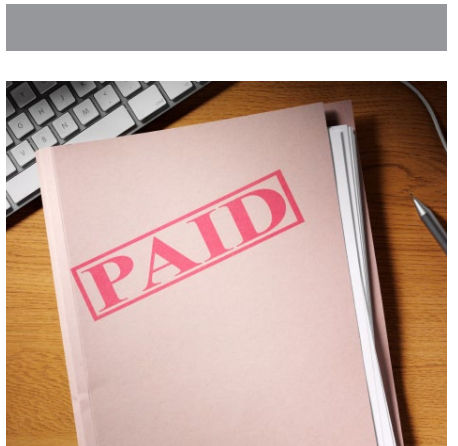


Paid in Full UPDATE

Who Pays for University Education in BC?



by Igluka Ivanova

JANUARY 2012



CCPA
CANADIAN CENTRE
for POLICY ALTERNATIVES
BC Office

PAID IN FULL UPDATE: Who Pays for University Education in BC?

By Iglia Ivanova

January 2012

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Summary

University graduates pay much more than the full costs of their education under the existing system of taxes and fees.

THIS REPORT EXAMINES HOW POST-SECONDARY EDUCATION is funded in BC, and challenges the conventional wisdom that students are heavily subsidized by taxpayers. It updates the analysis contained in a 1998 CCPA report of the same name written by former UBC economist Robert Allen.

The report calculates the financial contributions that students make toward their post-secondary degrees, taking into account two ways in which students pay:

- At the front door through tuition fees; and
- After graduation through higher income taxes over their working careers (university graduates generally have higher incomes and therefore pay more taxes than people with only a high school diploma).

Students' total payments for their degrees are then compared to the total cost of providing undergraduate education in BC. The analysis finds that, as a group, university graduates pay much more than the full costs of their education under the existing system of taxes and fees:

- Over their working lives, women with an undergraduate degree contribute, on average, \$106,000 more to the public treasury than women with only a high school diploma;
- Similarly, university-educated men contribute \$159,000 more to the public treasury than men with only a high school diploma; and
- In contrast, a four-year undergraduate degree costs \$50,630, of which tuition fees make up 40 per cent.

A review of recent Canadian research and data from the 2006 Census confirms that the economic returns to higher education in increased job skills and earning potential for graduates remain high for both men and women in virtually all fields of study. In turn, graduates' increased lifetime earnings result in higher income tax revenues for the public treasury. These higher income tax

revenues are in effect a form of payment students make for their education and should be recognized as such.

Using data from Canada's 2006 Census, it is estimated that the average university educated man pays about \$140,000 in additional income taxes (compared to the average male high school graduate) and receives \$15,400 less in transfer payments (such as welfare and EI) over his working life due to his higher earnings, for a total of \$155,400 in additional net taxes. University educated women pay over \$80,300 in higher income taxes and receive \$18,100 less in transfer payments (compared to the average female high school graduate), for a total of \$98,400 in additional net taxes.

If other taxes, such as sales and payroll taxes (EI and CPP deductions), were included, the amount paid by graduates for their education would be even higher.

Graduates in virtually all undergraduate programs, including humanities and social sciences, contribute considerably more to the government coffers over their working lives than their education costs. This points to the need to rethink how we fund post-secondary education in BC and Canada. Two policy recommendations follow from this analysis.

First, public investment in university education should be expanded. The substantial payoff from education in terms of extra taxes to the public treasury that this report documents strengthens the case for increased public funding to universities.

WHO PAYS FOR UNIVERSITY EDUCATION IN BC?

The infographic is divided into several sections. At the top left, a silhouette of a university building is shown with people walking around. To its right, a text box states 'A four-year university degree costs \$50,630' next to a money bag icon. Below this, a paragraph explains that graduates pay more in taxes and receive less in transfer payments. In the center, a diagram shows a woman and a man with arrows pointing to their respective contribution amounts: '\$106,000 more' for women and '\$159,000 more' for men, with three money bags below. On the right side, there are two red-bordered boxes with white text: 'A STRONG ECONOMY' and 'FAIR ACCESS', each followed by a paragraph of text. The background features a subtle grid pattern.

A four-year university degree costs **\$50,630**

In addition to paying tuition fees, university-educated women and men pay **more in taxes** and receive **less in transfer payments** over their working lives than those with only a high-school diploma...

Women contribute **\$106,000 more**

Men contribute **\$159,000 more**

...for a net contribution by graduates of two to three times the full cost of a degree

A STRONG ECONOMY
increasingly requires advanced education.
To ensure BC is well-positioned to succeed, **increase public investment** in post-secondary education.

FAIR ACCESS
can be achieved by **lower tuition fees.**
We can afford to reduce financial barriers to education because graduates repay the costs and more through higher taxes.

Second, up-front student payment for education—in the form of tuition—should be reduced and education funding should instead be recouped through the additional taxes paid by university graduates (ideally through increases in progressive taxes). The current policy approach to higher education financing, which puts increasing pressure on individual students and their families to pay for their university education up-front is both unfair and unnecessary. High tuition fees simply overcharge students and, in the process, compromise access to education for those who face financial barriers in their youth.

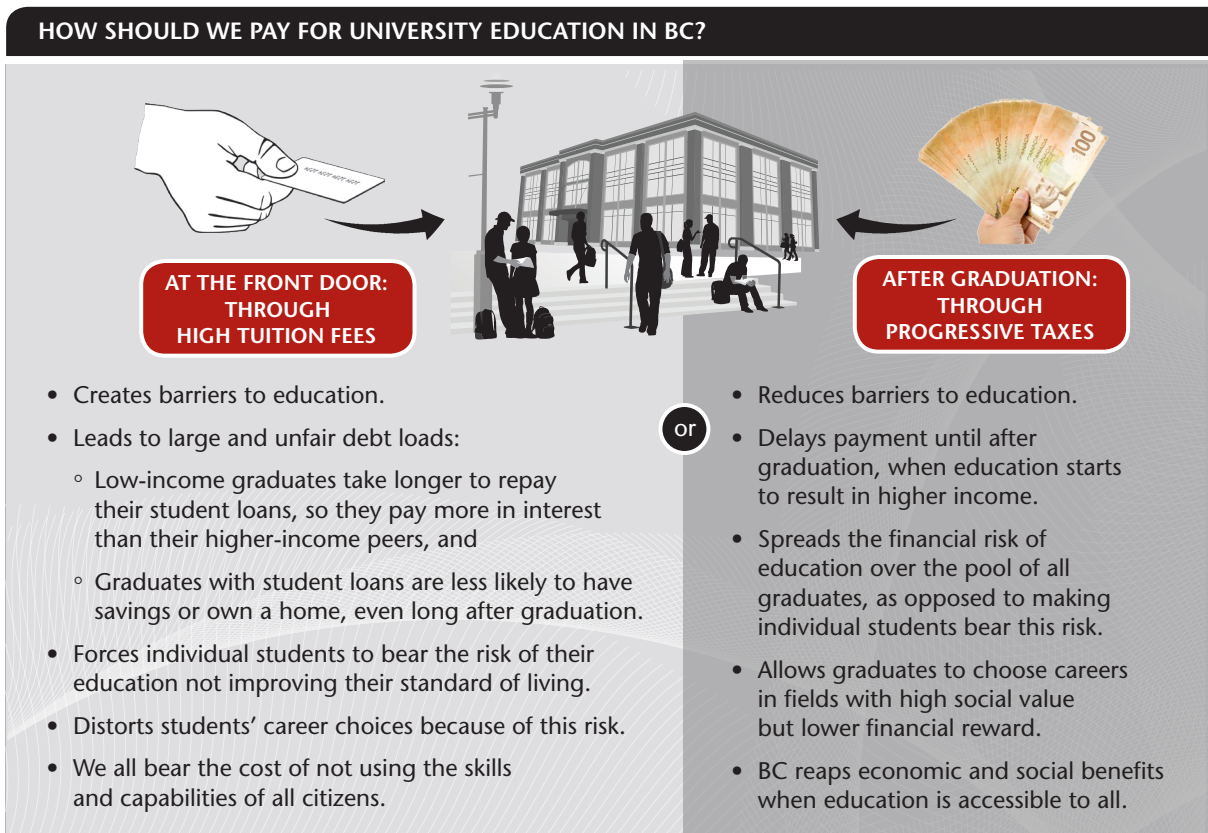
In today's economy, when a post-secondary education is increasingly becoming a requirement for many fields of employment, it is more important than ever to ensure that all British Columbians can access higher education. This report's findings suggest that it is economically feasible to improve access by reducing the up-front financial barriers to education and recognizing the payments graduates make for their schooling throughout their working careers.

It is important to note that while those with post-secondary degrees and certificates earn more *on average*, some individuals with higher education earn less than the average high school graduate. A progressive income tax system is sensitive to these individual differences and will ensure that the risk is pooled over all graduates.

In addition, it will allow graduates to make career decisions freely, without the threat of unmanageable debt loads hanging over their heads. Those who opt to pursue careers with high social value, but low remuneration, such as in the visual arts or non-profit sectors, would not have their choices distorted by high education costs.

