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The Returns to Flexible Postsecondary Education: The Effect of Delaying School

Ana M. Ferrer
University of Calgary

Alicia Menendez
University of Chicago

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The Returns to Flexible Postsecondary Education: The Effect of Delaying School[1]

Ana M. Ferrer
Department of Economics
University of Calgary
aferrer@ucalgary.ca

Alicia Menendez
Harris School of Public Policy
University of Chicago
menendez@uchicago.edu

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Abstract. We investigate the returns to postsecondary education relaxing the standard assumption that it proceeds in a continuous manner. Using a unique survey that collects information on a representative cohort of graduates, we are able to estimate the effects of delaying school among successful graduates abstracting from specific macroeconomic conditions at the time of graduation. Our results show that graduates that delayed their education receive a premium relative to graduates that did not, even after considering other factors such as experience or labour market connections. These estimates are robust to the possibility of selection in the decision to return to school.

JEL classification: J24, I2

Keywords: Human capital, postsecondary education, flexible school choice, school delay

Executive Summary

Rapidly changing technologies and increasing costs of postsecondary education induce individuals to delay education or to return to school to update productive skills. As a result, the fraction of individuals who engage in education after some time away from learning institutions increases. With few exceptions, traditional models that analyze the returns to education do not take into account the flexibility of schooling choices. This paper considers flexible post secondary educational choices, and estimates the returns to delaying post-secondary schooling using the Canadian National Survey of Graduates (NSG) 1995. This information is not only of interest for students and institutions of learning. At a time of intense debate about how government, institutions, and students should share the costs of postsecondary education, it is important to have as complete as possible knowledge of the returns to different programs and disciplines of study. In addition, we conduct separate analysis for universities and colleges, which allows us to contribute to the debate about the value of the skills learned in different institutions.

We consider four type of graduates: (a) *Single degree continuing graduates or traditional* (mainly high school graduates that proceeded directly to postsecondary education) (b) *Multiple degree continuing graduates (* those who were also in school before enrolment, but had obtained at least one previous postsecondary degree) (c) *Single degree delayed graduates (*those who delayed their postsecondary education after high school to work or to pursue other activities) and (d) *Multiple degree delayed graduates (*those who attained some level of postsecondary education but delayed the completion of additional postsecondary education to work or pursue other activities)

We find that:

- Graduates from non-university post-secondary institutions. Relative to traditional college and trade school graduates, substantial premiums exist for delayers (3%) and delayers with multiple degrees (10%). These premiums are realized for individuals who were working between education periods. However, no penalty exists for those who were unemployed or out of the labour force. They earn the same returns for their degree than traditional graduates. Continuers with multiple degrees earn a premium only if they complete a second trades certificate or diploma.
- Graduates from universities. Those that delay university (bachelor) education experience a premium of 8% relative to traditional bachelor graduates, if they were in the labour force between education periods. Those who were out of the labour force, however, experience substantially lower earnings (20% lower). Continuing graduates with multiple degrees earn on average 13% more than traditional graduates, but only if their previous degree was a university degree as well.
- These returns diminish by half, but remain significant, five years after graduation.

The above figures underestimate the returns to delay because they do not take into account that students who choose to delay might be different from those who do not. More accurate returns are on the order of 13% for non university institutions and 26%

for university institutions. Therefore, these findings add to previous studies that suggest that individuals with higher opportunity costs of schooling may have relatively high returns to education.

Due to the nature of our data, we cannot conclude that this premium would exist for all cohorts of graduates. We can conclude, however, that for those students from the class of 1995 who were back in school after a period of absence from learning institutions, the interruption did not have a negative impact on earnings when compared to continuously enrolled students.

1. Introduction

This paper estimates the returns to delaying school using the Canadian National Survey of Graduates (SOG), a unique data set that collects the early labour market experiences of the 1995 cohort of postsecondary graduates. We find a substantial short term premium for delaying school. The premium exists for both types of institutions, colleges and universities, and, in some cases, persists up to five years after graduation. These estimates are, in general, robust to the possibility of selection in the decision to delay postsecondary schooling.

We develop a simple framework to understand the decision to delay schooling as a function of uncertain future returns to education and then use standard self-selection correction methods to estimate the effect of the delay on earnings. In this framework, individuals decide whether or not to go to school taking into account the idiosyncratic cost of schooling, the differences in returns due to education-enhanced productivity and the option value of delayed schooling. Our empirical strategy consists in comparing the wages of graduates who completed their first postsecondary degree right after high school, with the wages of individuals who were not in school before enrolling in the same type of program. We use variation in the labor market conditions at the time of the interruption and re-enrolment decisions to assess the causal effect of the delay. Our results show that delay of postsecondary education involves a substantial short term premium that is robust to the possibility of selection in the decision to return to school.

The SOG collected information about labor market experiences of the 1995 cohort since graduation in 1997 and again during its Follow-up Survey (FSOG) in 2000. This is, to our knowledge, the first study to analyze the returns to delaying postsecondary education using a representative survey of graduates. The data is uniquely suited for the analysis. First, the sample is large enough to obtain precise estimates on the effect of less traditional patterns of educational choices, such as delay and multiple degrees. In addition, since all individuals graduated at the same time we are able to avoid the

confounding effects of differences in the economic environment at the time of graduation, which could potentially bias the estimates.[1]

There exists ample evidence on the benefits of education. These involve increases in lifetime earnings, better health outcomes, higher assimilation rates in the mainstream economy for minority groups and immigrants, lower crime rates and lower unemployment rates among the better educated.[2] The general framework used to estimate these effects implicitly assumes that individuals acquire education continually until the gains of an extra year of education equal the costs, at which point they enter the labour market to work. However, maintaining this assumption is increasingly problematic in light of the changes in the economic environment surrounding the decisions to attend postsecondary institutions. First, the demands of emerging technologies are inducing more individuals to return to school after a period of absence to acquire new, or upgrade existent skills. Second, the increasing costs of postsecondary education force some students to delay the completion of a degree until they have a clearer picture of the rewards involved, or until they are able to finance their education. As a result, more and more individuals engage in education after some time away from learning institutions.[3] The image of the "typical" graduate that proceeds in a linear, uninterrupted fashion from primary school to the highest level of education desired is becoming less and less common.[4] The consequences of recognizing the flexibility of educational choices are not trivial. The estimates of the returns to postsecondary education motivate education related policies, including subsidies to postsecondary education and regulation of tuition fees. They are also central to labour market access policies, like training programs for unemployed youth or displaced workers. However, under the assumption of linear investments in education these estimates may be non representative for substantial

[1] Beaudry and DiNardo (1991) propose that the timing of entry in the labour market may have long scarring effects on earnings and employment patterns.
[2] See for instance, Coelli, Green and Warburton (2007), Lleras-Muney (2005), Lochner and Moretti (2004), Oreopolous (2003), Dicks and Sweetman (1999)
[3] According to the 2001 Canadian Census of Population, 21% of postsecondary students are 25 to 29 years old, and 13% are between 30 and 34 years of age.
[4] In the US one third of the 1995-96 starting class of postsecondary students waited a year or more after finishing high school to enrol (US Dpt. of Education, NCES 2005-152). In Canada, 28% of the class of 1995 had delayed their first postsecondary degree by one year or more. This is in line with estimates from other surveys which show that 20% of 20 year-olds postsecondary students had delayed their enrolment for at least one year (Bushnik and Tomkowicz,, 2003)

subgroups of the population. Further, understanding the effects of school delay on labour market outcomes becomes crucial to guide policies that affect school enrolment incentives.[5]

