the definition to include those who had a Canadian address and were assigned a Canadian tax province. In each case, the person had to have been observed to meet the definition of having departed to be at risk of returning. This categorisation results in six types of return – combinations of the three exit types and the two return types. Models have been run for all combinations, but the discussion focuses on the A\_A and C-B combinations – i.e., the narrowest and widest definitions each side. The trend/year variables are, however, shown for all the combinations.<sup>8</sup>

### ***The Explanatory Variables***

The explanatory variables included in the models are the following: age, family status, province/region, a minority language indicator (English in Quebec, French outside Quebec – thus

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the major results of the model do not change with this treatment.

<sup>8</sup> \*\*\*\* Add further discussion of the technical points relating to these definitions, the consistency rules applied, etc.

leaving the province/region variables to represent the majority language group in each jurisdiction), area size of residence, the provincial unemployment rate, market income in the last full year in Canada, and an indicator of the receipt of U/E-I in that same year.<sup>9</sup>

There is at least one important variable not on this list: level of educational attainment. The reason is that there is no such measure on the LAD. This is an unfortunate omission, especially with respect to any desired focus on the “brain drain”. There is, though, an income indicator, and this will have to stand in for the omitted “brain” indicator.<sup>10</sup>

### **III. LEAVING**

#### ***Simple Leaving Rates***

Figure 1 shows the annual rates of leaving Canada for the three definitions – a declared departure, a declared departure or becoming a non-resident, either of the above two conditions or moving to a foreign address – for all individuals and by sex.<sup>11</sup> Overall, the rates are generally very low, ranging from .04 percent (i.e., under one-half of one-tenth of 1 percent) to .14 percent (somewhat over one-tenth of 1 percent). In absolute numbers, these represent 14,900 leavers in 1982 to 24,825 leavers in 1999 by definition A, 16,375 leavers in 1983 to 26,425 leavers in 1998 by definition B, and 20,075 leavers in 1983 to 26,725 leavers in 1998 by definition C.<sup>12</sup>

These rates and absolute numbers generally correspond to other estimates in the literature for the years other figures are available, as reviewed in Finnie [2002]. These LAD data, however,

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<sup>9</sup> \*\*\*\*Should probably add more detailed explanation of why these variables are included in the models.

<sup>10</sup> The notion of “brain” is not always well defined in the drain debate. Sometimes, for example, it includes entrepreneurs, whether or not they have/are brains. The income indicator included in the models would normally capture those income-related definitions better than an education measure, but both types of measures would clearly be desirable.

<sup>11</sup> In each case, the state of being at risk is adjusted appropriately. In short, if the person has already been identified to leave by one of the conditions of the definition in question, he or she can no longer be at risk of leaving.

<sup>12</sup> The B and C definitions have no exits for 1982 because they are based on a change in tax province or address from one year to the next, thus requiring the individual to first be observed in Canada. With the data starting in 1982, the first exit can be observed only be in 1983. Similarly, by the B and C definitions, an exit is identified as occurring in the year *before* any observed change in tax province or residency, because in the year the individual actually left, he or she will be indicated as having Canadian residency and a tax province. This is why there are no exits in 1999 for definitions B and C either.

represent an annual series spanning an extended period of time with a consistent definition(s) of leaving such as cannot be found elsewhere.

The rates tend to be lowest for the strictest definition of leaving (definition A) and rise with the broadening of the definition (B, C). Declared departures (definition A) rise slightly from the beginning of the period to the end, from around .10 percent in 1982 to .12 percent in 1999 – an increase of around 20 percent. In contrast, the broadest definition (C) actually declines slightly, from around .14 percent in 1983 to about .13 percent in 1998. The B definition rates and trends tend to lie between these other two, although the B and C definitions converge after about 1990, presumably due to a tightening of the treatment of tax files with respect to province and residency.<sup>13</sup>

The leaving rates follow the economic cycle fairly closely – but not perfectly. The substantial declines in rates through the mid-to-late 1980s correspond to the strong growth in the Canadian economy over that period, but they bottom out in 1987, whereas the economy continued to grow through 1988 before beginning to stall in the end of 1989. Rates then rose through the early part of the 1990s, when the economy was in a lingering recession, and continued to do so until 1997, after which they declined, corresponding to the period when the Canadian economy finally showed strong growth.

Overall, then, leaving rates are generally very low, tend to be inversely related to prevailing economic conditions, and have in the most recent years been either slightly higher or lower than the beginning of the period, depending on the specific definition employed.

Perhaps of special interest is the reversal in the steady upward trend that characterised the first part of the 1990s towards the end of the decade. The data suggest the earlier rise was cyclically driven to a significant degree, and was therefore reversed as the economy recovered, rather than some inexorable secular increase that was sometimes feared would continue to rob the country of ever greater numbers of our most talented workers. That said, rates were clearly higher at the end of the 1990s than at the end of the 1980s, and it not clear to what levels they might move if the economy remains strong – greater than before or not. Clearly, there are cyclical and trend effects at work, and it is probably too soon to say exactly how important each of these factors is.

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<sup>13</sup> The difference between definitions B and C is with respect to those who have a Canadian address but foreign residency. In later years, those with foreign addresses were more likely to be assigned a foreign residency, and vice versa, thus forcing a convergence of the definitions.

All these patterns are fairly similar for males and females, although the rates are slightly higher for men than women throughout.

### ***The Leaving Models***

The leaving model results are shown in Tables 1a, 1b and 1c, corresponding to the three different leaving definitions employed. The findings are presented in probability space, as derived from the underlying models. That is, the model estimates were used to first estimate a baseline probability of leaving with each categorical variable set to zero, thus corresponding to the omitted categories for each set, and setting the only continuous variable, the unemployment rate, at its mean (8.7 percent). Each categorical variable was then “turned on” one at a time, and the coefficient estimates were used to calculate a new predicted probability. These are the numbers shown in the tables. (The omitted categorical variables are shaded; all have, by construction, the same base level probability.) The statistical significance of the associated coefficient estimates is also shown in the usual fashion (.05 and .01 confidence levels).<sup>14</sup> The results are qualitatively very similar for the three sets of models, except for the year effects.

The rates of leaving the country rates are fairly low for the youngest individuals (18-24), then rise (age 25-34), and decline thereafter. This would be consistent with a life-cycle model where the costs and benefits of moving, both economic and psychological costs, would point towards doing so earlier in life – but only after finishing schooling and otherwise starting a career.

Family status effects might be expected to reflect a similar set of cost and benefit factors, but the results are not entirely as might have been anticipated. Couples with children tend to be more likely to leave, followed by singles, then couples with no children. These results differ from those found for inter-provincial mobility, where being married and having children are related to lower mobility rates, not higher ones.<sup>15</sup> Evidently, leaving the country is different than moving across provincial lines in this respect; individuals seem to prefer not to do it alone. Single parents actually have among the highest rates of leaving, but this could represent individuals not identified as married in the LAD data joining partners abroad.<sup>16</sup>

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<sup>14</sup> \*\*\*\*The actual model results will be shown in an appendix.

<sup>15</sup> Finnie [1999].

<sup>16</sup> If the person does not declare him- or herself to be married they may be identified as a single parent.

The probability of leaving the country varies considerably by province. People living in Atlantic Canada are considerably less likely to leave than most others, those in British Columbia and the North are most likely to leave, and those in Ontario and the Prairies (including Alberta) are in the middle rank. Most remarkable, however, are the extremely low rates for those living in Quebec – with the indicated probabilities reflecting the majority francophone speakers in that province; English-Quebec minority language variable indicating that anglophones in that province have a much higher rate of leaving than do francophones. French speakers outside of Quebec do not, in contrast, have statistically different leaving rates than others in the province/region in which they live. Not surprisingly, individuals living in larger cities are, *ceteris paribus*, about twice as likely to leave as those in small cities and towns and rural dwellers.