It makes good sense to ask university graduates to pay the costs of their education once they start reaping the payoffs of their education, rather than charging them high tuition fees up front.

It is economically feasible to improve access by reducing the up-front financial barriers to education and recognizing the payments graduates make for their schooling throughout their working careers.



How University Education is Financed in BC and Why it Matters

HIGHER EDUCATION IN BRITISH COLUMBIA has always been funded with a mix of government spending and student tuition fees, but over the last decade we have seen an increasing reliance on tuition fees and other private sources of funding for education (see Figure 1). This shift has been justified, in part, by the notion that post-secondary education results in higher incomes after graduation, and thus is a profitable investment for students that should not be subsidized by taxpayers. With student fees accounting for 40 per cent of BC university operating revenues in 2008/09,¹ students may still appear to be a subsidized group.

In this report, I argue that the conventional thinking misses an important way in which students repay the cost of their education: through higher taxes in the decades after graduation. As Oxford University economics professor Robert Allen (formerly at UBC) outlined in a 1998 report for the Canadian Centre for Policy Alternatives, the illusion of a subsidy comes from the fact that the government pays most of the up-front costs of educating Canadians, since Canadian universities are publicly owned. However, the government is able to recoup these costs through the higher taxes on income gains flowing from this education.² The higher taxes graduates pay are a direct result of the increased lifetime earnings that post-secondary education brings.

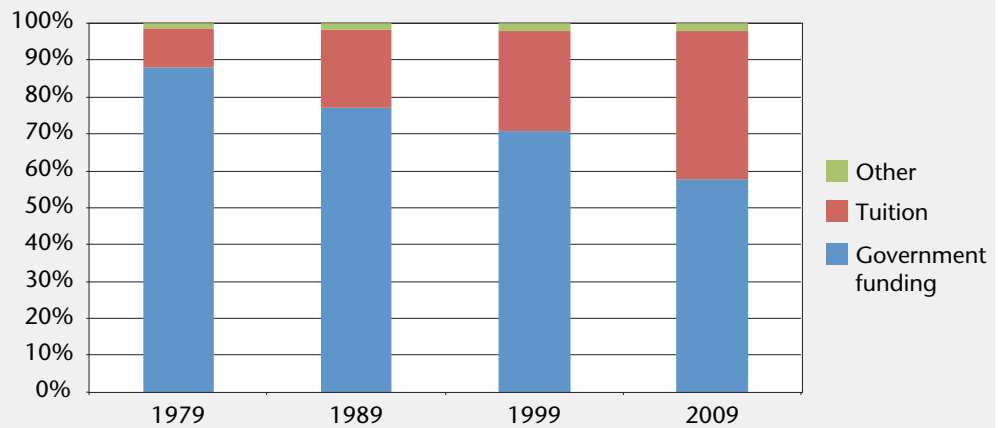
Allen found that, as a group, BC students in 1990 ultimately paid the full costs of their university education (and often more) through higher taxes over their working lives. He estimated the higher lifetime taxes paid by university graduates by field of study and showed that graduates

In a 1998 study, Robert Allen found that, as a group, BC students in 1990 ultimately paid the full costs of their university education (and often more) through higher taxes over their working lives. In this report, I use more recent data to examine whether university students still pay the full cost of their education in BC.

1 Sources: Statistics Canada and CAUT. Tuition fees account for 25 per cent of total university revenues; however, total revenues cover costs other than teaching (for example, research and community involvement), which is more than what students should be expected to pay for.

2 Allen, 1998.

Figure 1: BC university operating revenue by source



Source: Statistics Canada, Canadian Association of University Business Officers and Canadian Association of University Teachers.

in almost all fields, including basic science and humanities degrees, pay the full costs of their education through higher taxes.³

In this report, I use more recent data to examine whether university students still pay the full cost of their education in BC.⁴ The questions of who benefits from higher education and how this education should be financed are more important than ever now, when advanced education has a growing impact on people's ability to compete in the labour market, on the types of jobs they obtain, and the incomes they are able to earn.

The BC government's own estimates show that over this decade (2010 to 2020), about 35 per cent of new job openings will require university-level education, while 42 per cent are projected to require non-university post-secondary education, college or trades certificates.⁵ In contrast, occupations that require a high-school diploma or lower education will account for less than a quarter (22 per cent) of total projected job opportunities in the province.

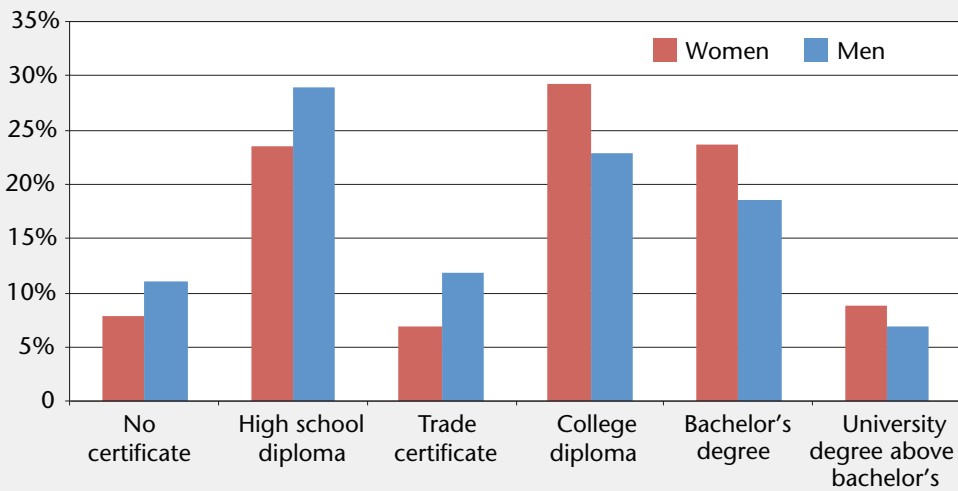
BC's population is relatively well educated and enrollment in post-secondary education increases with each younger cohort, but data from the 2006 Census shows that the share of workers with post-secondary education, even among 25 to 34 year-olds in BC, is less than the projected growth in employment for these occupations (see Figure 2).

3 The exceptions are humanities degrees for men and agriculture/biology degrees for both genders.

4 In this report, I focus on the economic returns from higher education in BC. Canadian provinces have different industrial structures and face different economic pressures. In addition, provincial governments control important elements of the education system, such as setting public funding for educational institutions, regulating tuition fees, determining the generosity and type of student financial assistance programs, and the tax-and-transfer system, which allows provincial policies to make large impacts on the distribution of costs for education. Like Allen (1998), I focus the analysis on graduates of undergraduate university programs with no further education credentials (i.e., bachelor's degree graduates) because there is more data available for them than for other post-secondary students, such as community college graduates.

5 Work BC, 2010.

Figure 2: Share of BC population aged 25–34 by education level, 2005



Source: Statistics Canada, 2006 Census, catalogue no. 97-560-XCB2006008 (BC, Code59).

In today's economy, a post-secondary education is no longer a luxury but a minimum requirement for many fields of employment. This is why it is more important than ever to ensure that all British Columbians can access advanced education.

The report begins with an overview of the recent evidence on the gains from higher education to students themselves and to society as a whole. Both monetary and non-monetary returns to education are considered. Part 3 quantifies the costs of educating undergraduate students in BC, which is compared to the payments students make for their degrees in Part 4. I then show that from the perspective of the public treasury, undergraduate education pays for itself in the sense that the additional income taxes graduates pay over their lifetimes fully cover the costs of their education. The implications of these results for public policy and higher education finance are discussed in the final section of this report.

In today's economy, a post-secondary education is no longer a luxury but a minimum requirement for many fields of employment. This is why it is more important than ever to ensure that all British Columbians can access advanced education.

The Economic Gains from Education for Students and Society

The economic returns to higher education for individuals are typically measured as the difference between the earnings of university graduates and their peers with high school education only.