Literature review

The theory of human capital predicts that individuals who attain more education will receive higher wages derived from higher levels of productivity acquired at school. Empirical studies consistently find substantial returns to a variety of postsecondary degrees.[6] The common underlying assumption in most models analyzing returns to education is that schooling proceeds in a linear and uninterrupted fashion from primary school to the highest level of education the individual attains in her lifetime. This assumption, although convenient, is not totally satisfactory. Indeed, the common perception is that the luck of postsecondary graduates differs considerably depending on the paths they take (Mincer and Ofek (1982)). Confirmation of the disparities in returns to different types of postsecondary education is extensive. Kane and Rouse (1993) discuss variation in returns to different types of college degrees in the US. Boudarbat (2003) presents evidence on the differences in returns across fields of study in Canada. The returns to postsecondary education differ also between immigrant and non-immigrant groups and between immigrants by quality of schooling and field of study (Bratsberg and Ragan (2002), McBride and Sweetman (2003), Sweetman (2004) and Ferrer and Riddell (2004)).

Differences in the returns to education by the timing of postsecondary schooling have been less studied and the evidence is mixed. A small number of North American studies find substantial returns to formal certification for older individuals. Leigh and Gil (1997) find that, in the US, individuals over 28 with previous labor market experience have returns to community college degrees that are at least as high as, and in some cases higher than, those of continuing high school students. Jacobson et al. (2003) using data

[5] Political debates on the improvement of educational standards and access to higher education are on-going in western economies. (Human Resources Development Canada (2002) and US Department of Education (2006))

[6] See Card (1999) and Heckman, Lochner and Todd (2006) for exhaustive surveys on the literature of the returns to education. Vaillancourt and Bourdeau-Primeau (2002) provides recent Canadian evidence

for the State of Washington, also find that community college re-training for displaced workers has substantial returns in terms of wages and employability. Griliches (1980) and Marcus (1984) estimate the returns to interrupted schooling using the young men cohort of the National Longitudinal Survey. Light (1995a) uses a superior data set to explore the effects of school interruption on the wages of a cohort of young white men in the US. Her paper shows that, controlling for the number of years of education, individuals who interrupted their schooling earn generally less than those educated continuously. The two exceptions are individuals with exactly 12 years of education, and those with more than 16 years of education. For these two groups, she finds no difference between returns to continuous or interrupted education. She also finds that the earnings gap between individuals with similar amounts of schooling and total experience, but who differ in the timing at which these were acquired, tends to diminishes and generally disappears over time (after 4 years of post schooling experience). In Canada, Zhang and Palameta (2006) use panel data to evaluate the impact of formal schooling on earnings for individuals that have been out of school for more than one year, finding, in general, positive returns to school interruption.

Some studies focus on the European experience of adult education programs. A British study by Blundell, Dearden and Meghir (1996) finds positive returns to all forms of training of older individuals leading to formal qualifications. Egerton (2000) and Jerkins et al. (2003), however, do not find such positive returns. These studies reveal that episodes of adult education, particularly in occupational training, have positive effects on employment but limited effect on wages, except for the least qualified individuals. In Sweden, Albrecht, van den Berg and Vroman (2004) follow the large expansion of the Swedish adult education program during 1997 through 2002, called "Knowledge Lift" (KL), to estimate the impact on annual earnings and employment of increasing formal schooling for the low skilled. Their results show no effect of KL programs on earnings or employment, with the exception of an increase in the employability (but not earnings) of young men.

We proceed to review the methodology we use in the next section. In section 3 we describe the data and present the results in section 4. The final section concludes.

2. A Simple Framework for Analyzing School Delay

Consider a simple economy with only two employment opportunities: skilled (S) work, which requires the worker to have a postsecondary degree, and unskilled (U) work, which does not. Wages for these occupations are as follows:

Skilled	$w^S_{it} = \gamma_S \, a_i + \varepsilon_t$	ε_t iid V t
Unskilled	$w^U_{it} = \gamma_U a_i + \varepsilon_t$	$\gamma_S > \gamma_U$; $a_i > 0$

where a_i denotes the ability of the worker i performing specific tasks, the parameters γ_S and γ_U reflect differences in career opportunities across types of jobs and ε_t accounts for aggregate shocks to the labour market. This shock could be broadly interpreted as the effect of labour market conditions. We assume that the shock is observable at the beginning of the period and that it affects all types of occupations equally.[7]

High school graduates have to decide whether or not to go on to postsecondary education based on their idiosyncratic cost of schooling (c_i,) and their productive ability. We assume that ability is unknown at the time of high school graduation, but that it becomes known with either postsecondary education or labour market experience.[8] The cost reflects pecuniary costs and is drawn at the beginning of the period and determined at the time of making schooling decisions. Costs and ability are jointly distributed with cdf $F(c_i, a_i)$. To the extent that low income during childhood may be correlated to both relatively high opportunity costs of education later on and lower productivity, we believe the assumption of a joint distribution of cost and ability to be a reasonable one.[9]

Initially, individuals decide whether or not to enrol in postsecondary education. Those who do not go to study enter the labour market and work, earning w^U_i. In the next stage, all individuals learn their ability. Those who acquired an education in the first period simply go to work, and those who worked in the initial period consider whether to

[7] This is assumed for simplicity. The results would persist as long as occupation specific shocks are more favourable to skilled than unskilled workers.
[8] Initial uncertainty about ability is plausible if we consider that high school graduation conveys only general skills that do not completely inform individuals about potential earnings in performing job-specific tasks. This knowledge is acquired with either experience or additional skill specific education.
[9] Alternatively, costs could be drawn independently of ability, which facilitates the calculation of decision rules.

continue working or return to school. After all education is completed individuals go to work, collecting for ever the wages that correspond to their skill level.

The payoffs are as follows:

At time 2 each worker collects the expected present value of wages according to their ability and skill level:

$$V^J(a_i) = \sum_{t=2}^{\infty} \beta^{t-2}(\gamma_J a_i + \varepsilon_t)\,; \qquad J=U, S$$

for unskilled and skilled occupation respectively, where β is the discount factor.

At time 1 individuals who just graduated from a postsecondary degree in period 0 work as skilled workers. Individuals who worked before now may choose whether or not to return to school based on their realized ability, idiosyncratic cost, and current and future wages.

Expected payoff if working: $\gamma_J a_i + \varepsilon_1 + \beta V^J(a_i)$ $J=U, S$

Expected payoff if returning to school: $- c_i + \beta V^S(a_i)$

Unskilled individuals will return to school if and only if the payoff of returning is greater than the payoff of continuing working. That is,

$$\text{Return} <=> \quad -c_i + \beta V^S(a_i) \geq \gamma_U a_i + \varepsilon_1 + \beta V^U(a_i);$$

$$\frac{c_i + \varepsilon_1}{z} \leq a_i \quad ; \quad z = \frac{\beta\gamma_S - \gamma_U}{(1-\beta)}$$

The above expression defines a threshold $a^*_i = (c_i + \varepsilon_1)/z$ such that those with ability greater than a^*_i will return to school. Note that a non trivial solution where some individuals choose to return to school implies that $(\beta\gamma_S - \gamma_U) > 0$ and $(c_i + \varepsilon_1) > 0$.

