

- as per contract (new one - \$20,000)  
- as sent to Gen. Inl. of Higher Ed.

**THE SCHOOL-TO-WORK TRANSITION OF CANADIAN POST-  
SECONDARY GRADUATES: A CROSS-COHORT, LONGITUDINAL  
ANALYSIS USING THE NATIONAL GRADUATES SURVEYS**

81F0015XPE

c.3

by

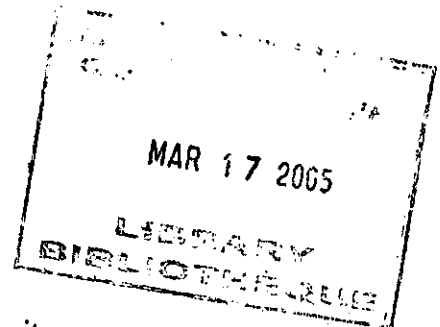
**Ross Finnie**

School of Policy Studies at Queen's University

and

Business and Labour Market Analysis Division, Statistics Canada.

April 1999



This research was made possible by financial support received from the Human Capital and Education Studies Division of Human Resources Development Canada (Applied Research Branch). A Social Sciences and Humanities Research Council grant provided assistance for an earlier phase of the work. Helpful comments were received from Chris Ferrall, Doug Giddings, Philip Jennings, Garnett Picot, Ted Wannell, and two anonymous reviewers. Excellent research assistance was provided by Michel Villeneuve, Marc Frenette, and Roger Sceviour.



## **ABSTRACT**

This paper reports the results of an empirical analysis of the school-to-work transition of Canadian post-secondary graduates based on three waves of the National Graduates Surveys, representing those who successfully completed their programmes at Canadian colleges and universities in 1982, 1986, and 1990. Information was gathered during interviews conducted two and five years after graduation for each group, thus facilitating a dynamic analysis of the critical early post-graduation years, broken down by gender and specific level of education (College, Bachelor's, Master's, Ph.D.) Outcomes analysed include the number and characteristics of graduates (by level, sex, and discipline); the number of graduates who went on to further degrees and the types of degrees thus obtained; the job-education skill match and the relationship between the current job's educational pre-requisites and graduates' qualifications; job satisfaction; the overall evaluation of the educational programme; and inter-provincial mobility in the post-graduation years. Various implications of the findings are discussed.



## I. INTRODUCTION

Graduating from college or university and moving into the labour force is an important transition, yet our understanding of it is – while growing – still quite limited.<sup>1</sup> What are the employment rates in the years following graduation? What kind of jobs are being found – part-time or full-time, temporary or permanent – and what sort of movement is there across these different types of jobs? How do earnings levels evolve over the early years in the labour market? What is the level of job satisfaction – soon after graduation and a few years later? To what extent do graduates use the skills they have learned at school, and how do their qualifications line up against the pre-requisites of their jobs? What is the extent of job turnover in the early years following graduation? How mobile are graduates across provincial boundaries? How do graduates evaluate their programmes of study?

The contribution of this paper to our understanding of such issues is to report the results of an empirical analysis of the school-to-work transition of Canadian post-secondary graduates based on three waves of the National Graduates Surveys, which comprise large, representative samples of those who successfully completed their programmes at Canadian colleges or universities in 1982, 1986, and 1990, with information gathered during interviews conducted two and five years after graduation for each group of graduates (1984/87, 1988/91, 1992/95).

The NGS databases are well suited to such an undertaking, with their size and representative structure, the selection of interesting variables available, the longitudinal nature of the information contained on the files, and the availability of three cohorts of data providing the opportunity for a rather uniquely extensive and detailed dynamic view of the school-to-work transition of Canadian post-secondary graduates in the 1980s and 1990s, a period generally thought to have been one of significant educational and labour market changes for younger workers.<sup>2</sup>

---

<sup>1</sup> See Krahn [1996] for a review of the existing evidence in the Canadian context, and OECD [1996] for an international perspective.

<sup>2</sup> Beaudry and Green [1997], Beach and Slotsve [1996], Finnie [1997a], Morissette and Bérubé [1996], Morissette, Myles, and Picot [1995], Picot [1997], Riddell [1995], and Zyblock [1996] all report that the earnings levels of younger workers have been declining in relative and/or absolute terms; while Beaudry and Green, Morissette and Bérubé, and a series of papers by Finnie [1997b, c, d] indicate that younger workers' movements up the earnings ladder over the early years in the labour market have also slowed.



This particular paper covers the following aspects of the school-to-work transition: the number of graduates and their distribution by level, sex, and discipline; the number of graduates who have gone on to obtain additional degrees and the type of these new diplomas (including a focus on "back-tracking" to a lower level); the job-education skill match and the relationship between the current job's educational pre-requisites and the graduate's qualifications; job satisfaction; the overall evaluation of the educational programme; and geographical mobility. The entire study covers graduates at the college level and all three university levels (Bachelor's, Master's, and Ph.D.), and outcomes are broken down by sex, thus providing for gender comparisons throughout.<sup>3</sup>

The results of this paper should be of interest to a variety of readerships. Labour market scholars should be interested in the dynamic picture the analysis provides of early career outcomes; education policy experts and university administrators should find the analysis relevant to a variety of education-related issues concerning how well colleges and universities have been doing in preparing young people for interesting, meaningful, and productive careers at a time of shifting labour markets and an evolving post-secondary system; while graduates who have been through the transition might be interested in comparing their own experiences to those of others, while current and future students should be able to make more informed choices by knowing better what to expect in the post-graduation years.

The paper is laid out in a straightforward fashion. The next section describes the National Graduates Surveys databases and the construction of the working samples used in the analysis. This is followed by the presentation of the empirical findings. The concluding section summarizes the major findings, discusses some of the implications of the results, and offers suggestions for further research.

---

<sup>3</sup> This is one of a series of related papers by the author based on the NGS data: Finnie [1999a] focuses on the employment and earnings patterns of graduates, Finnie [1999b] analyses the changes in the structure of graduates' earnings across cohorts using a regression based decomposition approach, Finnie [1999c, d] look at Bachelor's graduates' outcomes by field of study, while Finnie [1999e] comprises a longer working paper from which the present paper is derived and Finnie [1999f] is a complementary piece which focuses on the labour market aspects of the school-to-work transition. In other joint work, Betts, Ferrall and Finnie [1998] use a hazard model framework to look at the time to the first job, while Betts, Ferrall and Finnie [1999] analyse the effects of the quality of post-secondary institutions on earnings; Burbidge and Finnie [1999] investigate inter-provincial mobility at the baccalaureate level; Finnie and Garneau [1996] and Schwartz and Finnie [1996] analyse student borrowing; Finnie and Wannell [1999] and Abbott, Finnie and Wannell [1999] focus on gender comparisons; and Lavoie and Finnie [1999] analyse outcomes for science and technology graduates, while Lavoie and Finnie [1998a, b, c] investigate the record for engineering graduates and their role in the accumulation of technology.



## **II. THE DATA<sup>4</sup>**

### **II.1 The National Graduates Surveys**

The National Graduates Surveys (and Follow-Up) databases, developed by Statistics Canada in partnership with Human Resources Development Canada, are well suited to this analysis for a number of reasons. First, the NGS files are quite large, with each survey including over 30,000 individuals, thus facilitating the sort of detailed analysis of the post-graduation experience that no general survey database (such as the Survey of Consumer Finances, General Social Survey, and Survey of Labour Income Dynamics) could ever provide, while the representative nature of the databases allows the results to be safely generalised to the population of graduates at large.<sup>5</sup>

Second, and again stemming from the particular focus of the NGS databases, the files include an interesting array of variables covering graduates' educational and early labour market experiences. These include not only more conventional measures, such as employment status and earnings levels, but also others more specifically related to the particular experiences of recent post-secondary graduates going through the school-to-work transition, such as the extent to which the skills learned at school are used in the current job, evaluations of the job and the education programme from which the individual graduated, and so forth.

Third, the longitudinal element of the NGS surveys, stemming from the two interviews conducted for each cohort two and five years following graduation, facilitates a dynamic tracking of the school-to-work transition, with the resulting perspective precisely situated as of the two specific points in time relative to graduation represented by the interview dates, while covering a relatively extended period of time – the first five years after leaving school.

---

<sup>4</sup> A more detailed discussion of the NGS data, the construction of the working samples, and the variables used in the analysis (some of which depart from similarly named variables available on the raw NGS databases) is contained in Finnie [1999e].

<sup>5</sup> The NGS databases are based on a stratified sampling scheme (by province, level of education, and field of study), with all results reported below reflecting the appropriate sample weights (see Finnie [1999e] for further discussion). The databases also include trade and vocational school graduates, but these individuals are not included in the present analysis.



Finally, the availability of data for three different cohorts allows for the identification of the more enduring patterns versus those which have been shifting over time, and – more particularly – permits us to see if there has been a general deterioration of fortunes over the period covered, generally thought to have been one of important labour market changes, especially for younger workers, while also bringing the record as up to date as possible.<sup>6,7</sup>

In summary, the three NGS databases uniquely provide for a focused, detailed, and dynamic analysis of Canadian post-secondary graduates in the critical early years following graduation from the early 1980s into the mid-1990s. The data are, in fact, not only interesting and unique in a Canadian context, but to the best of this author's understanding are unequalled in the world in terms of offering large representative surveys covering various elements of the school-to-work transition over the last decade and a half.

## **II.2 Selection of the Working Samples**

In the first part of the analysis, which focuses on the characteristics of graduates (by level, sex, and field of study), virtually no restrictions are imposed on the data apart from deleting the very few observations for which the relevant information is missing. After this, however, the analysis is limited to graduates who were successfully contacted and who completed both interviews so that the tracking of outcomes from two to five years following graduation would not mix the “composition effects” of the changing samples with the actual dynamics of the school-to-work transition.<sup>8</sup>

---

<sup>6</sup> Beaudry and Green [1997], Beach and Slotsve [1996], Finnie [1997a], Morissette and Bérubé [1996], Morissette, Myles, and Picot [1995], Picot [1997], Riddell [1995], and Zyblock [1996] all report that the earnings levels of younger workers have been declining in relative and/or absolute terms; while Beaudry and Green, Morissette and Bérubé, and a series of papers by Finnie [1997b, c, d] indicate that younger workers' movements up the earnings ladder over the early years in the labour market have also slowed.

<sup>7</sup> The first survey of a 1995 graduates has been carried out, but those data were not ready for analysis at the time this analysis was begun and will obviously lack the second interview data (which are critical) until after those are collected in the year 2000 and then processed.

<sup>8</sup> See Finnie [1999e] for further discussion of the relevant issues. Response rates were around 80 percent for the first interview, and 80 to 90 percent of these individuals were successfully interviewed a second time (as documented in Table 1, presented below).



After looking at the number of graduates who obtained an additional degree by either of the two interviews (*i.e.*, subsequent to the one received in 1982, 1986, or 1990 representing the basis of inclusion into the samples), such individuals were also excluded from the analysis at that point.<sup>9</sup> This was done on the grounds that such graduates no longer belonged to the original education group (*e.g.*, a Bachelor's graduate might have become a Master's graduate and perhaps changed disciplines) and had in any event been mixing school and work in a way likely to affect the labour market outcomes upon which much of this analysis is focused. Including on-going students would also have thrown off the precise post-graduation time frame corresponding to the two interview dates (*i.e.*, two and five years after graduation) which holds for the non-continuing group. Finally, little would be gained in including those who obtained further degrees, since such individuals are already represented in the NGS databases at those later degree levels. This selection criterion allows the analysis to be focused on a relatively well-defined and homogenous group of graduates who had completed their studies and were moving through the school to work transition.

Third, for the analysis of job-related outcomes, part-time workers who cited school as the reason for their only partial involvement in the labour market were also excluded from the relevant period's calculations on the grounds that such individuals were – by definition – still principally students and had therefore not yet entered the school-to-work transition phase of their careers in earnest.<sup>10</sup> Other part-time workers are, on the other hand, included in the analysis, lending it a broad labour market base. The few individuals who were other than regular paid workers (family workers, volunteers, *etc.*) or who had unreasonably low earnings were also dropped at this stage.<sup>11</sup>

---

<sup>9</sup> That is, graduates who had obtained a new degree/certificate/diploma by the first interview were deleted from both periods' analysis, while those who obtained a new diploma only by the second interview were included in the first period calculations (as long as they met the other selection criteria) but not the second. This selection procedure results in samples which are as inclusive as possible for each survey year. See Finnie [1999e] for a detailed description of this selection procedure.

<sup>10</sup> An analysis of the 1982 cohort, for which enrolment status as of the interview dates is given in the NGS files (which is not the case for the later cohorts), revealed that most individuals eliminated by this restriction (part-time – student) were in fact full-time students and, conversely, that most full-time students were eliminated by this condition, precisely as wished.

