THE DETERMINANTS OF ADULT PARTICIPATION IN JOB-RELATED EDUCATION/TRAINING IN CANADA: WHO GETS ACCESS?

by

Weiguo (William) Cai

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The undersigned hereby certify that they have read and recommend to the Faculty of Graduate Studies for acceptance a thesis entitled " THE DETERMINANTS OF ADULT PARTICIPATION IN JOB-RELATED EDUCATION/TRAINING IN CANADA: WHO GETS ACCESS?" by Weiguo (William) Cai in partial fulfillment of the requirements for the degree of Master of Development Economics.

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Supervisor: _____

Readers: _____

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Author: Weiguo (William) Cai

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Signature of Author

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Abstract

In this thesis, we explore determinants of Canadian workers' job-related education and training take-ups by using the 2008 Access and Support to Education and Training Survey (ASETS). We implement three models, OLS, probit and logit. Regression results show that the three models produce similar and generally consistent estimates. We find systematic patterns across demographic groups in relation to job-related education and training. Most of our findings, such as the effect of age and education, are consistent with previous research. We also find two new influential factors, namely, individuals' computer ability and their information search behavior, which are critical in determining job-related education and training take-ups. This new finding not only further completes the image of job-related education or training take-ups, but also suggests that government, educational institutions and employers invest more resources into internet to effectively promote job-related education and training.

List of Abbreviations Used

OLS	Ordinary Least Squares
$ASETS$	the Access and Support to Education and Training Survey
WES	the Workplace and Employee Survey
$IALSS$	the International Adult Literacy and Skills Survey
$AETS$	Adult Education and Training Survey
$PUMF$	Public Use Micro data File
$SAEP$	the Survey of Approaches to Educational Planning
$PEPS$	the Post-secondary Education Participation Survey
BIC	Bayesian Information Criterion

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Chapter 1

Introduction

In most developed countries, employers' demand for skills has grown over the past few decades, largely due to the implementation of new technologies in the workplace, and the evolution of industry structure where growth in traditional and low value-added industries has been outpaced by that in advanced and knowledge-based industries. In a comparative study of new adult learning patterns, Bélanger and Tuijnman, eds (1997) conclude that lifelong learning has been increasingly regarded as important to the health of a nation's economy. Mincer (1989) and Pont et al. (2003) show that when an economy becomes more knowledge-based, the need for job-related training is more urgent, more important and more valuable. Underbill (2006) further takes a detailed look at the Canadian case and concludes that Canada is also under pressure of increasing demand for more skilled workers.

Underbill (2006) points out that, aging population, rapid technology evolution, widely adopted usage of computer and internet are the main driving forces which push hard for more skilled workers. Producing more fresh graduate students and attracting skilled immigrants from overseas can be a solution, but it is costly and time-consuming. Training and development for existing workers can be the other solution, and it can be implemented more quickly and effectively. Thus, promoting job-related education and training has been an important policy objective for a long time in Canada.

According to Knighton (2009), though participation in job-related education and

training has been on the rise in Canada recently[1], about one third of adult Canadians still report unmet training needs. Furthermore, 28% adult Canadians had not taken any education or training between 2002-2008, thus regarded as the disengaged group. Considering that education and training are very important factors for both personal well being and productivity gains, it is no wonder that all levels of Canadian governments try their best to promote education and training. However, in order to meet workers' demand, provide an "enabling environment" and target well-specified worker groups, it is essential to have a clear understanding of the determinants of job-related education and training. For example, what is the general trend of job-related education and training? What is the most vulnerable group which needs special attention? What is the most efficient way to promote job-related education and training? Only after we can answer these questions, governments can better formulate right policies, address problems and promote job-related education and training more effectively.

In this thesis, we will address the following issues. First, we will summarize the characteristics of people undertaking job-related education and training. Second, we will compare our findings to existing research on the incidence of job-related education and training. Third, we are interested to find out the relationship between workers' characteristics and workers' likelihood of getting job-related education and training. Finally, we will try to figure out the relationship between worker's characteristics and the likelihood of reporting effectiveness on job-related education.