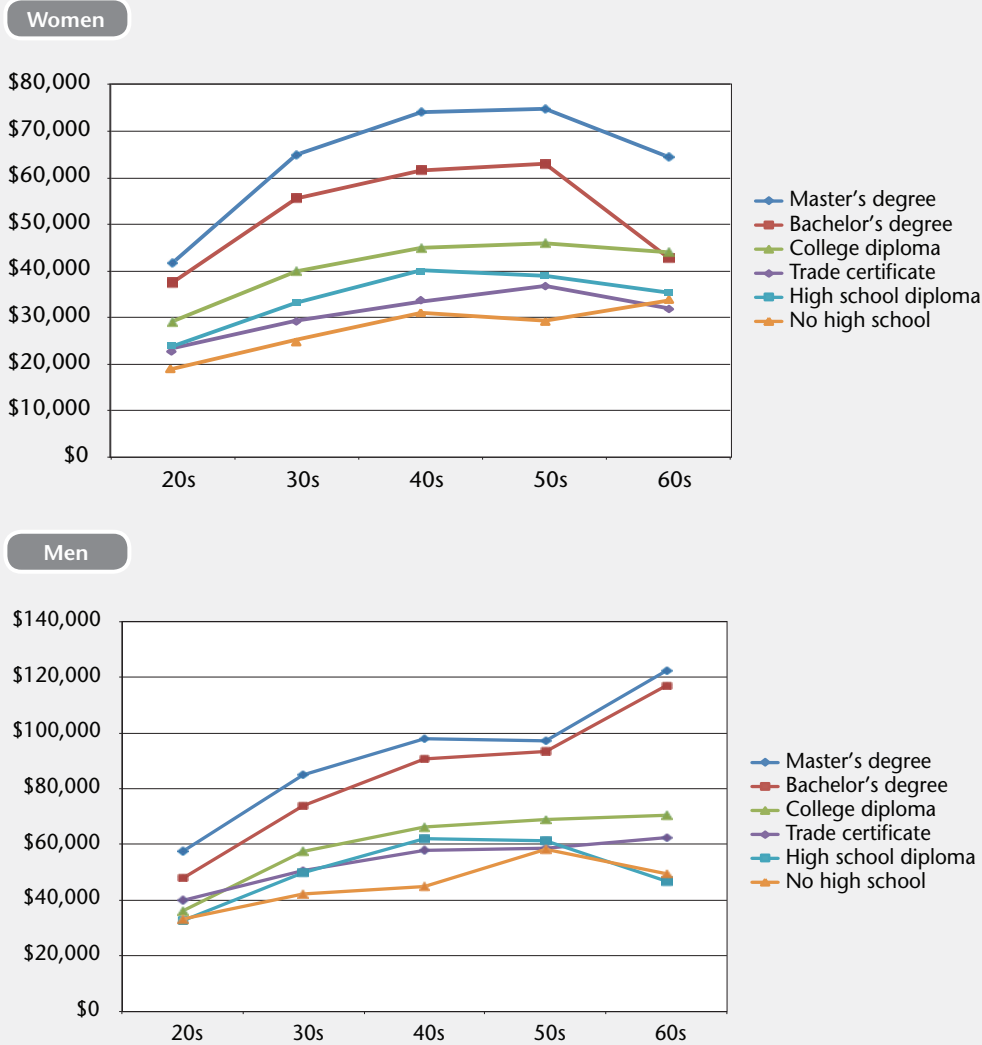
UNIVERSITY EDUCATION IS AN INVESTMENT that pays off for both individual students and for society as a whole. The economic returns to higher education for individuals are typically measured as the difference between the earnings of university graduates and their peers with high school education only. Research has found that the returns to education are large and tend to be higher for women than men. A recent study by University of Montreal economist Brahim Boudarbat and his UBC colleagues Thomas Lemieux and Craig Riddell found that men with university education earned 40 per cent more on average than their high school peers in 2005 while university educated women earned 51 per cent more (after adjusting for job experience).⁶

The same study found that the economic returns to education in Canada have increased since the early 1980s for both men and women, although slightly more so for men (8 percentage points for men and 6 for women). The increase in the wage premium for university education occurred despite the large increases in university enrollment over the last three decades, which increased the supply of graduates (and which some economists expected to reduce the economic returns to education).

Figure 3 shows the economic returns to higher education in BC based on data from the 2006 Census. It is clear that in BC, full-time, full-year workers with higher levels of education have higher average employment income at every age. In addition, those with higher education see

⁶ Boudarbat, Lemieux and Riddell, 2010. It is common to control for the effects of work experience on wages when examining the economic returns to education. Because educational attainment has increased significantly over the last three decades, older (and more experienced) workers tend to be less educated than younger workers. Therefore, comparing average earnings for all higher educated workers to earnings of less educated workers would underestimate the real returns to education unless work experience or age (which is a close approximation of work experience) is controlled for.

Figure 3: BC employment income (full-time, full-year) by education and age group, 2005



Notes: Employment income includes wages and salaries from paid employment and positive net income from unincorporated self-employment and/or professional practice for all jobs held in 2005 by BC residents who worked full-year, full-time, and did not attend school that year. Immigrants are excluded from this analysis in order to focus on the returns to Canadian education. The category "60s" includes people aged 60 to 64 only (those who are expected to be in the labour market).

Source: Statistics Canada. 2006 Census Public Use Microdata File.

steeper earnings growth over their working careers than their high-school educated peers. Annual employment incomes for men and women are examined separately because of the persistent earnings gaps between the genders.⁷

7 In the 2006 Census, full-time, full-year work is defined as working 49 to 52 weeks mostly full-time (30 hours or more per week) in 2005. The large differences in annual earnings of full-time, full-year workers by gender is explained in part by women typically working fewer hours per week in the paid labour market (closer to 30 hours, compared to men working on average closer to 40 hours per week), and women working on average slightly fewer weeks than men. Wage differences between men and women are smaller when wages per hour worked are compared, but a gender wage gap remains even after controlling for hours of work.

Figure 3 shows that among women in their 40s, working full-time the entire year, those whose highest level of schooling was a bachelor's degree earned on average \$61,600 in 2005, compared to \$45,000 for college graduates, \$40,000 for high school graduates and \$31,000 for high school dropouts. Men also saw high premiums for education, although their annual earnings were substantially higher on average. A man in his 40s working full-time, full-year in BC with a bachelor's degree earned \$90,700 in 2005, considerably more than a college graduate (\$66,300), a high school graduate (\$62,200) and a high school dropout (\$45,000).⁸

Among full-time, full-year workers, bachelor's degrees (with no further education) were associated with 36 per cent higher annual incomes for men and 43 per cent higher incomes for women in BC in 2005 compared to high school graduates.⁹

The gaps in annual earnings between university graduates and their high school peers across all workers are even higher than those observed among full-time, full-year workers (average employment incomes for all workers are shown in the Appendix). This is because post-secondary education is associated with better performance in the labour market (or more hours of work over the year) as well as a wage premium on each hour worked.¹⁰

Despite the pervasive stereotype of English majors serving lattes at Starbucks, university graduates are more likely to be employed, to hold full-time jobs, and to experience shorter periods of unemployment when they are laid off than their peers with only high school diplomas.¹¹ Figure 4 shows that higher education levels are clearly associated with lower unemployment rates in BC. The gap is larger during recessions (early 2000s and 2009) and lower during booms (mid-2000s).

The benefits of education go beyond increased job skills and earning potential; education provides people with the critical thinking skills they need to be active and confident participants in our communities, and in our democratic society. Better educated people participate more actively in their communities, have higher voter turnout rates and volunteer more. Moreover, studies show that educated people are, on average, healthier, that they experience lower rates of depression and mental illness, and report a higher degree of satisfaction with life even after accounting for differences in gender, age and income.¹²

The benefits of education go beyond increased job skills and earning potential; education provides people with the critical thinking skills they need to be active and confident participants in our communities, and in our democratic society.

8 Note that men working full-time, full-year whose highest level of education is a trade certificate (which includes registered apprenticeship certificates) earned less (on average) than high school graduates in their 40s and 50s. Among women, those with trade certificates earned less than high school graduates in all age groups. The poor returns to trade certificates in terms of annual employment earnings are somewhat counterintuitive given anecdotal evidence of high-earning tradespeople, but they may be a result of different number of hours worked by those with trade certificates and those with only high school diplomas or of the prevalence of a cash-based economy in the trades (construction in particular), which may be related to under-reporting actual income. Note that poor economic returns to trade certificates for women have been documented in other research. A 2010 C.D. Howe Institute report that used the same 2006 Census data, but compared weekly earnings of Canadians by education level (instead of annual earnings), found that men with trades certificates earned on average 12 per cent more than male high-school graduates while women earned the same as female high-school graduates (Boothby and Drewes, 2010). The authors speculate that the low returns to trades certificates for women may have to do with their distribution among men and women, noting that in 2007 about 67 per cent of women completing apprenticeship did so in hairstylist programs and only 1 per cent of those certified in construction trades were female.

9 Based on regression analysis of the 2006 Census data.

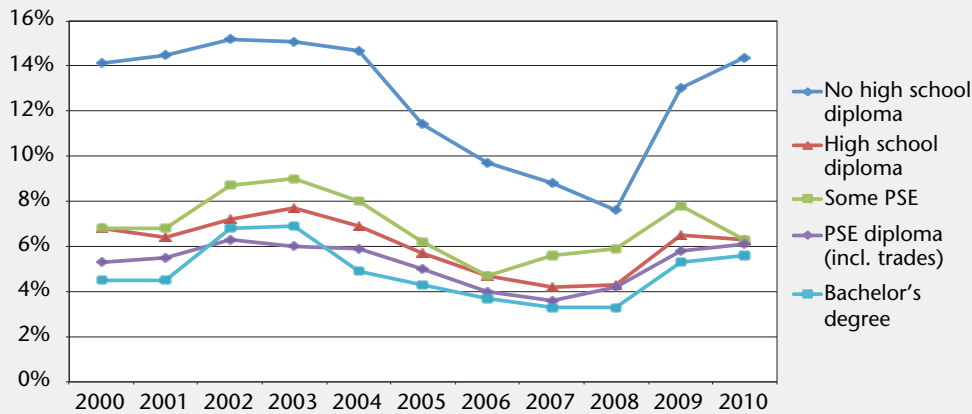
10 While many economists narrowly define the returns to higher education as the wage premium on each hour worked, the total benefit for individuals and their families from higher education is better measured in the increase of their total annual incomes.