<sup>11</sup> The latter condition was defined as being a full-time worker having less than \$5,000 in annual earnings (the equivalent of a wage of about \$3.20 per hour for 30 hours of work per week over 52 weeks).



Finally, observations were deleted on a variable-by-variable basis where the required information was missing, typically resulting in a very small numbers of further deletions.

### **II.3 The Variables Used in the Analysis**

The variables included in this analysis are mostly somewhat non-conventional in terms of standard labour force surveys, but are included on the NGS files due to their focus on the particular circumstances of recent graduates – and are exploited here to that effect. This section provides a brief description of each of the measures employed, while further documentation, including the precise construction of each of the measures, the comparability of the measures across survey years, and where the variables used here differ from similar measures available directly on the NGS files, is found in Finnie [1999e].

**Further studies:** A straightforward indicator of having received another college or university diploma since graduation in the baseline year (1982, 1986, or 1990).<sup>12</sup>

**The job-education skill match:** The extent to which the skills learned in school were used in the current job held, as reported by the graduate. The specific figures reported below represent the means of an index running from 0 to 100 created by the author from the categorical information available in the raw NGS data derived from the question “Do you use any of the skills acquired through the education programme in your job?”, with higher values indicating closer job-education skill matches. More specifically, for the 1982 and 1986 cohorts, the responses of “no” and “yes” were assigned index values of 0 and 100 (corresponding to the response options available for those surveys), while for the 1990 cohort, values of 0 (“not at all”), 33 1/3 (“very little”), 66 2/3 (“to some extent”), or 100 (“to a great extent”) were assigned. The measure is, therefore, consistent for both years of each cohort, but is not necessarily directly comparable across the two earlier cohorts and the last cohort. (The standard errors of the means are also indicated; see Finnie [1999e] for further description of those calculations.)

---

<sup>12</sup> Represents the first such new degree received for the 1986 and 1990 cohorts; the highest new degree received for the 1982 cohort..



**The educational pre-requisites of the job versus the individual's qualifications:** Represents the level of education required for the job as compared to the diploma obtained at graduation, based on comparing the responses to the question: "When you were hired...what were the minimum educational qualifications required?" to the degree received in 1982, 1986, or 1990. The response options varied across the survey years, but were converted to the broader categories (below College, College, Bachelor's, Master's, and Ph.D.) which correspond to the degree level information available for the 1982 cohort in order to have the most consistent measure possible across surveys, even as such comparability likely remains imperfect, and to focus the measure on the more significant differences between pre-requisites and qualifications.

**Job satisfaction:** The reported results represent the means of an index similar to the one constructed for the job-education skill match, again created from the categorical responses given in the NGS data, in this case based on the responses to the question "Considering all aspects of your job, how satisfied are you with it?", with higher values indicating greater overall job satisfaction. The measures should be directly comparable across all survey years, since the response options were relatively similar: "very satisfied", "satisfied", "dissatisfied", "very dissatisfied" in the 1986 and 1990 survey years (1988/91 and 1992/95); and the last two options differing only very slightly for the first cohort: "not satisfied", "not at all satisfied"

**Overall evaluation of the education programme:** Based on the question: "Given your experience since completing the requirements for the diploma/degree...would you have selected the same educational program, a different program, or no program?" for the 1982 and 1986 cohorts, and a similar question regarding the specific field of study for the 1990 cohort, with these different treatments driven by the different information available across the various surveys. The tables report the mean score of an index constructed from the responses to these questions similar to those created for the job-education skill match and job satisfaction variables discussed above, essentially representing the percentage of graduates who said they would have chosen the same programme again.

**Inter-provincial migration:** A straightforward measure of a change in the province of residence i) from graduation to the first interview, ii) between the two interviews, iii) either one or the other.



### **III. THE EMPIRICAL FINDINGS**

The discussion of the empirical findings is structured along three principal themes:

- the general dynamic nature of the school-to-work transition as viewed two and five years following graduation;
- differences in the patterns by level of education and sex;
- comparison of the results across cohorts.

#### **III.1 The Distribution of Graduates by Sex, Level and Field**

##### ***Sample Sizes and the Underlying Populations of Graduates***

Table 1 shows the sample sizes for each of the cohorts. The unweighted numbers represent the number of individuals included in each of the NGS databases (with essentially no restrictions imposed), while the weighted numbers represent estimates of the underlying national population of graduates in each of the relevant years. (All results presented below reflect those weights.)

The first striking aspect of these numbers is the large sample sizes, with the NGS thus facilitating an analysis at a level of detail and level of robustness that would be impossible with other more general surveys. Even at the Ph.D. level (where the NGS databases effectively represent complete censuses of the entire population of graduates) there are between 600 and 1,650 observations across the various surveys, while the sample sizes are well into the thousands at the other levels (College, Bachelor's, Master's).

Also notable are the increases in the overall number of graduates over time, from approximately 149,700 for the first cohort (based on the 1984 weighted numbers) to 182,300 in the most recent group (1992 weighted numbers), an increase of 21.8 percent, with the later numbers being down slightly (2.2 percent) from the middle cohort (186,400 graduates). Thus, the number of post-secondary graduates increased significantly from the early 1980s to middle of that decade, then dropped off slightly in the early 1990s.



### *The Distribution of Graduates by Degree Level*

Table 2a shows the distribution of graduates by degree level. Both the levels and the changes in these levels over time are interesting. We can see, first of all, that College graduates comprised a declining share of post-secondary graduates over the period covered by the three cohorts, falling from 35.6 percent of all graduates in 1982 to 31.1 percent in 1990. These declines were matched by increases in the shares of graduates at the other levels: from 55.8 percent to 59.0 percent on the part of Bachelor's graduates, from 8.0 percent to 8.8 percent at the Master's level, and from .6 percent to 1.1 percent for Ph.D. graduates.

The overall rise in the number of post-secondary graduates across cohorts noted above was, therefore, mostly driven by increases at the Bachelor's level, these making up approximately 24,000 (or a more than proportionate 74 percent) of the 32,600 increase. On the other hand, the increases in the numbers of graduates were, in proportional terms, even greater at the Master's and Ph.D. levels. That is, the rise in the number of Master's graduates (from 11,900 to 16,000) made up 12.6 percent of the total increase in the number of graduates from 1982 to 1990, but this is considerably higher than their 8-9 percent share of the number of graduates in each of those years. Similarly, the increases at the Ph.D. level (from 986 in 1982 to 2051 in 1990) made up 3.3 of the total expansion of post-secondary graduates, but this was far in excess of their 0.7 - 1.1 percentage shares of the total number of post-secondary graduates in those two cohorts.

Otherwise put, the growth rates in the numbers of graduates from 1982 to 1990 rose monotonically with degree level: 6.6 percent at the College level, 28.7 percent at the Bachelor's level, 34.2 percent at the Master's level, and a rather remarkable 108.0 percent at the Ph.D. level.

Any general discussion of post-secondary education in Canada should probably take such trends into account. What is the role of graduate level education in the new "knowledge based economy", and are the relatively large proportional increases at the Master's and Ph.D. levels a positive development in this regard, or simply a case of "too little too late"? On the other hand, what does the relative shift away from diplomas at the College level mean in terms of the broad goals of satisfying students and equipping the next generations of labour force participants with the most useful forms of human capital



in the most efficient manner? Is it, for example, possible that some of the “new” Bachelor’s level university graduates might have been better off attending College, with the savings from such a shift (universities are considerably more costly to operate than colleges) ploughed back into the system in a manner which increased the quality of education (and/or decreased the cost) at all levels? And so forth.

### *The Distribution of Graduates by Sex*

Table 2a also shows the percentage of female graduates at each level. The female shares are generally lower at the higher degree levels for each cohort, but these cross-level gaps all narrowed over time. Thus, in the latest cohort women continued to make up more than one-half of all graduates at the College and Bachelor’s levels (59 and 56 percent respectively), very close to half at the Master’s level (48 percent), and just over one-third at the Ph.D. level (36 percent).

### *The Distribution of Graduates by Discipline*

The distribution of graduates by field of study and the share of female graduates within each discipline at the four degree levels are shown in the various parts of Table 2b. Interestingly, the distributions by discipline were relatively stable at all levels, with the only shifts really worth mentioning being a reduction in the share of education graduates at the Master’s and Ph.D. levels; and a decline in “other social sciences” graduates (*i.e.*, all social sciences except for commerce, economics, and law, which are shown separately) in the final cohort and a moderate movement towards science and technology degrees at the Ph.D. level – the latter comprising what could be seen as a favourable development in terms of the country’s accumulation of technology, a subject pursued in depth Lavoie and Finnie [1999].

It is perhaps surprising that the distribution of graduates by field was so stable over time, leading to a number of related questions. Was this stability primarily due to demand side factors (*i.e.*, students’ preferences, including those related to labour market developments), supply side constraints (limited course offerings and places in programmes), or some combination of the two? Has the “production” of graduates in different fields been as fluid as it should have been as employment opportunities (and employers’ needs) have shifted over time? Should the general lack of secular shifts in the distribution of graduates by field of study be cause for worry as the economy moves in directions which would seem



to favour certain types of graduates over others? As an important specific example, the share of computer science graduates did not increase in any dramatic fashion across cohorts, despite the evident need for a greater number of graduates with these skills.

As for the share of female graduates, there has obviously been tremendous variation by discipline at all degree levels, but there are perhaps few real surprises in this regard. Focusing on the Bachelor's and Master's level graduates (the figures are more volatile at the Ph.D. level due to the smaller number of observations, while the College level distributions generally follow those at the university level), women have tended to be over-represented in teaching/education, fine arts/humanities, the "other" social sciences, and other health disciplines (*i.e.*, apart from doctors, dentists, pharmacists, and the like – dominated by nursing graduates). Women have, on the other hand, been under-represented in commerce (especially at the Master's level), economics, engineering, computer science, and math and the other pure sciences. Finally, the male-female shares have been relatively equal in law (the figures at the Master's level are unstable due to the relatively small numbers involved), the agricultural and biological sciences, veterinary sciences, and medical professions.

But again perhaps the most interesting finding is that the gender patterns did not change a great deal across cohorts, although an increase in the proportion of women in commerce, especially at the Bachelor's level, is worth noting. Other than this, there were no clear shifts in the general tendencies just described and most disciplines continued to be more or less as male or female dominated in the last cohort as the first. The continuing under-representation of women in the more technical disciplines is particularly noteworthy, especially at a time when it is thought that we should be trying to increase the numbers of such graduates.

### **III.2 Further Studies**

#### ***New Diplomas***

Table 3 shows the percentage of graduates who obtained a new diploma between graduation in the survey base year (1982, 1986, or 1990) and either of the two interviews. These are also graphed in Figure 1. Bachelor's level graduates were, not surprisingly, the most likely to go on to complete another degree, with rates mostly in the 15 percent range as of two years following graduation, and



from 20 to 34 percent by five years later, these rates varying by sex and cohort.

Interestingly, the rates were uniformly lower for the second cohort – but only as of the second interview. These findings suggest there might be roughly two types of Bachelor's graduates who continue with their studies: those who go straight through after finishing their undergraduate degrees and who might be committed to this path more-or-less regardless of the prevailing labour market conditions, and those who make initial forays into the labour market and subsequently return to school if they find their employment opportunities to be relatively limited.

That is, the relatively high unemployment rates experienced in the early post-graduation years by the 1982 and 1990 cohorts (1983 and 1984 were recession years, while the early 1990s were marked by another recession followed by a very lukewarm labour market recovery – see Finnie [1999a]) may have resulted in a higher proportion of these graduates undertaking further studies, while the lower unemployment rates faced by the 1986 cohort following graduation (1987 through 1989 were years of strong economic growth) may have diminished this tendency.

Similar patterns hold at the other levels: the percentage of graduates who obtained an additional degree is similar across all three cohorts as of two years following graduation, but considerably lower as of five years out for the middle cohort relative to the first and last. This relationship between further studies and the business cycle is, furthermore, generally stronger for men than women, which is consistent with the hypothesized market-enrolment connection given that the labour force attachment of male graduates was generally greater than that of female graduates as well (more graduates in full-time and permanent jobs, *etc.*)

These results raise questions regarding the factors which affect the decision to go on to further studies and *who* is likely to do so. Although we would generally expect decisions about pursuing further studies to be at least somewhat related to current labour market opportunities, it would be interesting to explore this relationship in more detail, and to know to what degree the graduate school system, in particular, is attracting individuals with (relatively) more limited labour market opportunities rather than those who would make better graduate school candidates – and better graduate level *graduates* – *per*



se.<sup>13</sup>

With the precise mix of graduates at the College, Bachelor's, Master's, and Doctoral levels – in terms of both their numbers and their quality – now generally recognised as being a very important element of the “knowledge based economy”, further investigations along these lines would seem worth pursuing. The ultimate goal might be to obtain reliable estimates of the private and social returns to each degree level, to determine the factors which affect graduates' decisions to continue with their studies, and to identify the policy measures which could help ensure the optimal number and type of graduates using the most efficient policy levers available. The numbers presented here could provide a useful starting point for such investigations, while the NGS data could perhaps be useful for pursuing these issues further.