The provincial unemployment rate appears to be statistically insignificant, but given that there are sets of variables for both calendar year and province/region, the dimensions along which this measure varies, this result is not surprising. A later version of the model might present a cleaner picture of things by simply surprising the unemployment rate, thus allowing the year and province effects to capture economic conditions, as they are already doing to a large degree.

The market income variables are very interesting, and indicate that the higher the individual's income, the greater the probability of leaving, especially at the highest levels (\$60,000-\$100,000 and \$100,000 +).<sup>17</sup> This tendency is particularly marked among men. To the degree income levels capture the “brain drain”, rates of leaving are clearly greater for our best workers. That said, their numbers are small, since relatively few individuals have incomes of these levels, and the vast majority of leavers are in the lower income categories.<sup>18</sup>

Those receiving unemployment/employment insurance in a given year are less likely to leave. This could reflect a lack of employability – in other countries as here, a dependency on this income support program, an absence of funds to finance a move, or some combination of these and/or other factors.

The raw trends in leaving rates were shown above. What do they look like after the factors represented by the variables included in the models are taken account of? These are captured by the

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<sup>17</sup> Market income captures wages and salaries, self-employment and professional income, dividend and interest income, and all other private (non-government) sources except for capital gains (omitted partly due to adjustments related to tax rules in certain years).

<sup>18</sup> See Finnie [2001].

calendar year variables. The associated predicted probabilities are shown in the tables and plotted for all three leaving definitions in Figure 2. The raw and adjusted trends are very similar. The leaving rates decline significantly through most of the 1980s, begin to rise after bottoming out in 1987, then rise through 1997, after which they decline. The story would, therefore, again be one of strong cyclical effects and probably at least some sort of secular upward trend, but it is difficult to know how strong that trend might be at this point in time.

Finally, to test for shifts over time, Model II includes the interaction of the income variables with a dummy variable representing the 1990s. If more individuals at higher income levels were relatively more likely to leave in recent years, this would show up as strong, statistically significant coefficients on the interactions with the higher income terms relative to the lower ones. The results suggest there has been a very moderate increase in the relationship between income level and leaving of late, but the effect is not significant in all specifications, and the magnitudes of the effects are not very large.

## **IV. RETURNING**

### ***Empirical Hazard Rates***

Figure 3 shows the empirical hazard rates of returning to Canada for those observed to leave over the period of the analysis. All six possible combinations of leaving and return definitions are plotted (A-A, A-B, ... C-B). The patterns are relatively robust in terms of the general shape, the only exceptions being for females using the second, more expansive ("B") definition of return (i.e., a declared return or observed to have a Canadian tax province and a Canadian address after having left the country by one of the three definitions).

Those exceptions apart, individuals are more likely to return after having been away two years than just one, but after this the rate of return declines, taking the classic negatively sloped form of most empirical hazards. Using the stricter "A-A" definitions (declared departure and return) as an illustrative example, the rates are 3.27, 4.28, 3.50, 2.37, and 1.80 percent over the first five years. These numbers imply survivor rates (i.e., still out of the country) of 96.7, 92.6, 89.3, 87.2, and 85.5 percent. Thus, after five years, 14.5 percent of those who left come back. These rates are, however, averaged over the whole period covered by the analysis, and do not control for any of the factors accounted for in the models. We now turn to the return models to take this deeper look at returns.

### ***The Return Models***

The results for the return models are shown in Table 2. In order to conserve space, only the A-A and C-B combinations of departure and return are presented, but the results were quite similar for the other four combinations for all the variables except the year effects, as will be discussed further below. It is important to keep in mind throughout that these results are for those already identified as leavers, so they are mobile individuals to start with. Keeping this conditioning in mind helps make some of the findings seem more reasonable.

Age, for example has an interesting pattern. Those 65 and older are by far the least likely to return, but the patterns across the other age groups are less easy to generalise across the different sets of findings. Younger individuals are generally more likely to return, but this patterns is not uniform, and is perhaps less strong than might have been expected.

There is no clear pattern by family status, except that unattached individuals have the highest rates of return. Singles would, not surprisingly, appear to be more able to make chancy moves, and move back if things don't work out, than those with spouses and children.

Again there are no strong general patterns by province or region, except that francophone Quebecois tend to be among the high probability returnees – and this on top of their very low leaving rates. Anglophone Quebecers are, in contrast, significantly less likely to return than their francophone compatriots with, in fact, the very lowest rates of return of any province-language group in every case.

There is little of significance by area size of residence. Nor by whether or not the individual had been receiving U/E-I in the year prior to leaving.

Of considerably more interest is the pattern by the individual's income level before leaving Canada. As high income individuals (\$60,000 - \$100,000) were several times more likely to leave than those at lower levels, their return rates are also significantly higher, at least in the case of men. The differences are not as strong as in the case of leaving, but do still point to those at higher income levels being more generally mobile, being more likely to return as well as leave. Tests for shifts in the relationship between income level and the probability of return in the 1990s versus the 1980s similar to those for the leave models indicated no strong pattern in this respect.

The duration terms are plotted in Figure 4 for the three "A" (declared) return definition. They show the same general shape as the raw rates presented earlier: a rise in the second year

relative to the first, and a decline after that. Here, the terms are extended further, and are seen to continue to decline throughout, not flattening ever. The associated survivor rates implied by these rates, thus representing the duration effects applied to the base line person (all categorical variables set to 0) are 85.5 percent after five years, and 81.1 percent after 10. Thus, most of those who leave stay away, even if small numbers continue to trickle back over time.

The return models also include calendar year variables, and these too are plotted for the “A” return models. (The B models have some odd patterns that may be related to how Revenue Canada treats individuals who file tax forms declaring Canadian addresses without actually having declared their return to the country. This could be the reason the duration terms have a slightly different shape for the “B” return definition as well – at least for women.)

There is a bit of noise in the year patterns, but the overall trends are interesting. Most importantly, the rates declined through 1992, then rose through the rest of the decade. Using the tightest “A-A” definitions, return rates went from a low of 1.93 in 1992 to 3.08 in 1999, and were still trending upward. Using the other definitions of leaving (A, B) and the same definition of return, the graphs are even more sharply sloped.

Thus, while rates of leaving the country generally rose in the 1990s (until they turned down at the end of the decade), so too did the rates of returning. This points to a generally more mobile population – a more global labour market. Before, we only had evidence on leavers, not knowing who returned. These data provide a fuller view of what has been occurring.

If annual rates of return have in fact doubled or so in the last decade, and are perhaps continuing to do so, that would lead to very different overall rates of return as these probabilities accumulated. If the overall rates were in the range of just 15 percent after five years before, they would be much higher than that with the higher rates which now seem to be applying in each year.

## **V. CONCLUSION**

This paper has provided new empirical evidence on the rates at which Canadians leave the country and return. The major findings may be summarized as follows:

- Overall, somewhere in the range of .01 percent of the adult population leaves the country in any given year.

