CHANGES IN THE STRUCTURE OF CANADIAN POST-SECONDARY
GRADUATES' EARNINGS IN THE 1980S AND 1990S

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by

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March 1999

ABSTRACT

This paper looks at the labour market outcomes of three recent cohorts of Canadian post-secondary graduates using the National Graduates Surveys of the classes of 1982, 1986, and 1990. Their unemployment rates compare very favourably with those of non-graduates, including large declines from two years to five years following graduation, and no general deterioration over time. Earnings levels have shown small-to-moderate declines (depending on the specific level of education – College, Bachelor's, Master's, and Ph.D.) across cohorts in the case of male graduates and increases of similar magnitudes for female graduates. The factors underlying these patters are investigated using a standard regression-based decomposition analysis, with the result indicating that there has been no large scale shift against graduates in terms of prevailing market conditions.

I. INTRODUCTION

How have recent post-secondary graduates been faring in the labour market of late? This is an important question for a number of reasons. First, there is the straightforward issue of economic well-being, with employment rates and earnings levels obviously translating directly into standards of living for this group of workers, with any shifts in outcomes which appear to be of a longer-run nature being especially important in this regard. Secondly, and related, any such changes could have significant implications for various social programmes, especially in the long run, since future revenues and expenditures will depend on the fortunes of today's younger workers. Third, the performance of post-secondary graduates is relevant to a variety of education-related issues, including the rates of returns to the underlying investments (for both individuals and society in general), the associated incentives for pursuing post-secondary studies, the share of education costs and the related debt loads which students might be expected to bear, the need for curriculum reform, and more. Finally, being at the point of entry into the labour market, recent graduates' experiences comprise an important indicator of what is happening in labour markets generally, with their high levels of qualifications being especially interesting by dint of representing those at the cutting edge of the "new knowledge economy".

The general impression – on the street and in the existing literature – is that recent cohorts of post-secondary graduates have been doing worse than previous ones. For the particular case of Canada, numerous studies have reported declines in the employment rates and earnings levels of younger workers generally, accompanied by explanations of the underlying causal factors, and some of these have at least tried to separate out the fortunes of post-secondary graduates from other younger workers in some manner and have found similar, if not quite as serious, declines for those with higher levels of education.[1]

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[1] 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 and various co-authors (Finnie [1997b, c, d], Finnie and Beach [1998], Finnie and Gray [1998]) indicate that younger workers' movements up the earnings ladder over the early years in the labour market have also slowed. In short, the age-earnings profiles of recent cohorts of younger workers appear to have both shifted downward and become flatter, thus indicating a decline in "lifetime" earnings. See OECD [1996] for an international perspective of the earnings of younger workers.

These Canadian studies have, however, mostly been restricted to a single database, the Survey of Consumer Finances, meaning that there has been less cross-verification of the patterns than would be desirable. This is especially worrying in a context where the SCF databases have significant limitations for any study focused on post-secondary graduates in terms of sample size, the information available on the files, and inconsistencies in the identification of specific levels of education over time.[2]

The contribution of this paper is, then, to offer new empirical evidence regarding the fortunes of younger workers by reporting the results of a cross-cohort, longitudinal analysis of the early labour market outcomes of Canadian post-secondary (college and university) graduates based on three waves of the relatively under-utilised National Graduates Surveys. These databases comprise large, representative samples of Canadian post-secondary students who successfully completed their college and university programmes in 1982, 1986, and 1990, and include detailed information on individuals' educational experiences and early labour market outcomes collected during interviews conducted two and five years after graduation for each group. The NGS data thus facilitate a tightly focused and detailed dynamic analysis of the school-to-work transition of Canadian post-secondary graduates from the early 1980s into the mid-1990s, a period generally thought to be one of significant change in labour market outcomes – especially for younger workers.

After describing the data and sample construction, the trends in employment rates and mean earnings levels by sex and level of education – College, Bachelor's, Master's, and Ph.D. – as of two and five years after graduation for each of the three cohorts covered by the NGS data are presented, thus providing a dynamic overview of the school-to-work transition along these dimensions over the period covered. The remainder of the paper then presents an analysis of the change in the patterns of graduates' earnings using the standard "decomposition" technique of estimating separate earnings regressions for each cohort and using these results to identify the effects of changes in individuals' characteristics and the effects of changes in the structure of earnings as represented by the relevant regression coefficients on mean earnings levels across cohorts.

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[2] See Finnie [1998a] for further discussion of these issues.

The broad goal of the paper is, therefore, to exploit the NGS databases to paint a picture of what has been happening to recent Canadian post-secondary graduates in terms of their employment rates and earnings levels and to document the various influences which have been affecting the latter.

II. THE DATA AND THE ECONOMETRIC APPROACH[3]

II.1 The NGS Data and the Construction of the Working Samples

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 representative of the underlying national population of college and university graduates and have abundant numbers of observations (over 30,000 individuals in each survey), thereby facilitating the meaningful analysis of the post-graduation experience at a detailed level.[4]

Second, the availability of data for three separate cohorts of graduates – those who completed their studies in 1982, 1986, and 1990 – permits the comparison of outcomes over a period generally thought to be one characterised by important changes in labour market outcomes, especially for younger workers, while also bringing the record as up to date as possible.[5]

Third, the NGS files are longitudinal, based on information gathered during interviews carried out two and five years after graduation for each cohort (1984/87, 1988/91, and 1992/95), thus allowing for a dynamic and somewhat extended analysis of the school-to-work transition precisely situated as of two particular points in time relative to graduation.

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[3] The material covered in this section is treated in more depth in Finnie [1998a].

[4] A stratified sample scheme (by province, level of education, and field of study) is employed in the NGS databases. All results reported below reflect the appropriate sample weights. The databases also include trade and vocational school graduates, but these individuals are not included in the present analysis.

[5] The first survey of a 1995 graduates has been carried out, but those data are not ready for analysis at the time of this writing and will obviously lack the second interview data until those are collected in the year 2000.

Finally, the databases include an interesting array of variables covering the educational experiences, general labour market outcomes, specific job characteristics, and basic demographic characteristics of graduates.

Construction of the Working Samples

Graduates who obtained an additional degree by one of the two interviews were deleted from the analysis at that point.[6] 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 major field of study) and had in any event been mixing school and work in a way likely to affect the labour market outcomes upon which this analysis is focused. Including later graduates would also throw 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.

After calculating labour force activity rates, the samples were further restricted to full-time workers, thus focusing the exercise on individuals with significant labour market attachment and abstracting from labour supply decisions which could affect earnings patterns. In particular, most continuing (full-time) students were eliminated by this condition, desirable for reasons similar to those given for the deletion of graduates who went on to obtain additional diplomas just discussed.[7] For those concerned that the resulting samples are overly restrictive, mean earnings patterns and the associated decomposition results with part-time workers included are provided in Finnie [1998a], with the results being generally similar to those for full-time workers alone.

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[6] See Finnie [1998a] for further discussion of the precise procedures which were implemented.

[7] The use of selection criteria based on student status as of the interview dates is precluded by the fact that this information is – perhaps surprisingly – missing from all surveys except one (1987). Furthermore, a strong argument can be made for retaining full-time workers who also happen to be students on the grounds that such individuals are first and foremost in the labour force and rightly belong in any analysis of earnings patterns – thus further justifying the use of the selection criteria based on labour force status used here rather than student status.

Finally, observations were deleted where the individual was other than a regular paid employee or self-employed, or where the required information was missing, took extreme values (in the case of earnings), or was otherwise deemed unusable.[8]

II.2 The Decomposition Method and the Econometric Models

The Decomposition Method

The decomposition analysis essentially follows standard conventions.[9] First, earnings models are estimated for each group of graduates – by level of education (College, Bachelor's, Master's, Ph.D.) and sex – using the information gathered during the two interviews carried out for each cohort, two and five years after graduation (1984/87 for the 1982 graduates, 1988/91 for the 1986 graduates, and 1992/95 for the 1990 graduates).

These results – 48 regressions in all – are then used to analyse the change in the structure of the mean earnings levels for each sex-education group from the first and second interviews of the first cohort to the corresponding points in time for the later two cohorts by identifying the effects of changes in the mean values of the explanatory variables (field of study, labour market experience, province of residence, individual characteristics, *etc.*) and the effects due to changes in the associated coefficient estimates.[10]

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[8] See Finnie [1998a]. The results of applying the various restrictions on sample sizes are shown in Annex A of that paper.

[9] See Cain [1986] for a thorough exposition of the decomposition method.