### *Diploma Dynamics*

Table 4 shows which particular diplomas were obtained by those individuals who continued with their studies.<sup>14</sup> Perhaps the most initially intriguing aspect of these results is the rather high proportion of diplomas at the same or lower level than the one obtained in the survey base year. Amongst Bachelor's graduates, for example, just 30 to 40 percent of the new diplomas were at the Master's or Ph. D. level, with the rest being at the College or (again) Bachelor's level.

There are, however, many reasons for these relatively high rates of “non-progression”: some individuals begin with a certificate programme and continue on to the formal Bachelor's degree once that is completed; others do an additional year or so beyond their original degree in order to pick up a different field of concentration, otherwise round out their qualifications, or just effectively bide time; and first professional degrees are included at the Bachelor's level (consistent with their treatment in the NGS data and most standard education statistics). It is, therefore, perhaps not so surprising that

---

<sup>13</sup> In general, we would expect individuals to base their decisions about going on to further studies – to at least some degree – on the value of current and future labour market opportunities at the current degree level versus those at other levels, with weaker current labour market conditions generally diminishing the value of the former relative to the latter.

<sup>14</sup> There are too few observations to report these distributions at the Ph.D. level.



approximately one-half of all new diplomas obtained by Bachelor's graduates were at that same level, with the various underlying representing quite different paths – some representing “normal” educational pathways (*e.g.*, going on to professional school), others indicating “back-tracking”, and so on.<sup>15</sup>

Perhaps of greater interest, then, are the patterns of clear “backtracking”. For example, as many as 26 percent of the new diplomas obtained by Master's graduates were at the College level (females, 1990 cohort), and another 29 to 45 percent were at the Bachelor's level – although the latter again include first professional degrees (as mentioned above), while not all individuals who continued on to a Ph.D. (a “normal” path) would have completed their studies by the second interview date, thus biasing the numbers on that path downward. For Bachelor's graduates, around 10 percent of all new degrees were at the College level for the first cohort, but the figures rose to between 15 and 20 percent for the two later cohorts. We might, therefore, conclude that “non-standard” educational pathways have not been uncommon, and that there was a general increase in the incidence of such career profiles over time.<sup>16</sup> These results raise questions regarding individuals' educational choices, the role of the different types of post-secondary education in the overall scheme of things, and so forth.

---

<sup>15</sup> Tighter categories could be defined in some of the years, allowing the differentiation of certificates and other related awards from the formal Bachelor's degree, to identify first professional degrees, and so on, and the same could be done at the other degree levels. One problem here, however, is that such an exercise could not be carried out in a consistent fashion across all three cohorts, due to the given differences in the categories of the degrees awarded (original and/or subsequent) across the surveys. Second, there would remain considerable uncertainty even after the construction of such precise pathways, since the same diploma can mean different things in different situations, including different rules across different institutions (*e.g.*, at some universities, a second Bachelor's degree is not awarded, with certificates given instead; while certificates indicate a much shorter “sub-Bachelor's” programme at other places). In short, such a greater detailing of educational pathways would be interesting, but comprise a relatively complex and at the same time uncertain exercise.

<sup>16</sup> As mentioned above, enrolment status as of the interview dates is not available on the NGS data files in most years. Enrolment status at two particular points in time in the year following graduation (January, October) is, however, provided, along with employment status (part-time versus full-time for each). These data provide another view of graduates' continuing education in the context of the labour force option, and are reported in Annex B of Finnie [1999e].



### **III.3 Job-Education Skill Matches and Educational Qualifications Matches**

#### ***The Skill Use Index***

Table 5 reports the index of the extent to which the skills developed during the educational programme were being used in the current job, with higher values indicating a closer job-education skill match. As noted above, the results should be directly comparable across interview years for a given cohort and between the first two cohorts, but not necessarily between the first two and last groups of graduates due to a change in the response options given in the NGS questionnaires. The results are also shown in Figure 2.

The job-education skill match scores are, not surprisingly, generally higher at the Master's and Ph.D. levels than amongst College and Bachelor's graduates, while there is no obvious pattern between men and women except, perhaps, for the scores to be somewhat higher for women than men at the College level.

With respect to the dynamic element, there were – perhaps surprisingly – no dramatic increases in the index scores from two to five years following graduation: in some cases the scores are higher, but in many other cases the reverse is true, and the magnitudes of the changes are nowhere very great. It is, however, difficult to know how to interpret these results, especially given their underlying subjective nature. It is, for example, possible that by five years after finishing their programmes, graduates have difficulty in differentiating their current skill sets in terms of what was developed during their formal schooling, what was gained on the job, and what is a combination of the two. It is also possible that some graduates were using different skills than those which were gained at school – but which could never have been developed except by building upon that more fundamental base.

For these reasons and others, the results regarding the evolution of the job-education skill match scores over the early years in the labour market should probably not be regarded too seriously in terms of indicating graduates' "true" skill use patterns. Other, more explicit questions – probably tailored to each discipline/occupation – would likely be required to get at this interesting and important dynamic in a more meaningful way.



### *Educational Pre-requisites and Graduates' Qualifications*

Another measure of "skill matches" is represented in the comparisons of graduates' educational backgrounds with the pre-requisites of the job held. The measures which have been constructed for this study should tell us something regarding the practical usefulness of the educational decisions that graduates have been making, the performance of the post-secondary system in producing the graduates required in the labour market, the efficiency of the labour market in matching graduates to jobs, and so on – all very interesting and important issues with respect to school, work, and the general functioning of the economy, with a variety of policy implications.

Table 6 thus shows the percentage of graduates who had a higher level of education than that required for the job (as of the starting date), the percentage who had the same level, and the percentage with a lower level of education than that required. The discussion here will, however, mostly focus on the first of these outcomes, principally due to the inherently interesting nature of the "over-qualified" phenomenon, but also because the "under-qualified" outcome is quite rare, thus also leaving the "evenly-qualified" measure as pretty much the obverse of the first. The over-qualification rates are also shown graphically in Figure 3.

At first look, a substantial proportion of graduates appear to have been over-qualified for their jobs in terms of the required levels of education, with these rates varying from 35 to 41 percent for graduates of all educational levels taken together (varying along this fairly narrow range by sex, cohort, and interview year.) Interestingly, Master's graduates have generally had the highest rates of over-qualification, Bachelor's and Ph.D. graduates the lowest rates, and College graduates have generally been in the middle.

These results could, however, at least partly reflect a certain ambiguity regarding the formal educational pre-requisites versus the true requirements of many jobs. In the case of Master's graduates, for example, it might often be the case that only a Bachelor's degree is officially required to apply for a position, but that a Master's degree is needed to successfully compete for the spot. Hence, while the high over-qualification amongst Master's graduates are certainly worth noting, the results should be interpreted with caution, especially with respect to any temptation to conclude that these results show



that we have been producing too many Master's graduates. A similar reasoning might, furthermore, apply at the College level: graduates have perhaps often found themselves in jobs where the post-secondary diploma has not been formally required, but where it has been instrumental in actually obtaining the position.

By gender, being over-qualified has been somewhat more common amongst men than women at the College and Master's levels, whereas the differences have more typically gone rather slightly in the other direction at the Bachelor's and Ph.D. levels.

As for the changes in the qualifications measure in the years following graduation, a significant level of ambiguity again applies, especially since the underlying questions asked about the required qualifications "when first hired" (the only measure which is consistent across all survey years). It is, therefore, perhaps difficult to interpret the findings that over-qualification rates have tended to increase in the years following graduation at the College and Bachelor's level, to decrease amongst Master's graduates, and to remain fairly steady for the Ph.D. groups. The Master's results might, however, reflect something of a "correction" for the apparently odd findings (high rates of over-qualification) discussed above.<sup>17</sup>

Along the other time dimension, there would appear to have been a tendency towards moderately lower rates of over-qualification for the later cohorts of graduates. While it is again difficult to know exactly how to interpret these findings, we can at least say that they offer no support for the notion that the quality of jobs being found by graduates has been deteriorating. That is, the data would seem to indicate that if there has been a change in this regard, it would appear to have been in the opposite direction, towards "better" – not worse – jobs. On the other hand, the underlying increases in the educational levels required in the jobs graduates have been finding could also represent "qualification creep" – in a weak labour market, requirements may have been arbitrarily raised for some positions. Further analysis would obviously be required to uncover what has really been happening in this regard.

---

<sup>17</sup> For example, perhaps a significant proportion of Master's graduates gain promotions into positions which more clearly require the advanced degree.



### **III.4 Overall Satisfaction With the Job and Educational Programme**

#### ***Job Satisfaction***

The scores reported in Table 7 and Figure 4 reflect graduates' responses to questions regarding their overall satisfaction with their current jobs, as translated into an index running on a scale running from 0 to 100, with higher scores indicating greater satisfaction (as described above). Over all, graduates have been what might be called "quite" satisfied with their jobs, with the range of mean scores in the 80 point range (all levels taken together) indicating that given the response options of "very satisfied", "satisfied", "dissatisfied" (or "not satisfied"), "very dissatisfied" (or "not at all satisfied"), the average responses were generally just under half-way between the two most favourable evaluations.

Perhaps not surprisingly, in most cases the scores increase with the level of education, the only exceptions being the marginally lower scores for female Bachelor's level graduates relative to those at the College level in 1984 and 1988, and the approximately equal scores of female Master's and Ph.D. graduates. On the other hand, although the scores follow this clear pattern and the cross-level differences are generally statistically significant, the magnitudes of these differences are relatively moderate – ranging from 5 to 9 points from the College level up to the Ph.D. Given the construction of the index, this is approximately the equivalent of one graduate in four giving a response of "very satisfied" rather than "satisfied".

Seen from an alternative view, even College level graduates were, on average, relatively satisfied with their jobs, while the rise in scores with the level of education was such that at the Ph.D. level the average scores tilted more towards the even more positive "very satisfied" response option.

Interestingly, despite the differences in job characteristics by sex seen in earlier sections, overall levels of job satisfaction are very similar for male and female graduates. These patterns, as well as those across interview dates, would seem to reflect the subjective nature of the job satisfaction measure and indicate that jobs are evaluated in a relative manner – presumably, as compared to expectations, which would themselves vary across groups and shift over time. Hence, female graduates' generally greater incidence of (involuntary) part-time and temporary work, reduced earnings levels, and other "lower" outcomes (see Finnie [1999e, f]) have not generally led to commensurately diminished levels of job



satisfaction, while the general improvements in outcomes over the early years in the labour market, such as the movements into full-time and permanent jobs and increases in earnings levels, have not typically resulted in proportional improvements in job evaluations.

Finally, the job satisfaction scores generally rose slightly from the first cohort through the third, thus lending further support to the notion that post-secondary graduates have not experienced any significant deterioration in labour market outcomes over this period. On the other hand, the data also indicate slight differences as of the first and second interviews in this regard: the most recent cohort has uniformly stable or higher job satisfaction scores relative to the first cohort as of the two-year interviews, whereas the later cohort's scores are no greater than one index point higher than those of the first cohort, and some of the changes are negative as of the five-year interviews. These results might therefore suggest that the improvements which occur over the early years in the labour market have perhaps been slightly attenuated for the most recent group of graduates.

#### *Overall Evaluation of the Educational Programme*

The other evaluative measure concerns the educational programme itself, and reflects graduates' responses to a question as to whether they would choose the same programme again if given the choice – a relatively objective summary measure of this key decision. For the first two cohorts, the measure is based upon a question regarding both level and field jointly ("the programme"), while for the third cohort the measure is restricted to the field element. The findings are reported in Table 9 and Figure 5.

The differences in scores by degree level are more substantial than for the job satisfaction measure – although the patterns have to be carefully interpreted due to the change in the measure from the first two cohorts to the third, as noted above. Specifically, the patterns indicate that College graduates have been much less satisfied than university graduates with their choices in terms of the level of their programmes (college versus trade/vocational schools on the one hand, university programmes on the other), but closer to the others with respect to their satisfaction with their choices of specific fields of study. This is evidenced by the relatively low scores amongst College graduates in the first four surveys, where both programme level and field enter the measure, and their stronger evaluations in the



later two, where just field is considered – especially as of the first interview.<sup>18</sup>

Employing similar logic, the cross-cohort patterns amongst university graduates point to relatively high levels of satisfaction with the levels of their programmes, seen in the small differences in the scores in the years the level element is included (1984/87, 1988/91) and the years it is excluded (1992/95).<sup>19</sup> This inference also allows us to interpret the reported scores as coming close to representing the percentage of university graduates who said they would choose the same field again (the 1992 and 1995 results represent this directly), these varying from 68 to 75 percent for Bachelor's graduates, from 77 to 85 percent at the Master's level, and from 79 to 86 percent at the Ph.D. level. In most cases, women tend to have somewhat lower scores than men.