11 There is increasing evidence that higher education leads to these improved labour market outcomes instead of just being correlated with them. See, for example, Riddell and Song (2011).

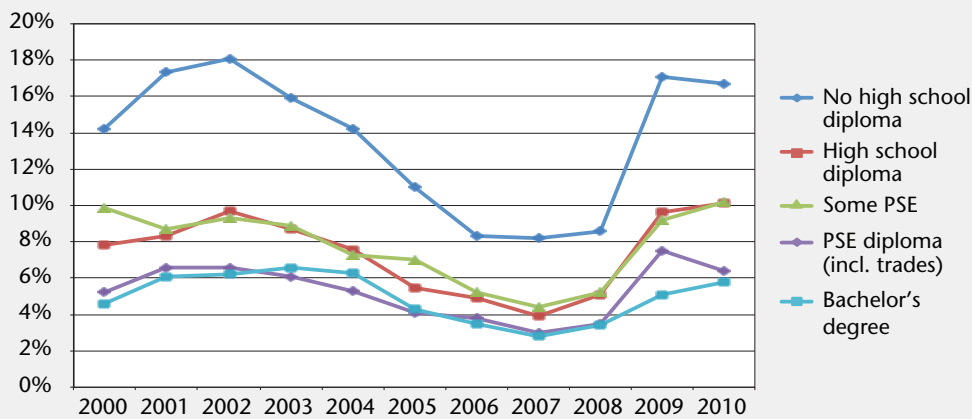
12 OECD, 2011.

Figure 4: BC unemployment rate by education level

Women



Men



Source: Statistics Canada, Labour Force Survey, CANSIM table 282-0004.

Higher education is also associated with considerable social benefits that extend beyond individual graduates and their families. For example, innovation and knowledge creation are linked to a strong research and development sector, drawing on the abilities of highly trained individuals. Formal education has an important role to play in developing the human capital needed by individuals and communities to succeed in the knowledge economy. It is not surprising that an educated and highly skilled workforce is widely viewed as a crucial element for the continued economic and social growth and development of BC and Canada.

While the social benefits to education are rarely quantified, UBC economist Craig Riddell's summary of the economic research on the topic concludes that "the non-market and social benefits of education appear to be substantial, perhaps as large as private market returns to education from higher lifetime earnings."¹³

13 Riddell, 2007.

The Cost of Providing Higher Education

Universities are multi-purpose organizations that engage in research, community service and teaching of graduate students as well as teaching undergraduates.

Therefore, it would be inaccurate to attribute all of university expenditures to teaching undergraduate students.

THE FIRST STEP IN ESTIMATING whether university graduates pay the full costs of their degrees is to determine how much it costs to educate an undergraduate student in a given program. Universities are multi-purpose organizations that engage in research, community service and teaching of graduate students as well as teaching undergraduates. Therefore, it would be inaccurate to attribute all of university expenditures to teaching. At present, universities do not report publicly on the costs of their different functions; however, economists Kirk Collins and James Davies estimate that in Canada, the costs of educating undergraduate students is approximately 50 per cent of university operating expenditures.¹⁴

Data on university operating expenditures in each province is regularly compiled by the Canadian Association of University Teachers (CAUT). According to CAUT, BC universities had total operating expenditures of \$1.7 billion in 2005/06.¹⁵ This figure includes the operating expenditures of Royal Roads University, Simon Fraser University, Thompson Rivers University, Trinity Western University, the University of British Columbia, the University of Northern British Columbia and the University of Victoria, which collectively had 65,067 undergraduate full-time equivalent students in 2005/06 (CAUT, 2010).

14 Kirk Collins and James Davies, "Measuring Effective Tax Rates on Human Capital: Methodology and an Application to Canada," in Peter Sorensen (ed.) *Measuring the Tax Burden on Capital and Labour* (MIT Press, p. 171-211, 2004), cited in Burbidge et al., 2011.

15 The exact number, \$1,647,168,000, was provided by researchers at CAUT. To be consistent with the Census data used later in the analysis of the payments of university graduates, I use data from the 2005/06 fiscal year on university spending. The 2006 Census was taken in May 2006 and asked Canadians about their annual incomes for the year 2005.

Table 1: Cost of teaching undergraduates in BC, 2005/06

Operating expenditures of BC universities	\$1,647,168,000
Cost assigned to teaching undergraduates (50 per cent of total)	\$823,584,000
Total undergraduate FTEs	65,067
Cost per undergraduate FTE per year	\$12,657
Average cost for a four-year undergraduate degree	\$50,630
Sources: Operating expenditures of BC universities from CAUT (unpublished data). Cost assigned to teaching—see text above. Undergraduate FTEs from CAUT (2010), Table 3.6. Average cost for a four-year undergraduate degree is calculated as 4 x cost per undergraduate FTE per year (\$12,657.40).	

Table 1 summarizes the calculation of the average costs of university education per full-time equivalent student in BC in 2005/06. I find that it costs on average \$12,657 to educate an undergraduate student in BC for a year, which adds up to \$50,630 over the course of a four-year bachelor's degree.¹⁶

There are notable differences in the costs of teaching undergraduates depending on the course level, faculty, and course delivery mode (e.g., distance education), which are often recognized by weighting programs in proportion to these differences to produce weighted full-time equivalent enrollment numbers. The University Presidents' Council of BC (now known as the Research Universities' Council of BC) provided annual estimates of weighted full-time equivalent (FTE) enrollment in BC universities up to 2005/06.¹⁷ Using a weight of 1.0 for first and second year Arts, Social Sciences, Communications and Education programs, 1.5 for third and fourth year courses in these programs and all Business and Fine Arts courses, and 2.0 for courses in Applied Science, Health Services and all Science, the Council estimated there were 106,771 undergraduate weighted FTEs in 2005/06.¹⁸

It is possible to estimate the costs of undergraduate instruction in different academic fields of study using these weighted enrollment numbers. Dividing the total costs assigned to teaching undergraduates by the number of undergraduate weighted FTEs in BC universities, I calculate that the average instructional cost per weighted FTE in 2005/06 was \$7,714.¹⁹ This corresponds to the costs of educating a first or second year Arts student and must be multiplied by the weight per year in a given program to estimate the four-year cost of different fields of study in BC. Table 2 on the following page summarizes the results.

16 Burbidge et al. (2010) estimate that the cost of educating an undergrad in BC in 2005/06 was \$9,731 per year using the same methodology but different data on university operating expenditures and enrollment numbers. If anything, the estimate I use in this paper is likely to overestimate the cost of undergraduate teaching in BC (see note 19).

17 TUPC, 2007.

18 The complete list of weights by field and year of study are provided in Table 4.2 in TUPC (2007). It should be noted that enrollment numbers are missing for Thompson Rivers University, which means that the 106,771 is an underestimate of the actual weighted full-time equivalent enrollment in BC. The change is likely not very large as CAUT (2009) reports 8,808 total FTEs for Thompson Rivers University, not all at the undergraduate level.

19 This is likely to be an overestimate of the actual costs per weighted FTE in BC because the enrollment numbers reported in TUPC (2007) exclude students at Thompson Rivers University.

Table 2: Cost of undergraduate degrees in BC, 2005/2006

	Weight in year 1 and 2	Weight in year 3 and 4	Average weight per year	Cost of four-year degree
Education	1.00	1.50	1.25	\$38,568
Visual and performing arts, and communications	1.50	1.50	1.50	\$46,281
Humanities	1.00	1.50	1.25	\$38,568
Social and behavioural sciences	1.00	1.50	1.25	\$38,568
Business, management and public administration	1.50	1.50	1.50	\$46,281
Physical and life sciences, and technologies	2.00	2.00	2.00	\$61,708
Mathematics, computer and information sciences	2.00	2.00	2.00	\$61,708
Architecture, engineering	2.00	2.00	2.00	\$61,708
Agriculture, natural resources and conservation	2.00	2.00	2.00	\$61,708
Health, parks, recreation and fitness	2.00	2.00	2.00	\$61,708
Average undergraduate degree				\$50,630

Notes: Cost of degree is calculated as 4 x weight/year x cost per weighted full-time equivalent student (\$7,714). The cost of the average undergraduate degree is from Table 1 above.

Weight per year is the average of the weights in each of the four years of the program.

Fields of study are Statistics Canada categories for all post-secondary studies, not just those at the undergraduate level. Statistics Canada includes law programs in the broader field "social and behavioural sciences and law." Since law programs are not considered to be at the undergraduate level in BC, there are no law graduates included in the analysis presented here, which is why I have dropped "law" from the title of the field. The weight for students in Fine Arts (1.5 per year) is used for the field "Visual and performing arts, and communications," even though students of music typically receive a weight of 2 for each year of study, while communications students receive a weight of 1 for first and second year and 1.5 for third and fourth year. The weight of health science students is used for the field "Health, parks, recreation and fitness" even though it includes students in physical education and recreation programs, who are given a weight of 1.5 per year of study.