[10] The effects of the changes in the explanatory variables (the first term in the decomposition) have been evaluated using the coefficient estimates obtained for the first cohort, while the effects of the changed coefficient estimates (the second term) have been evaluated using the mean levels of the later cohorts. As in any such exercise, the decomposition algebra could have been reversed, but in a situation where the choice is effectively arbitrary due to the absence of any theoretical imperative for using one set of calculations or the other, this breakdown would seem to have a certain intuitive appeal: i) the effects of the changes in the "rates of return" (*i.e.*, the coefficients) given the later (*i.e.*, most recent) characteristics, ii) the effects of the changed characteristics given the original rates of return. Comparisons of the decompositions using the reversed breakdowns generated similar overall results to those reported here (*i.e.*, overall coefficient/characteristic effects), while the effects of specific variables were somewhat more variable, as would be expected, due to the changes in certain coefficients across years. These other results are available from the author upon request.

The Earnings Models

The regression models used in the analysis conform to standard conventions adapted to the post-graduation period captured by the NGS data, with annual earnings taken to be a function of series of variables representing the individual's human capital and other factors that affect earnings.

The earnings variable available on the NGS databases represents what the person would earn on an annual basis were the current job to last the full year, regardless of the actual job status. In adjusting for irregular work patterns in this manner, the measure represents the individual's rate of pay as measured on an annual basis, rather than the amount necessarily earned. It is a somewhat unconventional measure, but well-defined, analytically interesting, and presumably well reported (being a figure individuals should either know or be able to calculate rather easily). All earnings values are given to the nearest thousand, expressed in constant 1995 dollars, and capped at the $99,000 upper limit which characterises the 1984 data (the lowest bound in the six databases), or $143,035 in constant 1995 dollars.

Earnings are specified in their actual dollar level, not the natural log, as is often used in such models. This choice stems largely from the fact that the effects represented by coefficient estimates in a log specification are, strictly speaking, correct only at the precise point estimates due to the function's non-linearity, and increasingly depart from the true effects the further the calculations move from the point where those marginal changes correctly apply (*i.e.*, the fitted "Xb" effects become increasingly less accurate approximations of the true effects as they depart from the neighbourhood where the linearisation strictly holds). In the present case, this general margin of error is sometimes important, with significant consequences for the decomposition exercise, because some of the coefficient estimates are in fact quite large and/or shift significantly across certain equations.[11]

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[11] The importance of these non-linear approximation errors was tested empirically, and a first set of results based on the natural log specification indicated that the related decomposition algebra was in some cases distorted to a significant degree – that is, the results yielded some overly strong effects due to the estimates being applied beyond the marginal changes where they correctly apply. The linear models produced coefficient estimates and standard errors which were similar to those of the log models (once transformed into percentage effects), but which generated "cleaner" (more robust) decomposition results due to their reduced insensitivity to non-marginal effects.

The linear models were, therefore, chosen over the log specifications for these very practical reasons, but with this decision perfectly defensible on theoretic-econometric grounds as well – with the two approaches generating similar results in any event.[12] Furthermore, the linear specification also makes for direct comparisons of the decomposition results across groups and over time which some readers might find appealing, as the effects are expressed in (real) dollar terms rather than the percentage terms which depend on the baseline point of comparison (*i.e.*, the percentage effects are essentially evaluated around each particular sample' means) which characterise such comparisons based on log earnings models. For convenience, however, the linear-based effects are also reported in percentage terms (relative to the mean earning values of the earliest cohort for each group) – with those values being close to what would be generated with a log earnings model.

The Variables Included in the Models

The models include the following categories of variables: i) the amount and type of education-related human capital, such as field of study and already holding a more advanced degree; ii) on-the-job work experience (both pre- and post-programme) in order to capture related human capital accumulations and other experience-related influences (*e.g.*, the outcomes of search/matching processes); iii) job characteristics, such as being self-employed, being in a temporary job, and sector of employment; iv) marital status and the presence of children, reflecting further human capital influences and/or supply side choices; and v) province/region of employment and language first spoken.

While each of the 1982, 1986, and 1990 databases contains other variables of interest, the nature of the decomposition exercise necessitates that the specifications be restricted to variables available and defined in a relatively consistent fashion across all three cohorts so that the appropriate cross-cohort comparisons may be carried out. It was also deemed desirable to restrict the models to variables which

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[12] Once the simple theoretically derived Mincerian benchmark model (where log earnings are regressed on years of schooling and a quadratic in labour market experience) is departed from – which is invariably the case in any specific practical application – the log specification is no longer necessarily superior to the linear variant, and it is largely due to convenience (the coefficients are interpretable as percentage effects) and convention that the former is more commonly used than the latter. That is, there is no general theoretical or technical reason to prefer the natural log specification over the linear form, essentially leaving model choice to be determined by practical considerations – what works best in a specific context – and personal preference. The log model results are available from the author on request.

could reasonably be considered as purely exogenous, so as to obviate the need to deal with issues relating to the potential endogeneity of the regressors and to allow the coefficients to be interpreted in terms of the effects of individuals' characteristics and the attributes of their jobs on earnings – that is, "effects" rather than "associated outcomes".

Based on these basic principles, the regression models contain the following variables, all of which are defined in a consistent fashion across all three cohorts (except for the one minor exception mentioned).[13]

i) Education Characteristics

- *Field of study*: 15 discipline groups at the university level and 16 groups at the college level, reflecting roughly comparable subject material and similar earnings patterns as determined by a preliminary analysis conducted at the specific discipline level across the six points in time covered by the data. *General social sciences* is the omitted group in the regressions.

- *A previously obtained higher degree*: a dummy variable indicating that the individual held a higher degree than the programme from which he or she graduated in the sample year (*e.g.*, an individual who graduated with a Bachelor's degree in 1982 who already held a Master's degree).

ii) Work Experience and Age

- *Pre-programme work experience:* a dummy variable indicating the individual had five or more years of full-time work experience before completing the programme.

- *Age:* two dummy variables indicating the individual was i) two to seven years older than the level-specific mean age (the average across all three cohorts), or ii) more than seven years older than the mean.[14]

- *Post-graduation work experience:* proxied with indicators of part-time and full-time work status at a number of specific points in time following graduation – two dates between

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[13] See Annex B in Finnie [1998a] for further details on these variables.

[14] The experience and age dummy variables employed here was derived from test runs where each additional year of experience and age was included separately, with the chosen variables representing the clearest cut-points in these functions.

graduation and the first interview in the case of the first interview regressions; the addition of the first interview employment status to the second interview regressions. *Not working* is the omitted category in each case, allowing the coefficients to be interpreted as the returns to experience. (More conventional measures of work experience (*e.g.*, total number of months working) are not available in the existing NGS databases.)

iii) Job Characteristics

- *Temporary job status*: a dummy variable indicating the individual held a temporary (as opposed to permanent) job.
- *Self-employed*: a dummy variable indicating self-employment (as opposed to being a paid worker).
- *Sector of employment*: dummy variables representing thirteen different industrial sectors. *Business Services* is the omitted sector.

iv) Marital Status/Number of Children

The specific variables included allow for the effects of children to vary by marital status:

- *Single (never married), with/without children (2 variables).*
- *Married, with/without children (2 variables.*
- *Widowed/Separated/Divorced, with/without children (2 variables.*

Single, no children is the omitted category.

v) Province/Language

The specific choice of variables allows for "majority" and "minority" language effects as well as provincial/regional differences, with the language variables pertaining to the that first spoken by the individual (the most measure across cohorts):

- *Atlantic Canada, Quebec, Manitoba/Saskatchewan, Alberta, British Columbia and the Territories*: a series of dummy variables representing the graduate's current province of residence.

- *Quebec-English*: captures the effect of being an anglophone in Quebec, leaving the Quebec variable on its own to represent (primarily) francophone residents (the majority group) of that province.

- *Minority French*: captures the effect of being a francophone outside of Quebec, leaving the provincial/regional indicators noted above to represent anglophones (the majority groups) in those areas (assuming a common effect across provinces).

- *Other language*: captures non-French/English speakers (again assuming a common effect across provinces – including Quebec).

Ontario – representing anglophone Ontarians – is the omitted category in the regressions.

III. EMPLOYMENT RATES AND EARNINGS LEVELS[15]

III.1 Employment Rates

Table 1 shows the labour force activity rates of the graduates in the working samples. Unemployment rates were generally quite low for all graduates, but tended to be lowest of all for those at the more advanced degree levels, ranging from as low as 2 percent for some of the classes of Ph.D. graduates in certain years to a maximum of 11 percent for College graduates in certain years.[16] These rates are considerably below those of all labour force participants of the relevant age groups taken together (*i.e.*, including both post-secondary graduates and others), with the general rates for all younger workers generally ranging from 10 to 20 percent, thus implying rates considerably higher than these for non-post-secondary graduates taken alone (see Finnie [1998b] for the relevant comparisons based on standard Labour Force Survey data). The graduates' rates also generally compare rather favourably to those of men and women of all ages taken together, thus further distancing college and university graduates from "the youth unemployment problem" – an obviously important distinction to make, particularly for policy purposes.