At time 0 ability is unknown. All individuals choose whether to continue schooling or to start working based on individual costs, expected ability, current and expected wages and the realization that they will have the option of re-enrolling next period, once ability is known. If continuing, they incur the cost of education and become skilled workers the next period. If they interrupt their education, they receive the unskilled wage

today and have an expected future payoff that incorporates the decision to re-enrol next period.

Payoff education: $V^E = -c_i + \beta E_{a|c} [\gamma_S a_i + \varepsilon_1 + \beta V^S(a_i)]$

Payoff interrupt: $V^I = E_{a|c} [\gamma_U a_i + \varepsilon_0] + \beta E_{a|c} \{max [- c_i + \beta V^S(a_i) ; \gamma_U a_i + \varepsilon_1 + \beta V^U(a_i)]\}$

Individuals will interrupt their education if and only if the payoff of doing so is greater than the payoff of continuing their education, that is if $V^I \geq V^E$, which implies:

$$\begin{aligned} &\beta E_{a|c} [\max \{\gamma_U a_i + \varepsilon_1 + \beta V^U(a_i) ; - c_i + \beta V^S(a_i)\}] \geq \\ &\beta E_{a|c} [\gamma_S a_i + \varepsilon_1 + \beta V^S(a_i)] - E_{a|c}(\gamma_U a_i + \varepsilon_0) - c_i \end{aligned} \quad (1)$$

which just states that the option value of re-enrolment, has to at least equal the benefits of continuing education net of all costs, including opportunity cost of foregone wages.

After taking expectations, the functions in the max operator are linear and increasing in ability, one with slope $\gamma_U/(1-\beta)$ and intercept (ε_1), and the other with slope $\gamma_S \beta/(1-\beta)$ and intercept $(-c_j)$. Under the assumption of a non trivial solution to the delay decision $[(\beta\gamma_S - \gamma_U) > 0]$, they will cross once on the positive quadrant at the point $a^* = (c_i + \varepsilon_1)/ z$ (see figure 1). Therefore, we can decompose the expectation of the maximum operator as follows:

Interrupt $\Leftrightarrow$

$$\begin{aligned} &\beta \frac{\gamma_U}{1-\beta} E_{a|c}(a_i; a^* > a_i) + \beta\varepsilon_1 + \beta \frac{\beta\gamma_S}{1-\beta} E_{a|c}(a_i; a^* \leq a_i) + \sum_{t=2}^{\infty} \beta^{t-2}\varepsilon_t \geq \\ &\frac{\beta\gamma_S - (1-\beta)\gamma_U}{1-\beta} E_{a|c}(a_i) + \beta\varepsilon_1 + \sum_{t=2}^{\infty} \beta^{t-2}\varepsilon_t - \varepsilon_0 - (1-\beta)c_i \end{aligned}$$

or

$$z [E_{a|c}(a_i) - \beta E_{a|c}(a_i; a^* \leq a_i)] \leq (1-\beta)c_i + \varepsilon_0 \quad (2)$$

Equation (2) indicates that individuals will interrupt schooling when the difference in their expected productivities if they do so is low relative to the costs of education.

The model emphasizes that delaying school involves two separate choices: the decision to interrupt and the decision to return to school. Both decisions are affected by the individual cost of schooling and by a common component, represented by the current shock to the labour market. For a given distribution of costs, favourable labour market

conditions at the time of the interruption decision will induce more individuals to interrupt schooling, while favourable labour market conditions at the time of the return decision will reduce the number of individuals that return. Alternatively, given specific labour market conditions, those who interrupt will be the individuals with the higher costs of schooling, while those who return will be those with higher ability within this group. Note that if ability and costs are independent (there is the same fraction of high ability individuals at any cost level) those who return will have higher ability than those who proceed uninterrupted. Under the more realistic assumption that individual costs and abilities are negatively correlated (there is a larger fraction of low ability individuals at high individual costs levels) those who interrupt will have lower ability than average. Depending on the functional form of *F(.,.)* it is possible that ability levels of those returning are close to those who proceeded uninterrupted. Note that delay in this model is a consequence of the uncertainty about future wages. Indeed, if there is not such uncertainty, and cost and ability are perfectly correlated (ability is perfectly determined at the time of making schooling decisions), there is no delay and everybody makes their final educational choice in the first period.

Empirical Framework

The general empirical framework to analyze earnings generation proposes a reduced form equation of individual wages stated as a function of different measures of skills, usually education and experience. The coefficients of these skill measures can, under certain assumptions, be interpreted as the rate of return of education and experience. This framework has been widely used in labor economics to assess the effect of schooling on earnings. The education estimates rest under the assumption that individuals follow a linear and continuous education path, progressing uninterruptedly in their schooling, from high school into college or university. Schooling continues until the returns to one more year of education do not compensate the costs involved in the acquisition of additional education. Therefore, if a student delays her schooling, the effect of this delay is not considered to affect the returns to education. Within this framework one could disaggregate the returns to postsecondary schooling by the type of activity before enrollment (schooling or no schooling) to provide a measure of the differences in returns

between those students proceeding in the linear and continuous manner described above and those who choose to delay.

$$LnY_i = \beta X_i + \gamma S_i + \varphi D_i + u_i \qquad (3)$$

where Y represents wages or a close measure of productivity, S is a vector of human capital and skills variables, such as education and experience, X is a vector of additional controls and D is a dummy variable indicating whether the individual was engaged in non-schooling activities before enrolling in the program for her last educational degree, that is, if she has delayed schooling. The coefficients β and γ are vectors of parameters summarizing the effect of X on earnings and the returns to human capital respectively and φ is a parameter reflecting the effect of delaying postsecondary education. Finally, u is a vector of independently and identically distributed error terms.

A substantial branch of the literature on the returns to education concerns the proper estimation of equation (3). To the extent that individuals are not homogeneous, the unobserved heterogeneity introduces a bias in standard estimates of the returns to education.[10] In our case, we are less concerned about the effect of this bias on the returns to education. Because all individuals in our sample have graduated from at least one postsecondary degree in 1995, the unobserved heterogeneity plaguing most studies on the returns to education more generally are substantially reduced here. More so, since we have also separated the sample by the type of institution, college or university, that has granted the degree. Both features of our data are likely to leave us with a relatively homogenous ability sample within each category.

We rather focus on addressing the endogeneity of the main variable of interest, D. The distribution of students over the categories delayed/continuous education is likely not random, even within the above narrowly defined groups. The model above illustrates how, if individual costs of schooling and ability are independent, individuals who delay schooling will have higher ability than those who proceed continuously. If, as it seems plausible, the individual cost of schooling and ability are negatively correlated, at any given cost more individuals will interrupt because they anticipate to be of low ability.

[10] For a survey of the implications of the selection problem and empirical methods to address it can be found in Card (2001) and more recently in Goldberg and Smith (2007).