How BC Students Pay for Their Degrees

Students pay for their education in two distinct ways: first, through tuition fees while enrolled in university, and second, through higher taxes throughout their working life. This second type of payment is less obvious and, as a result, it is rarely considered in the public debate about how post-secondary education should be funded. However, the work of Allen (1998) suggests that the amounts students pay in additional taxes over their lifetime greatly exceed their tuition fees. To accurately estimate students' full payment for their degrees, both types of payments for education must be considered.

Undergraduate tuition fees in BC vary considerably by institution and type of program. According to Statistics Canada, full-time undergraduate students in BC paid on average \$4,922 in tuition fees in 2007/08.²⁰ Average fees varied from a low of \$4,367 for students enrolled in programs related to agriculture, natural resources and conservation to a high of \$5,599 for those in the fields related to health (other than medicine and nursing), parks, recreation and fitness.²¹

Students pay for their education in two distinct ways: first, through tuition fees while enrolled in university, and second, through increased taxes throughout their working life.

20 Statistics Canada table, Undergraduate Tuition Fees for Full Time Canadian Students, by Discipline, by Province. Last updated October 3, 2011. www40.statcan.gc.ca/l01/cst01/educ50k-eng.htm. Average tuition fees are weighted by the number of students enrolled by institution and field of study. Note that this produces a more accurate estimate of tuition fees paid by the average BC student than taking total student fees received by BC universities and dividing them by the number of full-time equivalent students. The latter tuition estimation method, used in Allen (1998), is likely to overestimate the tuition fees paid by domestic students because total student fees include fees collected from international students who pay considerably higher fees than domestic students and whose numbers have grown rapidly over the last two decades (from 5.8 per cent of all students in BC universities in 1992 to 10.6 per cent in 2008, according to McMullen and Elias [2011], Chart 2). 2007/08 is used because it is the earliest year for which average tuition fees are reported by field of study according to the Classification of Instructional Programs (CIP), a new coding standard for grouping different programs into "fields of study" that Statistics Canada phased in over the early 2000s (2002–2007). More information on the CIP is available on Statistics Canada's website at www.statcan.gc.ca/concepts/psis-sieip/cip-cpe2000-eng.htm.

21 Tuition fees were higher for professional programs such as dentistry, medicine, law and pharmacy, but these are more appropriately classified as graduate programs, so I have excluded them from the analysis of how students pay for their bachelor's degrees.

Some government funded financial aid is available to help university students cover the costs of their education, via federal and provincial student loans and grants. Not all of this financial aid is a direct government subsidy—a large portion of aid is delivered in the form of repayable student loans. However, any subsidy embedded in student financial aid must be subtracted from the total payment students make for their education to accurately estimate the income that governments can expect to recoup in return for their investment in education.

Some of the only recent data on student financial aid in Canada comes from the research published by the now defunct Canada Millennium Scholarship Foundation. Berger and Parkin (2008) estimated the amount of needs-based financial aid BC students received over the 1990s and up to 2006/07. According to the data they compiled, BC post-secondary students received a total of \$76 million in grants and loan remissions in 2005/06. This non-repayable student aid represents a direct subsidy to students. In addition, students received \$554 million in repayable loans from the federal and BC governments combined. Berger and Baldwin (2009) estimate that the government cost of providing loans (which includes administration, the cost of providing an interest-free loan for the duration of one's studies, and the provisions for defaults) is between 30 and 40 per cent of the face value of the loan. Since default rates on student loans among university students are considerably lower than those of students attending colleges and private institutions, I use the lower bound of Berger and Baldwin's estimate, 30 per cent, to calculate the subsidy embedded in student loans to university students.²² Even this may overestimate the true cost of providing student loans to undergraduates.

Since the late 1990s, spending on education tax credits has grown significantly, surpassing \$2 billion per year in 2005/06.

I estimate that the total subsidy embedded in government student loans to BC university students was \$166 million, for a total government subsidy of \$242 million per year. Dividing this government subsidy by the number of full-time equivalent college and university students in 2005/06 (139,179 according to CAUT (2009), Table 3.6), this works out to \$1,738 per full-time equivalent university student in BC.²³

Governments also deliver financial aid for students through the income tax system via federal and provincial education tax credits. Since the late 1990s, spending on education tax credits has grown significantly, surpassing \$2 billion per year in 2005/06. In comparison, the total value of student loans issued in 2005/06 was \$3 billion.²⁴ The value of this type of student financial aid is included in the analysis of the additional taxes university graduates pay over their lifetimes.²⁵

22 HRSDC estimates that the three-year default rate on federal student loans was 10 per cent for university recipients compared to 18 per cent for those in college and 35 per cent for recipients attending private institutions (HRSDC, 2010).

23 Note that post-secondary students in private institutions are also eligible for student aid, and their numbers are not included in the estimate of total FTEs used for the calculation. According to data presented in Table 3.25 in CAUT (2009), student loans per recipient are higher in private institutions than in public colleges and universities. The data provided in Table 3.25 can be used to calculate that 45 per cent of all Canada student loans in BC went to university students in 2005/06, while 35 per cent went to college students and 20 per cent to students in private institutions. Assuming BC provincial student loans were distributed similarly, we can make an alternative calculation of government subsidy per university student, taking 45 per cent of the total value of subsidy embedded in student aid (which works out to \$109 million) and dividing by the number of full-time equivalent undergraduate university students in BC (65,067 according to Table 3.6 in CAUT (2009)). This calculation puts the cost of student aid per undergraduate FTE at \$1,673, which is roughly in the same ballpark as the calculation presented in the text.

24 The source for the total value of education tax credits and student loans is Berger and Baldwin (2009), Figure 6.II.I, p. 157.

25 Income taxes in the 2006 Census are net of all non-refundable tax credits, including education tax credits actually claimed by the recipients. Education tax credits claimed while attending university are captured in the analysis of the foregone taxes while in school. Education tax credits can also be saved for future years and claimed after graduation if the student does not owe income taxes while in school. Education tax credits saved in that way are captured in the comparison of income taxes paid from age 22 up (over the graduates' working lives).

The second type of payment for education that students make is the increased taxes paid throughout their working career. Post-secondary education is an investment in human capital and it pays off by improving the graduates' performance in the labour market. As noted earlier, university graduates are more likely to be employed and tend to earn higher incomes than their peers with only a high school education. This means that university graduates pay more taxes every year throughout their career. These additional taxes paid are another way in which students pay for their education: in effect, the government treasury captures a proportion of the individual income gains from higher education through taxation.

To quantify the amount of additional taxes paid by university graduates, I use data from Statistics Canada's 2006 Census Public Use Microdata file. The Census is preferred to other Statistics Canada surveys because of its large sample size, which allows employment income earned and income taxes paid by British Columbians to be analyzed by field of study, sex and age group.²⁶

To capture the flow of payments that university graduates make to the public treasury, I look at income taxes net of government transfers. This broader definition of taxes—taxes net of transfers—is a more accurate description of the income governments recoup from university graduates than just taxes alone. In the tables that follow, I present average income taxes and average government transfers separately by gender to highlight the different experiences of men and women university graduates in the BC labour market.

Table 3 on the following page shows total income taxes paid in 2005 by BC women and men, respectively, by level of education and age. Income taxes include provincial and federal income taxes payable, after taking into account all exemptions, deductions and non-refundable tax credits (including education tax credits).²⁷ The additional taxes paid by university graduates can be calculated as the difference between their tax payments and those of high school graduates in the same age group.

Table 3 presents average income taxes paid by women and men of working age (age 20 to 64) who did not attend school in 2005. Full-time workers, part-time workers, the self-employed and those who did not work during the year are all included in the calculation.²⁸ This captures the full effects of post-secondary education on annual incomes and therefore taxes, including the earnings premium for every hour worked and the increase in hours worked over the year due to lower unemployment rates and shorter duration of unemployment among university graduates.

It is clear from Table 3 that university graduates of all ages pay higher taxes than their peers with only high school diplomas. This is true for graduates in most fields of study as well, and it is a direct result of university graduates earning higher incomes, on average, than high school graduates (see the Appendix for detailed tabulation of employment incomes by gender, age and education).

University graduates are more likely to be employed and tend to earn higher incomes than their peers with only a high school education.

26 The 2006 Census was the first Canadian Census to include questions on income taxes paid and government transfers received by individuals. This makes it even better suited for this analysis than the 1991 Census data used by Allen (1998).

27 Many 2006 Census recipients allowed Statistics Canada to access their actual income tax files and derive the variables income tax paid and government transfer payments received directly from there. For the rest of the Census recipients, income taxes and government transfers were self-reported (though the questionnaire prompted recipients to consult their 2005 income tax return and information slips when answering the relevant questions).

28 As noted earlier, self-employed who reported negative incomes from self-employment are excluded from this calculation to be consistent with other academic studies on the returns to schooling, such as Boudarbat, Lemieux and Riddell (2010). This group represents only 3 per cent of all working age adults not attending school (for both genders).