- Departure rates have largely followed the business cycle: declining in the 1980s, turning up towards the end of the decade, rising through most of the 1990s, then turning down just as the Canadian economy gained strength in the last years of the decade.
- Departure rates also decline with age (except for the very youngest), are higher in bigger cities and for couples with children and singles relative to childless couples, are much lower for francophone Quebecers, and are much greater for those at higher income levels, thus supporting the “brain drain” hypothesis to at least some degree.
- Only a small minority of those who leave ever return, with the hazard rates estimated here indicating about 14-15 percent of all leavers returning after five years, and about 19 percent after 10 years.
- That said, there was a substantial upward trend in return rates from 1992 onward, continuing right through the last data point in 1999, with the numbers indicating something like a doubling of return rates in recent years.
- Other explanatory variables are not generally very significant, although – notably – return rates are significantly higher for those at higher income levels.

There are thus strong cyclical factors, but also some important underlying trends in both leaving and return rates. There was probably a general upward trend towards in departures, but the decline in the most recent years, as well as the earlier declines through most of the 1980s, indicating this pattern will not necessarily continue, with future trends likely dependent on the strength of the economy along with the underlying trend factors. Furthermore, although return rates have historically been relatively low, the strong increase observed through the 1990s reported here offsets the other evidence on departures alone, and suggests mobility is a two-way street. Not only does Canada attract large numbers of immigrants, but also a growing number of its own expatriates, including disproportionate numbers of those with higher incomes.

In short, the data support the notion that Canada is in a global labour market, and while a small, yet perhaps important, proportion of the population leaves in every year, that share of the population remains relatively small (around one-tenth of one percent in any given year), and does not appear to be on an ever-increasing upwards spiral. And, some return.

There is surely much that can – and should – be done to stem certain aspects of these outflows, especially among our best and brightest. It is hoped this work will contribute to the debates that will unfold on these matters.

Figure 1 - Leaving Rates

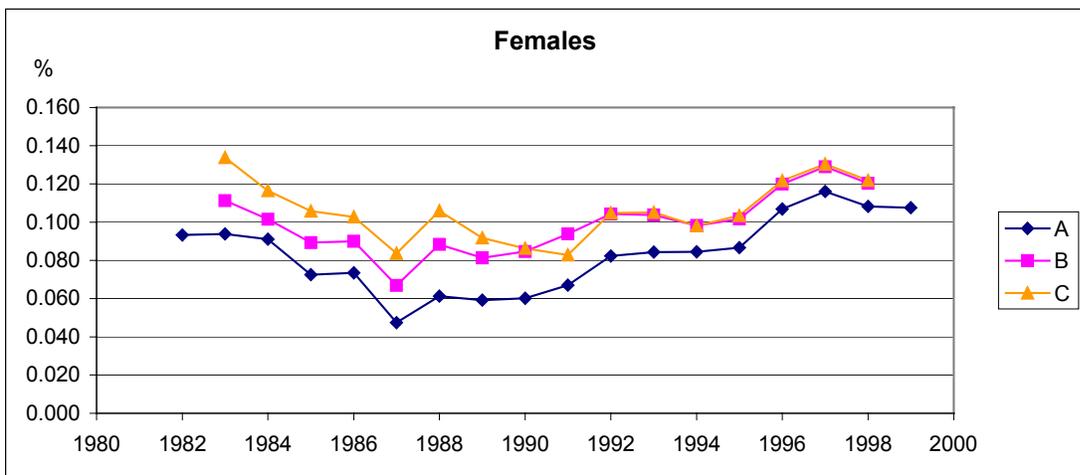
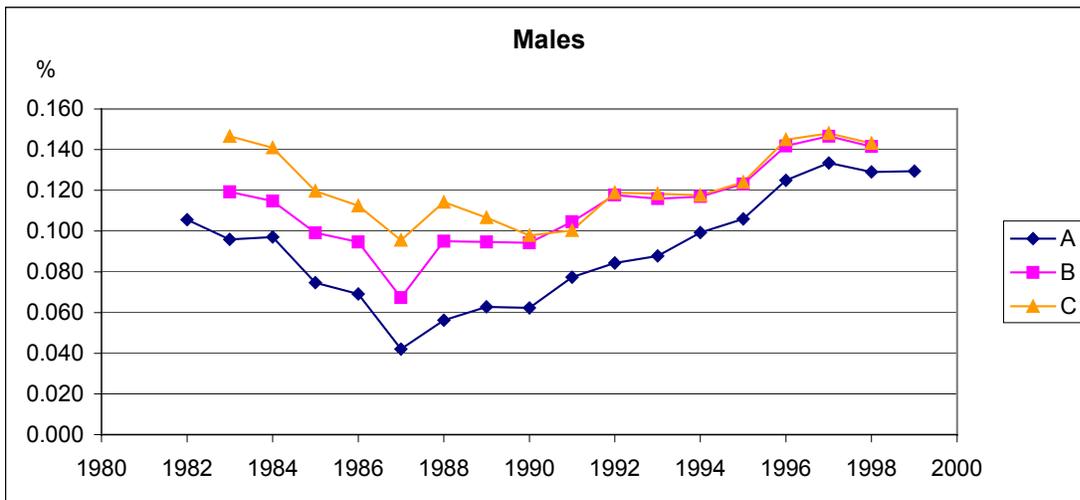
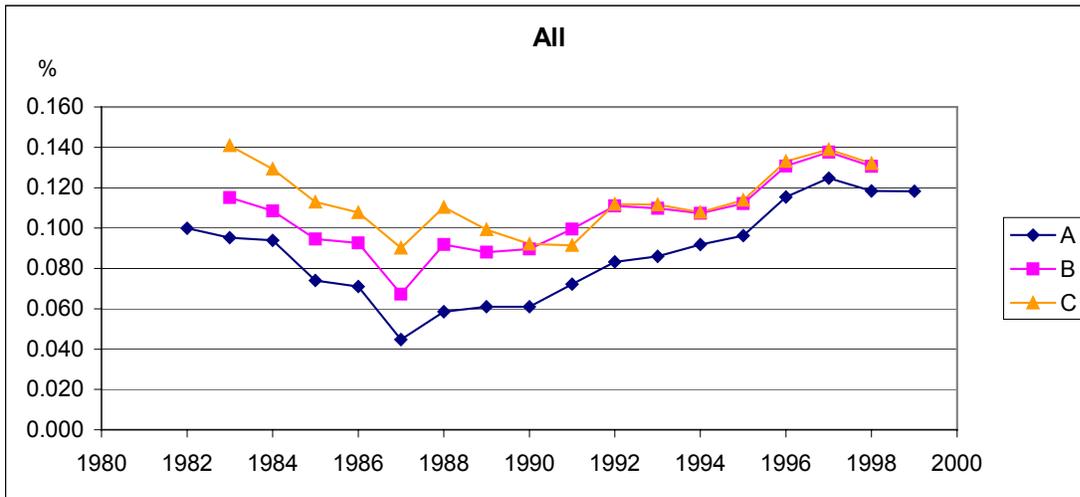