However, since only those with ability over the threshold a^* will return, the ability of those delaying (those who interrupted *and* returned) could still be either to the right or to the left of the ability of those who proceeded continuously. The stronger the (negative) correlation between idiosyncratic costs and ability, the smaller the fraction of individuals coming back and the lower the ability of these delayed students will be.

Empirically, the effect of delaying school can then be estimated with a two-step least square procedure that takes into account the endogeneity of the decision to delay.

$$\begin{aligned} LnY_i &= \beta X_i + \gamma S_i + \varphi D_i + u_i \\ D_i &= \beta X_i + \alpha Z_i + dW_i + v_i \end{aligned} \qquad (4)$$

where Z_i is a vector of exogenous variables capturing the decision to delay education and W_i is a vector of additional variables relevant to the delay decision.

Our model suggests that delay depends on the aggregate labor market conditions at the time of schooling decisions and on the idiosyncratic cost of schooling. We capture the former in vector Z, which includes the national unemployment rate at the time of the interruption decision, the year before obtaining either high school diploma or the previous postsecondary degree, and the provincial unemployment rate at the time of the return decision, the year before enrollment in the current program. Idiosyncratic costs of schooling are captured in the vector W and include indicators of parental postsecondary education.[11]

The choice of our instrument is based on empirical evidence that suggests that postsecondary enrollment rates are countercyclical. For example, Light (1995b) and Betts and McFarland (1995) show that unemployment increases community college enrollment in the US. Similarly, Rees and Mocan (1997) find that high unemployment rates reduce dropout rates. Evan and Kim (2005) analyze the impact of local labor market conditions on the demand for education in Indian reservations and find that favorable shocks increase high school dropout rates and reduce college enrollment rates. Similarly, using panel data from 1987 to 2002, Greenbaum (2004) shows that poor labor market

[11] Whether or not parental schooling is correlated with the educational choices of the offspring is not clear (Card, 1999). We remain agnostic in the matter and perform the analysis with and without parental education as a determinant of the decision to delay. The results in the theoretical model are similar whether or not we consider the idiosyncratic cost to be correlated with ability.

conditions increase the number of law school applications. In addition, the literature on the returns to education has a long tradition of using background family variables to deal with non-random selection on different levels of schooling (Card, 1999). We will use both sets of variables separately in our analysis.

3. Data Description

We use data from the SOG and its follow-up survey conducted by Statistics Canada in partnership with Human Resources Development Canada in 1997 and 2000 respectively. The SOG examines the labour market experiences of the 1995 graduates from universities, community colleges, and trade/vocational programs since graduation. The survey collects a broad range of information on the links between education and labour market outcomes, including characteristics of the programs of study, activities before and after graduation, and socioeconomic background.[12]

For the purposes of the survey, a graduate is a student that completed the requirements for a degree, diploma, or certificate during the 1995 calendar year in a trade/vocational, college, or university program. The sample includes:

a) graduates from university programs leading to bachelor's, master's, or doctoral degrees or to specialized certificates or diplomas;

b) graduates of postsecondary programs (one year's duration or longer, requiring secondary school completion or equivalent for admission) in Colleges of Applied Arts and Technology (CAAT), Colleges d'enseignement general et professionnel (CEGEP), community colleges, technical schools or similar institutions;

c) graduates from skilled trades (pre-employment programs that are normally three months or more of duration) in trade/vocational schools[13].

Graduates from private postsecondary institutions, from "continuing education" programs not leading to a degree, from part-time trade courses that were working full

[12] More information about the survey can be found at http://www.statcan.ca/bsolc/english/bsolc?catno=81M0011X

[13] A trade/vocational school is a public educational institution offering courses to prepare people for employment in specific occupations. Many community colleges and technical institutes offer these certificates as well.

time, from vocational programs of less than three months or those not in the skilled trades, and those from apprenticeship programs are excluded.

The path to postsecondary education is a complex one. Graduates of the 1995 class may have had high school degrees prior to their postsecondary enrollment or they may have already obtained postsecondary degrees. Indeed, in some provinces in Canada attending college prior to university is the usual way to proceed.[14] In addition, they may have been students during the year prior to enrolling in the 1995 program, or they may have been involved in other activities in or out of the labour market (unemployment, paid work, or unpaid household work). To investigate all likely venues, we consider two different characteristics of the 1995 graduates. The first characteristic regards activity before enrollment, whether or not the graduate was in school before registering for the degree obtained in 1995. We will refer to these groups as continuing and delayed graduates respectively. Graduates who were studying full time, or working and studying are considered continuing graduates. Delayed graduates are those that during the year before enrolling in the 1995 program were not in school but either working full time, unemployed, or out of the labour force. The second characteristic regards previous postsecondary education. It indicates whether or not the 1995 degree is the first postsecondary degree obtained. We will refer to these as single degree holders and those who report having a previous postsecondary degree as multiple degree holders.[15]

There are 24,433 individuals in the sample that report positive earnings in the week of reference in 2007 and are 45 years old or younger. Tables 1 and 2 show previous levels of schooling and previous main activity by type of institution (non university or university). We make this distinction because we expect the characteristics of graduates from non university and university institutions to differ considerably as their programs vary in terms of their financial and time requirements. Each of these groups is potentially different in terms of the reasons that lead them to school and in terms of the gains that

[14] In Quebec, CEGEPS are a required and normal stage between high school and university. In British Columbia transfer credits from colleges to university are also common. For a view of the provincial structure of postsecondary education in Canada see "Provincial Postsecondary Systems and Arrangements for Credit Transfer", at (http://www.cmec.ca/postsec/CreditTransfer.en.pdf)

[15] Because the graduate is only asked about her highest degree before enrolling in the program leading to the 1995 degree, it is strictly possible that she holds more than one postsecondary degree before enrolling. Therefore, we refer to these graduates more generally as multiple degree holders.

they obtain from further education. Therefore, we will perform separate analysis to address these differences. Looking at the previous level of education (Table 1), around one third of the graduates already hold postsecondary degrees, 16% had a degree from non-university postsecondary institutions and 18% had a previous university degree. Table 2 shows the main activity of graduates before enrolment in the program. 48%, while 7% reported both working and attending school. A significant fraction of graduates – 46% -- were not attending school before enrollment in the 1995 program, most of them because they were working. However, around 15% of those who returned to non-university institutions and 5% of those who returned to a university institution were either unemployed or out of the labour force. Approximately one third returned to school within three years of completing their previous degree.

We define four types of graduates according to these characteristics:

- *Single degree continuing graduates* are those who were in school before they enrolled in the program leading to the 1995 degree but did not have a previous postsecondary degree. These are mainly high school graduates that proceeded directly to postsecondary education and it constitutes our base category.
- *Multiple degree continuing graduates* include those who were also in school before enrollment, but had obtained at least one previous postsecondary degree.
- *Single degree delayed graduates* are those who delayed their postsecondary education after high school to work or to pursue other activities.
- *Multiple degree delayed graduates* are those who attained some level of postsecondary education but delayed the completion of additional postsecondary education to work or pursue other activities.