As for the dynamic element of the evaluations, the scores of College graduates are in every case lower as of the second interviews than the first, especially for the first and (especially) last cohorts, whereas there is no such pattern at the university levels. This result might be cause for concern regarding programme choices at the College level – why have a significant number of these graduates not been satisfied with their choices, what would they have preferred, and what could/should be done about this? With such choices being so important to an individuals' career and life in general, any improvements which could be realised would presumably have significant personal – and presumably social – benefits.

Finally, while the different constructions of the measures in the first two and third cohorts mean that we should not go very far in comparing the levels across these time different time periods, at least cautious observations can be made regarding the changes between the first and second interview for the three cohorts, with the results being uniformly less favourable for the later group of graduates relative to the

---

<sup>18</sup> This evaluation is, however, tempered, by its underlying assumption that the cross-cohort differences in scores are principally driven by the change in the nature of the measure (programme and field versus field alone), as opposed to any shift in the actual underlying evaluations with respect to field over this period.

<sup>19</sup> That is, since moving from the level-included measure to the level-excluded measure results in little change in the index scores, the level effects themselves would appear to be small (*i.e.*, few graduates would have chosen differently in this regard). This notion is supported by the results for the programme level alone in the years that this information is available.



earlier two. That is, all scores declined from 1992 to 1995, whereas this was not the case for the earlier groups, which might hint at least a smallish change in the evolution of outcomes for graduates over the early years in the labour market.

### **III.5 The Inter-Provincial Mobility of Graduates**

Table 9 presents the record regarding inter-provincial mobility, showing the percentage of graduates who moved from one province to another i) between graduation and the first interview, ii) from the first interview to the second, and iii) during either of these intervals (*i.e.*, the cumulative total). Figure 6 shows the results graphically to especially good effect.

Probably the most striking aspect of the results is the large differences in the rates of inter-provincial mobility by level of education. Just 6 or 7 percent of the College graduates moved in the five years following graduation, rates varied from 11 to 18 percent amongst the Bachelor's and Master's level graduates, while between 21 and 34 percent of the Ph.D. level graduates changed their province of residence (the rates varying by sex and particular cohort). The rates at the highest degree level were, therefore, 3 to 5 times greater than those at the lowest level.

These patterns presumably reflect the geographical extent of the relevant labour sub-markets corresponding to level of education – with College graduates clearly in more local markets, Ph.D. graduates operating at the national level to a much greater degree, and Bachelor's and Master's graduates lying between these others. While the general nature of these patterns might have been predicted, the specific magnitudes are interesting.

The results are also relevant to considerations of the costs and benefits of post-secondary education in Canada. In a context where education is exclusively a provincial jurisdiction (although partially supported by block grants from the federal government and the Canada Student Loans Program), the mobility rates shown above indicate that significant numbers of graduates have been leaving the provinces that have financed their schooling – with the positive relationship between mobility and the level of education meaning that it has been those individuals in which the greatest investments have



been made which have been leaving at the greatest rates.<sup>20</sup>

That said, the fact that a substantial number of post-secondary graduates have been moving from one province to another is hardly surprising, and such mobility is of course generally desirable in terms of economic efficiency and the other benefits (economic, cultural, social, political) which result when young people (in particular) move across the country. Furthermore, if the inter-provincial flows have more or less evened out – with a province's losses generally made up by entrants from elsewhere – then there might not be any serious problem with respect to the financing of post-secondary education or human capital flows, as what is lost at one end (the outflows) would be made up at the other (inflows).

If, on the other hand, the flows have been asymmetric across the provinces, this would represent a situation where there have been net winner and loser provinces in terms of who has been paying for the post-secondary training of the nation's most skilled workers and who has been benefiting from those investments, with important implications for the fairness and efficiency of post-secondary education in the country. Inter-provincial migration of graduates is, therefore, worthy of much further study, and the NGS databases would be an excellent vehicle for such investigations.<sup>21</sup>

As for other specific patterns, there was generally more mobility over the two years between graduation and the first interview than over the following three years, thus indicating a situation of declining marginal mobility over time. This is not surprising, since many graduates are likely to move at the precise point of graduation, while mobility would presumably diminish as more satisfactory jobs were found, the preferred province was moved to, personal roots became established, and so on.

With respect to gender, male graduates have generally been somewhat more mobile than female graduates, presumably for a number of economic and non-economic reasons. The somewhat greater

---

<sup>20</sup> Of course many graduate students undertake their advanced studies in provinces other than where they completed their first degrees, meaning that the total investments in Master's and Ph.D. graduates are often shared by at least two provinces – with the associated losses thus similarly divided.

<sup>21</sup> Burbidge and Finnie [1999] focus on this issue for the case of Bachelor's level graduates.



general attachment to the labour market and associated career orientation of males would presumably cause them to move more often in response to employment opportunities in other provinces, while the “psychological costs” of moving might also be smaller.<sup>22</sup>

Finally, there are no obvious trends in mobility patterns – no general increases or decreases in the rates of inter-provincial mobility across the three cohorts – seen best in the cumulative totals for each cohort of graduates. This might be a somewhat surprising finding for some, coming as it does in a context where increased mobility of all sorts seems to be taken as a matter of fact.<sup>23</sup> The exception to this rule is the case of Ph.D. graduates, for whom mobility did rise over time – perhaps at least partly reflecting the great decline in permanent hiring at colleges and universities, thus increasing the itinerant component of the professoriat.

#### **IV. CONCLUSION**

This paper has presented the findings of a multi-faceted empirical analysis of the school-to-work transition of post-secondary graduates in Canada in the 1980s and 1990s based on the National Graduates Surveys. The principal goal of the paper has been to exploit the longitudinal aspect of the NGS data, the interesting mix of variables included on the files, and the availability of data for three separate cohorts to provide a dynamic view of the general nature of the school-to-work transition of post-secondary graduates, to compare the patterns by level of education and sex, and to see if these tendencies have shifted from the early 1980s into the mid-1990s.

The major findings and some of their implications may be summarised as follows:

- There was an increase in the number of post-secondary graduates over this period and a shift in their composition towards university, rather than college, graduates, with the relative increases being greater at each level from Bachelor’s through Master’s to Ph.D. The increases at the graduate level may presumably be seen as a positive development, as such graduates ought to play

---

<sup>22</sup> Such issues are discussed in the context of mobility patterns for the entire population (not just post-secondary graduates) in Finnie [1999g].

<sup>23</sup> The finding is, however, consistent with what is reported in Finnie [1999g].



a key role in the new “knowledge based economy”, while it is less clear if the decline in the share of College graduates is a good thing in terms of providing individuals with productive careers and employers with the workers they need in the most efficient manner.

- The percentage of female graduates was generally lower at the higher degree levels, but these cross-level gaps all narrowed over time as the female shares increased more at the higher degree levels.
- The distributions of graduates by discipline were surprisingly stable at all levels, raising questions as to the factors underlying this stability (students’ preferences versus rigidities of the system) and concerns regarding the lack of change at a time when labour markets appear to be shifting in important ways (*e.g.*, towards a need for more scientific and technical workers at all levels). The male-female splits were also quite similar, raising an even deeper set of questions.
- Many graduates have gone on to further studies, with current labour market conditions appearing to play a significant role in this dynamic, while “back-tracking” has been perhaps surprisingly common (*e.g.*, as many as one-quarter of the female Master’s graduates subsequently obtained a College diploma) and appears to have increased over time, raising questions about individuals’ educational choices, the role of the different types of post-secondary education in the overall scheme of things, *etc.*
- The job-education skill match scores are, not surprisingly, generally higher at the Master’s and Ph.D. levels than amongst College and Bachelor’s graduates, but show no clear time trends.
- While comparisons of the educational pre-requisites of graduates’ jobs versus the degrees held are somewhat challenging to interpret, the results show no deterioration across cohorts, thus suggesting that the quality of jobs being found by graduates has not been on the decline.
- The job satisfaction scores are generally greater at the higher degree levels, but seem to incorporate a significant relative element. The cross-cohort trends are generally slightly upward, adding further support to the view that there has at least been no significant deterioration in the quality of jobs being found by graduates over this period.
- Graduates generally express high levels of overall satisfaction with their educational choices, with most graduates saying they would choose the same programme again, especially at the higher levels.
- The extent of inter-provincial mobility of graduates rises with the educational level, presumably



reflecting the more national scope of the associated labour markets for individuals with more education. The significant levels of inter-provincial mobility generally raise a number of issues about the costs and benefits of post-secondary education, which is primarily provincially funded – since the “product” (*i.e.*, graduates) often picks up and moves.

As usual, the results reported in this study point to any number of further avenues of research, including looking at virtually any of the outcomes reported here in more detail or using more sophisticated empirical methods to get at the determinants of the various outcomes and how they might influence each other and still other outcomes (such as employment rates and earnings levels – discussed in Finnie [1999e, f]).

Perhaps the most intriguing general result is, however, the absence of any clear evidence of a deterioration in outcomes across the three cohorts, although it could be that there has in fact been such a decline but that it has not been reflected in the measures covered here (or those covered in the Finnie [1999e, f] companion papers), or that any such deterioration has been a more recent phenomenon not yet captured by the graduates treated here. Nevertheless, it seems likely that we would have seen at least the hint of any such changes by at least the second interview for the latest group of graduates – and that was generally not the case.

In summary, the results reported here should provide a useful description of the school-to-work transition of post-secondary graduates over the last decade and a half and provide a good starting point for other related analyses which probed any of these findings in more detail, which extended the analysis to other dimensions, or which updated the record with more recent data.



## REFERENCES

- Abbott, Michael, Ross Finnie and Ted Wannell [1999], "Gender Differences in the Earnings Growth of Recent University Graduates in Canada: Empirical Evidence from the National Graduate Surveys", paper prepared for the Analysis and Special Projects Section of the Centre for Education Statistics at Statistics Canada.
- Beaudry, Paul, and David Green [1997], "Cohort Patterns in Canadian Earnings: Assessing the Role of Skill Premia in Inequality Trends", mimeo, Department of Economics, University of British Columbia.
- Finnie, Ross, and Charles M. Beach [1998a], "Earnings Mobility 1982-1994", *Canadian Business Economics*, Vol. 6, No. 4 (November 1998), pp. 3-25.
- Beach, Charles M., and George A. Slotsve [1996], *Are We Becoming Two Societies?*, Toronto: C.D. Howe Institute.
- Betts, Julian, Chris Ferrall, and Ross Finnie [1999], "The Role of University Quality in Determining Post-Graduation Outcomes: Panel Evidence from Three Recent Canadian Cohorts, forthcoming Statistics Canada (Analytical Studies Branch) Working Paper.
- \_\_\_\_\_ [1998], "Time to First Job – a Hazard Model Approach Using the National Graduates Survey", forthcoming Statistics Canada (Analytical Studies Branch) Working Paper.
- Burbidge, John and Ross Finnie [1999], "The Geographical Mobility of Baccalaureate Graduates: Evidence From Three Cohorts of the National Graduates Surveys, 1982, 1986, 1990", paper prepared for the Analysis and Special Projects Section of the Centre for Education Statistics at Statistics Canada.
- Finnie, Ross [1999a], "Holding Their Own: Trends in the Employment Rates and Earnings Levels of Recent Post-Secondary Graduates in Canada", *Canadian Business Economics*, forthcoming.
- \_\_\_\_\_ [1999b], "Changes in the Structure of Earnings of Canadian Post-Secondary Graduates in the 1980s and 1990s", forthcoming Human Resources Development Canada (Applied Research Branch) Working Paper.
- \_\_\_\_\_ [1999c], "Fields of Plenty, Fields of Lean: An Analysis of Early Career Outcomes by Discipline Using the National Graduates Surveys", forthcoming Human Resources Development Canada (Applied Research Branch) Working Paper.