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[15] The material in this section is covered at a deeper level in Finnie [1998b].

[16] In Canada, colleges offer career oriented programmes ranging in length from one to three years, while all baccalaureate degrees and beyond (Master's, Ph.D.) are offered at universities. Canadian "college" graduates are, therefore, not comparable to American ones, who are instead like the Bachelor's group here.

Secondly, the unemployment situation generally improved quite dramatically from two to five years following graduation, with unemployment rates declining everywhere, usually significantly so, and sometimes halving or dropping even further over this three year interval.[17]
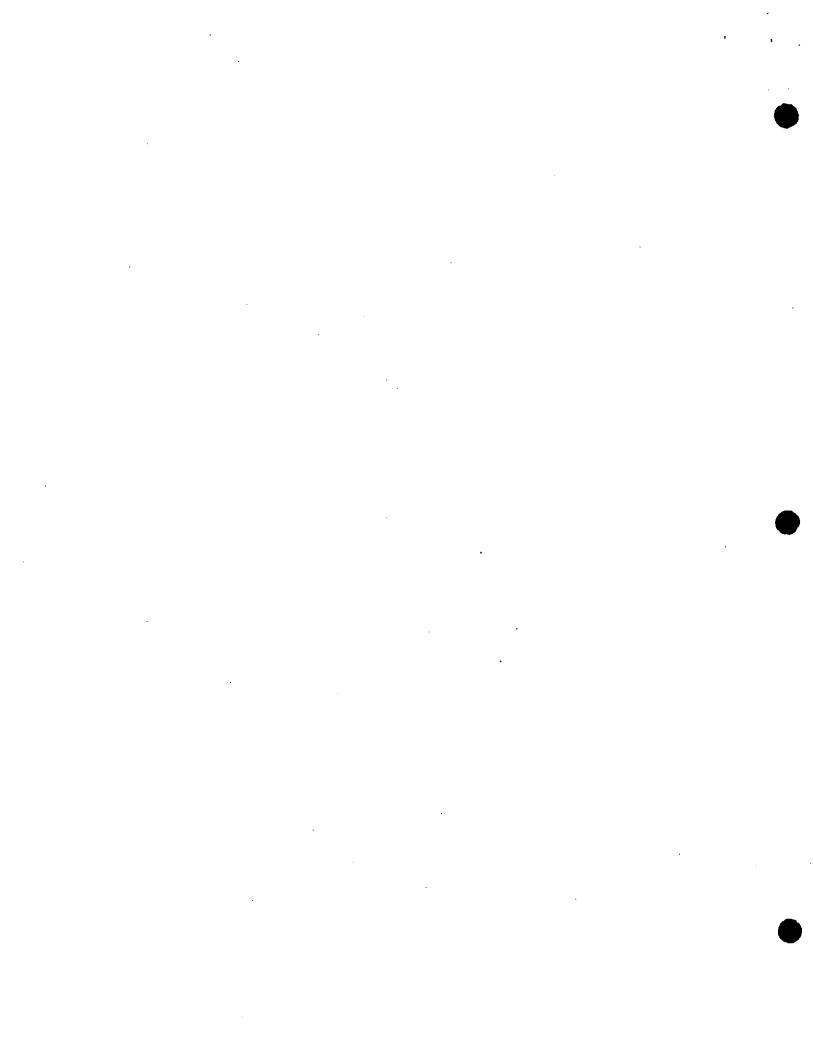
Third, and most pertinent to this paper, the unemployment rates show only a very slight upward trend across cohorts, with rates generally stable or rising only one percentage point or so from the first to last set of graduates (by sex and degree level), with some of the later groups actually showing declines at either the two- or five-year interviews (which occurred at roughly similar points in the business cycle for the two cohorts, thus allowing the results to be interpreted in terms of holding cyclical effects more or less constant). Thus, in addition to enjoying unemployment rates which have generally been much lower than those of the general population, post-secondary graduates also appear to have experienced no significant general deterioration in employment opportunities from the early 1980s into the middle 1990s – an important finding relative to the central issue addressed by this paper.

Turning to part-time work, there are various interesting trends by gender and level of education, but the most important outcome here is – as with the unemployment rates – the absence of any clear shift across cohorts. At a time when it is often taken for granted that there have been significant increases in the rates of "non-standard work" in general, and part-time work in particular, and where these are typically assumed to represent demand-side forces (*i.e.*, the absence of full-time job opportunities), the data provide no empirical evidence of this phenomenon amongst post-secondary graduates. Indeed, comparing the first and last set of graduates, there were more declines than increases in the percentage of part-time workers amongst the various sex-education groups over the relevant 1984-92/1987-95 comparison periods.

III.2 Mean Earnings Levels

Table 2 reports the mean real earnings of graduates who were working full-time as of the relevant interview dates. The first observation to make is the rather unsurprising one that mean earnings are

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[17] The central element of Finnie [1998c] is the transition theme – how outcomes evolve over the early years in the labour market. See Betts, Ferrall, and Finnie [1998] for an analysis of the specific issue of time to first job.

substantially higher at each level of education from College through Master's. Over all survey years, the difference in mean annual earnings between College and Bachelor's graduates ranges from $6,000 to $10,200, averaging approximately $8,300 for men and $8,700 for women. The differences between Bachelor's and Master's graduates were generally greater, ranging from $10,000 to $14,000, and averaging $12,700 for men and $11,300 for women. Finally, at the Ph.D. level, mean earnings generally dipped slightly from what Master's graduates earned in the case of men (except 1995, when earnings were basically equal), while they rose further for women.

A second main point is that mean earnings generally rose substantially from two to five years following graduation, the percentage increases varying from a minimum of 7 percent for 1986 female Master's graduates to as much as 26 percent for 1982 male Bachelor's graduates. Interestingly, earnings growth was uniformly greater (in percentage terms) for College and Bachelor's graduates than at the Master's and Ph.D. levels, the latter thus being characterised by higher, but flatter, post-graduation earnings profiles.

Third, mean earnings were in almost all cases higher for men than women, with women's mean earnings varying from 77 percent to 100 percent the level of men's for a given education group in a given year (see the "Female Ratio" rows in Table 2). The differences generally vary inversely with education level, with women's earnings being closest to men's amongst Ph.D. graduates, next nearest at the Bachelor's and Master's levels, and lagging furthest behind amongst College graduates. On the other hand, women's relative earnings rose in each succeeding cohort – for each education group at each of the interview dates, with the gender earnings gap generally declining by 30-55 percent from the first cohort to the third amongst College, Bachelor's, and Master's graduates.

Along the other time dimension, however, men's mean earnings rose more than women's from two to five years following graduation for every set of graduates except Ph.D. graduates of the middle cohort, and especially amongst College and Bachelor's graduates, and there was no obvious shift in these patterns across cohorts. Thus, while female graduates' earnings profiles shifted up towards the males' profiles with each succeeding cohort in terms of the starting *levels*, there was no comparable change in the *slopes* of those profiles.

Most important to the major themes of this paper, however, are the cross-cohort earnings patterns for given sex-education groups. Focusing on the first and last sets of graduates (with the relevant two year (1984/92) and five year (1987/95) interview dates being at roughly comparable points in the business cycle), men's mean earnings were stable to moderately lower for the later graduates. The specific changes were as follows: no change (two years after graduation) and a 3.6 percent decline (five years) for College level men, declines of 4.5 and 6.8 percent – the sharpest drops – for Bachelor's graduates, more moderate declines of 1.8 and 1.7 percent for Master's men, and almost negligible changes of .8 and .7 percent for males at the Ph.D. level.

For women, on the other hand, mean earnings were uniformly higher amongst graduates of the later cohorts than the earlier ones, in some cases quite substantially so. Furthermore, in almost every case, the increases came steadily over time, with earnings first rising from the first cohort to the second and then from the second to the third (the only exception being the 1 percent decline in the mean earnings of Bachelor's graduates from 1991 to 1995). The specific increases from the first cohort to the third were: 8.4 (two years after graduation) and 5.3 percent (two years after graduation) for College level women, 2.8 and .3 percent (the smallest increases) for females at the Bachelor's level, 3.6 and 4.1 percent for Master's graduates, and 5.8 and 6.1 percent for Ph.D. women.