Table 3: Income taxes paid by BC women and men in 2005, by highest education level

WOMEN	Age groups				
	20s	30s	40s	50s	60s
Bachelor's degree graduates	\$3,408	\$7,020	\$8,711	\$9,256	\$7,914
High school graduates	\$1,546	\$2,937	\$4,357	\$3,927	\$3,570
By field of study (bachelor's degree with no higher post-secondary education)					
Education	\$2,333	\$5,508	\$7,310	\$9,580	\$8,544
Visual and performing arts, and communications	\$1,523	\$4,184	\$2,000	\$5,640	.
Humanities	\$2,773	\$4,306	\$4,385	\$6,837	\$4,304
Social and behavioural sciences	\$3,389	\$7,633	\$11,138	\$10,695	\$8,777
Business, management and public administration	\$4,487	\$8,947	\$14,011	\$7,760	\$7,333*
Physical and life sciences and technologies	\$2,898	\$7,944	\$8,364	\$13,455	\$19,000*
Mathematics, computer and information sciences	\$11,000*	\$9,444*	\$2,667*	\$7,444*	\$1,001*
Architecture, engineering	\$5,625*	\$12,167*	\$6,600	\$6,750*	.
Agriculture, natural resources and conservation	\$4,364	\$5,546	\$6,500	\$34,440*	.
Health, parks, recreation and fitness	\$5,117	\$8,545	\$8,327	\$9,107	\$9,686
MEN	Age groups				
	20s	30s	40s	50s	60s
Bachelor's degree graduates	\$5,652	\$13,908	\$19,084	\$21,289	\$18,858
High school graduates	\$3,477	\$6,882	\$10,964	\$10,795	\$9,871
By field of study (bachelor's degree with no higher post-secondary education)					
Education	\$3,909	\$6,472	\$10,419	\$9,000	\$9,308
Visual and performing arts, and communications	\$4,500	\$6,185	\$5,700	\$6,263	.
Humanities	\$5,511	\$7,961	\$16,041	\$14,457	\$5,217
Social and behavioural sciences	\$4,492	\$16,148	\$20,375	\$31,367	\$25,916
Business, management and public administration	\$4,556	\$21,004	\$28,856	\$28,837	\$32,903
Physical and life sciences and technologies	\$5,533	\$11,143	\$15,560	\$14,731	\$21,702
Mathematics, computer and information sciences	\$8,643	\$13,977	\$17,636	\$15,043	\$11,600*
Architecture, engineering	\$7,467	\$16,070	\$21,670	\$24,840	\$19,722
Agriculture, natural resources and conservation	\$8,250	\$9,563	\$13,174	\$17,000	\$16,200*
Health, parks, recreation and fitness	\$4,482	\$12,448	\$11,920	\$11,700	\$8,833*
Notes: . indicates insufficient data to calculate. * indicates a small sample size in that cell (fewer than 10 respondents).					

Among women, only graduates with visual arts degrees in their 20s and 40s, and mathematics and computer science graduates in their 40s and 60s, pay less in taxes than their peers with only high school education. There are very few women with mathematics and computing science degrees in the Census sample, so the estimate of the taxes they pay should be interpreted with caution. Interestingly, women with visual arts degrees in their 20s actually earn more on average than their high school educated peers (see Appendix), even though they pay slightly lower taxes. This may be because of education tax credits or other deductions and credits that the university graduates claim (e.g., RRSP or child care deductions). It is also important to note that women with fine arts degrees in all age groups except their 20s receive less in cash transfers from governments than their peers with high school education only (see Table 4 on the following page).

Among men, university graduates who pay less in income taxes than their high school peers include education and visual arts graduates in all age groups (except their 20s), as well as humanities and health, fitness and recreation graduates in their 60s. Notably, male education graduates earn more employment income than their high school educated peers in virtually all age groups except those in their 60s (see Appendix). They also receive less government transfers (see Table 4). It would appear that university graduates are availing themselves of more deductions and tax credits than their high school educated peers (such as the RRSP deduction).

Table 3 reveals that average taxes paid by women of all education levels are considerably lower (often as much as twice as low) than taxes paid by men of the same age and education level. The reason for that is the large difference in annual employment income between men and women, explained partly by lower hourly wages for women as well as by fewer total weeks and hours worked by women, who are still much more likely to be employed part-time and/or part-year than men. While women, on average, earn up to 70 per cent of men's average annual earnings, they pay half as much in income taxes because our income tax system is progressive and those with lower incomes pay less in tax as a share of their income.²⁹

The higher employment incomes associated with post-secondary education mean that graduates pay higher taxes, but also that they cost less to the public purse in terms of income supports, EI benefits and other transfers (most of which tend to be income tested). The 2006 Census provides information on all cash benefits received by individuals from the federal, provincial and municipal governments during 2005, summarized in Table 4 on the following page.

The large differences in government transfers received between men and women can be explained by the fact that women earn less than men. In addition, more women than men tend to be single parents and thus qualify for additional income transfers. Finally, many taxable government transfers to families (in particular child benefits) must be claimed by the spouse with lower taxable income, which in most cases is a woman.

Tables 3 and 4 provide snapshots of the relationship between taxes, transfer payments and education at a particular point in time—in 2005. To evaluate the contribution of university graduates in the mid-2000s to the public treasury, it is necessary to project their incomes, taxes and transfers over their working careers. The simplest way to do this is to assume that the relationship between taxes, transfer payments and education observed in 2005 will remain constant over the working lives of graduates, which is to say that the returns to education will remain unchanged over time.³⁰ This seems like a reasonable, even conservative, assumption, in light of recent studies that show returns to university education growing for both men and women between 1980 and 2005

The higher employment incomes associated with post-secondary education mean that graduates pay higher taxes, but also that they cost less to the public purse in terms of income supports, EI benefits and other transfers.

29 Note that adding other, less progressive, taxes to the mix, such as MSP premiums and sales taxes, will reduce the difference in the total annual tax bill between men and women.

30 And that the system of government taxes and transfers will remain the same.

Table 4: Government transfer payments received by BC women and men, 2005

WOMEN	Age groups				
	20s	30s	40s	50s	60s
Bachelor's degree graduates	\$999	\$2,348	\$1,438	\$1,028	\$3,948
High school graduates	\$2,110	\$3,393	\$1,958	\$1,578	\$3,794
By field of study (bachelor's degree with no higher post-secondary education)					
Education	\$1,495	\$2,681	\$1,668	\$1,058	\$4,602
Visual and performing arts, and communications	\$875	\$2,218	\$1,290	\$408	.
Humanities	\$1,148	\$3,020	\$2,054	\$1,197	\$3,583
Social and behavioural sciences	\$938	\$1,885	\$997	\$1,391	\$4,338
Business, management and public administration	\$496	\$2,270	\$1,321	\$1,326	\$3,683*
Physical and life sciences and technologies	\$898	\$2,453	\$1,430	\$1,107	\$2,300*
Mathematics, computer and information sciences	\$0	\$1,222	\$933	\$222	\$2,300*
Architecture, engineering	\$263*	\$2,950*	\$3,020	\$175*	.
Agriculture, natural resources and conservation	\$2,218	\$3,909	\$1,340	\$200*	.
Health, parks, recreation and fitness	\$1,220	\$2,256	\$1,262	\$659	\$2,975
MEN	Age groups				
	20s	30s	40s	50s	60s
Bachelor's degree graduates	\$485	\$735	\$442	\$888	\$3,021
High school graduates	\$1,117	\$1,267	\$1,424	\$1,665	\$3,749
By field of study (bachelor's degree with no higher post-secondary education)					
Education	\$264	\$1,500	\$477	\$816	\$3,331
Visual and performing arts, and communications	\$300	\$1,893	\$715	\$1,232	.
Humanities	\$609	\$714	\$662	\$1,400	\$4,009
Social and behavioural sciences	\$431	\$704	\$492	\$845	\$2,546
Business, management and public administration	\$464	\$545	\$340	\$594	\$3,879
Physical and life sciences and technologies	\$377	\$1,171	\$629	\$1,236	\$2,813
Mathematics, computer and information sciences	\$222	\$620	\$139	\$787	\$1,840*
Architecture, engineering	\$704	\$68	\$424	\$962	\$2,500
Agriculture, natural resources and conservation	\$315	\$1,278	\$383	\$39	\$3,180*
Health, parks, recreation and fitness	\$844	\$169	\$48	\$160	\$1,333*
Notes: . indicates insufficient data to calculate. * indicates a small sample size in that cell (fewer than 10 respondents).					

despite the increase in the supply of graduates.³¹ I also assume that those who get bachelor's degrees attend university for four years between the ages of 18 and 21 and enter the workforce at age 22. A discount rate of 3.5 per cent is used for calculating the net present value of the additional net taxes paid.