- \_\_\_\_\_ [1999d], "Earnings Differences by Field of Study Amongst Recent Canadian University Graduates", forthcoming Human Resources Development Canada (Applied Research Branch) Working Paper.
- \_\_\_\_\_ [1999e], "A Dynamic Analysis of The School-to-Work Transition of Canadian Post-Secondary Graduates", forthcoming Human Resources Development Canada (Applied Research Branch) Working Paper.
- \_\_\_\_\_ [1999f], "From School to Work: The Early Labour Market Experiences of Canadian Post-Secondary Graduates", mimeo, School of Policy Studies, Queen's University.
- \_\_\_\_\_ [1999g], "Inter-Provincial Mobility in Canada, 1982-94: A Longitudinal Analysis", *Canadian Journal of Regional Science*, forthcoming.
- \_\_\_\_\_ [1997a], "Stasis and Change: Trends in Individuals' Earnings Inequality, 1982-92", *Canadian Business Economics*, Vol. 5, No. 4 (October-December/Fall), pp. 84-107.
- \_\_\_\_\_ [1997b], "The Correlation of Individuals' Earnings Over Time in Canada, 1982-92", Human Resources Development Canada (Applied Research Branch) Working Paper W-97-3Ec.
- \_\_\_\_\_ [1997c], "The Distribution of Earnings in a Dynamic Context in Canada, 1982-92" (working title), Human Resources Development Canada (Applied Research Branch) Working Paper W-97-3Eb.
- \_\_\_\_\_ [1997d], "Earnings Mobility in Canada, 1982-92", Human Resources Development Canada (Applied Research Branch) Working Paper W-97-3Ea.
- \_\_\_\_\_ [1995], *Steppin' Out: An Analysis of Recent University Graduates Into the Labour Market*, Industry Canada, Working Paper Number 5 (May 1995), 129 pp.
- Finnie, Ross, and Gaétan Garneau [1996], "An Analysis of Student Borrowing for Post-Secondary Education", *Canadian Business Economics*, Vol. 4, No. 2 (January-March/Winter), pp. 51-64.
- Finnie, Ross and Marie Lavoie [1997], "The School-to-Work Transition of Engineering Graduates: A Cross-Cohort, Longitudinal Analysis of Four Major Decisions in the Engineering Career", Human Resources Development Canada (Applied Research Branch), Research Paper R-97-4E.
- Finnie, Ross and Ted Wannell [1999], "The Gender Earnings Gap Amongst Canadian Bachelor's Level University Graduates: A Cross-Cohort, Longitudinal Analysis", in *Women and Work*,



Richard Chaykowski and Lisa Powell, eds., Queen's University Press (John Deutsch Centre): Kingston, forthcoming.

Krahn, Harvey [1996], "School-Work Transitions: Changing Patterns and Research Needs", discussion paper prepared for the Applied Research Branch of Human Resources Development Canada.

Lavoie, Marie and Ross Finnie [1999], "Is it Worth Doing a Science or Technology Degree in Canada? Empirical Evidence and Policy Implications", *Canadian Public Policy*, forthcoming.

---

[1998a], "The Occupational Dynamics of Recent Canadian Engineering Graduates Inside and Outside the Bounds of Technology", *Research Policy* Vol. 27, No. 2, pp. 143-160.

---

[1998b], "The Early Careers of Engineers and the Accumulation of Skills in the Canadian Economy", *Economics of Innovation and New Technology*, Vol. 7, No. 3, pp. 53-69.

---

[1998c], "The Management Ladder for Recent Engineering Graduates in Canada", *International Journal of Innovation Management*, Vol. 2, No. 3.

Morissette, René, and Charles Bérubé [1996], "Longitudinal Aspects of Earnings Inequality in Canada", Analytical Studies Branch, Statistics Canada, Research Paper No. 94.

Morissette, René, John Myles, and Garnett Picot [1995], "Earnings Polarization in Canada, 1969-1991", in Banting, Keith G., and Charles M. Beach (eds.), *Labour Market Polarization and Social Policy Reform*, School of Policy Studies, Queen's University, Kingston, 1995, pp. 1-20.

OECD [1996], *Employment Outlook*, Chapter 4: "Growing Into Work: Youth and the Labour Market Over the 1980s and 1990s", pp. 109-159, Organization for Economic Cooperation and Development, Paris.

Picot, Garnett [1998], "What is Happening to Earnings Inequality in the 1990s?", *Canadian Business Economics*, Vol. 5, No. 4 (October-December/Fall), 3-16.

Riddell, Craig, [1995] "Human Capital Formation in Canada: Recent Developments and Policy Responses", in Banting and Beach, *op. cit.*, pp. 125-172.

Schwartz, Saul, and Ross Finnie [1996], "Student Loans in Canada: An Econometric Analysis of Borrowing and Repayment Using the National Graduate Surveys", Human Resources Development Canada (Applied Research Branch), Working Paper W-96-4E.



Zyblock, Myles [1996], "Individual Earnings Inequality and Polarization: An Exploration into Sub-Population trends in Canada, 1981 to 1993", *Canadian Business Economics*, Vol. 5, No. 4 (October-December/Fall).



# Table 1: Sample Sizes

	1982 Cohort				1986 Cohort				1990 Cohort			
	1984		1987		1988		1991		1992		1995	
	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.
<b>ALL</b>												
Male	13,317	69,709	11,626	68,055	15,356	85,189	13,132	82,358	13,464	80,069	11,215	76,861
Female	13,124	80,040	11,534	78,638	15,528	101,178	13,407	98,294	14,473	102,251	12,557	101,310
Total	26,441	149,749	23,160	146,693	30,884	186,367	26,539	180,652	27,937	182,320	23,772	178,171
<b>COLLEGE</b>												
Male	4,965	22,397	4,451	22,247	5,962	28,556	5,114	27,710	4,018	23,309	3,428	22,896
Female	5,908	30,851	5,261	30,452	6,367	35,310	5,510	34,153	4,737	33,408	4,151	33,274
Total	10,873	53,248	9,712	52,699	12,329	63,866	10,624	61,863	8,755	56,717	7,579	56,170
<b>BACHELOR'S</b>												
Male	4,743	39,595	4,122	38,496	5,576	47,994	4,778	46,412	4,999	47,197	4,150	44,848
Female	4,841	43,997	4,357	43,335	6,269	58,988	5,408	57,498	6,057	60,355	5,245	59,794
Total	9,584	83,592	8,479	81,831	11,845	106,982	10,186	103,910	11,056	107,552	9,395	104,642
<b>MASTER'S</b>												
Male	3,094	7,015	2,627	6,685	3,111	7,767	2,645	7,407	3,388	8,242	2,792	7,876
Female	2,060	4,909	1,731	4,583	2,517	6,418	2,170	6,205	3,097	7,758	2,665	7,529
Total	5,154	11,924	4,358	11,268	5,628	14,185	4,815	13,612	6,485	16,000	5,457	15,405
<b>DOCTORATE</b>												
Male	515	703	426	628	707	872	595	829	1,059	1,321	845	1,240
Female	215	283	185	268	375	462	319	438	582	730	496	713
Total	730	986	611	896	1,082	1,334	914	1,267	1,641	2,051	1,341	1,953



**Table 2a: The Distribution of Graduates and Percentage  
of Female Graduates by Level of Education<sup>1</sup>**

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Level	% Female	% by Level	% Female	% by Level	% Female
College	35.6	58	34.3	55	31.1	59
Bachelor's	55.8	53	57.4	55	59.0	56
Master's	8.0	41	7.6	46	8.8	48
Doctorate	0.7	29	0.7	35	1.1	36
	100		100		100	

<sup>1</sup> The percentages in this and all following tables do not necessarily add up to 100 due to rounding.



**Table 2b: The Distribution of Graduates and Percentage  
of Female Graduates by Field of Study<sup>1</sup>**

**College**

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	5	47	4	48	4	56
Arts & Humanities	10	66	10	61	10	65
Nursing	12	94	11	91	12	88
Medical Tech.	5	81	5	81	5	77
Other Health	1	74	1	70	2	75
Electronic Tech.	7	5	7	3	5	9
Math/Comp. Sc.	4	50	6	40	5	33
Gen. Engineering Tech.	3	87	4	11	3	14
Other Engineering Tech.	9	86	8	14	7	18
Natural/Animal Sc.	2	53	2	44	2	50
Primary Industries	3	85	3	18	3	18
Protection/Correction	2	58	3	35	5	39
Soc. Serv./Recr./Sport	4	81	6	80	7	82
Other Social Sciences	4	87	5	88	5	89
Secretarial Services	9	99	8	96	6	92
Other Bus. & Comm.	19	55	16	55	19	62
	100		100		100	

**Bachelor's**

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	10	57	4	51	3	56
Elem./Secon. Teaching	12	76	11	71	11	72
Other Education	6	65	5	66	6	66
Fine Arts & Humanities	13	65	16	65	15	63
Commerce	11	38	14	47	13	49
Economics	3	20	3	34	3	27
Law	4	46	3	46	3	49
Other Social Sciences	15	60	17	68	19	66
Agricultural & Bio. Sc.	5	51	5	52	6	58
Veterinary	1	48	1	41	1	56
Engineering	8	10	8	13	7	15
Medical Professions	2	33	2	38	2	43
Other Health	5	84	5	88	5	84
Computer Science	2	24	4	34	2	21
Math. & Other Phys. Sc.	3	30	4	31	4	35
	100		100		100	

Continued...



### Master's

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	4	30	2	40	1	48
Elem./Secon. Teaching	6	58	8	64	8	70
Other Education	16	49	11	57	12	60
Fine Arts & Humanities	14	61	15	60	15	60
Commerce	17	27	17	27	20	33
Economics	3	29	2	26	2	34
Law	1	-	1	-	1	24
Other Social Sciences	17	46	17	54	16	62
Agricultural & Bio. Sc.	4	42	3	50	4	48
Veterinary	1	24	1	47	1	42
Engineering	7	10	8	10	8	14
Medical Professions	2	54	4	51	2	36
Other Health	4	60	5	59	4	77
Computer Science	1	24	1	20	2	20
Math. & Other Phys. Sc.	4	18	4	22	5	20
	100		100		100	

### Doctorate

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	4	46	0	-	0	-
Elem./Secon. Teaching	3	-	3	68	3	50
Other Education	10	44	7	57	8	55
Fine Arts & Humanities	16	33	25	33	15	46
Commerce	1	-	2	-	2	38
Economics	2	-	2	-	2	19
Law	0	-	2	-	0	-
Other Social Sciences	19	38	19	48	16	50
Agricultural & Bio. Sc.	10	27	8	26	11	32
Veterinary	3	-	2	-	2	-
Engineering	10	5	8	4	14	9
Medical Professions	1	-	1	-	3	50
Other Health	8	27	8	52	8	47
Computer Science	1	-	1	-	2	-
Math. & Other Phys. Sc.	12	13	12	14	15	9
	100		100		100	

<sup>1</sup> In this and all following tables, a dash indicates too few observations to report (see the text for an explanation of the reporting ru



**Table 3: Percentage Who Completed a New  
Diploma by the Relevant Interview<sup>1</sup>**

	1982 Cohort		1986 Cohort		1990 Cohort	
	82-84 %	82-87 %	86-88 %	86-91 %	90-92 %	90-95 %
<b>All:</b>						
Male	13	28	11	18	13	29
Female	14	26	12	19	12	28
<b>COLLEGE:</b>						
Male	10	22	10	19	10	25
Female	8	18	9	16	8	22
<b>BACHELOR'S:</b>						
Male	16	34	10	20	15	33
Female	20	33	15	22	15	33
<b>MASTER'S:</b>						
Male	7	17	5	9	5	17
Female	7	14	5	10	4	14
<b>DOCTORATE:</b>						
Male	3	5	1	4	3	7
Female	3	10	3	7	5	10

<sup>1</sup> Samples exclude those who did not respond to the second interview.



**Table 4: Diploma Dynamics<sup>1</sup>**

	Next Diploma			
	College %	Bachelor's %	Master's %	Doctorate %
<b>1982 Diploma</b>				
<b>MALE</b>				
College	52	45	3	0
Bachelor's	8	54	38	1
Master's	7	36	34	22
Doctorate	-	-	-	-
<b>FEMALE</b>				
College	58	40	2	0
Bachelor's	11	54	35	1
Master's	6	44	38	13
Doctorate	-	-	-	-
<b>1986 Diploma</b>				
<b>MALE</b>				
College	76	22	1	1
Bachelor's	17	51	31	1
Master's	19	45	28	8
Doctorate	-	-	-	-
<b>FEMALE</b>				
College	78	20	1	1
Bachelor's	17	55	28	1
Master's	19	43	31	7
Doctorate	-	-	-	-
<b>1990 Diploma</b>				
<b>MALE</b>				
College	59	39	1	1
Bachelor's	18	41	39	2
Master's	15	29	21	35
Doctorate	-	-	-	-
<b>FEMALE</b>				
College	58	40	1	0
Bachelor's	19	49	31	1
Master's	26	35	20	19
Doctorate	-	-	-	-

<sup>1</sup> Samples exclude those who did not respond to the second interview and those who did not obtain a new diploma.