IV. THE DECOMPOSITION RESULTS

IV.1 Framing the Discussion

The results of the decomposition analysis are reported in Table 3. In each case, the decompositions are shown for the two and five year interview points for the 1982-86 and 1982-90 cohort comparisons (1984-88/92, 1987-91/95). The effects are broken down by the variable groups described above, with the effects of the changes in the coefficients ("Beta"), the changes in the mean characteristics ("X"), and the totals given in both dollar and percentage terms, with the latter calculated relative to the 1982 cohort's baseline mean earnings values. The dollar effects thus sum (approximately) to the differences

in mean earnings across cohorts shown in Table 1, and the percentages correspond to these dollar amounts.[18, 19]

In many cases, graduates in the second and third cohorts had mean earnings levels that did not differ a great deal from those of the first cohort, perhaps leading a reader to conclude that nothing of significance had happened to earnings. The decompositions, however, allow us to dig deeper into the underlying processes to see where there were changes in the underlying *structure* of earnings, including any offsetting shifts amongst particular groups of variables (*e.g.*, educational characteristics, on-the-job experience, personal attributes) or between the characteristics of graduates and the associated regression coefficients generally which may have left overall earnings levels (the *net* effect of the various influences) relatively unchanged. We can, in particular, see where changes in the market returns to certain characteristics (represented in the coefficients) have put downward pressures on earnings while the characteristics of graduates (fields of study, accumulated work experience, *etc.*) have shifted in such a way as to neutralise those forces.

A further point to keep in mind is that it is necessary to be wary of changes in the intercept shift which might, at first glance, point to a generalised shift in earnings levels when this is not be the case. The reason is that the myriad categorical variables included in these models means that the intercept term represents the earnings of individuals possessing the very specific characteristics implied by the various omitted categories. Those baseline individuals are, to be precise: a social science graduate who did not already hold a higher degree, have any great amount full-time work experience before entering (or completing) the programme, or work at any of the points in time between graduation and the relevant interview date (the experience variables are dummy variable indicators of having a part-time or full-time job as of the appropriate dates); who had a permanent (not temporary) job as a paid worker (rather than being self-employed) in the government services sector; who was never married with no

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[18] The changes are not exactly the same as those implied in Table 1 due to the differences in the samples used in the regressions.

[19] There are too many results for the discussion to go into each particular finding – the effects associated with each group of variables for each cross-cohort comparison for each sex-education group. We will, instead, focus on the results of most interest and greatest importance. A full variable-by-variable listing of the decomposition results – the coefficient and characteristics effects associated with each variable – run to many pages and are therefore not reported here, but are available from the author upon request.

children; and who was an English speaking resident of Ontario. Thus, a significant shift in the intercept may, for example, be offset by roughly commensurate shifts in other variables which apply to most graduates, with the net effect being little general change in observed earnings levels.

IV.2 College Graduates

Males

Overall, the later cohorts of male College graduates had stable to moderately lower mean earnings relative to the first cohort, as seen in the "total" columns of Table 3: declines of $280, or 1.0 percent and $1,140, or 3.1 percent, for the 1986 cohort as of two and five years following graduation; and declines of $40 (effectively unchanged) and $1,120 (3.3 percent) for the 1990 cohort. These changes were the net outcome of negative characteristics effects being offset by positive coefficient effects for the first cohort, with both these sets of effects and the net change considerably stronger as of five years following graduation (1991) than two years out (1988); and a reverse of these tendencies for the later cohort, with positive characteristic effects offsetting some fairly strong negative coefficient effects as of two years out (1992), and similar coefficient effects with much weaker characteristics offsets as of the five years mark (1995). The market thus first shifted in a favourable way, and then turned against, male college graduates over the period covered, with changes in the characteristics of graduates offsetting these trends to varying degrees.

Looking at these trends in more detail, the intercept terms were mostly significantly higher for the later cohorts (with the increase being smaller in 1988), and the changes in the coefficients on the educational characteristics are also quite strongly positive for the middle group of graduates (see the 1984-88 and 1987-91 comparisons), while the marriage/children effects are positive as well, but of a much smaller magnitude throughout. These positive coefficient effects are, however, offset by the disadvantageous shifts in the work experience coefficients (significant declines in the coefficients on the part-time and, especially, full-time experience variables – these specific effects not shown, as explained above), cautiously interpretable as representing generalised declines in earnings in combination with diminished returns to experience (see the comments in the preceding sub-section on this point). There were also unfavourable shifts in the educational coefficients for the latest cohort (especially in 1992). The job characteristic coefficient effects were, on the other hand, more mixed – significantly positive in 1988,

significantly negative in 1992, and small in the other years – and quite generalised, representing general increases or decreases (respectively) in the earnings of individuals working in a broad number of sectors relative to those in the omitted sector (business services) for the most part, although a large decline in the positive coefficient associated with self-employment in 1995 is a notable exception in this regard. The province/language coefficient effects were also somewhat mixed, but in two of the four periods (1988 and 1992) point to generalised declines in the earnings of individuals living outside of Ontario (the omitted category – and historically the largest and wealthiest province in Canada), with the declines being greatest for politically uncertain Quebec and resource-based Alberta.

Turning to the characteristic effects, the overall influences were, as noted, negative for the 1986 graduates and positive for the later group, while varying in magnitude across interview dates within each cohort, thus indicating the absence of any generalised, secular shifts in earnings due to changes in graduates' fields of study, patterns of work experience, sectors of employment, and so on. Probably the most noteworthy specific findings are the moderate increases in the number of (lower earning) temporary workers for both years of the first cohort and again in the second year of the later cohort, and a decrease in accumulated post-graduation experience in 1991 (presumably reflecting the effects of the recession Canada experienced from the late 1980s into the early 1990s), but not for the 1990 cohort at either of its two interviews, with the 1992 data actually showing increased accumulations of experience (with commensurately positive earnings effects).

The overall conclusion, then, is that (focusing on the first and third cohorts) market conditions generally shifted against male College level graduates to a moderate degree, largely in the form of fairly generalised shifts, along with some evidence of reduced returns to labour market experience and hints of reduced opportunities for obtaining permanent jobs and work experience in the early post-graduation years in certain specific periods.

Females

The underlying trends for the College level women of the second cohort (*i.e.*, 1986 graduates) were similar to those of their male classmates, with the small net changes in earnings – smallish gains for the females as opposed to the small to moderate losses experienced by the males – resulting from the

negative effects being not quite so negative and the positive effects being a little more positive, as opposed to any great difference in the qualitative nature of the effects. The intercept and education effects were thus positive, the work experience coefficient effects negative, and so on, with the total coefficient effects being positive and the characteristic effects negative, and the former dominating, thus generating the observed gains in mean earnings from 1984 to 1988 and from 1987 to 1991.

For the third cohort, however, the male-female patterns show considerably more divergence. With respect to the coefficient effects, the substantial upward shifts in the intercept (especially from 1984 to 1992) were less than fully offset by negative changes in the education, work experience, and province/language coefficients, thus indicating rather generalised earnings gains for female college graduates ascribable to favourable shifts in the market conditions they faced.[20] There were also the same indications of reduced returns to experience as was seen with the men in 1992, but not in 1995, while the negative province/language effects were more consistent, again driven by declines in the relative earnings of graduates living in Quebec and Alberta. As with the male graduates, the characteristics effects were moderately positive in their overall effect – although here they were almost entirely due to greater accumulations of experience, both up to the point of completing the degree and thereafter.

For female college graduates, then, we could say that their relatively substantial increases in earnings from the first to third cohorts (gains of 8.8 and 5.0 percent as of the first and second interview, respectively) were the result of favourable shifts in the market conditions they faced along with "improved" characteristics, with the greater amounts of work experience which dominate the latter reflecting a combination of increased labour supply and better job opportunities, as opposed to more purely "exogenous" or "predetermined" shifts in characteristics, such as field of study, marital/family effects, or province of residence.

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[20] The changes in intercepts or other generalised effects could, alternatively, stem from changes in other factors not accounted for in the models – as is the case in any regression-based analysis.

IV.3 Bachelor's Graduates

Males

For male Bachelor's level graduates, earnings were just marginally lower for the second cohort as of the first interview (the 1984-88 comparison), but were significantly lower at all other points (1987-91, 1984-92, 1987-95). The first general point to make is that the story is not principally one of changed characteristic, since the combined effects of shifts in graduates' fields of study and other educational characteristics, accumulated work experience, job characteristics, marriage/children, and province of residence and language amount to somewhat under one-half of the decline in the 1987-91 comparison, while the total effect of these influences was actually positive everywhere else, largely driven by the work experience variables.

This obviously leaves the shifts in coefficients to account for the declines. The intercept shifts are strongly positive, and the changes in the education coefficients are also favourable (with particularly important gains for commerce, law, and medical graduates for the 1986 cohort, and for commerce and engineering graduates for the 1990 cohort). These influences are, however, more than offset by the other coefficient effects, dominated by the declines in the returns to on-the-job experience, but also including negative shifts in the coefficients on the job characteristics, especially as of five years following graduation (significantly reduced benefits to being self-employed in 1991, 1992, and 1995 are particularly noteworthy). The province effects are also quite negative, again led by declines for Quebec and Alberta (relative to Ontario). Returning to the point made earlier, these results are probably best interpreted as representing generalised downward shifts in earnings levels accompanied by a reshuffling of the relative earnings of certain particular groups of workers, including a general compression in the differences in earnings between those who had been quicker to obtain job experience and those who had not.