The calculations show that the average university educated man pays about \$140,000 in additional income taxes and receives \$15,400 less in transfer payments over his lifetime compared to the average high school graduate due to his higher earnings, for a total of \$155,400 in additional net taxes. University educated women, on the other hand, pay over \$80,300 in higher income taxes and receive \$18,100 less in transfer payments, on average, for a total of \$98,400 in additional net taxes.³²

These numbers, large as they are, underestimate the total amount of tax revenues governments collect from university graduates. This is because income taxes are the only taxes included in the calculation above. All other taxes, such as the CPP and EI contributions, sales taxes, and property taxes, are excluded from this analysis (because the 2006 Census does not provide data on them). It is possible to estimate these additional taxes using a regression model of the tax system from another dataset, as Robert Allen did in his 1998 CCPA report. Doing so will result in a larger estimate of total net taxes paid because the higher income university graduates earn means they pay a higher amount in all other taxes than their peers with only high school education.

Before comparing the average costs of university education with the total payments made by university graduates over the course of their working careers, there is one additional cost of education that must be considered. Young people who choose to attend university are foregoing income they could have earned while they were in school. From the perspective of the public treasury, this means that university students pay less in taxes during the course of their degrees than their peers with high school education only who join the paid labour force instead of going to school.

To quantify the foregone income taxes of university students, I compare the income taxes paid net of transfer payments received by high school graduates who are attending school with those of their peers not in school and working full-time.³³ Table 5 on the following page shows that over the course of a four-year bachelor's degree, the province foregoes about \$9,335 in net income taxes from men, and \$5,114 from women. Note that these income taxes are net of non-refundable tax credits students claim on their tax returns (including education tax credits). This likely accounts for the very low income taxes paid by both men and women attending school, despite the fact that their average annual employment earnings are not that much lower than those of full-time workers with high school education only.

These calculations show that the average university educated man pays about \$140,000 in additional income taxes and receives \$15,400 less in transfer payments over his lifetime compared to the average high school graduate due to his higher earnings, for a total of \$155,400 in additional net taxes. University educated women, on the other hand, pay over \$80,300 in higher income taxes and receive \$18,100 less in transfer payments, on average, for a total of \$98,400 in additional net taxes.

31 See Boudarbat, Lemieux and Riddell (2010). If this trend continues, the calculations presented in this report will underestimate the payment today's university students will make for their education.

32 The results for total net taxes (combined effect of additional taxes and lower transfers) by field of study are reported in Table 6. Calculations of the net present values of additional taxes and transfers separately are not reported here for the sake of brevity.

33 Data from the 2006 Census public use microdata file is used for the comparisons. The average taxes paid by high school graduates attending school are likely to somewhat overestimate the taxes paid by full-time university students. This is because some of the high school graduates attending school are likely to work more and thus earn more, on average, than full-time undergraduate students, for example students enrolled in part-time programs. To offset this, I compare the average taxes paid by high school graduates attending school to those of *full-time* workers not attending school (which is an overestimate of the taxes the average youth not attending university would pay because some high school graduates who choose not to attend university become unemployed or work part-time only).

Table 5: Foregone net income taxes from BC students while in school, 2005/2006

	Men		Women	
	age 18–19	age 20–24	age 18–19	age 20–24
Average income taxes net of transfers for full-time workers not in school	\$1,295	\$3,324	\$761	\$1,456
Average income taxes net of transfers for those attending school	-\$46	-\$3	\$54	-\$394
Foregone net income taxes by students, per year	\$1,341	\$3,326	\$707	\$1,850
Net income taxes foregone over a four-year degree	\$9,335		\$5,114	

Note: Negative numbers mean that transfer payments received from governments exceed income taxes paid.

The data shows clearly that university graduates, as a group, pay more for their education than their degrees cost. Women pay on average \$106,000 for a degree costing \$50,630 while men pay \$159,000 for the same degree.

Table 6 on the following page pulls all the above calculations together. It compares the average costs of university education with the payments made by the graduates over the course of their working careers. Payments consist of tuition fees as well as the present value of additional taxes a university graduate pays compared to their peers with high school education only. Graduates' payments are reduced by the subsidy embedded in student financial aid and by an estimate of the taxes that graduates would have paid over the four years of their degree had they not been in school.

Table 6 shows clearly that university graduates, as a group, pay more for their education than their degrees cost. Women pay on average \$106,000 for a degree costing \$50,630 while men pay \$159,000 for the same degree.

There is some variation in how much students repay to the provincial treasury among fields of study, but by and large graduates in most fields pay for their own degrees. Even general education programs like humanities and social sciences produce high payoffs for graduates of both genders.

For both genders, graduates in the field of visual and performing arts and communications earn considerably less than their peers with high school education only.³⁴ This raises some important questions about how we value the work of artists, which has considerable non-monetary benefits for society. In the big picture, however, there are relatively few students in this field of study: about 4 per cent of all women and 3 per cent of all men undergraduate full-time equivalents in 2005/06 were enrolled in visual arts and communications programs in BC.³⁵

Among female university graduates, visual arts is the only field of study that appears to be subsidized by the public treasury. Among men, graduates of education programs with no further post-secondary credentials are the other group that does not cover the full cost of their degrees.

34 The Appendix table shows that men with fine arts degrees earn more than women with the same degree in most age groups. The only reason why men with fine arts degree appear to pay so much less of their education costs than women is that men with high school diplomas earn a lot more than women with the same educational background (and additional taxes paid are calculated as the taxes paid above and beyond high school graduates of the same gender).

35 CAUT, 2009, Table 3.10.

Table 6: Payments for undergraduate degrees, BC women and men, 2005/2006

WOMEN	Cost of degree	Present value of extra taxes	Tuition fees	Student aid	Foregone taxes	Total net payment by students	Difference between student payment and cost of degree
Average undergraduate	\$50,630	\$98,429	\$19,688	-\$6,952	-\$5,114	\$106,051	\$55,422
By field of study (bachelor's degree with no higher post-secondary education)							
Education	\$38,568	\$69,576	\$18,712	-\$6,952	-\$5,114	\$76,222	\$37,654
Visual and performing arts, and communications	\$46,281	\$25,218	\$18,868	-\$6,952	-\$5,114	\$32,020	-\$14,261
Humanities	\$38,568	\$37,339	\$19,264	-\$6,952	-\$5,114	\$44,537	\$5,969
Social and behavioural sciences	\$38,568	\$122,348	\$19,232	-\$6,952	-\$5,114	\$129,514	\$90,947
Business, management and public administration	\$46,281	\$140,139	\$19,656	-\$6,952	-\$5,114	\$147,729	\$101,448
Physical and life sciences and technologies	\$61,708	\$127,904	\$18,092	-\$6,952	-\$5,114	\$133,930	\$72,222
Mathematics, computer and information sciences	\$61,708	\$145,475	\$18,188	-\$6,952	-\$5,114	\$151,597	\$89,889
Architecture, engineering	\$61,708	\$120,532	\$17,600	-\$6,952	-\$5,114	\$126,066	\$64,358
Agriculture, natural resources and conservation	\$61,708	\$145,427	\$17,468	-\$6,952	-\$5,114	\$150,829	\$89,121
Health, parks, recreation and fitness	\$61,708	\$121,980	\$22,396	-\$6,952	-\$5,114	\$132,311	\$70,602
MEN							
Average undergraduate	\$50,630	\$155,435	\$19,688	-\$6,952	-\$9,335	\$158,836	\$108,206
By field of study (bachelor's degree with no higher post-secondary education)							
Education	\$38,568	\$3,411	\$18,712	-\$6,952	-\$9,335	\$5,836	-\$32,732
Visual and performing arts, and communications	\$46,281	-\$29,093	\$18,868	-\$6,952	-\$9,335	-\$26,512	-\$72,794
Humanities	\$38,568	\$60,398	\$19,264	-\$6,952	-\$9,335	\$63,375	\$24,807
Social and behavioural sciences	\$38,568	\$209,064	\$19,232	-\$6,952	-\$9,335	\$212,009	\$173,441
Business, management & public administration	\$46,281	\$279,279	\$19,656	-\$6,952	-\$9,335	\$282,647	\$236,366
Physical and life sciences and technologies	\$61,708	\$100,341	\$18,092	-\$6,952	-\$9,335	\$102,146	\$40,437
Mathematics, computer and information sciences	\$61,708	\$146,916	\$18,188	-\$6,952	-\$9,335	\$148,816	\$87,108
Architecture, engineering	\$61,708	\$208,663	\$17,600	-\$6,952	-\$9,335	\$209,976	\$148,268
Agriculture, natural resources and conservation	\$61,708	\$103,035	\$17,468	-\$6,952	-\$9,335	\$104,215	\$42,507
Health, parks, recreation and fitness	\$61,708	\$70,656	\$22,396	-\$6,952	-\$9,335	\$76,765	\$15,056

However, this group is even smaller than the visual arts graduates—only 2 per cent of all male undergraduate full-time enrollments were in education in 2005/06.³⁶

It is important to emphasize that the present value of extra taxes paid by graduates in Table 6 includes income tax only. If other taxes, such as sales and payroll taxes, were included, the amount paid by graduates for their education would be even higher. In addition, the calculations of taxes paid are based on the experience of British Columbians in 2005. If the economic returns to education (in terms of higher earnings) continue to grow in the future as they did between 1980 and 2005, then by the time a 2005 university graduate reaches age 40, he/she would earn a lot more and thus pay a lot more in taxes (on average) than his/her peers with only high school education did in 2005.