**Table 5: Education Level Compared  
to the Level Required for the Job<sup>1</sup>**

	1st Interview			2nd Interview		
	Over %	Even %	Under %	Over %	Even %	Under %
<b>1982</b>						
<b>ALL:</b>						
Male	40	59	2	40	56	4
Female	35	62	2	36	60	4
<b>COLLEGE:</b>						
Male	42	55	2	48	48	4
Female	33	63	4	41	54	5
<b>BACHELOR'S:</b>						
Male	31	67	2	29	67	4
Female	34	64	1	29	66	4
<b>MASTER'S:</b>						
Male	73	26	1	64	34	2
Female	62	37	1	54	44	2
<b>DOCTORATE:</b>						
Male	42	58	0	39	61	0
Female	41	59	0	37	63	0
<b>1986</b>						
<b>ALL:</b>						
Male	41	56	3	37	57	6
Female	41	57	2	37	58	5
<b>COLLEGE:</b>						
Male	46	52	2	47	47	6
Female	38	61	1	40	56	5
<b>BACHELOR'S:</b>						
Male	34	63	3	28	66	6
Female	42	56	2	34	61	5
<b>MASTER'S:</b>						
Male	63	36	1	57	37	5
Female	61	38	0	55	41	3
<b>DOCTORATE:</b>						
Male	34	66	0	34	66	0
Female	36	64	0	35	65	0
<b>1990</b>						
<b>ALL:</b>						
Male	36	61	3	40	56	3
Female	33	65	3	34	63	3
<b>COLLEGE:</b>						
Male	41	56	3	47	48	4
Female	34	64	2	34	62	4
<b>BACHELOR'S:</b>						
Male	29	67	4	25	72	4
Female	29	68	3	27	70	4
<b>MASTER'S:</b>						
Male	60	40	1	57	42	1
Female	49	50	1	47	52	1
<b>DOCTORATE:</b>						
Male	29	71	0	29	71	0
Female	30	70	0	30	70	0

<sup>1</sup> Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.



**Table 6: Education Level Compared  
to the Level Required for the Job<sup>1</sup>**

	1st Interview			2nd Interview		
	Over %	Even %	Under %	Over %	Even %	Under %
<b>1982</b>						
<b>ALL:</b>						
Male	40	59	2	40	56	4
Female	35	62	2	36	60	4
<b>COLLEGE:</b>						
Male	42	55	2	48	48	4
Female	33	63	4	41	54	5
<b>BACHELOR'S:</b>						
Male	31	67	2	29	67	4
Female	34	64	1	29	66	4
<b>MASTER'S:</b>						
Male	73	26	1	64	34	2
Female	62	37	1	54	44	2
<b>DOCTORATE:</b>						
Male	42	58	0	39	61	0
Female	41	59	0	37	63	0
<hr/>						
<b>1986</b>						
<b>ALL:</b>						
Male	41	56	3	37	57	6
Female	41	57	2	37	58	5
<b>COLLEGE:</b>						
Male	46	52	2	47	47	6
Female	38	61	1	40	56	5
<b>BACHELOR'S:</b>						
Male	34	63	3	28	66	6
Female	42	56	2	34	61	5
<b>MASTER'S:</b>						
Male	63	36	1	57	37	5
Female	61	38	0	55	41	3
<b>DOCTORATE:</b>						
Male	34	66	0	34	66	0
Female	36	64	0	35	65	0
<hr/>						
<b>1990</b>						
<b>ALL:</b>						
Male	36	61	3	40	56	3
Female	33	65	3	34	63	3
<b>COLLEGE:</b>						
Male	41	56	3	47	48	4
Female	34	64	2	34	62	4
<b>BACHELOR'S:</b>						
Male	29	67	4	25	72	4
Female	29	68	3	27	70	4
<b>MASTER'S:</b>						
Male	60	40	1	57	42	1
Female	49	50	1	47	52	1
<b>DOCTORATE:</b>						
Male	29	71	0	29	71	0
Female	30	70	0	30	70	0

<sup>1</sup> Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.



**Table 7: Index of Overall Job Satisfaction<sup>1,2</sup>**

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984	1987	1988	1991	1992	1995
<b>All:</b>						
Male	77	80	78	81	80	80
Female	78	78	78	80	80	79
<b>COLLEGE:</b>						
Male	74	78	77	79	80	78
Female	78	78	78	78	80	78
<b>BACHELOR'S:</b>						
Male	78	81	78	80	80	80
Female	77	79	77	80	79	80
<b>MASTER'S:</b>						
Male	82	83	82	84	83	82
Female	81	82	81	83	84	82
<b>DOCTORATE:</b>						
Male	82 <sup>a</sup>	84	84	85	86	84
Female	87 <sup>a</sup>	85 <sup>a</sup>	85 <sup>a</sup>	83 <sup>a</sup>	87	85

<sup>1</sup> Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

<sup>2</sup> The means with no letter superscript have standard errors below 1, while those with an <sup>a</sup> superscript have standard errors between 1 and 2.



**Table 8: Index of the Overall Evaluation of the Education Programme<sup>1,2</sup>**

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984 %	1987 %	1988 %	1991 %	1992 %	1995 %
<b>All:</b>						
Male	70	68	70	64	80	68
Female	68	64	69	63	78	65
<b>COLLEGE:</b>						
Male	63	59	65	64	80	68
Female	65	57	67	63	76	65
<b>BACHELOR'S:</b>						
Male	72	70	71	71	75	72
Female	69	68	69	70	74	71
<b>MASTER'S:</b>						
Male	83	83	83	82	87	84
Female	77	79	80	81	85	81
<b>DOCTORATE:</b>						
Male	81 <sup>a</sup>	84 <sup>a</sup>	83 <sup>a</sup>	82 <sup>a</sup>	85 <sup>a</sup>	82 <sup>a</sup>
Female	79 <sup>b</sup>	84 <sup>b</sup>	78 <sup>b</sup>	81 <sup>a</sup>	86 <sup>a</sup>	82 <sup>a</sup>

<sup>1</sup> Samples exclude those did not respond to the second interview.

<sup>2</sup> The means with no letter superscript have standard errors below 1, those with an *a* superscript have standard errors between 1 and 2, and those with a *b* have standard errors between 2 and 3.

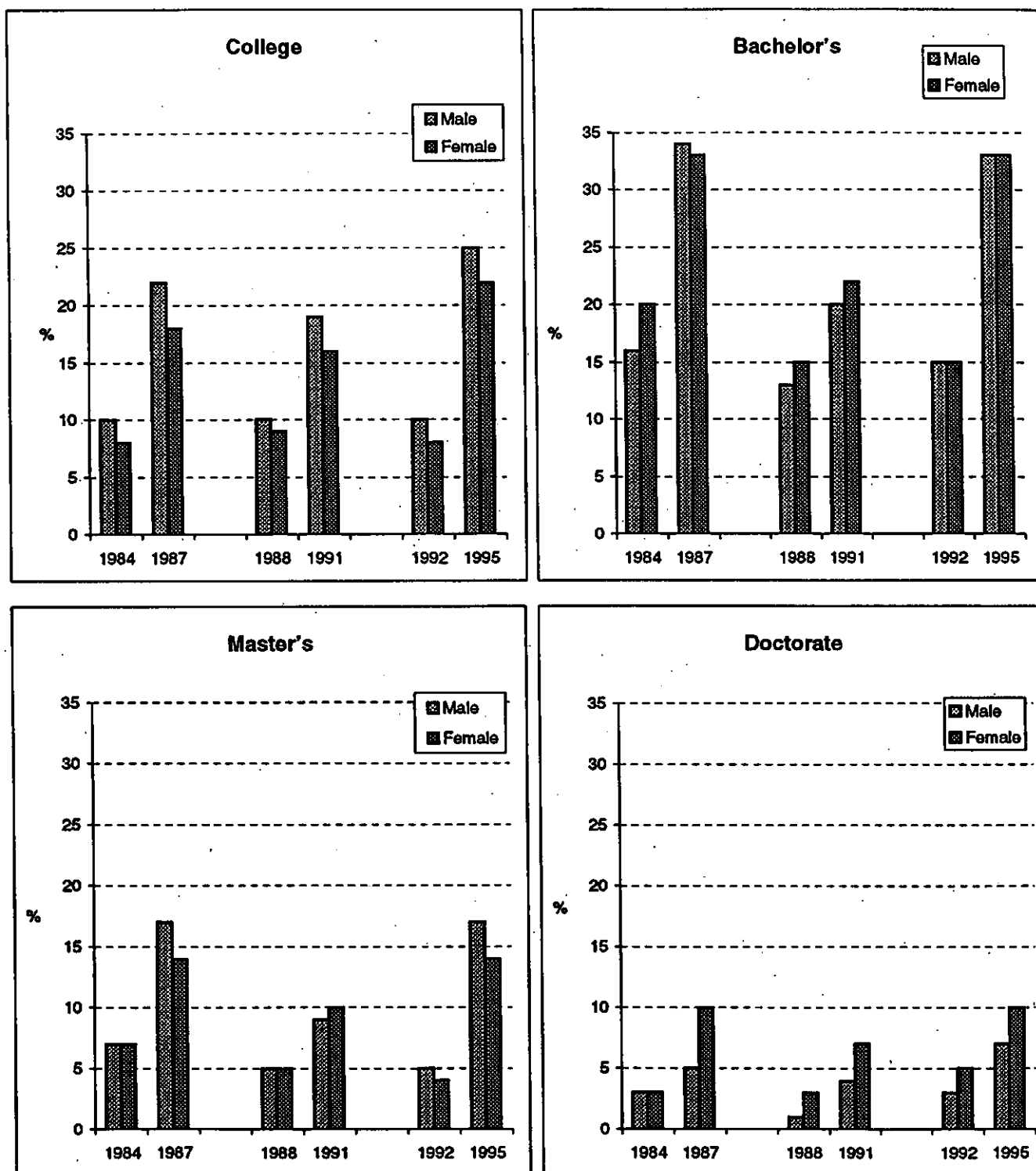


**Table 9: Percentage Who Migrated Between Provinces**

	Graduation to 1st Interview (%)	1st Interview to 2nd Interview (%)	Graduation to 2nd Interview (%)
<b>1982</b>			
<b>All:</b>			
Male	11	7	13
Female	9	7	11
<b>COLLEGE:</b>			
Male	6	5	7
Female	5	4	7
<b>BACHELOR'S:</b>			
Male	13	9	16
Female	11	8	14
<b>MASTER'S:</b>			
Male	15	8	17
Female	13	7	14
<b>DOCTORATE:</b>			
Male	18	11	24
Female	20	11	23
<b>1986</b>			
<b>All:</b>			
Male	9	7	12
Female	7	7	10
<b>COLLEGE:</b>			
Male	5	5	7
Female	4	5	7
<b>BACHELOR'S:</b>			
Male	10	8	14
Female	8	7	11
<b>MASTER'S:</b>			
Male	14	9	17
Female	11	7	14
<b>DOCTORATE:</b>			
Male	25	16	34
Female	15	11	21
<b>1990</b>			
<b>All:</b>			
Male	11	7	13
Female	9	6	11
<b>COLLEGE:</b>			
Male	6	4	7
Female	4	3	6
<b>BACHELOR'S:</b>			
Male	12	8	14
Female	11	8	14
<b>MASTER'S:</b>			
Male	15	9	18
Female	12	6	13
<b>DOCTORATE:</b>			
Male	27	12	32
Female	22	9	25