It would, therefore, appear that the general declines in male Bachelor's graduates' earnings were driven by shifts in market demand conditions rather than any changes in their behaviour or characteristics. Indeed, the results suggest that had the structure of earnings remained constant, the 1990 cohort would

have enjoyed earnings levels somewhat greater than those of the 1982 cohort – as opposed to the fairly significant declines experienced.[21]

Females

For female Bachelor's graduates, on the other hand, the coefficient effects were also generally small, but generally positive (rather than negative) in all years except 1988. Amongst these, the increased earnings of education graduates are alone worth close to $500 overall in each period, improvements in the relative earnings of married women were also important contributors to the overall gains, while the provincial effects largely resemble those of men (the Quebec effects are again strong, but the shifts in the Alberta coefficients are not quite so important). With the characteristics effects being similar to or slightly greater than those of men – and thus all positive (with the greatest of these again being the increased accumulations of work experience) – the net result is the smallish gains which are observed, in contrast to the losses for males.

We can, therefore, think of the market conditions in the later years, including those related to marital status (the result of work place policies – public and/or private?), working slightly in their favour, rather than against them, while they also made somewhat more rapid movements into part- and full-time job situations following graduation, which pushed their earnings up a bit further.

IV.4 Master's Graduates

Males

The later cohorts of male Master's level graduates had lower earnings than the 1984 graduates in all cases, ranging from a small .7 percent decline for the 1986 cohort as of the first interview, to a more significant 2.4 percent for the same group three years later (1987-91), while the 1990 cohort registered declines of 1.5 and 1.6 percent as of the two and five year interview dates.

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[21] It should be emphasized that individuals' characteristics are treated as exogenously determined throughout this analysis (as is standard in such studies), and treating some of these as endogenous could potentially change the results significantly. The approach is, in this sense, best thought of as a descriptive exercise, which could lead to further analysis focused on the variables found to be most important here.

For the middle cohort (1986 graduates), the characteristics effects drove earnings .7 percent lower as of each interview date, with the experience measures being most important in this regard, especially for the five-year results. More specifically, there were reduced numbers of older and more experienced graduates in 1988, with these same effects plus reduced accumulations of post-graduation experience operating in 1991. These changes more than off-set the positive education effects (increased numbers of commerce and medicine graduates versus some losses due to a smaller number of education graduates), as well as some smaller job characteristics effects related, amongst which the positive effects of a slight rise in the number of (higher earning) self-employed workers is probably the most interesting.

Turning to the coefficient effects for the middle cohort, many of these are strong individually, but *in toto* the influences are largely countervailing, with the net effects being nil in 1986 and a negative $1,000 (1.7 percent) in 1991. More specifically, the intercepts shifted upwards relative to the baseline 1982 cohort (especially in 1988); the shifts in the education coefficients generated positive overall effects, largely driven by large gains for commerce graduates and smaller increases for those with degrees in education, engineering, and mathematics/physics; the work experience coefficients shifted downwards very sharply, comprising a generalised negative influence on earnings along with a reduction in the experience effects (as already seen and discussed in the context of other groups above); the job characteristics effects went from moderately positive to the reverse from two to five years out, that evolution chiefly due to increasingly negative effects of having a temporary job; the family status variables had a similar positive-then-negative dynamic, principally due to substantial shifts in the marriage premium over the relevant interval; and the province/language effects were moderately negative at both interview points, the smaller effects relative to what was found with the Bachelor's graduates presumably reflecting the different spatial aspects of the labour markets for individuals with more advanced degrees. The coefficient effects thus point to a moderate reshuffling of relative earnings patterns amongst graduates (by field of study, amount of job experience, marital status, *etc.*) amidst a small to moderate generalised downward pressure on earnings, especially as of the second interview date.

The story is a bit different for the 1990 cohort. The characteristics effects are again negative, but more strongly so than for the earlier group, especially as of the second interview date (negative 2.8 percent in 1995). Experience effects are again important in this dynamic, at least for the later year, but stem from a reduction in the percentage of older graduates (who tend to have higher earnings), as *post*-graduation accumulations of experience are actually greater. These more than offset the unfavourable shifts in graduates' education characteristics (as opposed to the positive effects of the 1986 cohort), with declines in the number of education and medical graduates more than offsetting the positive influence of an increased number of commerce graduates.

The overall coefficient effects for the 1990 cohort are, as for the preceding class, slightly negative as of the first interview (1992), but then positive for the second (1995), although the various sets of influences are qualitatively similar to those of the 1986 cohort: favourable shifts in the earnings patterns by field of study similar to those characterising the earlier group; strong experience effects representing generalised decreases in earnings and an apparent reduction in the returns to post-graduation experience, offset to some degree by increases in the premiums to pre-graduation experience; various job characteristics effects, with the declines in the earnings of workers in temporary jobs and the self-employed being most interesting in this regard, but essentially washing out amongst themselves in each year (as opposed to the significantly positive and then negative net effects for the preceding group); shifting family status coefficients, with movements in the marriage premium again being most important in this regard; and stronger province effects than for the preceding cohort, with the effects somewhat more generalised (*i.e.*, beyond Quebec and Alberta) than for Bachelor's graduates.

We might, therefore, summarise the analysis of male Master's graduates by saying that although some of the market effects were individually important, and some of the shifts quite interesting (*e.g.*, the increased returns to pre-graduation experience and the declines in the earnings of the self-employed and temporary workers for the 1990 cohort), the overall effects ranged only from quite small and even positive (1988, 1992, 1995) to moderately negative (1991), while changes in graduates' characteristics also had relatively small negative effects until this downward pressure increased in 1995. It thus appears that there were no generalised shifts in the market parameters faced by male Master's graduates, with their small to moderate declines in earnings driven principally by various characteristics

effects, only some of which could in turn be thought of as being related to market conditions (*e.g.*, post-graduation experience).

Females

For female Master's graduates, mean earnings (in the regression samples) were more or less the same for the 1986 cohort as the baseline 1982 group (a small rise in 1988, a small decline in 1991), and approximately 3.5 percent higher for the 1990 group – all in contrast to the uniform declines experienced by their male classmates, thus generating net gains of about five percent for female graduates relative to male graduates at the Master's level for the most recent group (female gains of about 3.5 percent versus male losses of about 1.5 percent at each interview). The underlying factors are, however, fairly diverse and diffuse – with no important secular trends in particular characteristics or coefficient effects operating for female Master's graduates over this period.

More specifically, the characteristics effects are all quite small for the 1986 cohort, with no particularly important changes in field of study, job characteristics, family status, or province/language, although there are some smallish effects due to increases in the numbers of older graduates with more pre-graduation experience and post-graduation accumulations of experience in certain years. The coefficient effects for the 1986 cohort are, as noted, largely offsetting (the net effects are exactly zero and -.8 percent in 1988 and 1991 respectively) and largely devoid of any clear patterns of importance, with the largish shifts by category principally due to changes in the relative earnings patterns of the omitted categories and most other categories within a given group (*e.g.*, shifts in the relative earnings of the omitted education, industry, and province variables shifting the overall intercept and commensurate countervailing shifts of most of the other variables within each group). The only particularly interesting changes are some moderately favourable increases in the earnings of older and more experienced graduates (with the other experience effects being quite mixed); further declines in the already lower earnings of temporary workers (as for males) versus small improvements in the earnings of the self-employed (more favourable than the male situation); some disadvantageous shifts in the earnings of married graduates from two to five years following graduation, turning the family structure effects from moderately positive to distinctly negative over this interval; and the by now

familiar negative province effects, these being (as for males) more widespread than amongst Bachelor's graduates.

For the 1990 cohort, there were increased numbers of older graduates and increased post-graduation experience, with these changes principally responsible for the positive characteristics-related effects both two and five years following graduation. Regarding the coefficient effects, there were again increased returns to older, more experienced graduates and to post-graduation experience at the first interview (1992), but more neutral post-graduation experience effects for the second interview (with the overall experience and intercept effects shifting accordingly). As was found for the 1986 cohort, the marriage coefficient effects are positive for the first interview (see the family status effects), but not the second. Finally, the province/language effects are quite strong, representing rather generalised declines in the earnings of graduates living outside of Ontario, with these effects being considerably stronger than the case of men – perhaps reflecting a different job related dynamic with respect to decisions about where to live on the part of men and women.[22]

Overall, then, the record of female Master's graduates was – more than any other group – largely one of stability over this period, in terms of both characteristics and coefficients, with the most important and interesting shifts being certain changes in the experience variables (both characteristics and coefficient effects), the changes in the relative earnings of married graduates, and the province effects.