Figure 2 - Calendar Year Effects for the Leaving Models

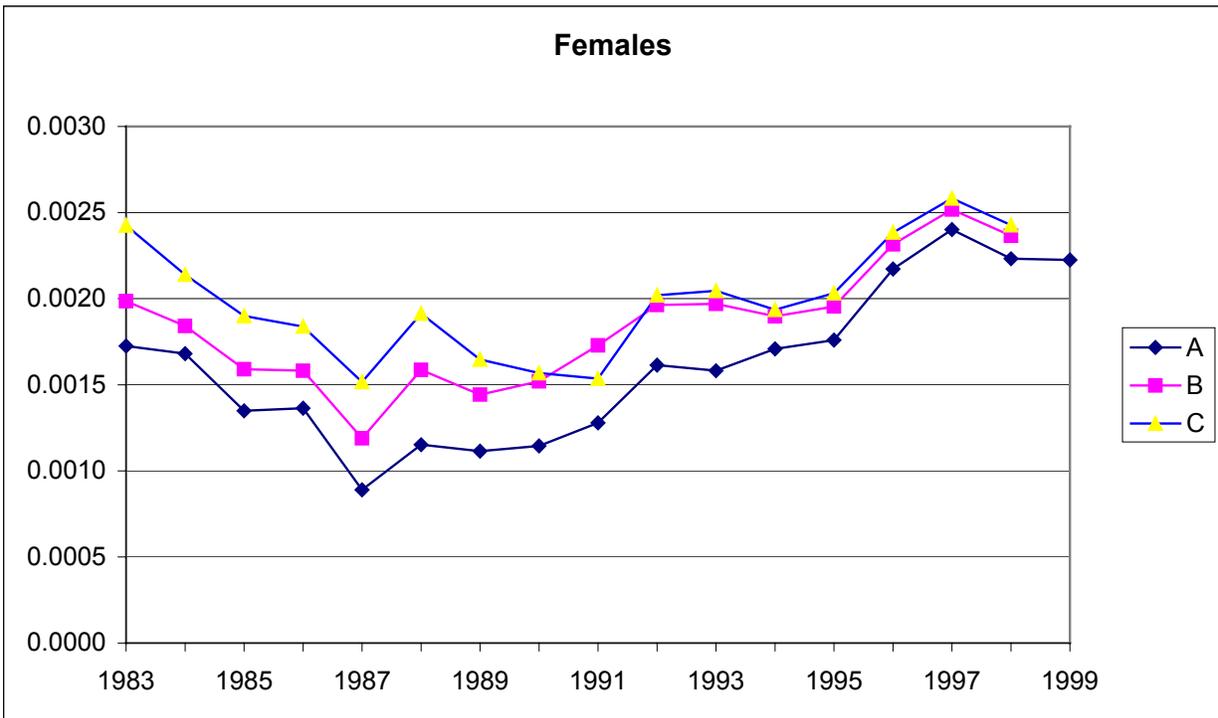
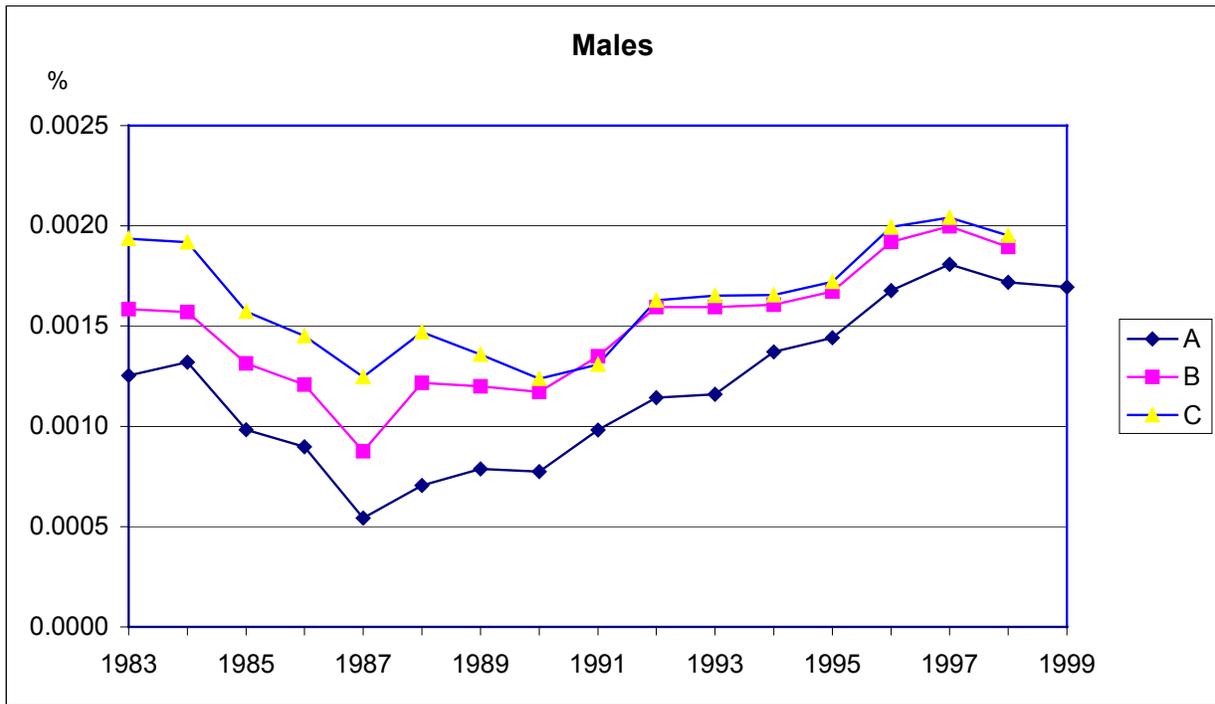