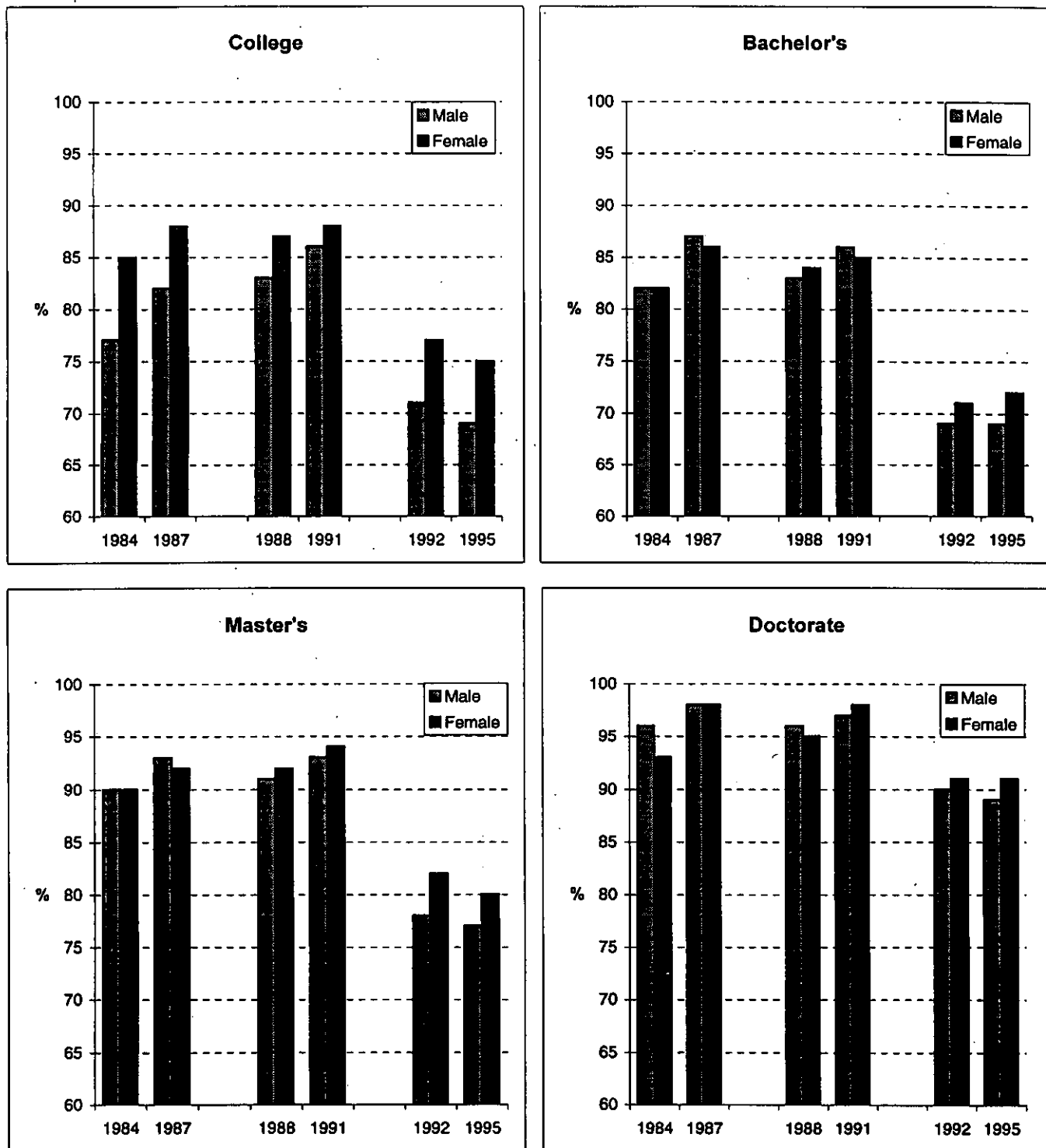
**Figure 1: Percentage Who Completed Another Diploma by the Relevant Interview<sup>1</sup>**



<sup>1</sup> Samples exclude those who did not respond to the second interview.



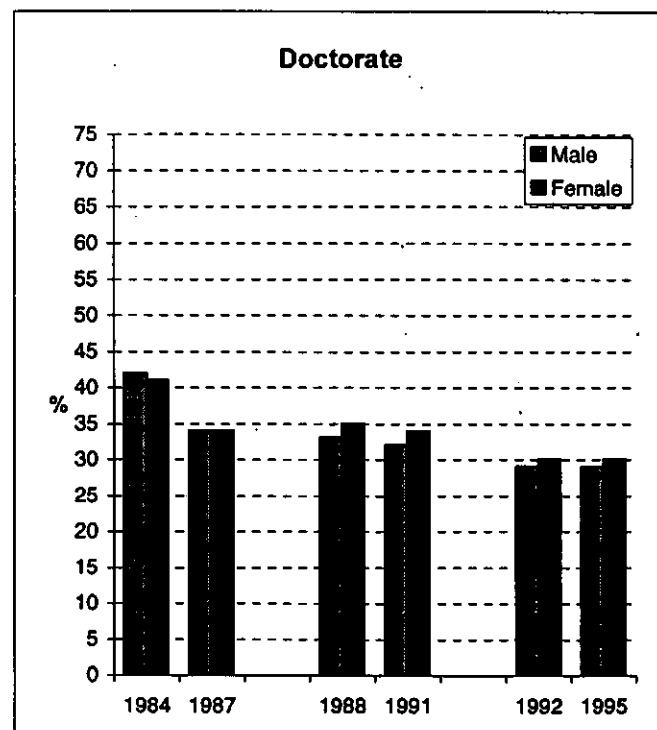
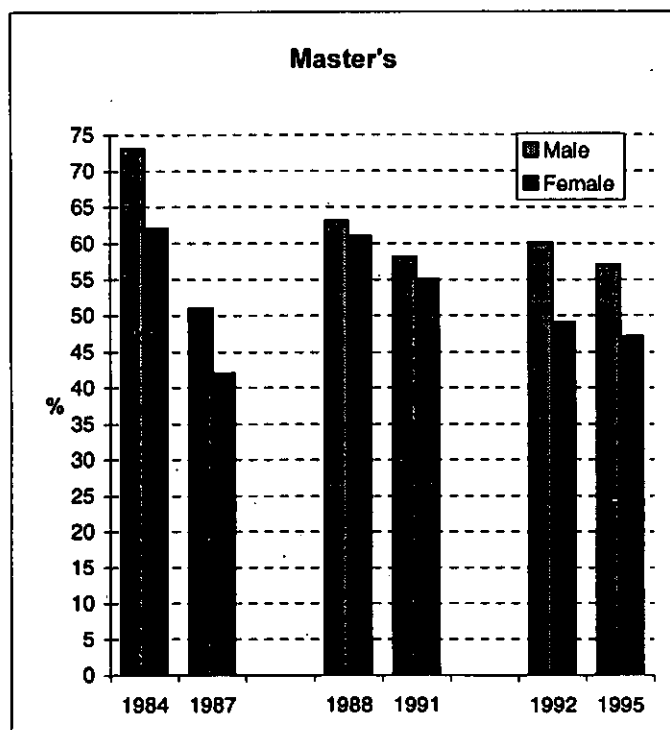
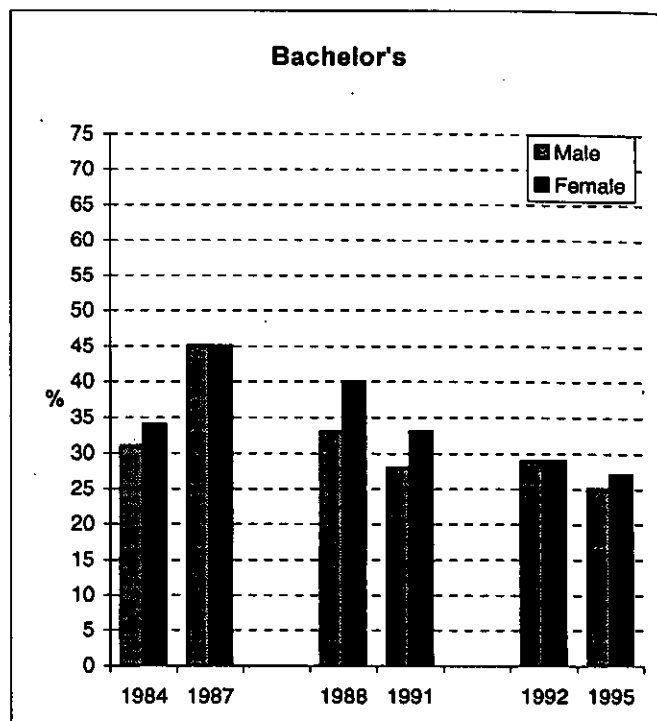
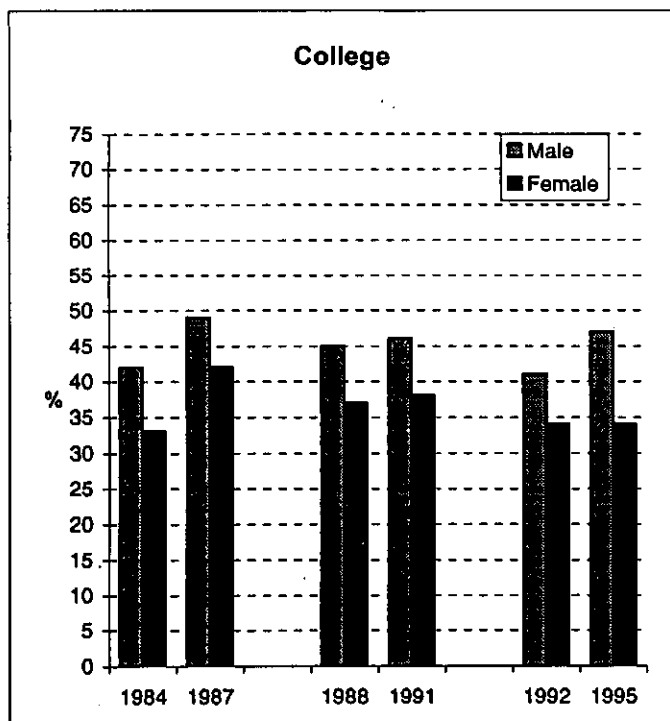
**Figure 2: Index of the Job-Education Skill-Match<sup>1</sup>**



<sup>1</sup> Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.



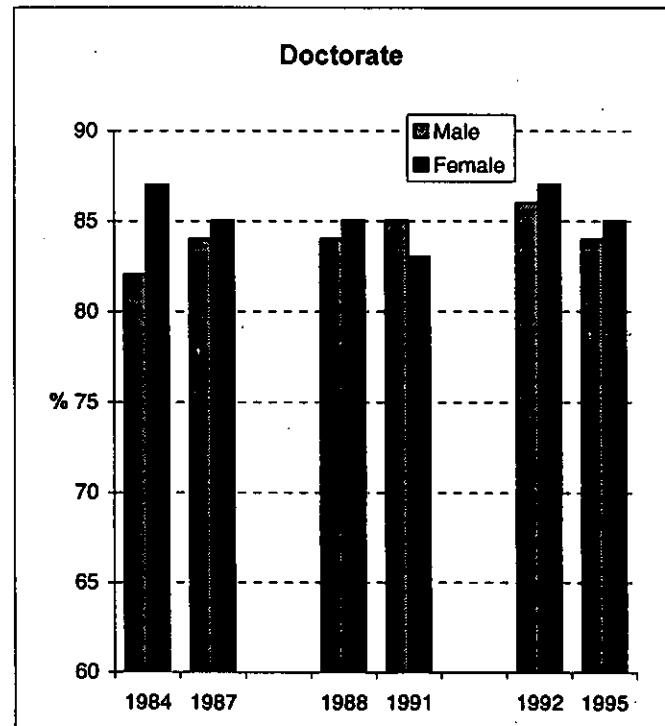
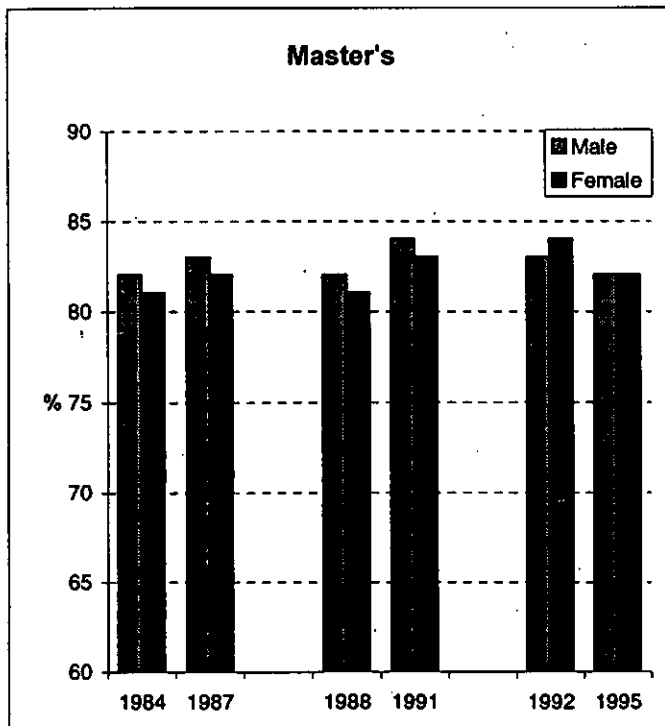
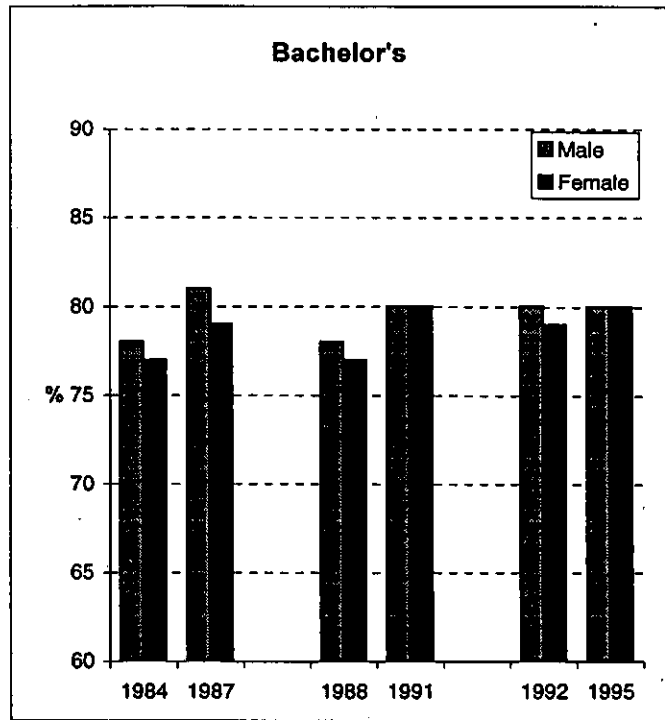
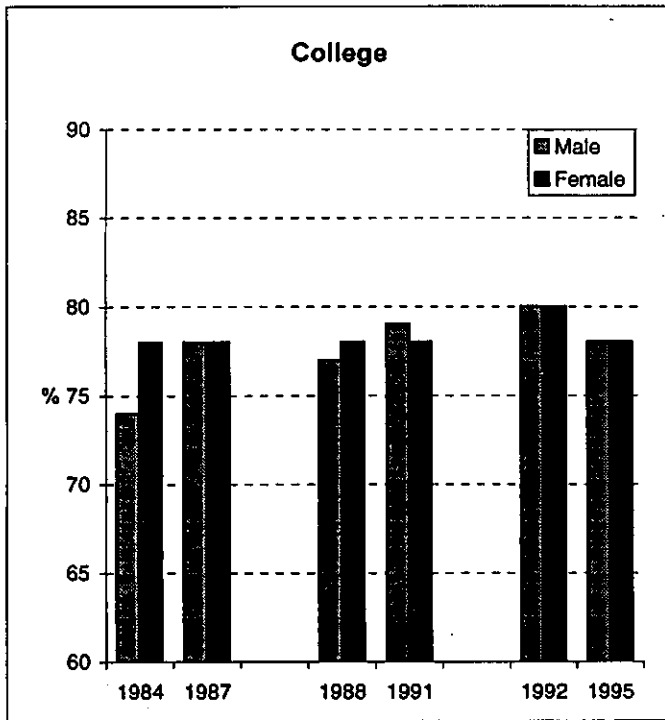
**Figure 3: Percentage of Workers Over-Qualified<sup>1</sup>**