Table 3 shows, by type of institution, the fraction of graduates that falls into each of the categories described above. Among graduates from non-university institutions, those with a single degree constitute the majority of the sample, around 83%. They are roughly equally divided between those who were previously in school -- the continuing graduates who transited to a non-university postsecondary program from secondary school-- and those who were not studying the year before enrollment. However a significant portion,

17% of non-university graduates, already had a postsecondary degree (multiple degree graduates). Most of them were not in school before enrollment in the 1995 degree program (non-continuing graduates) while 5% of non university graduates are continuing students transiting from one postsecondary degree to another without interrupting their studies. University graduates are roughly equally divided between single and multiple degree graduates. Since the opportunity cost of university degrees is likely to rise with the years of school separation, it is not surprising that fewer university graduates than non-university graduates were out of school before enrollment (non-continuing graduates). They are just less than a third of all university graduates. Among single degree university graduates, most (four fifths) are continuing graduates coming from high school. Among those with more than one degree, slightly more than half are continuing students.

The SOG provides detailed information about the degree obtained in 1995, education and activities before enrollment, as well as activities during the two years after graduation. For those who worked before enrollment, it records the type of job, occupation and usual hours of work.[16] For those who have previous postsecondary education, it provides graduation year, type of degree and field of study obtained. The SOG also contains information about additional education obtained after graduation in 1995, whether the individuals returned to a job held before enrollment, and characteristics of other jobs held between graduation and the time of the interview (duration, occupation and industry, earnings and usual hours per week). In addition, it provides similar information about the job held in the reference week, plus information about wages. From this information we construct a variable for potential experience before graduating in 1995 (age – 6 – years of education) and a variable accounting for months of experience acquired after graduation in 1995. Demographic characteristics of the graduates, such as province of residence, parental education, number of children and marital status, are also reported at the time of the interview. We measure the returns to education using the log of positive annual earnings from the job held in the reference week in 1997.[17]

[16] Unfortunately, it does not provide wages for jobs held before graduation.
[17] All results hold if we use hourly wages instead, however, the sample is further reduced. Results are available from authors

In order to conduct our analysis we further eliminate observations without information on experience, place of residence or field of study. We are left with 9,645 and 8,360 observations for non university and university graduates respectively. The main variables used in the analysis are described in Table A in the appendix.

4. The Effect of Non Linearities in the Path of Education

In Table 4 we examine average differences between graduates that delayed their schooling and those who were continuously enrolled. Graduates that delayed their schooling are, on average, older, more likely to be immigrants, to have children earlier, and to have parents who did not acquire postsecondary schooling. They are however, more likely to have previous postsecondary education and less likely to complete additional degrees after their graduation date in 1995. Delayed graduates seem to have a smoother transition into labour markets than their continuously enrolled fellow graduates. They earn higher wages two years after graduation and they are more likely to hold the same job at the time of the follow-up interview in 2000. Part of this success could be attributed to stronger labour market connections (a greater fraction of delaying graduates comes back to jobs held before graduation and are more likely to have worked full time before graduation). This is unlikely to be the whole story. If such were the case, we would expect that this advantage would vanish over time as the continuously enrolled graduates build labour market connections of their own. A cursory examination of the raw data does not suggest that this is case.

Regression Results

We show estimates of the association between log wages in 1997 and school delay. Columns labeled "Base Case" present basic results of OLS regressions as stated in equation (3). Columns labeled "Non linear" augment the model to account for the effect of multiple degrees (Second Degree), as well as an interaction term between delay and multiple degrees. The columns labeled "Detailed" disaggregate these effects by various types of previous activity and previous levels of schooling. All these regressions include indicators for field of study in humanities, commerce, agriculture, health, engineering, math and applied sciences, and other fields (social sciences/education is the omitted

category). We also control for province of residence at the time of the interview.[18] Results are shown separately for the sample of non-university and university graduates.

For all types of graduates, experience before graduation has a significant effect on earnings. Non university students show a significant non linear pattern in the returns to previous experience, while university graduates have smaller and linear returns to years of experience acquired before graduation. This pattern might suggest that university graduates are more likely to change career paths and therefore find previous experience less useful, while non university graduates may be more likely to upgrade existent skills. Proper analysis of this possibility is hampered by the difficulty of properly assessing whether additional education provides a set of new skills or upgrades existent ones. Experience after graduation (entered in a linear fashion since all individuals graduated at the same time) is also significant, increasing the earnings of non university graduates by 3.6% and those of university graduates by 2.6%. Returning to a previous employer has also a positive and strong effect on earnings. Demographic characteristics have the expected effects, which vary to some extent depending on the type of degree obtained. The gender gap is smaller for university graduates, whereas the immigrant gap is only significant for non-university graduates. Similarly, the (positive) bilingual premium is bigger among university graduates.

For non-university graduates, the return to a college degree, relative to a trades certificate, is 6% across all specifications. Those who delay schooling experience a 3% premium over and above what can be attributed to higher levels of experience and the extent of labor market connections. In the second column we allow those with additional postsecondary education to have different returns. Relative to single degree continuing graduates, multiple degree continuing graduates experience a loss of 4%, while single degree delayed graduates earn 2% more. These differences however are not statistically significant by themselves. Finally, multiple degree delayed graduates earn roughly 5% more than the base category (-0.043+0.021+0.072)). The next column further reveals that completing a second non university degree (without interrupting) significantly reduces

[18] As mentioned, differences in the educational systems between Quebec and the rest of Canada could be driving these estimates. We performed the same regressions excluding Quebec from the analysis and obtained similar results. These are available upon request.

earnings for those with a previous college degree. We find a significant premium for those who delayed the completion of their first postsecondary degree because they were previously working, but not for others.

Among university graduates, those with a graduate degree earn around 27% more than bachelor graduates[19] and the coefficient on the delay dummy is 6%. In the next column we show that those who obtained a second degree (without delaying) and those who delayed schooling before obtaining their first postsecondary degree receive a premium of approximately 2%. Graduates who delayed the completion of their second postsecondary degree earn roughly 9% more than traditional graduates (0.019+0.021+0.051)). Neither of these figures are, however, statistically significant. Further disaggregating these estimates in the "detailed" model suggests that the reason why we do not find significant returns to delaying schooling among university graduates resides in the differences that exist between types of previous education and types of previous activity while not in school. Individuals with previous university degrees earn between 9% and 25% more than individuals obtaining their first university degree. On the other hand, individuals with previous college education experience a 5% penalty with respect to graduates obtaining their first university degree. Note that accounting for these differences in previous education reduces by half the estimate of obtaining a graduate degree in 1995 (from 26% in column 4 to 15% in column 6). This reduction reflects the fact that the value of a graduate degree partly steams from the requirement of previous postsecondary degrees. Regarding the coefficient on school delay, we find that while graduates that were previously working receive returns of 6% to delaying school, those who were out of the labour force suffer substantial penalties of around 22%.

2SLS Estimates

Next, we present estimates that attempt to correct for the possible endogeneity of the delaying decision estimating an equation such as that specified in (4). According to the model outlined in the previous section, the average ability of individuals who delayed their education depends on the relationship between costs and ability. Under the

[19] The percentage change in wages implied by the estimated coefficient β is calculated as $(1-e^{\beta})$

assumption of negative correlation, if such correlation is strong the average ability of delayers is more likely to be lower than that of continuing graduates and the OLS estimates are more likely to be downward biased.