IV.5 Ph.D. Graduates

Males

Male Ph.D. graduates of the second cohort had slightly to moderately lower earnings than the preceding class (down 1.8 and 3.8 percent at the two interview dates respectively). These declines were largely driven by an increase in the number of fine arts and humanities graduates and a decrease in education graduates (affecting both interviews' results), along with considerably greater numbers of graduates in temporary jobs and fewer self-employed (which pays a premium for this group) as of the

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[22] The issue of inter-provincial mobility of post-secondary graduates is currently being pursued with John Burbidge of McMaster University.

second interview date – together driving the characteristics effects which dominate the overall changed earnings levels.

On the other side of the ledger, the coefficient effects are sometimes large, but largely cancel each other out (reflecting the same sort of shifting locus of the generalised effects as discussed for the other groups), together generating moderately negative net effects on mean earnings in each period except the first. Amongst these, the more interesting shifts include the increase in the relative earnings of applied science and health (non-medicine) graduates, along with some large swings in the earnings of fine arts and humanities graduates (significantly higher than the 1982 cohort level at the first interview, then significantly lower at the second interview); increased earnings of older graduates and those with more pre-graduation work experience, while the returns to post-graduation experience were lower at the first interview but higher at the second; further declines in the already lower earnings of temporary workers, but large gains for those working in the educational sector (representing approximately 55 percent of the graduates and, therefore, worth $3,000 to $4,000, thus driving the strong job coefficient effects); and an absence of the province effects seen for the other levels, presumably reflecting the more national scope of the labour markets faced by Ph.D. graduates, while individuals who first spoke a language other than English or French did a significant amount of catching up to others in this cohort.

For the 1990 cohort, male Ph.D. graduates' earnings recovered to levels very close to those of the earliest group. The characteristics effects show a net positive impact on earnings, with the most important changes being an increase in the number of engineering graduates (positive effect); a greater number of older graduates (also positive); more temporary workers as of the second interview (as in the 1986 cohort) and greater numbers of self-employed (rather than the decrease in 1991) comprising offsetting effects in the job characteristics category; and decreases in the percentage of third language graduates (positive effects).

The coefficient effects for the later group of male Ph.D. graduates were, overall, moderately negative. Shifts in earnings by field of study drove up the earnings of fine arts and humanities, medicine, and related health graduates (see the positive education coefficient effects); the age and experience premiums moved around too much from variable to variable and from the first interview to the second

to identify any general pattern (with the parallel shifts in the intercept representing the same shifting of the general effects as seen elsewhere); earnings were again significantly higher in the educational sector (predominantly college and university professors); while the province effects were significantly negative in 1992 (the trough of the early-90s recession), but much less so in 1995, when third language graduates again did significantly better than in the baseline 1982 cohort.

The overall story for male Ph.D. graduates is, then, one of lower overall earnings mostly driven by market factors (including the job characteristics effects related to the increases in temporary jobs and less self-employment) for the middle cohort, but then full recovery to the earnings levels of the baseline group of 1982 graduates for the most recent cohort, for which the various observed shifts in market forces had little net effect on overall mean earnings levels.

Females

For female Ph.D. graduates of the 1986 cohort, mean earnings were 0.3 percent lower than those of the baseline group as of the first interview point, and 2.9 percent higher as of the second, with the latter gains – and indeed the earlier relative stability – largely the result of favourable shifts in the coefficients, as the characteristics effects tilted their earnings somewhat downward. The negative characteristics effects were, in turn, largely owing to a decline in the proportion of graduates in education and (non-medicine) health disciplines, somewhat offset by a decrease in applied science graduates (who tend to have below average earnings); some mixed shifts in graduates' mean age and both pre- and post-graduation accumulations of labour market experience; and the offsetting (positive) effect of a doubling in the percentage of self-employed graduates at the second interview (worth approximately $1,500 on its own).

The coefficient effects are in many cases large, but are once again mostly off-setting, thus (again) representing shifts in the general effects from one set of variables to another. The most interesting specific coefficient effects include a significant increase in the returns to both pre- and post-graduation experience; a significant improvement in the relative earnings of the self-employed (characterised by lower earnings than regular paid workers at the first interview but paying a large premium at the second interview); significant improvements in the relative standing of married graduates with children

at the first interview but a disappearance of these gains by the second; and – in significant contrast to all other groups – *favourable* shifts in the relative earnings of graduates living outside of Ontario, and *especially* in Quebec.

For the class of 1990, female Ph.D. graduates had substantial gains in mean earnings over both earlier classes: 4.5 and 6.0 percent as of the two interview dates. Once again, the coefficient effects were quite strongly positive overall, with some of the specific shifts of interest being increased earnings of graduates in commerce, medicine, and other health disciplines (especially in 1992); gains to pre- and post-graduation experience (as for the 1986 cohort); improvements for those working in the educational services sector (as was found for their male classmates); first an improvement and then a deterioration in the relative earnings of married graduates with children (similar to the 1986 cohort); and the same sort of negative province effects as found for other groups (and quite different from the 1986 cohort).

The overall characteristics effects were somewhat unfavourable in 1992, but then (unlike the 1986 cohort) advantageous by the second interview in 1995. The latter stem from an increase in the percentage of engineering graduates (the 1 percent to 5 percent increase in the percentage of female Ph.D. graduates they represent worth $2,300 on its own); greater accumulations of labour market experience; an increase in the number of self-employed, offset by an increase in the number of temporary workers; plus some sectoral shifts, including a decrease in the number of female Ph.D. graduates employed in the educational sector (where earnings remained below average, despite the relative gains noted above).

All-in-all, then, female Ph.D. graduates did mostly better over this period, especially the later class, largely due to favourably shifting market parameters, except for the final period, when their characteristics also contributed substantially to the gains.

V. CONCLUSION

We return to the question posed at the outset of this paper: How have recent Canadian post-secondary graduates been faring in the labour market of late? The analysis presented here based on the National

Graduates Surveys of the classes of 1982, 1986, and 1990 has shown that unemployment rates have been considerably below those of non-graduates of the same age and the working age population in general, have declined substantially from two to five years following graduation, and – most significantly – have generally held approximately steady across the three cohorts, as did rates of part-time work. Earnings levels have been generally higher at the more advanced educational levels, increased substantially in the early years in the labour market, and – again most importantly – either held steady or shown small-to-moderate declines across cohorts in the case of men, or been stable-to-higher in the case of women.

Thus, while the maximum decline in mean earnings of just under 7 percent found for the Bachelor's level men is hardly trivial, it is perhaps not as great as many might have expected, especially in representing the worst case amongst all sets of graduates. On the other hand, the stable-to-significantly-improved trends in the earnings of female graduates has to be seen as good news at a time when many observers take it for granted that graduates' labour market fortunes have been in decline, and will be seen as a favourable development for those looking for a narrowing of the gender earnings gap.

As for the underlying forces which have been affecting earnings levels, men's earnings levels have for the most part been affected by a combination of moderately adverse shifts in market conditions, as represented in the coefficient effects and certain market-related characteristics effects (*e.g.*, post-graduation experience, job characteristics), plus mixed effects with respect to the changes in their characteristics (sometimes positive, sometimes negative), with these varying by education level and specific period. Female graduates have faced a more varied set of market influences, with the overall coefficient effects being favourable in the case of the College graduates, generally neutral for Bachelor's level graduates, slightly negative to moderately positive for women at with Master's degrees, and quite strongly positive at the Ph.D. level. Females' characteristics effects have also been mixed, affecting earnings most consistently in a positive way at the Bachelor's and Master's level, and less so amongst College and Ph.D. graduates. Thus, as graduates' earnings patterns have shown no simple general sets of trends, the underlying influences on earnings levels have been similarly mixed.