<sup>1</sup> Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.



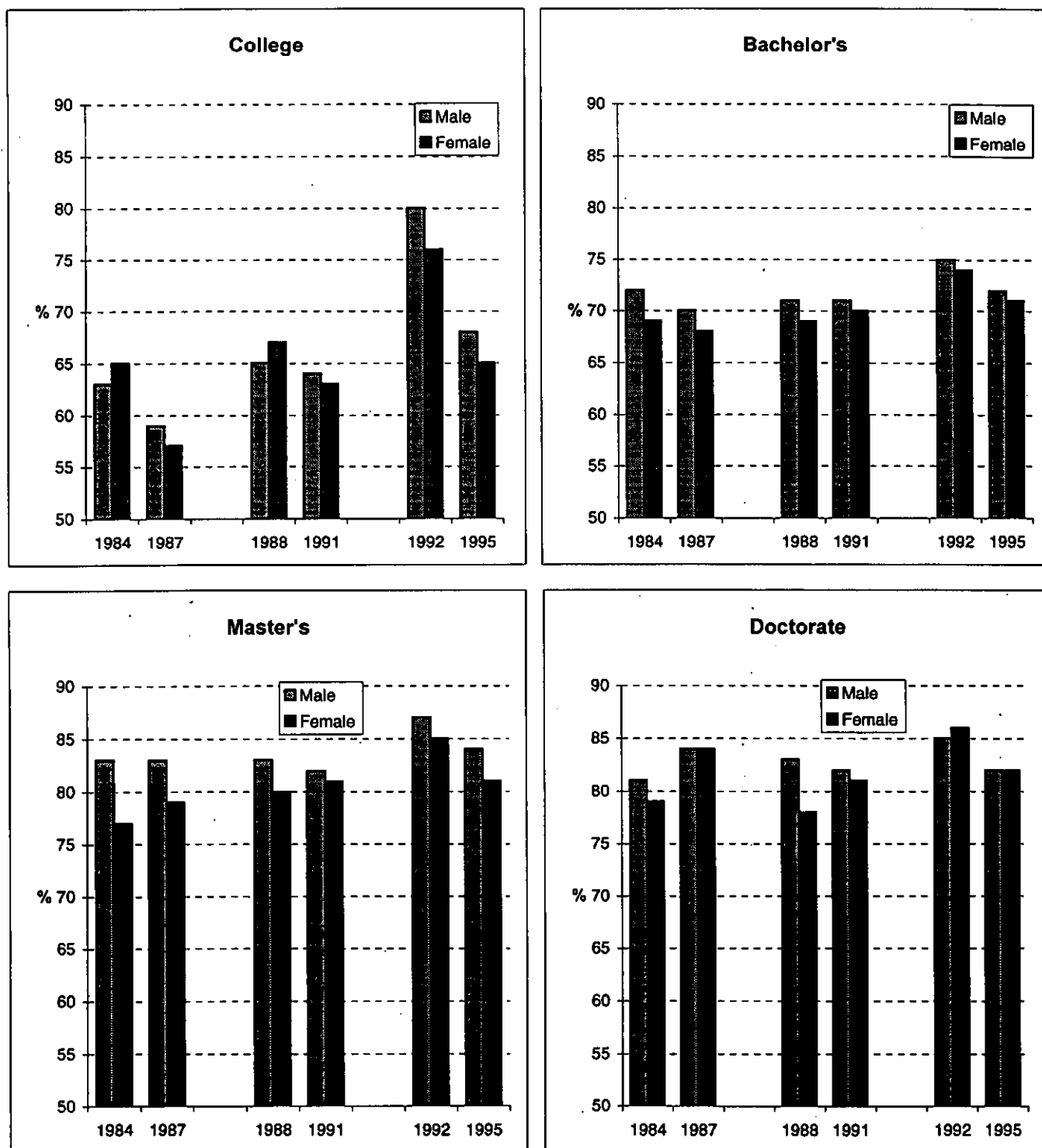
**Figure 4: Index of Overall Job Satisfaction<sup>1</sup>**



<sup>1</sup> Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.



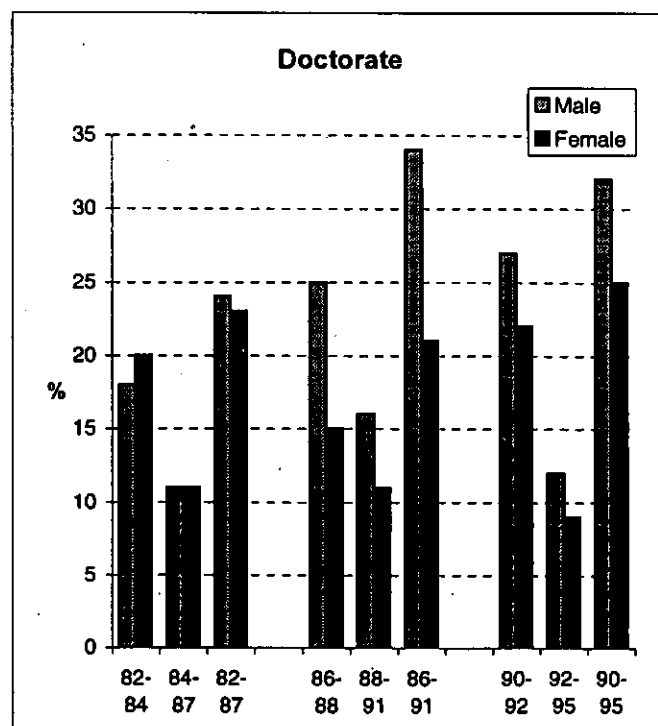
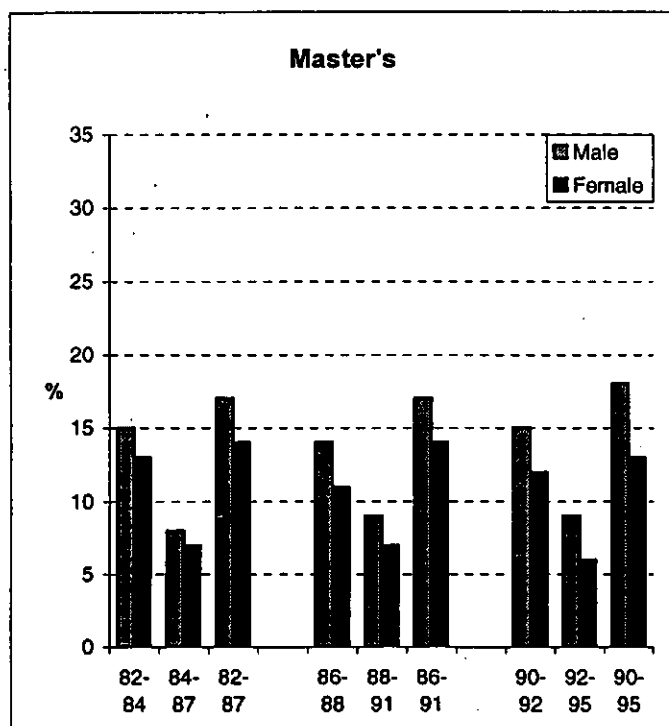
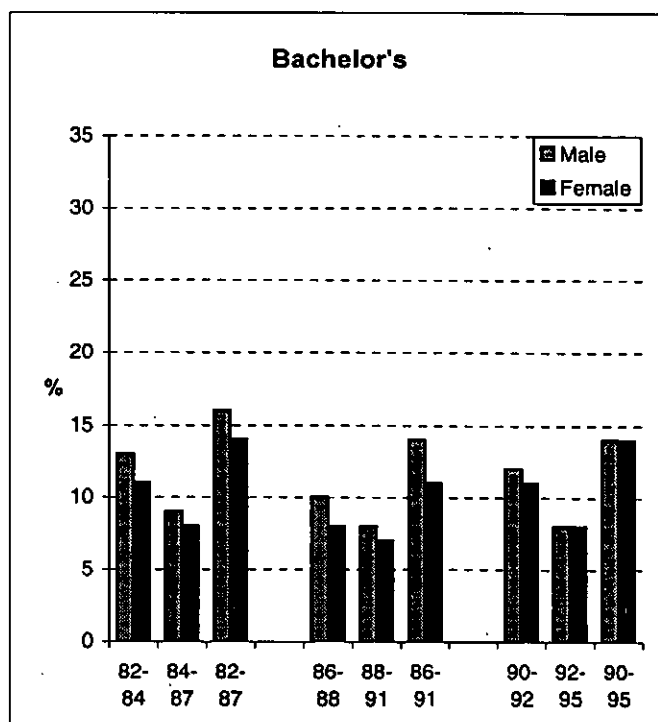
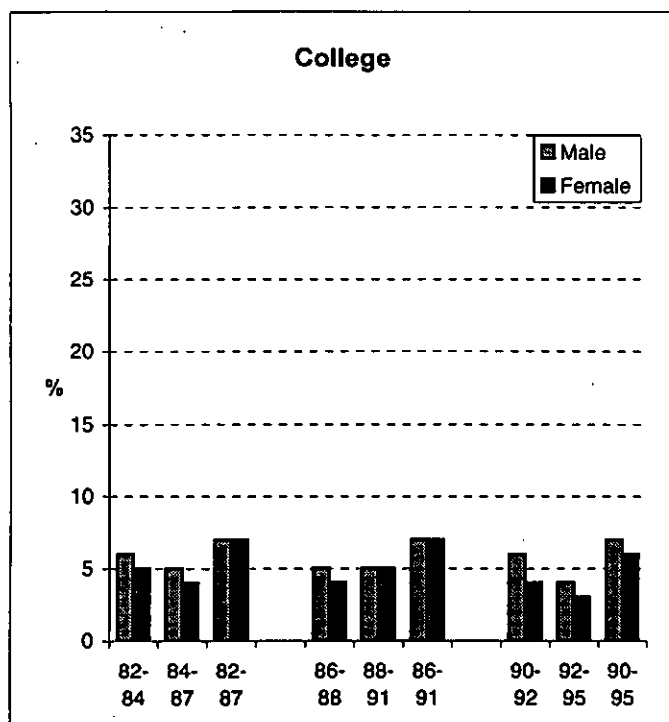
Figure 5: Index of the Overall Evaluation of the Programme<sup>1</sup>



<sup>1</sup> Samples exclude those who did not respond to the second interview.



**Figure 6: Percentage Who Migrated Between Provinces**



8-6-85