Because the decision to delay encompasses two decisions: the decision to interrupt *and* the decision to return, we consider as determinants of the delay choice the opportunity costs of schooling both at the time of interruption and at the time of re-enrolment. These are measured using provincial unemployment rates during the year before enrollment in the program leading to the degree obtained in 1995, and national unemployment rates the year graduates completed either high school or a previous postsecondary degree.[20] In additional regressions we also include parental postsecondary education (see footnote 11).

Table 6 presents results for non university (Panel A) and university (Panel B) graduates. Specification (1) reports the results without considering additional family background covariates, specification (2) adds these variables. To economize space we only show the coefficient of school delay and the results from the first stage regression, since there are no significant differences in the estimates of the covariates between OLS and 2SLS methods.

The effect of both unemployment rates is significant, suggesting that there is sufficient variation between the circumstances at the point of interruption and at the point of return to use both instruments. This is so even when we include family background variables. A test of the joint null hypothesis that the first stage regressors are all zero is rejected in all cases (see Chi-2 statistic at the bottom of the first stage regression). The effect of unemployment rates at the time of graduation from the previous degree is negative: high unemployment rates induce more delay. This conforms to previous evidence indicating that high unemployment rates increase postsecondary enrolment (reducing interruption and hindering delay). The effect of the unemployment rate the year before enrolment differs by type of institution, being negative for non university graduates and positive for university graduates. There is much less evidence about the

[20] Results using youth unemployment rates are similar although the explanatory power of the instrument is lower.

whether employment-to-school transitions are also countercyclical. It could be the case that high unemployment rates reduce wages or the stability of current jobs lowering opportunity costs of schooling (and inducing more individuals to return to school). On the other hand, it may be perceived as a bad time to quit a job that is sufficiently secure reducing the incentives to return to school. The first effect is more likely to dominate if both costs and returns to postsecondary degrees are perceived to be high as it is the case of university degrees. According to our estimates, this seems to be the case, as we observe a positive effect of unemployment the year before enrolment on delay (via an increase in the propensity to return to school).[21]

In general, it appears that the returns to school delay are underestimated by standard OLS regressions, suggesting that the correlation between costs and abilities for this particular sample is indeed negative. The corrected estimates suggest over 18% and 30% higher returns for college and university graduates respectively who delayed their studies. The effects are similar when we consider additional covariates.

Our stylized model of Section 2 offers an explanation for the higher (relative to the OLS) estimated returns to delaying education. A (strong) negative correlation between costs and ability will reduce the average ability of the potential population that will contemplate returning to school, since graduates who come back to school are more likely to have lower ability (below the threshold a^*) than the group who attended school continuously.

More interestingly, the results indicate that there is a positive return to delaying postsecondary education, over and above what we can expect due to higher levels of experience and labor market connections obtained during the interruption. To the extent that students delay their education because of uncertainty about its returns, it would appear that the value of postsecondary education is enhanced by solving this uncertainty before entering school. Therefore delaying postsecondary education might have, at least for certain students, a productive value because it allows them to learn about the returns to postsecondary education, or about which skills the market demands.

[21] King and Sweetman (2002) show that for older workers with substantial pre-separation labor force attachment, employment-to-school transitions are indeed pro-cyclical.

Persistence of estimates

One question that naturally arises from our results relates to the persistence of the premium to delaying schooling. We use the 2000 Follow-up Survey of Graduates to estimate the effect of delaying schooling on earnings in 2000, five years after graduation. These results are summarized in Table 7. Panel A corresponds to non university graduates and Panel B to university graduates. According to the OLS estimate the premium for delayed schooling in 2000 does not change much relative to that estimated two years after graduation. A small premium (2%) persists for non university graduates and a slightly bigger one for university graduates (around 4%). The corrected 2SLS estimates also indicate that OLS underestimates the returns to delaying school. They point to the existence of significant premium for delaying schooling for non university graduates (8%) although smaller than that estimated for 1997. Estimates for university graduates, on the other hand, do not show evidence of being affected by non random selection five years after graduation. The returns are similar to the OLS estimates (5%) and the Chi2 test does not reject the null of no selection.

Robustness

We consider several robustness checks for these results. First, since unemployment rates (UR) are likely to be autocorrelated, it could be the case that the UR the year before re-enrolment determines both the decision to re-enroll and the observed wage two years after graduation, particularly for very short degrees (Oreopolous, von Wachter and Heisz (2006)).[22] To examine this possibility, we re-run our estimates using a sample of individuals that graduated from programs that take longer than 6 months to complete. This renders a sample for which the UR the year before enrolment is sufficiently removed from observed labour market outcomes to be considered an exogenous instrument. Our results are similar for this sample, although smaller in magnitude. Second, we checked for the possibility that the results are driven by our definition of delay. Recall that we considered those who reported their main activity during the year before enrolment jointly as working and in-school to be mainly in school and therefore not delaying education. These could lead us to underestimate the magnitude of the delay premium,

[22] Annual unemployment rate series typically follow an AR(2).

particularly if theses graduates were actually maintaining strong ties with the labour market. In that case, the effect of these ties could improve their labour market outcomes upon graduation, increasing the average earnings of individuals who do not delay school. We redefined the delay variable eliminating from the sample the group of individuals who report being working and in school the year before enrolment. The results from this sub-sample of individuals suggest that this is not a major concern, as we found only slight differences in the delay premium between the two samples.[23]

4. Conclusion

We find positive returns to postsecondary education delay that exist over and above the returns to experience and labor market connections gained during the interruption period. Substantial differences in the returns to delaying education exist between graduates from university and non-university postsecondary institutions, and also between those who obtained a second postsecondary degree relative to those obtaining their first. These estimates abstract from specific macroeconomic effects at the time of graduation that may affect labour market success and are also robust to the possibility of selection in the decision to delaying education.