This thesis adds to the literature in a number of ways. First, we use the most recent data, the Access and Support to Education and Training Survey 2008 (ASETS), which is more comprehensive than the other commonly used Canadian dataset, the Workplace and Employee Survey (WES). For example, the WES data concentrates on private sector and lacks public sector information, while ASETS contains information

[1]The participation rate increased from 30% in 2002 to 36% in 2008.

from both the private sector and the public sector thus provides a more complete image of Canadian workers. Given the mixed empirical results on the determinants of job-related education and training and the important policy implication, we believe that additional research using the most recent data will be valuable.

Most of our findings are consistent with the stylized facts found in previous research. For example, the patterns of job-related education and job-related training are indeed different across different groups. Older workers are less likely to take up job-related education or training and highly educated men and women are more likely to receive job-related education or training. We find that job-related training participation rate is significantly lower in Quebec than in other provinces. In terms of industry and occupation, we find that there is limited evidence that industry and occupation matter for job-related education, but strong evidence that they matter for job-related training.

Moreover, we examine two new important determinants, namely workers' computer ability and individuals' information search behavior, which have not triggered any attention in previous research. It is commonly believed that workers' positive attitudes towards job-related education and training should promote job-related education and training take-ups. Intuitively, actively looking for opportunities to get involved with job-related education and training can be treated as a good proxy of positive attitude, and a person with positive attitude might be more likely to take up job-related education and training and improve their learning performance. If this common belief is true, the policy implication is that labor departments could take appropriate steps to target specific groups of workers thus effectively promote job-related education and training.

We organize the thesis as follows. Chapter 2 will examine the literature and

summarize stylized facts. Chapter 3 describes the data and Chapter 4 discusses estimation strategy. Chapter 5 will present both descriptive statistics and multivariate analysis results. Chapter 6 is the conclusion.

Chapter 2

Literature Review

Life-long learning has triggered much research interest worldwide. For example, O'Connell (1999) uses the International Adult Literacy Survey (IALS) to compare job-related education and training among ten developed countries: Australia, Belgium, Canada, Ireland, the Netherlands, New Zealand, Poland, Switzerland, the United Kingdom, and the United States. O'Connell does find some common patterns regardless of the country of residence. For example participation rates do not differ substantially by gender, are higher among adults who already possess better educational qualifications, and are higher among younger adults. Fortin and Parent (2009) analyze the determinants of training using data from the 2003 International Adult Literacy and Skills Survey (IALSS). Their main finding is that the effect of education is different on job-related education than on job-related training. They find that education plays a big positive role in promoting job-related education. However, it hardly affects job-related training. In another international study, Xiao and Tsang (2004) examine patterns in employees' participation in job-related education and training in China. They divide the survey data into four categories: job-related education only, job-related training only, both and none. By applying multinomial logit model, they find that these four groups of employees vary not only by their individual socioeconomic attributes, but also by cultural and symbolic attributes, and the economic attributes of their firms.

In Canada, employment growth in occupations requiring a university credential is

much faster than that in occupations requiring lower credentials. 87% of new jobs created in professional and management occupations were filled by university graduates over the past 20 years (AUCC (2010)). From 2004 to 2010, job opportunities grew by 28% for those with a university degree, 17% for people with a college certificate, and only 4% for people with a high school diploma (AUCC (2011)). The need for job-related education and training has been on the rise, which requires us to have a better understanding of the determinants of job-related education and training.

To understand what attributes will determine the decision to take job-related education and training, there are several theories and hypotheses. Among all the proposed theories, the best known and the most widely adopted one is the human capital theory (Becker (1975)). Becker distinguishes general human capital from specific non-transferable human capital. According to Becker's classification, job-related training can be regarded as non-transferable human capital since the knowledge employees learn through training is usually position-specific. On the other hand, job-related education can be regarded as general human capital since employees can easily walk out of a company with the knowledge they get from job-related education. The distinction between job-related education and job-related training is part of the reason why we see more job-related training than job-related education and why employers sponsor more job-related training than job-related education.

Elman (2002) proposes the "job security" approach to explain the different patterns of job-related education and training. His main argument is based on the assumption that workers will try their best to improve their working knowledge if they fear that their jobs are insecure. Thus, pursuing job-related education or training is more of a reflection of perceived insecurity, rather than the human capital theory.