Undergraduate students continue to pay on average double the cost of their education when their additional income tax contributions are considered.

The results presented in this report are very similar to what Robert Allen (1998) found using the 1991 Census. Despite the fact that the cost of education has risen considerably since then (after accounting for the effects of inflation), the returns to education in terms of higher employment earnings are high enough that undergraduate students continue to pay on average double the cost of their education when their additional income tax contributions are considered.³⁷

36 CAUT, 2009, Table 3.10.

37 Using the BC consumer price index to adjust for inflation between 1990 and 2005, the average cost of a degree in 2005 (\$50,630) is 24 per cent higher than Allen's calculated cost of a degree for men and 31 per cent higher than Allen's estimate of the cost of the degree for women.

Conclusion and Recommendations

THIS PAPER FINDS THAT UNIVERSITY EDUCATION is an investment that pays off in terms of better labour market performance and higher incomes for graduates in virtually all programs. Given the projected growth in employment for occupations requiring post-secondary education over the next decade, BC's post-secondary education sector will need to be expanded to ensure that our province is ready to meet the demands of our increasingly knowledge-based economy.

This paper also finds that undergraduate education stands out as a profitable investment for the public treasury when all students' payments for their education—both up-front tuition fees and additional income taxes paid over their careers—are compared with the costs of providing university education. What this means is that BC university students as a group are not subsidized by taxpayers. On the contrary, graduates contribute considerably more to the government coffers over their working lives than their education costs.

The finding that students pay much more for their education in additional income taxes throughout their working careers than they pay in tuition fees has important implications for rethinking how we fund post-secondary education in BC and Canada. Two broad policy recommendations follow from this analysis.

First, public investment in university education should be expanded, knowing that the investment would more than pay off in both monetary and non-monetary future benefits for all of BC (such as lower unemployment, higher income taxes, and reduced social and economic inequality).

Second, up-front student payment for education should be reduced and higher government funding for education should be recouped through the additional taxes paid by university graduates. The current policy approach to higher education financing, which puts increasing pressure on individual students and their families to pay for their university education up-front is both unfair and unnecessary. High tuition fees simply overcharge students and, in the process, compromise access to education for those who face financial barriers in their youth.

BC university students as a group are not subsidized by taxpayers. On the contrary, graduates contribute considerably more to the government coffers over their working lives than their education costs.

It makes good sense to ask university graduates to pay the costs of their education once they start reaping the payoffs of their education, rather than charging them high tuition fees up front. This would ensure that low family income does not continue to be a barrier to higher education for many British Columbians.

While governments have attempted to reduce the burden of recent hikes in tuition fees by increasing the maximum amounts of student loans, youth from lower income families continue to be underrepresented in Canadian universities. In Western Canada, youth living in families with income over \$100,000 per year are more than twice as likely to attend university than their peers with family income under \$25,000 per year.³⁸

Under the current post-secondary financing system, youth from lower and modest income families who manage to make it to university against the odds, graduate with high debt loads. This is fundamentally inequitable, because it means that they end up paying considerably more for the same education (through interest on their debt) than their peers whose parents can afford the tuition fees up front. In addition, Statistics Canada analysis shows that student debt continues to affect Canadians' finances long after graduation with borrowers being less likely to have savings and investments, and less likely to own their homes than non-borrowers.³⁹

Financing post-secondary education through a progressive tax system is fairer than relying on tuition fees because it reduces the risk that education may not pay off financially for the individual. It is important to note that while those with post-secondary degrees and certificates earn more on average, some individuals with higher education earn less than the average high school graduate. A progressive income tax system is sensitive to these individual differences and will ensure that the risk is pooled over all graduates.

In addition, it will allow graduates to make career decisions freely, without the threat of large debt loads hanging over their heads. Those who opt to pursue careers with high social value, but low market value, such as in the visual arts or non-profit sectors, would not have their choices distorted by high education costs. Studies of students in professional programs, such as medicine and law, show that high up-front program costs, leading to high debt levels, distort career choices away from public interest work and family practice to more lucrative job prospects.⁴⁰ These distorted career choices impact not only the individuals involved but society as a whole, by reducing the broader social benefits of education to all Canadians.

Reducing up-front costs for students will improve access to post-secondary education and ensure that BC can reap the benefits of having a well-educated labour force. This analysis shows that as a group, university graduates pay more than the full costs of their education through higher income taxes after graduation. The fact that there are large social benefits from higher education independent of the higher taxes graduates pay reinforces the case for improving access to universities and increasing public funding for higher education.

Canadian governments must start to acknowledge the payments graduates make for their education through the tax system and direct a larger share of these funds into post-secondary education. Currently, these funds are not identified as payments for education and are included in general revenues. Part of the problem with university financing lies with the fact that a large

38 57 per cent of youth from higher income families attend university by age 21, compared with only 27 per cent of those from the lowest income families, according to recent research by Finnie et al. (2011). Recent statistics are not available for BC only.

39 Luong, 2010.

40 For evidence of career distorting effects among medical students, see Kwong et al. (2002). For studies of law students see Ontario Bar Association (2003) and Field (2009).

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share of income tax revenues are collected by the federal government, while individual provinces are responsible for funding most of university teaching. There is also an issue with interprovincial migration, which can lead to some provinces helping to educate graduates who then move and pay higher provincial taxes in another province. These jurisdictional problems are best addressed through a national dialogue on post-secondary education financing, but fundamentally, all governments must begin to account for the additional tax payments universities help generate and develop a systematic way to credit them back to higher education programs through increased public funding. This will ensure that the current funding pressures faced by public universities are addressed in a way that is fair and does not compromise access to education.

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Appendix

Table A1: Average annual employment incomes in BC in 2005, by highest education level

WOMEN	Age groups				
	20s	30s	40s	50s	60s
Bachelor's degree graduates	\$27,392	\$39,825	\$44,631	\$40,727	\$15,152
High school graduates	\$15,457	\$21,085	\$27,679	\$23,188	\$11,857
By field of study (bachelor's degree with no higher post-secondary education)					
Education	\$24,351	\$34,145	\$39,026	\$38,761	\$9,319
Visual and performing arts, and communications	\$17,432	\$22,895	\$18,621	\$37,374	.
Humanities	\$22,667	\$27,122	\$25,512	\$26,944	\$20,348
Social and behavioural sciences	\$26,659	\$41,097	\$54,393	\$42,253	\$14,429
Business, management and public administration	\$33,763	\$51,004	\$56,416	\$48,215	\$14,833*
Physical and life sciences and technologies	\$26,061	\$46,056	\$46,876	\$41,639	\$107,176*
Mathematics, computer and information sciences	\$68,000*	\$44,222*	\$24,333*	\$32,111*	\$6,500*
Architecture, engineering	\$38,750*	\$67,392*	\$41,400	\$36,250*	.
Agriculture, natural resources and conservation	\$27,091	\$37,455	\$43,200	\$86,757*	.
Health, parks, recreation and fitness	\$35,633	\$47,096	\$49,067	\$48,378	\$18,000
MEN					
Bachelor's degree graduates	\$37,081	\$65,052	\$80,874	\$77,311	\$53,948
High school graduates	\$25,372	\$40,311	\$52,202	\$46,868	\$25,695
By field of study (bachelor's degree with no higher post-secondary education)					
Education	\$35,727	\$43,000	\$56,791	\$48,759	\$17,692
Visual and performing arts, and communications	\$29,357	\$34,667	\$33,700	\$32,211	.
Humanities	\$38,018	\$44,842	\$78,889	\$62,058	\$20,826
Social and behavioural sciences	\$31,836	\$73,274	\$83,267	\$93,889	\$69,806
Business, management and public administration	\$32,083	\$84,059	\$99,548	\$96,542	\$93,190
Physical and life sciences and technologies	\$37,000	\$55,122	\$73,406	\$65,267	\$56,818
Mathematics, computer and information sciences	\$50,464	\$67,650	\$82,115	\$59,000	\$19,800*
Architecture, engineering	\$42,378	\$74,577	\$100,575	\$95,806	\$83,996
Agriculture, natural resources and conservation	\$47,950	\$53,063	\$57,087	\$73,056	\$44,000*
Health, parks, recreation and fitness	\$32,815	\$63,069	\$60,240	\$59,800	\$30,833*

Notes: . indicates insufficient data to calculate. * indicates a small sample size in that cell (fewer than 10 respondents). Employment income includes wages and salaries from paid employment and positive net income from unincorporated self-employment and/or professional practice for all jobs held in 2005 by BC residents who did not attend school that year. Immigrants are excluded from this analysis in order to focus on the returns to Canadian education. The category "60s" includes people aged 60 to 64 only (those who are expected to be in the labour market). All workers who did not attend school in 2005 are included, which explains why the average employment incomes shown here are considerably lower than those seen in Figure 3 in the report, which summarize employment incomes for full-time, full-year workers only.



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