[23] These results are available upon request

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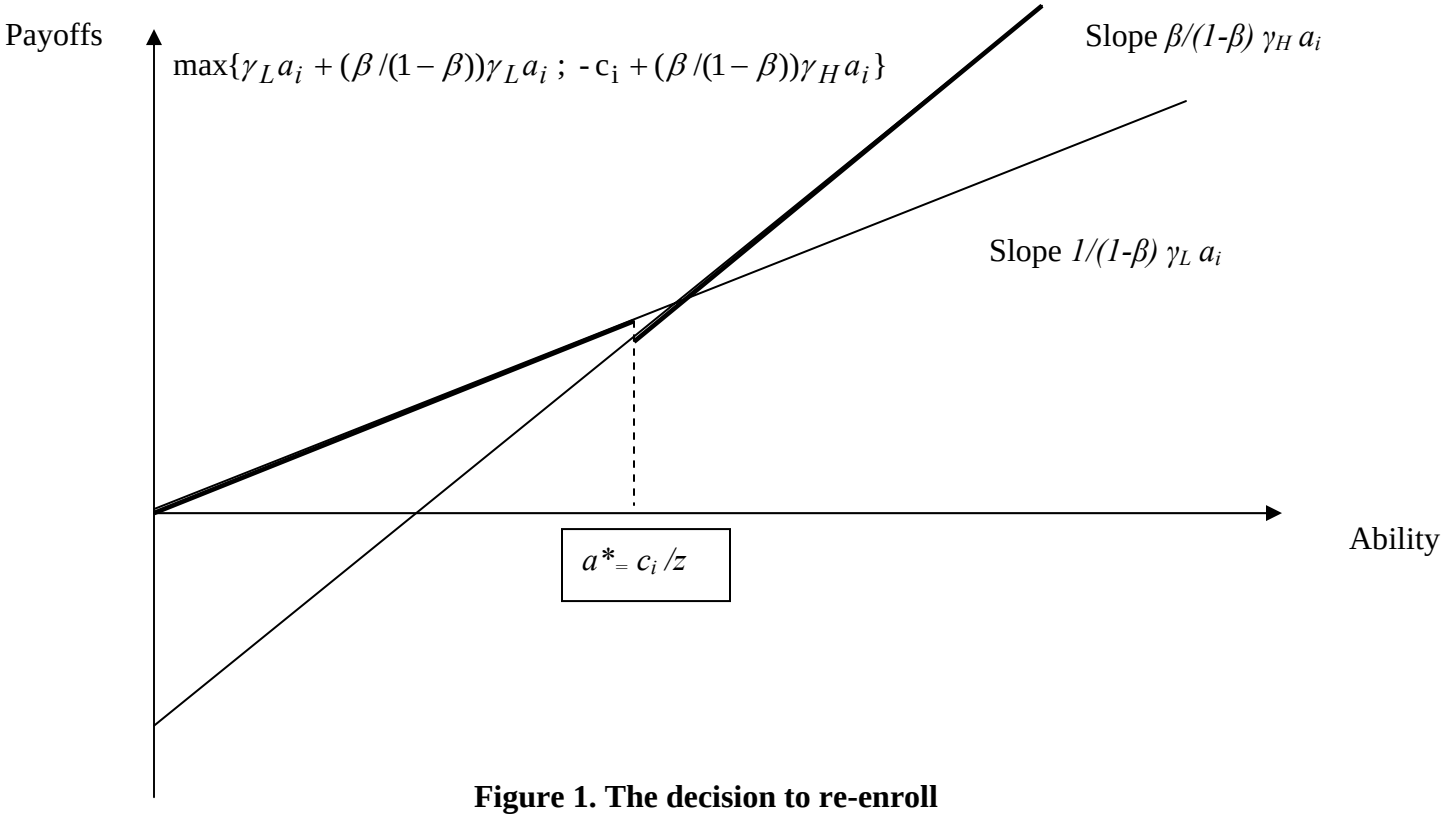

Figure 1. The decision to re-enroll

Table 1. Previous education level by type of degree in 1995

	Non University		University		% of all graduates
	Trade	College	BA	Graduate	
Previous Education					
No Post secondary	23%	36%	41%	--	66.5%
Trade	63%	21%	16%	--	1.7%
College	12%	17%	71%	--	14.1%
BA	5%	11%	50%	34%	16.3%
Graduate	4%	6%	32%	58%	1.5%
% of all graduates	19%	28%	46%	7%	24,433

Note: Cells indicate row percentages

Table 2. Main activity before enrollment by type of degree in 1995

	Non University		University		% of all graduates
	Trade	College	BA	Graduate	
Previous Main Activity					
School	28%	47%	65%	40%	48.0%
Working and School	5%	7%	8%	6%	7.0%
Working	46%	37%	23%	48%	36.0%
Unemployed	14%	4%	1%	2%	5.0%
Other	6%	5%	3%	3%	5.0%
	100%	100%	100%	100%	100%
Observations	5,145	7,745	10,185	1,418	24,433

Note: Cells indicate column percentages

Table 3. The Path to Postsecondary Education

	Non University			University		
	Multiple Degree			Multiple Degree		
	No	Yes	Total	No	Yes	Total
Continuing Graduate						
Yes	41%	5%	46%	43%	27%	70%
No	42%	12%	54%	9%	21%	30%
Total	83%	17%	100%	52%	48%	100%
Observations			12,868			11,565

Note: "Non University" includes Trade/Vocational and College students. "University" includes graduate and BA students

Table 4. Sample Characteristics – Mean Values

	Non-University Graduates			University Graduates		
	Continuous Schooling	**Delayed Schooling**	***p*-value of difference**	**Continuous Schooling**	**Delayed Schooling**	***p*-value of difference**
Age	24.3	30.3	(0.000)	26.9	33.5	(0.000)
Female	48.2	47.9	(0.795)	53.2	52.8	(0.730)
Immigrant	6.6	8.5	(0.000)	11.9	14.5	(0.000)
Bilingual	14.7	11.7	(0.000)	19.7	23.3	(0.000)
Children 0-6 in 1997	9.0	21.6	(0.000)	10.2	25.3	(0.000)
Children 0-6 in 2000	21.8	26.9	(0.000)	23.9	31.5	(0.000)
Children 0-6 at previous graduation	0.7	1.8	(0.000)	2.0	5.1	(0.000)
Father education-Postsecondary	27.3	21.0	(0.000)	47.6	38.7	(0.000)
Mother education-Postsecondary	25.8	19.7	(0.000)	43.4	35.4	(0.000)
UR year before enrolment	11.5	11.2	(0.000)	9.19	9.27	(0.302)
UR year at previous graduation	9.9	8.4	(0.000)	8.71	8.33	(0.000)
Back to job held before graduation	2.7	9.4	(0.000)	4.2	26.3	(0.000)
Held full time job before graduation	46.3	73.0	(0.000)	56.0	79.6	(0.000)
1997 Experience since graduation	1.7	1.72	(0.843)	1.75	1.87	(0.000)
Permanent job 1997	69.1	68.3	(0.367)	56.6	68.0	(0.000)
Full Time Job 1997	86.5	86.9	(0.553)	85.7	88.0	(0.000)
Positive earnings 1997	19,441	22,369	(0.000)	25,490	36,982	(0.000)
Work same job since 1997	37.9	43.2	(0.000)	37.5	54.1	(0.000)
2000 Experience since graduation	4.6	4.1	(0.570)	4.66	4.81	(0.000)
Permanent job 2000	76.2	73.3	(0.000)	71.4	75.7	(0.000)
Full Time Job 2000	92.0	91.0	(0.091)	91.2	90.8	(0.722)
Positive earnings 2000	32,907	34,035	(0.004)	46,582	53,400	(0.000)
Previous Level of Schooling						
Some PS	17.6	16.7	(0.233)	6.8	5.8	(0.065)
College	7.4	14.7	(0.000)	8.5	10.2	(0.000)
University	3.6	6.6	(0.012)	34.6	66.1	(0.000)
Other Degree after 1995	11.1	9.6	(0.000)	11.5	6.5	(0.000)
Other Degree after 1997	15.9	11.6	(0.000)	21.7	12.2	(0.000)

Table 5. OLS – 1997 Wage Regression (Robust Standard Errors)