Figure 3 - Empirical Return Rates

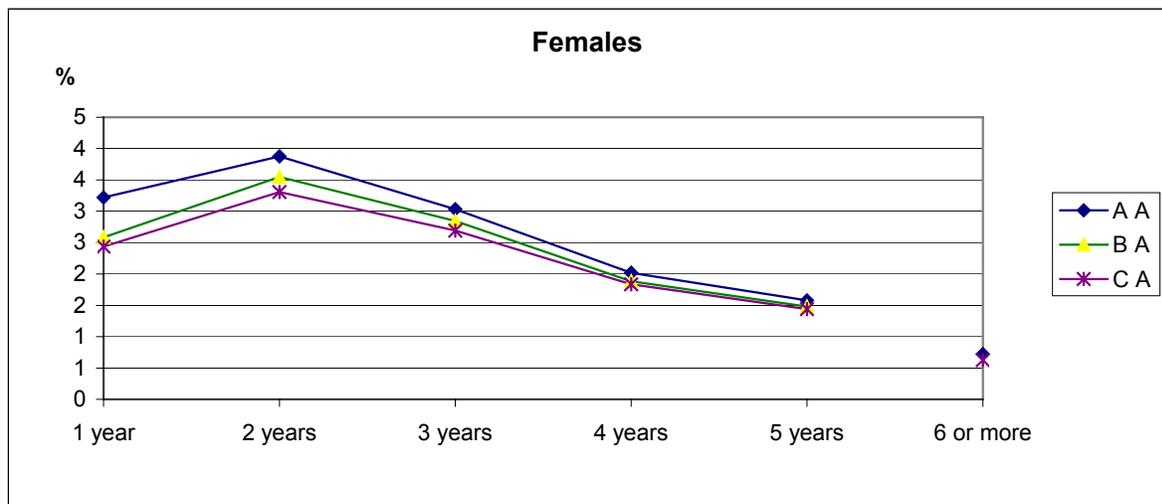
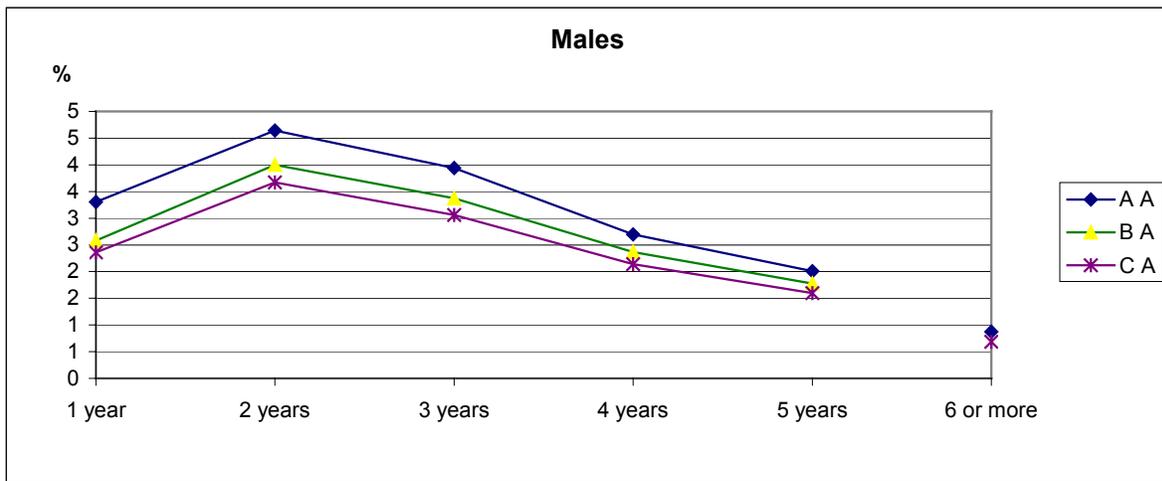
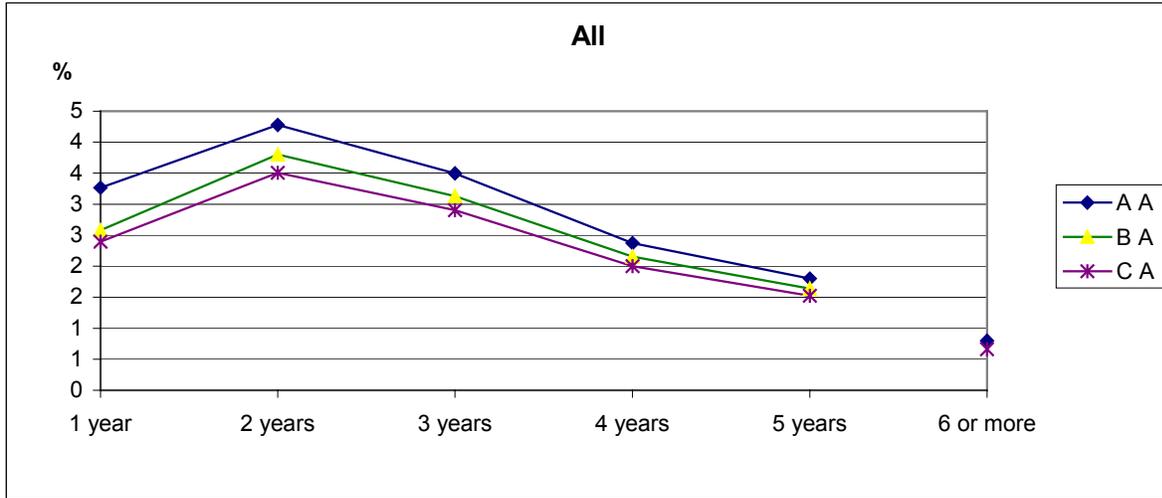


Figure 4 - Duration Effects for the Return Models

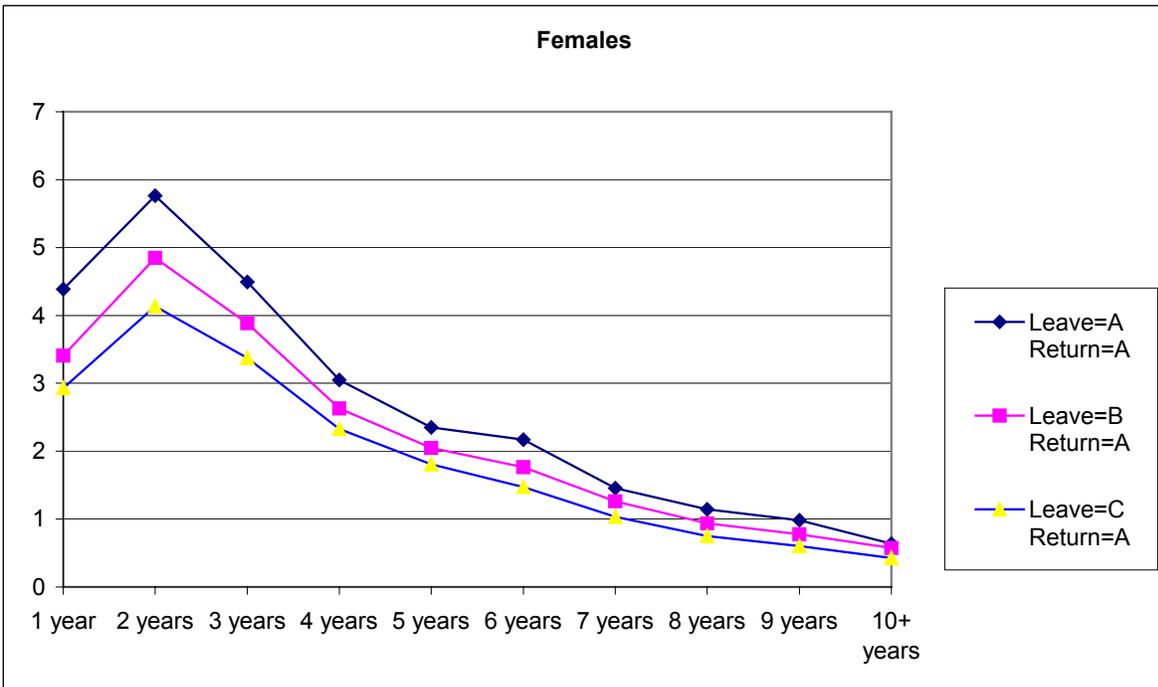
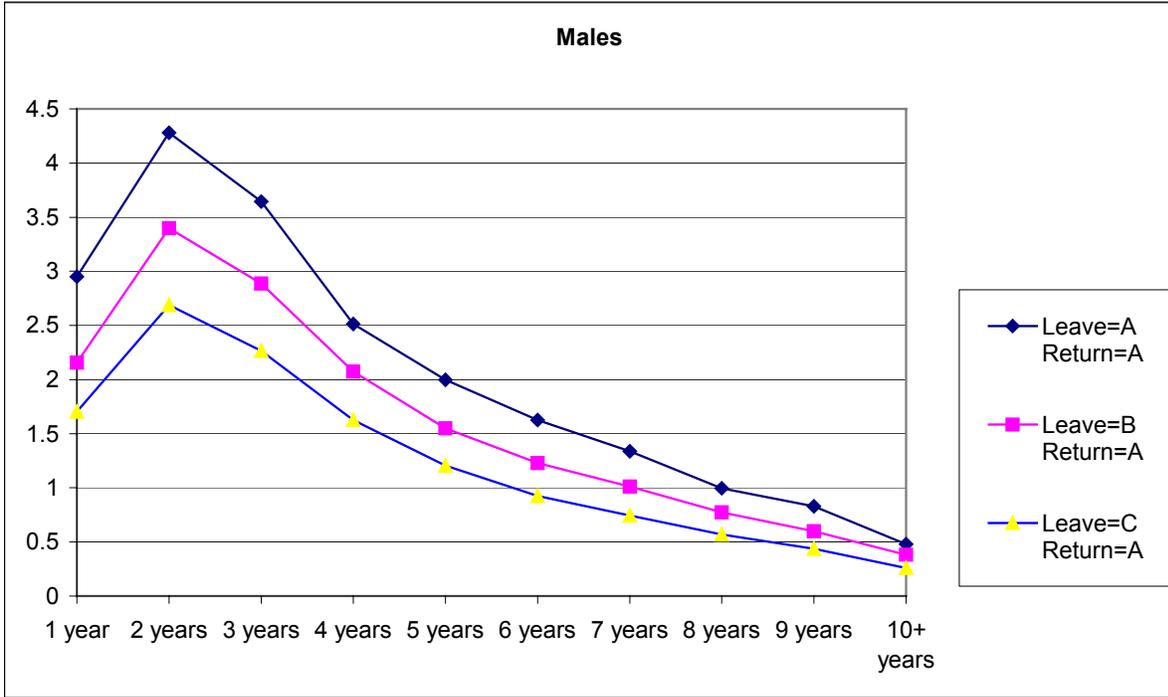