Elman's research focuses on the motivation of workers taking up job-related education or training. From a different angle, Sussman (2002) studies the barriers to job-related education and training. Sussman groups all the barriers into three interrelated categories, namely situational, institutional, and dispositional (or psychological). First, situational barriers arise from one's situation in life at a given time, for example, being too busy at work, financial constraints, family responsibilities or lack of child care, and language or health problems. Second, institutional barriers consist of established practices and procedures that exclude or discourage participation, such as high tuition fees, entrance requirements, limited course offerings, or courses offered at inconvenient times or locations. Third, dispositional barriers involve attitudes and opinions towards learning, as well as perceptions of oneself as a learner. Conventional research only takes the first two barriers into account. For example, household income, number of children in the household and immigration status can be counted as situational barriers, and education attainment can be counted as an institutional barrier. However, the third kind of barriers, dispositional barriers have not gotten much attention. In this thesis, we try to utilize individual workers' program information search behaviour to fill in the gap in dispositional barriers thus to get a more complete image of job-related education and training.

Though there is inconclusiveness in some areas of determinants of job-related education and training, there is, nonetheless, some consensus. For instance, literature shows that older people are less likely to get job-related education and training (Drewes (2008), Hui and Smith (2002), Underbill (2006), Xu and Lin (2011)). To understand this declining relationship between age and participation rate and performance, Kubeck et al. (1996) conduct a meta-analysis and examine three theoretical explanations: general slowing, reduced inhibition-attention models and limitations in working memory. This thesis confirms that age matters for job-related education and

training.

Literature also agrees that education plays a significant role: with higher educational attainment, workers are more likely to participate in job-related education and training (Cooke et al. (2009), Drewes (2008), Fortin and Parent (2009), Hui and Smith (2002), Underbill (2006)), which is particularly true for job-related education. This thesis's finding is also in line with these previous research.

However, in terms of other factors, such as gender, household income, union membership and occupation, empirical findings show controversial results. For example, Cooke et al. (2009) find that union membership decreases the rate of job-related training and women are less likely to get job-related training. Drewes (2008) shows that there is no gender differential but Underbill (2006) argues that women are more likely to participate in job-related training. Underbill (2006) finds that higher household income corresponds to higher job-related education and training participation rate, while Xu and Lin (2011) show that wage is neutral in influencing job-related training. Our research finds that gender is not significant for job-related education and training. In most cases, female workers follow the same pattern as male workers do.

Most Canadian research has been cross sectional study. Though in a case study Lowe and Krahn (1995) examine three types of job-related education and training: job-related post-secondary education, formal on-the-job training and informal on-the-job training, using data from a panel of 1985 Edmonton high school and university graduates. Their main findings are twofold. First, they find that younger workers are engaging in "continuous learning" by actively participating in labour market upgrading on their own. Second, they find that job-relevant skills are obtained from a diverse combination of sources within both workplaces and educational institutions.

Among cross-sectional research, a most common data set used to analyze the determinants of job-related education and training is the Workplace and Employee Survey (WES). Zeytinoglu et al. (2007) , Xu and Lin (2011) and Cooke et al. (2009) all use WES data to study the determinants of job-related education and training, though they have different emphasis. Zeytinoglu et al. (2007) use 2001 WES data and find that older workers are much less likely to receive job-related training. The authors thus argue that since now older workers are healthier than ever, it is important for policy makers to encourage them to take job-related training and remain in the workforce. Cooke et al. (2009) use 2003 and 2005 WES data to explore employer-supported training activity among potentially vulnerable workers. The main finding is that low-wage and less-educated workers are less likely to receive employer supported training. However, non-union workers have better chances than their unionized colleagues to get job-related training, which is a surprise to the researchers.

The intention of Xu and Lin (2011) is not to investigate the usual determinants of job-related education and training, but to investigate the role of firm characteristics and worker attributes surrounding employer-sponsored training at workplaces and further to address policy imbalances. Nevertheless, this thesis also sheds some light on the job-related education and training topic. For example, Xu and Lin (2011) find that age is negatively associated with employer-sponsored training, full-time workers participate more, workers with young child(ren) participate less, and less educated workers tend to get more job-related training.

Dostie (2007) writes a literature survey on papers using the WES data. They conclude that more advanced technology is driving the incidence of job-related training, gender has no significant impact and highly educated workers are more likely to receive job-related education.

Another commonly used data set in Canada is the Adult Education and Training Survey (AETS), which has lately been replaced by a new survey called the Access and Support to Education and Training Survey (ASETS). Underbill (2006) uses 2003 AETS data and finds that higher education, higher household income, being employed in the public sector, and working for larger firms increase job-related training. Also, occupation makes a difference, but it is most effective for younger workers. This thesis uses the 2008 ASETS data, and our findings are consistent with the previous Canadian research. For example, we find that the patterns of job-related education and job-related training are indeed different. Older workers are less likely to take up job-related education or training and highly educated men and women are more likely to receive job-related education or training.