	Non University *			University		
	Base Case	Non Linear	Detailed	Base Case	Non Linear	Detailed
Experience bfr graduation	**0.030**	**0.030**	**0.030**	**0.023**	**0.021**	**0.018**
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Exp^2 bfr. Graduation	**-0.001**	**-0.001**	**-0.001**	-0.0001	-0.0001	0.0001
	(0.000)	(0.000)	(0.000)	(0.0003)	(0.0003)	(0.0003)
Experience aft graduation	**0.035**	**0.035**	**0.035**	**0.026**	**0.025**	**0.028**
	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)
Back in 1994 job	**0.279**	**0.278**	**0.274**	**0.335**	**0.332**	**0.318**
	(0.025)	(0.025)	(0.025)	(0.028)	(0.028)	(0.028)
Female	**-0.249**	**-0.249**	**-0.246**	**-0.168**	**-0.168**	**-0.158**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Immigrant	**-0.076**	**-0.077**	**-0.081**	0.016	0.016	0.010
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Bilingual	**0.042**	**0.044**	**0.044**	**0.078**	**0.077**	**0.074**
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
College 1995	**0.061**	**0.060**	**0.062**	--	--	--
	(0.015)	(0.015)	(0.015)			
Graduate 1995	--	--		**0.235**	**0.216**	**0.143**
				(0.024)	(0.026)	(0.028)
Previous schooling:						
Second Degree in 1995	--	-0.043	--	--	0.019	--
		(0.029)			(0.021)	
Previously Trade			0.057			0.135
			(0.044)			(0.094)
Previously College			**-0.112**			**-0.050**
			(0.033)			(0.025)
Previously Bachelor			0.016			**0.085**
			(0.037)			(0.025)
Previously Graduate			-0.020			**0.225**
			(0.107)			(0.053)
Previous Activity :						
Not in school (NS)	**0.032**	0.021	**--**	**0.056**	0.021	--
	(0.015)	(0.016)		(0.021)	(0.029)	
NS – Working			**0.028**			**0.059**
			(0.017)			(0.029)
NS – Unemployed			-0.023			0.062
			(0.027)			(0.072)
NS – Other			0.032			**-0.202**
			(0.031)			(0.051)
NS * Second Degree	--	**0.072**	**0.074**		0.051	0.025
		(0.035)	(0.036)		(0.035)	(0.035)
Observations	9,645	9,645	9,645	8,360	8,360	8,360
R-squared	0.221	0.221	0.223	0.283	0.284	0.290

* "Non University" includes Trade/Vocational and College students. "University" includes graduate and BA students.
Note: All regressions include controls for usual hours of work, current marital status, presence of children under 6, current province of residence, an indicator for additional education after 1995, and field of study of the 1995 degree

Table 6. Treatment Effects Model – 1997 Wage Regression (Robust Standard Errors)

A. Non University*

		(1)		(2)	
		2SLS	**1-Stage**	**2SLS**	**1-Stage**
Previous Activity: Not in school		**0.164**		**0.148**	
		(0.062)		(0.061)	
Provincial unemployment rate			**-0.010**		**-0.011**
year before enrolment			(0.004)		(0.004)
National unemployment rate at the time			**-0.222**		**-0.220**
previous graduation			(0.007)		(0.007)
Children 0 to 6 at previous graduation					**0.772**
					(0.000)
Father Education – Postsecondary					**-0.101**
					(0.035)
Mother Education – Postsecondary					**-0.068**
					(0.035)
Lambda /	Chi2**	-0.091	1044.6	-0.081	1057.7
(SE) /	Test Rho = 0 (p-value) ***	(0.039)	0.02	(0.038)	0.03
Observations		8,698	8,698	8,698	8,698

B. University*

		(1)		(2)	
		2SLS	**1-Stage**	**2SLS**	**1-Stage**
Previous Activity: Not in school		**0.269**		**0.245**	
		(0.044)		(0.047)	
Provincial unemployment rate			**0.019**		**0.017**
year before enrolment			(0.005)		(0.005)
National unemployment rate at the time			**-0.094**		**-0.090**
previous graduation			(0.008)		(0.008)
Children 0 to 6 at previous graduation			--		**0.722**
					(0.000)
Father Education – Postsecondary			--		**-0.147**
					(0.033)
Mother Education – Postsecondary			--		**-0.128**
					(0.033)
Lambda /	Chi2**	-0.133	134.9	-0.117	192.3
(SE) /	Test Rho = 0 (p-value) ***	(0.023)	0.00	(0.025)	0.00
Observations		7,911	7,911	7,911	7,911

* "Non University" includes Trade/Vocational and College students. "University" includes graduate and BA students.
** Test of the null hypothesis that the identifying restrictions in the first stage are jointly 0
*** Test of independence equations (rho=0)
Note: The main equation includes all controls specified for the OLS regressions in table 5.

Table 7. OLS and Treatment Effects - 2000 Wage Regressions (Robust Standard Errors)

A. Non University*	**OLS**		**2SLS**
Previous activity: not in school	**0.020**	**0.021**	**0.091**
	(0.011)	(0.013)	(0.030)
Second Degree in 1995		**0.052**	
		(0.017)	
Second Degree in 1995*Previous activity NS		0.005	
		(0.026)	
Lambda /			-0.052
(SE)			(0.022)
Chi2**			826.5
Rho = 0 (P-value)			0.03
Observations	6,776	6,776	6,117
R-Squared	0.445	0.449	
B. University*	**OLS**		**2SLS**
Previous activity: not in school	**0.030**	**0.035**	**0.089**
	(0.013)	(0.018)	(0.052)
Second Degree in 1995		**0.065**	
		(0.013)	
Second Degree in 1995*Previous activity NS		-0.022	
		(0.021)	
Lambda			-0.049
(SE)			(0.032)
Chi2**			110.2
Rho = 0 (P-value)			0.15
Observations	5,737	5,737	5,427
R-squared	0.477	0.479	

* "Non University" includes Trade/Vocational and College students. "University" includes graduate and BA students.

** Test of the null hypothesis that the identifying restrictions in the first stage are jointly 0.

The OLS regressions include all controls listed in Table 5.

The main equation in the 2-step procedure includes all controls listed for the wage regression. The instruments are the provincial unemployment rate the year before enrolment and the national unemployment rate at the time of graduation from the previous degree.

Appendix

Description of main variables	
Dependent variable	
Annual earnings	Estimated annual gross earnings for 1997 and 2000, calculated from all jobs information
Demographic Characteristics	
Immigrant Status	Whether the Graduate was born in Canada or not
Children 0 to 6	Age and number of children are reported in 1997 and 2000.
Age in June 95	Age is reported in the 1997 interview
Activities before Enrollment	The main activity during the 12 months previous to enrolment in the 1995 program is reported. This variable is used to infer labour force status before enrollment in the program and whether or not the graduate was in school before enrollment in the 1995 program
Previous Highest Degree	Degrees obtained before 1995 graduation are reported
Previous Field of study	Field of study for postsecondary degrees held before 1995 graduation are reported
Date of completion previous degree	Graduate reports the date of completion of previous degrees.
Ever worked full time before	Graduate reports whether or not he worked full time before graduation
Degree 95	Type of degree obtained upon graduation in 1995
95 Field of study	Main field of study corresponding to the 1995 degree
Length of the program	Graduate reports the length of the program completed in 1995. This variable is used together with date of completion of previous degree to calculate length of interruption
Activities after Graduation	
Back to previous employer	Graduate reports whether she returned to work with a previous employer
Jobs held after graduation	
Permanent job	Graduate reports whether the job held after graduation was a permanent job
Paid job	Graduate reports if the job held after graduation was paid, unpaid, self-employed
Start and end dates	Graduate reports the start and end dates of the job(s) held in 1997 and 2000.