Figure 5: Calendar Year Effects for the Return Models

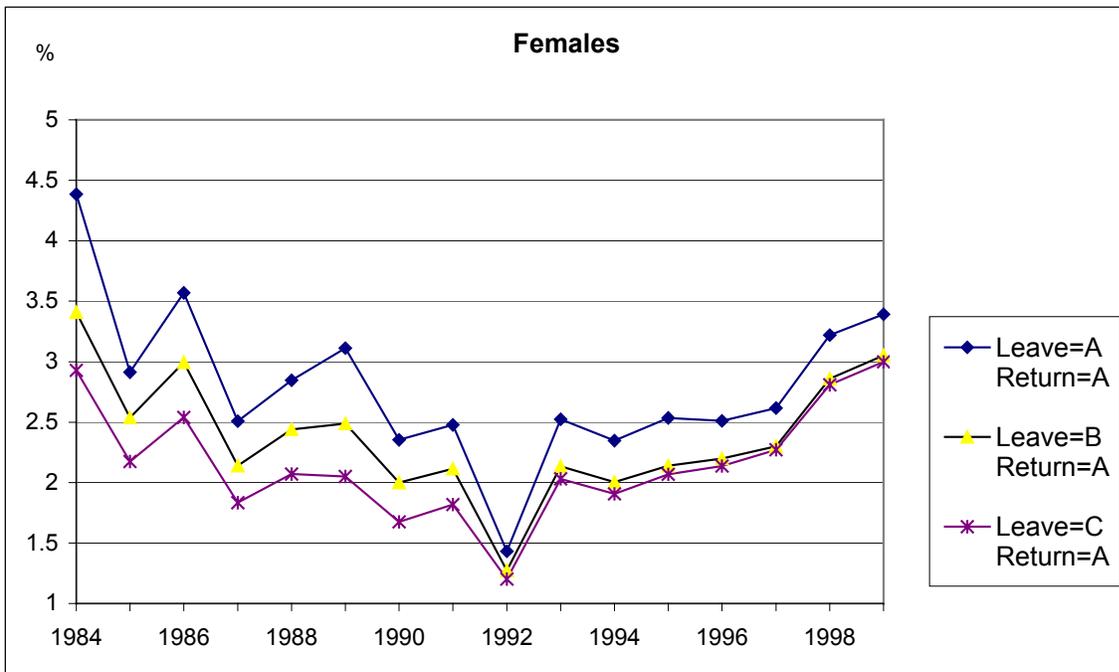
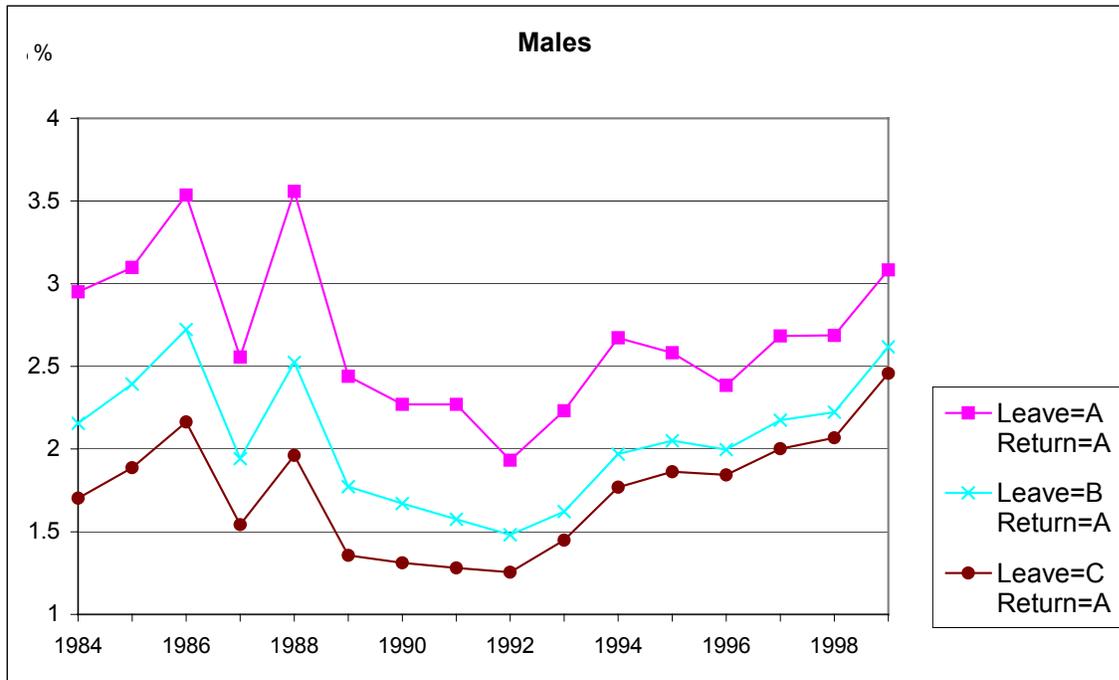


Table 1a - Leaving Models: Predicted Probabilites, Leaving Definition A

	Leaving Definition A			
	Males		Females	
	I	II	I	II
<b>Base Level</b>	0.125% **	0.135% **	0.173% **	0.165% **
<b>Age</b>				
18-24	0.098% **	0.105% **	0.196% **	0.187% **
25-34	0.197% **	0.211% **	0.285% **	0.272% **
35-44	0.125%	0.135%	0.173%	0.165%
45-54	0.089% **	0.095% **	0.125% **	0.119% **
55-64	0.062% **	0.067% **	0.078% **	0.074% **
65- +	0.033% **	0.035% **	0.041% **	0.039% **
<b>Family Status</b>				
Couple & Kids	0.125%	0.135%	0.173%	0.165%
Couple No Kids	0.037% **	0.040% **	0.060% **	0.058% **
Single & Kids	0.159% **	0.170% **	0.166% **	0.159% **
Single No Kids	0.102% **	0.110% **	0.162% *	0.155% *
<b>Province/Region</b>				
Ontario	0.125%	0.135%	0.173%	0.165%
Atlantic	0.065% **	0.070% **	0.094% **	0.090% **
British-Columbia	0.150% **	0.161% **	0.216% **	0.206% **
North & Other	0.144% *	0.154% *	0.249% **	0.237% **
Prairies	0.122%	0.131%	0.169%	0.162%
Quebec	0.039% **	0.042% **	0.051% **	0.048% **
<b>Minority Language</b>				
English in Quebec	0.640% **	0.687% **	0.885% **	0.845% **
French outside Q	0.138%	0.148%	0.178%	0.170%
Majority languag	0.125%	0.135%	0.173%	0.165%
<b>Area Size of Residence</b>				
000-14,000	0.066% **	0.071% **	0.095% **	0.091% **
015-99,000	0.078% **	0.084% **	0.104% **	0.099% **
100,000 +	0.125%	0.135%	0.173%	0.165%
<b>Provincial Unemployment Rate</b>				
8.7	0.125%	0.135%	0.173%	0.165%
9.7	0.125%	0.134%	0.172%	0.164%
<b>Unemployment Insurance</b>				
None	0.125%	0.135%	0.173%	0.165%
Some	0.074% **	0.079% **	0.136% **	0.130% **