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Table 1: Employment Rates (% Distribution)[1]

1982 Cohort

	1984			1987		
	Employed			Employed		
	Full	Part	Unemp.	Full	Part	Unemp.
COLLEGE:						
Male	84	5	11	89	4	7
Female	79	12	9	79	16	5
BACHELOR'S:						
Male	85	6	9	92	4	4
Female	79	12	9	81	14	5
MASTER'S:						
Male	89	4	6	92	6	2
Female	80	11	8	81	15	4
DOCTORATE:						
Male	89	4	6	93	4	3
Female	87	6	7	89	9	2

1986 Cohort

	1988			1991		
	Employed			Employed		
	Full	Part	Unemp.	Full	Part	Unemp.
COLLEGE:						
Male	85	4	11	86	4	10
Female	80	12	8	81	13	7
BACHELOR'S:						
Male	84	5	10	90	4	7
Female	78	13	9	81	14	6
MASTER'S:						
Male	87	6	7	90	6	4
Female	80	12	7	81	15	4
DOCTORATE:						
Male	91	4	4	96	2	2
Female	82	10	8	86	11	3

1990 Cohort

	1992			1995		
	Employed			Employed		
	Full	Part	Unemp.	Full	Part	Unemp.
COLLEGE:						
Male	84	5	11	90	4	7
Female	77	13	10	79	14	7
BACHELOR'S:						
Male	84	6	10	92	3	5
Female	78	13	10	82	13	5
MASTER'S:						
Male	86	7	7	89	5	6
Female	81	12	7	82	13	5
DOCTORATE:						
Male	92	3	5	94	3	4
Female	87	7	7	85	9	6

[1] Samples exclude graduates who had completed a new diploma by the relevant interview.

Table 2: Mean Earnings (1995 Constant Dollars) [1]

	1982 Cohort			1986 Cohort			1990 Cohort		
	2 Years (1984) $	5 Years (1987) $	Change (84-87) %	2 Years (1988) $	5 Years (1991) $	Change (88-91) %	2 Years (1992) $	5 Years (1995) $	Change (92-95) %
COLLEGE:									
Male	29,700	36,600	23	29,400	35,500	21	29,700	35,300	19
Female	24,900	28,200	13	25,100	28,700	14	27,000	29,700	10
Female Ratio (%)	84	77		85	81		91	84	
BACHELOR'S:									
Male	37,400	47,000	26	37,600	44,700	19	35,700	43,800	23
Female	32,700	38,400	17	33,500	38,900	16	33,600	38,500	15
Female Ratio (%)	87	82		89	87		94	88	
MASTER'S:									
Male	51,400	57,500	12	50,600	55,700	10	50,500	56,500	12
Female	44,400	48,400	9	45,500	48,900	7	46,000	50,400	10
Female Ratio (%)	86	84		90	88		91	89	
DOCTORATE:									
Male	49,700	56,300	13	49,100	54,400	11	49,300	55,900	13
Female	46,700	50,700	9	47,300	52,400	11	49,400	53,800	9
Female Ratio (%)	94	90		96	96		100	96	

[1] Samples exclude graduates who had completed another diploma by the relevant interview.

Table 3: Decomposition Results

College

1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	550	2.1	0	0.0	550	2.1	3,960	10.8	0	0.0	3,960	10.8
Ed. Chars.	4,040	15.1	-160	-0.6	3,880	14.5	1,630	4.4	-20	-0.1	1,610	4.4
Work Exp.	-4,840	-18.1	10	0.0	-4,830	-18.1	-5,970	-16.3	-760	-2.1	-6,730	-18.4
Job Chars.	2,000	7.5	-310	-1.2	1,690	6.3	230	0.6	-590	-1.6	-360	-1.0
Marr./Chil.	290	1.1	-30	-0.1	260	1.0	940	2.6	-100	-0.3	840	2.3
Province	-1,770	-6.6	-60	-0.2	-1,830	-6.9	-80	-0.2	-390	-1.1	-470	-1.3
Total	260	1.0	-540	-2.0	-280	-1.0	710	1.9	-1,850	-5.0	-1,140	-3.1
Females:												
Intercept	1,070	4.3	0	0.0	1,070	4.3	7,740	27.4	0	0.0	7,740	27.4
Ed. Chars.	1,140	4.6	-140	-0.6	1,000	4.0	520	1.8	-290	-1.0	230	0.8
Work Exp.	-1,730	-7.0	90	0.4	-1,640	-6.6	-4,820	-17.1	-440	-1.6	-5,260	-18.6
Job Chars.	2,660	10.7	-310	-1.2	2,350	9.4	560	2.0	-100	-0.4	460	1.6
Marr./Chil.	-300	-1.2	20	0.1	-280	-1.1	-620	-2.2	-10	0.0	-630	-2.2
Province	-2,160	-8.7	-70	-0.3	-2,230	-9.0	-1,850	-6.5	-160	-0.6	-2,010	-7.1
Total	690	2.8	-400	-1.6	290	1.2	1,510	5.3	-1,010	-3.6	500	1.8

1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	7,180	26.9	0	0.0	7,180	26.9	5,010	13.7	0	0.0	5,010	13.7
Ed. Chars.	-3,100	-11.6	510	1.9	-2,590	-9.7	-520	-1.4	560	1.5	40	0.1
Work Exp.	-3,050	-11.4	930	3.5	-2,120	-7.9	-3,280	-8.9	550	1.5	-2,730	-7.4
Job Chars.	-740	-2.8	-230	-0.9	-970	-3.6	-3,490	-9.5	-750	-2.0	-4,240	-11.6
Marr./Chil.	640	2.4	90	0.3	730	2.7	410	1.1	-100	-0.3	310	0.8
Province	-2,320	-8.7	150	0.6	-2,170	-8.1	430	1.2	-50	-0.1	380	1.0
Total	-1,400	-5.2	1,440	5.4	40	0.1	-1,430	-3.9	210	0.6	-1,220	-3.3
Females:												
Intercept	8,480	34.1	0	0.0	8,480	34.1	3,170	11.2	0	0.0	3,170	11.2
Ed. Chars.	-1,370	-5.5	100	0.4	-1,270	-5.1	-1,270	-4.5	90	0.3	-1,180	-4.2
Work Exp.	-4,300	-17.3	800	3.2	-3,500	-14.1	900	3.2	650	2.3	1,550	5.5
Job Chars.	920	3.7	-60	-0.2	860	3.5	-940	-3.3	80	0.3	-860	-3.0
Marr./Chil.	90	0.4	70	0.3	160	0.6	200	0.7	-110	-0.4	90	0.3
Province	-2,620	-10.5	80	0.3	-2,540	-10.2	-1,320	-4.7	-30	-0.1	-1,350	-4.8
Total	1,190	4.8	1,000	4.0	2,190	8.8	740	2.6	670	2.4	1,410	5.0

Decomposition Results

Bachelor's

1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	5,070	13.6	0	0.0	5,070	13.6	4,660	9.9	0	0.0	4,660	9.9
Ed. Chars.	1,250	3.3	140	0.4	1,390	3.7	3,790	8.0	-160	-0.3	3,630	7.7
Work Exp.	-4,120	-11.0	940	2.5	-3,180	-8.5	-6,710	-14.2	-130	-0.3	-6,840	-14.5
Job Chars.	-1,340	-3.6	40	0.1	-1,300	-3.5	-2,520	-5.4	-270	-0.6	-2,790	-5.9
Marr./Chil.	-220	-0.6	40	0.1	-180	-0.5	970	2.1	-130	-0.3	840	1.8
Province	-1,340	-3.6	-110	-0.3	-1,450	-3.9	-1,620	-3.4	-210	-0.4	-1,830	-3.9
Total	-700	-1.9	1,050	2.8	350	0.9	-1,420	-3.0	-910	-1.9	-2,330	-4.9
Females:												
Intercept	-850	-2.6	0	0.0	-850	-2.6	5,710	14.9	0	0.0	5,710	14.9
Ed. Chars.	1,740	5.3	220	0.7	1,960	6.0	250	0.7	450	1.2	700	1.8
Work Exp.	-1,720	-5.2	670	2.0	-1,050	-3.2	-4,980	-13.0	250	0.7	-4,730	-12.4
Job Chars.	880	2.7	40	0.1	920	2.8	270	0.7	-90	-0.2	180	0.5
Marr./Chil.	870	2.7	-30	-0.1	840	2.6	540	1.4	20	0.1	560	1.5
Province	-1,130	-3.4	-30	-0.1	-1,160	-3.5	-1,650	-4.3	-100	-0.3	-1,750	-4.6
Total	-210	-0.6	870	2.7	660	2.0	130	0.3	530	1.4	660	1.7

1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	2,010	5.4	0	0.0	2,010	5.4	2,030	4.3	0	0.0	2,030	4.3
Ed. Chars.	2,090	5.6	20	0.1	2,110	5.6	2,710	5.8	-360	-0.8	2,350	5.0
Work Exp.	-4,000	-10.7	860	2.3	-3,140	-8.4	-4,160	-8.8	650	1.4	-3,510	-7.5
Job Chars.	-810	-2.2	-70	-0.2	-880	-2.4	-3,170	-6.7	60	0.1	-3,110	-6.6
Marr./Chil.	180	0.5	-40	-0.1	140	0.4	-210	-0.4	-150	-0.3	-360	-0.8
Province	-1,810	-4.8	20	0.1	-1,790	-4.8	-870	-1.8	180	0.4	-690	-1.5
Total	-2,300	-6.2	790	2.1	-1,510	-4.0	-3,680	-7.8	390	0.8	-3,290	-7.0
Females:												
Intercept	920	2.8	0	0.0	920	2.8	530	1.4	0	0.0	530	1.4
Ed. Chars.	1,390	4.2	-70	-0.2	1,320	4.0	1,060	2.8	230	0.6	1,290	3.4
Work Exp.	-720	-2.2	330	1.0	-390	-1.2	-50	-0.1	150	0.4	100	0.3
Job Chars.	-290	-0.9	30	0.1	-260	-0.8	-990	-2.6	-300	-0.8	-1,290	-3.4
Marr./Chil.	960	2.9	-10	0.0	950	2.9	830	2.2	-10	0.0	820	2.1
Province	-1,890	-5.8	10	0.0	-1,880	-5.7	-1,360	-3.6	90	0.2	-1,270	-3.3
Total	370	1.1	300	0.9	670	2.0	30	0.1	160	0.4	190	0.5