Drewes (2008) uses a different data set, the Survey of Labour and Income Dynamics, to explain adult education and training in Canada. Their main finding is also generally consistent with other Canadian studies using WES data and ASETS data. However, they find some interesting patterns for visible minorities and immigrants, who get less job-related training but not less job-related education. Due to the limitation of our ASETS data, this thesis can not verify this new finding.

Chapter 3

Data

This thesis uses data from the Public Use Micro data File (PUMF) of the Access and Support to Education and Training Survey 2008 (ASETS). ASETS is a new voluntary survey of approximately 72,000 Canadian households. The main survey took place between June 16 and October 6, 2008. The target population is comprised of all Canadian residents aged less than 65 years old, excluding individuals residing in the three territories in the North and excluding individuals residing in institutions. According to Statistics Canada, the ASETS brings together three previously-conducted surveys: the Survey of Approaches to Educational Planning (SAEP), the Post-secondary Education Participation Survey (PEPS) and the Adult Education and Training Survey (AETS). In this thesis, we particularly focus on adult job-related education and training participation rate. Thus, we single out related information from the mixed survey data. After data cleaning and processing, our working sample contains 12,066 Canadians aged between 25 and 64 and employed between July 2007 and June 2008.

The ASETS PUMF dataset contains 189 variables, among which 19 are derived variables specifically created for the PUMF. Most of our explanatory variables are directly extracted from the PUMF file. However, in order to address our research questions more accurately, we generate several derived variables. These derived variables are job-related education, job-related training, search behavior and labour market attachment. The paragraphs following explain the definition and creation of these derived variables.

3.1 The Key Variables and Constructions

In this thesis, education is defined as "a series of courses taken towards a diploma, certificate, degree of license, which normally take more than 3 months to complete (Statistics Canada (2010), p16)". And training is defined as " courses, workshops or seminars" other than the education program (Statistics Canada (2010), p19). If the purpose of the correspondent to take the education or training program is related with jobs, such as trying to find a job, improving working knowledge, avoiding losing a job etc., we classify this program as job-related (Statistics Canada (2010), p51).

Labour market attachment is defined as a binary variable, "mainly working" and "mainly studying" where it takes value 1 if X is "mainly working". As we mentioned previously, the sample consists of 12,066 Canadians who were employed between July 2007 and June 2008, so all the respondents had a job. The question asked is: "During this period, what was your main activity? (Statistics Canada (2010), p12)". According to this question, we could further distinguish "mainly working" status from "mainly studying" status. In other words, the latter group is considered to be weakly attached to the labour market given that their job is not their main activity. Though this classification is a crude measurement of labour market attachment, we believe that it should play some role in the incidence of job-related education and training, and more importantly, the effectiveness of job-related education.

Information search behavior is defined as a three-category dichotomous variable: searched and succeed, searched but failed, and no search. In the ASETS survey, there are two questions in the Information on Learning section, which give us an opportunity to look at how individuals' attitude affects the incidence of the job-related education and training. The first question is: "In the last 12 months, have you looked for any information concerning courses, programs, workshops, seminars or

other activities you could have taken with the intention to improve your knowledge, skills or competencies ? (Statistics Canada (2010), p4)". If someone answers yes to this question, then they will be asked the 2nd question: "Did you find the information you were looking for ? (Statistics Canada (2010), p4)". By combining information from these two questions, a three level information search behavior variable is created.

The importance of the information search behavior is the following. The literature tends to use two streams of variables to explain the incidence of job-related education and training, that is, individuals' personal characteristics, such as gender, age, education attainment, etc., and firms' characteristics, such as size, employee number, local or transnational enterprises, etc. No researcher has ever looked at the topic from the perspective of individuals' subjective characteristics, more specifically, the attitude. Intuitively, a person with strong incentive is more likely to succeed, that is, more likely to get job-related education or training. One might argue that information search behavior is a good proxy for individuals' attitudes towards job-related education and training. In a word, workers' information search behavior is important for explaining and predicting their education and training participation.