**Market Income**

< 10,000	0.121%	0.137%	0.111% **	0.100% **
10,000 - 30,000	0.128%	0.144% *	0.136% **	0.126% **
30,000 - 60,000	0.125%	0.135%	0.173%	0.165%
60,000 - 100,000	0.296% **	0.303% **	0.281% **	0.231% **
100,000 - +	0.761% **	0.781% **	0.472% **	0.301% **

**Market Income interaction with post-1990 dummy**

< 10,000		0.126%		0.180% *
10,000 - 30,000		0.125% *		0.174%
30,000 - 60,000		0.135%		0.165%
60,000 - 100,000		0.145% *		0.202% **
100,000 - +		0.143%		0.277% **

**Calendar Year**

1983	0.125%	0.135%	0.173%	0.165%
1984	0.132%	0.141%	0.168%	0.160%
1985	0.098% **	0.105% **	0.135% **	0.129% **
1986	0.090% **	0.096% **	0.136% **	0.130% **
1987	0.054% **	0.058% **	0.089% **	0.085% **
1988	0.070% **	0.075% **	0.115% **	0.110% **
1989	0.079% **	0.084% **	0.111% **	0.106% **
1990	0.077% **	0.083% **	0.115% **	0.109% **
1991	0.098% **	0.098% **	0.128% **	0.125% **
1992	0.114% *	0.115% **	0.161%	0.158%
1993	0.116% *	0.116% **	0.158% *	0.155%
1994	0.137% *	0.137%	0.171%	0.168%
1995	0.144% **	0.144%	0.176%	0.172%
1996	0.168% **	0.168% **	0.217% **	0.213% **
1997	0.181% **	0.181% **	0.240% **	0.235% **
1998	0.172% **	0.172% **	0.223% **	0.218% **
1999	0.169% **	0.169% **	0.223% **	0.218% **

One asterisk (\*) indicates significance at the 5% level. Two asterisks (\*\*) indicates significance at the 1% level.

Table 1b - Leaving Models: Predicted Probabilites, Leaving Definition B

	Leaving Definition B			
	Males		Females	
	I	II	I	II
Base Level	0.158% **	0.166% **	0.199% **	0.191% **
<b>Age</b>				
18-24	0.130% **	0.135% **	0.206%	0.198%
25-34	0.246% **	0.258% **	0.315% **	0.302% **
35-44	0.158%	0.166%	0.199%	0.191%
45-54	0.120% **	0.125% **	0.148% **	0.142% **
55-64	0.082% **	0.086% **	0.091% **	0.088% **
65- +	0.043% **	0.045% **	0.048% **	0.046% **
<b>Family Status</b>				
Couple & Kids	0.158%	0.166%	0.199%	0.191%
Couple No Kids	0.053% **	0.056% **	0.071% **	0.068% **
Single & Kids	0.194% **	0.203% **	0.185% **	0.178% **
Single No Kids	0.130% **	0.136% **	0.192%	0.184%
<b>Province/Region</b>				
Ontario	0.158%	0.166%	0.199%	0.191%
Atlantic	0.098% **	0.103% **	0.119% **	0.115% **
British-Columbia	0.184% **	0.194% **	0.245% **	0.235% **
North & Other	0.978% **	1.023% **	1.953% **	1.869% **
Prairies	0.154% *	0.161%	0.194%	0.186%
Quebec	0.053% **	0.056% **	0.061% **	0.059% **
<b>Minority Language</b>				
English in Quebec	0.713% **	0.749% **	0.910% **	0.874% **
French outside Q	0.279%	0.292%	0.387%	0.372%
Majority languag	0.158%	0.166%	0.199%	0.191%
<b>Area Size of Residence</b>				
000-14,000	0.087% **	0.091% **	0.106% **	0.102% **
015-99,000	0.099% **	0.104% **	0.115% **	0.110% **
100,000 +	0.158%	0.166%	0.199%	0.191%
<b>Provincial Unemployment Rate</b>				
8.7	0.158%	0.166%	0.199%	0.191%
9.7	0.157%	0.165%	0.198%	0.190%
<b>Unemployment Insurance</b>				
None	0.158%	0.166%	0.199%	0.191%
Some	0.083% **	0.087% **	0.151% **	0.145% **

**Market Income**

< 10,000	0.149% **	0.160%	0.142% **	0.130% **
10,000 - 30,000	0.154%	0.166%	0.164% **	0.154% **
30,000 - 60,000	0.158%	0.166%	0.199%	0.191%
60,000 - 100,000	0.348% **	0.344% **	0.302% **	0.267% **
100,000 - +	0.757% **	0.700% **	0.459% **	0.299% **

**Market Income interaction with post-1990 dummy**

< 10,000		0.162%		0.204% *
10,000 - 30,000		0.160%		0.196%
30,000 - 60,000		0.166%		0.191%
60,000 - 100,000		0.183% *		0.215%
100,000 - +		0.201% **		0.314% **

**Calendar Year**

1983	0.158%	0.166%	0.199%	0.191%
1984	0.157%	0.164%	0.184% *	0.177% *
1985	0.131% **	0.137% **	0.159% **	0.153% **
1986	0.121% **	0.126% **	0.158% **	0.152% **
1987	0.088% **	0.092% **	0.119% **	0.114% **
1988	0.122% **	0.127% **	0.159% **	0.152% **
1989	0.120% **	0.125% **	0.144% **	0.139% **
1990	0.117% **	0.123% **	0.152% **	0.146% **
1991	0.135% **	0.133% **	0.173% **	0.170% **
1992	0.159%	0.158%	0.196%	0.193%
1993	0.159%	0.158%	0.197%	0.194%
1994	0.161%	0.159%	0.190%	0.187%
1995	0.167%	0.166%	0.195%	0.192%
1996	0.192% **	0.190% **	0.232% **	0.228% **
1997	0.200% **	0.198% **	0.252% **	0.248% **
1998	0.190% **	0.187% **	0.237% **	0.233% **
1999	0.172% *	0.170%	0.211%	0.208% *

One asterisk (\*) indicates significance at the 5% level. Two asterisks (\*\*) indicates significance at the 1% level.