Decomposition Results

Master's

1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	1,430	2.8	0	0.0	1,430	2.8	5,450	9.5	0	0.0	5,450	9.5
Ed. Chars.	3,810	7.4	360	0.7	4,170	8.1	3,330	5.8	790	1.4	4,120	7.2
Work Exp.	-7,470	-14.5	-510	-1.0	-7,980	-15.5	-6,510	-11.3	-1,220	-2.1	-7,730	-13.4
Job Chars.	1,060	2.1	10	0.0	1,070	2.1	-1,490	-2.6	480	0.8	-1,010	-1.8
Marr./Chil.	1,670	3.2	-200	-0.4	1,470	2.9	-1,500	-2.6	-330	-0.6	-1,830	-3.2
Province	-500	-1.0	10	0.0	-490	-1.0	-290	-0.5	-120	-0.2	-410	-0.7
Total	-10	0.0	-340	-0.7	-350	-0.7	-1,000	-1.7	-390	-0.7	-1,390	-2.4
Females:												
Intercept	330	0.7	0	0.0	330	0.7	7,200	14.7	0	0.0	7,200	14.7
Ed. Chars.	-2,410	-5.4	70	0.2	-2,340	-5.2	-20	0.0	330	0.7	310	0.6
Work Exp.	-280	-0.6	450	1.0	170	0.4	-4,480	-9.2	-130	-0.3	-4,610	-9.4
Job Chars.	3,310	7.4	-210	-0.5	3,100	6.9	360	0.7	-220	-0.4	140	0.3
Marr./Chil.	710	1.6	80	0.2	790	1.8	-1,500	-3.1	30	0.1	-1,470	-3.0
Province	-1,680	-3.8	60	0.1	-1,620	-3.6	-1,950	-4.0	-30	-0.1	-1,980	-4.0
Total	-10	0.0	450	1.0	440	1.0	-390	-0.8	-20	0.0	-410	-0.8

1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	4,340	8.4	0	0.0	4,340	8.4	1,950	3.4	0	0.0	1,950	3.4
Ed. Chars.	2,300	4.5	-210	-0.4	2,090	4.1	2,360	4.1	-680	-1.2	1,680	2.9
Work Exp.	-5,400	-10.5	90	0.2	-5,310	-10.3	-2,790	-4.8	-1,020	-1.8	-3,810	-6.6
Job Chars.	-170	-0.3	-220	-0.4	-390	-0.8	-210	-0.4	260	0.5	50	0.1
Marr./Chil.	1,220	2.4	-140	-0.3	1,080	2.1	250	0.4	-90	-0.2	160	0.3
Province	-2,610	-5.1	40	0.1	-2,570	-5.0	-870	-1.5	-60	-0.1	-930	-1.6
Total	-320	-0.6	-430	-0.8	-750	-1.5	690	1.2	-1,600	-2.8	-910	-1.6
Females:												
Intercept	-2,290	-5.1	0	0.0	-2,290	-5.1	1,730	3.5	0	0.0	1,730	3.5
Ed. Chars.	-400	-0.9	50	0.1	-350	-0.8	100	0.2	240	0.5	340	0.7
Work Exp.	5,370	12.0	920	2.1	6,290	14.1	40	0.1	580	1.2	620	1.3
Job Chars.	610	1.4	90	0.2	700	1.6	1,090	2.2	-40	-0.1	1,050	2.1
Marr./Chil.	670	1.5	120	0.3	790	1.8	130	0.3	90	0.2	220	0.4
Province	-3,430	-7.7	-120	-0.3	-3,550	-8.0	-2,240	-4.6	-90	-0.2	-2,330	-4.8
Total	540	1.2	1,070	2.4	1,610	3.6	850	1.7	780	1.6	1,630	3.3

Decomposition Results

Doctorate

1982 vs 1986

| | 2 years (1984-1988) | | | | | | 5 years (1987-1991) | | | | | |
| | Beta | | X | | Total | | Beta | | X | | Total | |
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	-1,250	-2.5	0	0.0	-1,250	-2.5	-5,830	-10.3	0	0.0	-5,830	-10.3
Ed. Chars.	-730	-1.5	-880	-1.8	-1,610	-3.2	-1,520	-2.7	-780	-1.4	-2,300	-4.1
Work Exp.	-2,700	-5.4	-130	-0.3	-2,830	-5.7	5,850	10.4	420	0.7	6,270	11.1
Job Chars.	4,410	8.8	310	0.6	4,720	9.4	3,790	6.7	-1,130	-2.0	2,660	4.7
Marr./Chil.	450	0.9	-180	-0.4	270	0.5	-3,250	-5.8	-150	-0.3	-3,400	-6.0
Province	-140	-0.3	-30	-0.1	-170	-0.3	270	0.5	170	0.3	440	0.8
Total	30	0.1	-910	-1.8	-880	-1.8	-680	-1.2	-1,480	-2.6	-2,160	-3.8
Females:												
Intercept	-14,660	-31.1	0	0.0	-14,660	-31.1	2,480	4.9	0	0.0	2,480	4.9
Ed. Chars.	-890	-1.9	-1,390	-2.9	-2,280	-4.8	-3,900	-7.7	-550	-1.1	-4,450	-8.7
Work Exp.	11,560	24.5	-630	-1.3	10,930	23.2	7,730	15.2	-1,070	-2.1	6,660	13.1
Job Chars.	2,280	4.8	30	0.1	2,310	4.9	-3,680	-7.2	790	1.6	-2,890	-5.7
Marr./Chil.	1,400	3.0	-260	-0.6	1,140	2.4	-670	-1.3	140	0.3	-530	-1.0
Province	2,440	5.2	-30	-0.1	2,410	5.1	540	1.1	-350	-0.7	190	0.4
Total	2,130	4.5	-2,280	-4.8	-150	-0.3	2,500	4.9	-1,040	-2.0	1,460	2.9

1982 vs 1990

| | 2 years (1984-1992) | | | | | | 5 years (1987-1995) | | | | | |
| | Beta | | X | | Total | | Beta | | X | | Total | |
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	-4,270	-8.5	0	0.0	-4,270	-8.5	-3,070	-5.4	0	0.0	-3,070	-5.4
Ed. Chars.	2,700	5.4	290	0.6	2,990	6.0	930	1.6	250	0.4	1,180	2.1
Work Exp.	420	0.8	220	0.4	640	1.3	-320	-0.6	930	1.6	610	1.1
Job Chars.	3,800	7.6	660	1.3	4,460	8.9	2,520	4.5	220	0.4	2,740	4.9
Marr./Chil.	-520	-1.0	-240	-0.5	-760	-1.5	-1,670	-3.0	70	0.1	-1,600	-2.8
Province	-3,120	-6.2	-10	0.0	-3,130	-6.3	130	0.2	-40	-0.1	90	0.2
Total	-990	-2.0	910	1.8	-80	-0.2	-1,480	-2.6	1,440	2.6	-40	-0.1
Females:												
Intercept	-24,930	-52.9	0	0.0	-24,930	-52.9	4,780	9.4	0	0.0	4,780	9.4
Ed. Chars.	2,080	4.4	-560	-1.2	1,520	3.2	290	0.6	710	1.4	1,000	2.0
Work Exp.	19,200	40.7	250	0.5	19,450	41.2	4,030	7.9	380	0.7	4,410	8.7
Job Chars.	3,860	8.2	60	0.1	3,920	8.3	-1,540	-3.0	530	1.0	-1,010	-2.0
Marr./Chil.	3,150	6.7	-220	-0.5	2,930	6.2	-3,970	-7.8	-120	-0.2	-4,090	-8.0
Province	-730	-1.5	-60	-0.1	-790	-1.7	-2,010	-3.9	-10	0.0	-2,020	-4.0
Total	2,650	5.6	-530	-1.1	2,120	4.5	1,590	3.1	1,490	2.9	3,080	6.0