3.2 A Comparison Between WES and ASETS Data

In Canada, two popular data sets are used to investigate job-related education and training issues. One is the Workplace and Employee Survey (WES), and the other is the Access and Support to Education and Training Survey (ASETS). The two data sets both are provided by Statistics Canada and provide information on job-related education and training. However they are two different data sets and each has their pros and cons.

A big advantage of the WES is that it is a longitudinal survey, which tracks

responses from certain employers and employees for years. Theoretically speaking, longitudinal data should enable researchers to do more rigorous and more accurate analysis. Surprisingly, no job-related education and training research in the literature has used the longitudinal feature of the WES. WES has been treated as cross-sectional data. The second big advantage of the WES data is that it combines inputs from both the employers' side and the employees' side thus providing a more complete picture of Canadian businesses. The biggest shortcoming of the WES data is that it only contains information from the private sector. Furthermore, certain industries in the private sector are deliberately removed, such as crop production, animal production, fishing, hunting, etc. This is understandable since the intention of the WES data is to study "how companies respond to economic and technological change, particularly in their human resource policies."[1] But this starting point of data design limits research scope to the private sector, which is only a partial reflection of the Canadian reality. On the other hand, though ASETS is a cross-sectional data set and only provides limited employer-side information, it does contain information from both the private sector and the public sector. For this very reason, it is useful to address the research question at hand using the ASETS dataset.

In most part, ASETS data is sufficient for the purpose of this research in terms of drawing inferences and conclusions. However, the use of ASETS public version does put some restrictions on this research. For example, the public version does not contain information on the duration of job-related education and training as does the master file. This limits our measurement of the quality of the job-related education or job-related training. Other important information, such as immigration status, is also missing thus limiting the scope of this research. For example, immigration

[1]Statistics Canada, Workplace and Employee Survey: What will the survey show? http://www.statcan.gc.ca/survey-enquete/business-entreprise/8104208-eng.htm#show

status might be important because of its policy relevance. Another shortcoming of the ASETS public version data is the lack of firm characteristics. Though some firm-related characteristics such as firm size are included in the survey, such information is excluded from the public version. The industry variable may pick up some useful information regarding firm characteristics, but it is a very crude measure.

Chapter 4

Estimation Strategy

The dependent variables, job-related education and training, are binary variables. Thus, we use the logit and probit models for estimation. Since we have a large cross sectional data set, and the distributions of our dependent variables are not strongly skewed, econometrics theory suggests that the marginal effects from estimating logit and probit models will be very close to the OLS coefficients, and our estimation results are consistent with this prediction. For all the three models, we use robust method to control for standard error.

Among the three models, OLS is the easiest to carry out and is relatively easier to interpret. However, OLS model assumes that the dependent variable will increase proportionately to independent variables, which seems unrealistic. In addition, the dependent variables in this thesis are binary, while OLS model can not put any boundaries on the values of dependent variables. Thus, OLS model is not a logical model in this setting. Since econometrics theory has already shown that when sample size is sufficiently large, OLS estimation results are similar to probit and logit marginal effects results, an OLS model is estimated as a benchmark.

Probit and logit models are both suitable for analyzing the probability that an event occurs or not, which is exactly the case in this thesis. They also produce similar results in terms of marginal effects. Overall, the main difference between these two models is different link functions. Probit model uses cumulative normal distribution function and logit model uses cumulative logistic function.

Using probit model as an example, we summarize our approach as follows.

$$Pr(T = 1|X) = Pr(T^* > 0|X) = \Phi(X'\beta)$$

where, T is an indicator variable, which takes the value 1 if an individual participates in job-related education or job-related training, the value of 0 otherwise. The X matrix denotes a vector of covariates, such as demographic information and other background variables, which we believe might have an impact on job-related education or training. Φ is the cumulative normal distribution, and T^* denotes the latent variable, which will be determined by

$$T^* = X'\beta + \epsilon$$

And,

$$T = 1[T^* > 0]$$

where 1[ ] denotes an indicator function. When the condition inside the brackets is true, value 1 will be assigned. Otherwise, value 0 will be assigned.

Since the raw coefficients of probit model are hard to interpret, we instead report marginal effects. Marginal effects measure by how much the probability of the outcome occurring changes when the explanatory variable changes by one unit for continuous variables or from zero to one for discrete variables, holding all other explanatory variables at their mean values. The probit marginal effects results are very similar to logit marginal effects results and OLS regression results.