Table 1c - Leaving Models: Predicted Probabilites, Leaving Definition C

	Leaving Definition C			
	Males		Females	
	I	II	I	II
<b>Base Level</b>	0.194% **	0.180% **	0.243% **	0.253% **
<b>Age</b>				
18-24	0.202% *	0.186%	0.270% **	0.281% **
25-34	0.310% **	0.287% **	0.381% **	0.397% **
35-44	0.194%	0.180%	0.243%	0.253%
45-54	0.145% **	0.134% **	0.176% **	0.183% **
55-64	0.095% **	0.089% **	0.106% **	0.111% **
65- +	0.051% **	0.047% **	0.056% **	0.059% **
<b>Family Status</b>				
Couple & Kids	0.194%	0.180%	0.243%	0.253%
Couple No Kids	0.068% **	0.064% **	0.089% **	0.093% **
Single & Kids	0.238% **	0.222% **	0.223% **	0.233% **
Single No Kids	0.145% **	0.136% **	0.224% **	0.234% **
<b>Province/Region</b>				
Ontario	0.194%	0.180%	0.243%	0.253%
Atlantic	0.143% **	0.134% **	0.170% **	0.178% **
British-Columbia	0.219% **	0.204% **	0.291% **	0.303% **
North & Other	0.745% **	0.688% **	1.181% **	1.226% **
Prairies	0.188% *	0.175%	0.234% *	0.244% *
Quebec	0.071% **	0.066% **	0.080% **	0.083% **
<b>Minority Language</b>				
English in Quebec	0.787% **	0.735% **	1.049% **	1.095% **
French outside Q	0.335%	0.310%	0.412%	0.429%
Majority languag	0.00193548	0.00180292	0.00242526	0.00252811
<b>Area Size of Residence</b>				
000-14,000	0.118% **	0.110% **	0.139% **	0.145% **
015-99,000	0.129% **	0.120% **	0.151% **	0.158% **
100,000 +	0.194%	0.180%	0.243%	0.253%
<b>Provincial Unemployment Rate</b>				
8.7	0.194%	0.180%	0.243%	0.253% *
9.7	0.193%	0.179%	0.240%	0.250%
<b>Unemployment Insurance</b>				
None	0.194%	0.180%	0.243%	0.253%
Some	0.094% **	0.088% **	0.193% **	0.201% **

**Market Income**

< 10,000	0.162% **	0.139% **	0.171% **	0.183% **
10,000 - 30,000	0.178% **	0.163% **	0.194% **	0.203% **
30,000 - 60,000	0.194%	0.180%	0.243%	0.253%
60,000 - 100,000	0.406% **	0.321% **	0.387% **	0.354% **
100,000 - +	0.896% **	0.640% **	0.578% **	0.370% *

**Market Income interaction with post-1990 dummy**

< 10,000		0.209% **		0.242%
10,000 - 30,000		0.187%		0.252%
30,000 - 60,000		0.180%		0.253%
60,000 - 100,000		0.241% **		0.303% *
100,000 - +		0.277% **		0.476% **

**Calendar Year**

1983	0.194%	0.180%	0.243%	0.253%
1984	0.192%	0.179%	0.214% **	0.223% **
1985	0.157% **	0.146% **	0.190% **	0.198% **
1986	0.145% **	0.135% **	0.184% **	0.192% **
1987	0.125% **	0.116% **	0.152% **	0.158% **
1988	0.147% **	0.137% **	0.191% **	0.199% **
1989	0.136% **	0.127% **	0.165% **	0.172% **
1990	0.124% **	0.115% **	0.157% **	0.164% **
1991	0.131% **	0.123% **	0.153% **	0.153% **
1992	0.163% **	0.154% **	0.202% **	0.202% **
1993	0.165% **	0.156% **	0.205% **	0.205% **
1994	0.165% **	0.156% **	0.194% **	0.194% **
1995	0.172% **	0.162% +	0.203% **	0.204% **
1996	0.199%	0.188%	0.238%	0.239%
1997	0.204%	0.192%	0.258% *	0.258%
1998	0.195%	0.183%	0.243%	0.243%
1999	0.175% *	0.164% *	0.211% **	0.211% **

One asterisk (\*) indicates significance at the 5% level. Two asterisks (\*\*) indicates significance at the 1% level.

Table 2: Predicted Probability of Return

Sex Leavetype Returntype	Males		Females	
	A A	C B	A A	C B
<b>Age</b>				
Base Level	2.95% **	2.01% **	4.38% **	5.31% **
18-24	4.08% **	2.37% **	6.27% **	4.12% **
25-34	3.78% **	2.42% **	5.35% **	4.54% **
35-44	2.95%	2.01%	4.38%	5.31%
45-54	2.88%	1.88%	4.19%	3.82% **
55-64	3.09%	1.96%	4.45%	2.64% **
65- +	1.96% **	1.40% **	3.05% **	1.91% **
<b>Family Status</b>				
Couple & Kids	2.95%	2.01%	4.38%	5.31%
Couple No Kids	3.33%	1.84%	5.08%	3.31% **
Single & Kids	2.54% **	1.80% **	4.12%	4.11% **
Single No Kids	3.17%	2.01%	5.46% **	4.02% **
<b>Province/Region</b>				
Ontario	2.95%	2.01%	4.38%	5.31%
Atlantic	3.44%	2.24%	4.83%	4.58% *
British-Columbia	3.35% *	2.26% **	4.84%	4.56% **
North & Other	3.65%	1.69%	4.99%	4.37%
Prairies	4.11% **	2.63% **	5.96% **	5.71% *
Quebec	4.16% **	2.51% **	6.08% **	5.51%
<b>Minority Language</b>				
English in Quebec	2.08% **	1.58% **	2.75% **	4.29% **
French outside Q	4.46% **	2.12%	5.92%	4.91%
Majority languag	2.95%	2.01%	4.38%	5.31%
<b>Area Size of Residence</b>				
000-14,000	3.26% *	2.18% *	4.89% *	5.18%
015-99,000	3.27%	2.14%	4.58%	5.52%
100,000 +	2.95%	2.01%	4.38%	5.31%
<b>Unemployment Insurance</b>				
None	2.95%	2.01%	4.38%	5.31%
Some	3.06%	2.24% *	4.61%	6.16% **
<b>Market Income</b>				
< 10,000	1.87% **	1.51% **	3.55% **	4.83% **
10,000 - 30,000	2.32% **	1.73% **	3.72% **	4.78% **
30,000 - 60,000	2.95%	2.01%	4.38%	5.31%
60,000 - 100,000	4.02% **	2.74% **	4.78%	5.70%
100,000- +	4.07% **	3.05% **	4.53%	4.57%

**Market Income interaction with Year post-1990 dummy**

	< 10,000	10,000 - 30,000	30,000 - 60,000	60,000 - 100,000	100,000- +
<b>Duration Term</b>					
1 year	2.95%	2.01%	4.38%	5.31%	
2 years	4.28% **	3.12% **	5.76% **	4.12% **	
3 years	3.65% **	2.50% **	4.49%	2.88% **	
4 years	2.51% *	2.34% *	3.05% **	2.09% **	
5 years	2.00% **	2.00%	2.35% **	1.60% **	
6 years	1.63% **	1.57% **	2.17% **	1.15% **	
7 years	1.34% **	1.11% **	1.46% **	0.89% **	
8 years	1.00% **	0.76% **	1.15% **	0.75% **	
9 years	0.83% **	0.53% **	0.98% **	0.65% **	
more than 9 years	0.48% **	0.41% **	0.64% **	0.39% **	
<b>Calendar Year</b>					
1984	2.95%	2.01%	4.38%	5.31%	
1985	3.10%	2.30%	2.91% *	5.83%	
1986	3.54%	5.93% **	3.57%	11.51% **	
1987	2.56%	1.93%	2.51% **	5.54%	
1988	3.56%	2.17%	2.85% **	6.44%	
1989	2.44%	1.53%	3.11% *	5.96%	
1990	2.27%	1.47% *	2.35% **	4.99%	
1991	2.27%	1.67%	2.48% **	6.15%	
1992	1.93% *	5.19% **	1.43% **	5.24%	
1993	2.23%	1.86%	2.52% **	21.91% **	
1994	2.67%	2.08%	2.35% **	12.00% **	
1995	2.58%	2.18%	2.53% **	16.59% **	
1996	2.38%	2.11%	2.51% **	15.97% **	
1997	2.68%	2.26%	2.62% **	10.05% **	
1998	2.69%	3.13% **	3.22% *	13.75% **	
1999	3.08%	3.81% **	3.39%	14.17% **	

One asterisk (\*) indicates significance at the 5% level. Two asterisks (\*\*) indicates significance at the 1% level.