In the regression results, we also report the Bayesian information criterion (BIC) result. BIC is partly built on the maximum likelihood function and has been widely used for model selection in empirical research.

For each model, we not only analyze job-related education and training separately, but also analyze a combined dependent variable, that is, participating in either job-related education or job-related training. Furthermore, we analyze separately for men and women. By doing this, we relax the strong assumption that the correlations between independent and dependent variables are constant across various sub-populations, e.g. men versus women. It is also useful for checking whether the results are robust or not.

For every regression model, we run 4 specifications. We put a short list of independent variables in the 1^{st} specification and use the results as a benchmark. These variables include age, marital status, highest education achievement, job sector indicator (public vs private), job status indicator (permanent vs non-permanent) and job attachment indicator (main activity was work or study). The rationale for only including these variables is that the literature already shows that these variables are influential for the incidence of job-related education and training. Since education is subject to provincial jurisdiction, we also include a set of province dummies to see whether there are systematic differences among Canadian provinces.

We introduce 7 occupation and 9 industry classifications to the 2^{nd} specification to see whether there are significant variations across industries and occupations. Furthermore, we introduce individuals' search behavior and their computer skills to the 3^{rd} specification. These variables have not been considered in the literature, but we believe that they warrant some attention since the former is a proxy of individuals' work ability and the latter is a proxy of individuals' attitudes. Finally, we add a few interaction terms with age, Age $\times$ Education, Age $\times$ Search behaviour and Age $\times$ Computer ability, to the 4^{th} specification. The main purpose of including interaction terms is to account for potential non-linearity in the model. We suspect that our main interest, job-related education and training information search behaviour, computer

ability and education attainment may have different effects for different age groups. And we do consistently find significant effect of Age $\times$ Search behaviour for men.

Chapter 5

Main results

5.1 Descriptive Analysis

In Table 1 and Table 2, we summarize means of independent variables by gender and education attainment, respectively.

Overall the nationwide combined job-related education and training participation rate is 42.9% for women and 40.4% for men. Women have slightly higher participation rate than men. The nationwide combined job-related education and training rate is 47.7% for people who have a post-secondary degree or higher, and 27.6% for people who possess a high school diploma or less. Higher education attainment corresponds to higher job-related education and training participation rate. In terms of age distribution, the nationwide combined job-related education and training participation rate is roughly the same for people below 55 years old. Specifically, the participation rate is 44.3% for people aged 25-34, 45.2% for people aged 35-44 and 41.1% for people aged 45-54. However, the participation rate drops to only 30.9% for people aged 55-64. Overall, the job-related education effectiveness rate is high. 82.4% participants regard job-related education as effective in certain respects.

There are variations among the ten provinces of Canada. For job-related education, the highest participation rate is 10.2% in British Columbia, which is more than double the lowest rate, 4.6% in New Brunswick. Other provinces, from the

lowest to highest are Saskatchewan, Newfoundland and Labrador, Prince Edward Island, Quebec, Nova Scotia, Ontario, Manitoba and Alberta, with participation rates ranging from 5.8% to 9.7%. As to job-related training, the highest rate is 43.9% in Saskatchewan. It then decreases gradually to the second lowest rate, 35.4% in British Columbia. The rate in Quebec is exceptionally low at 27.1%. [1]

The descriptive analysis here is in line with stylized facts in the literature, for example, the roles of age and education attainment in determining the incidence of job-related education and job-related training. Specifically, for people holding a post-secondary degree or higher, the incidence of job-related education or training is almost twice as high as the incidence among people who only have a high school diploma or less.

Participation in education decreases as workers age. For each age group, women are more likely than men to take part in job-related education. This is not apparent for job-related training, with job-related training participation rate lower among women for the two younger age groups, 25-34 and 35-44, but higher for the two older age groups, 45-54 and 55-64. The age distribution of job-related training exhibits an inverse U-shape, with the incidence higher among the two middle-aged groups than among the 25-34 and the 55-64 age groups.

From the descriptive analysis here, we also see that job-related education and job-related training have inherently different nature. This is the reason that we have to analyze job-related education and job-related training separately. For example, we see the incidence of job-related education declines when participants get older. However, for job-related training, we observe that the incidence increases first, then drops eventually after participants reach 45-54.

[1] The reported descriptive statistics may slightly differ from those reported in the Knighton (2009) report, given the sample domains differ.

The analysis also shows that gender generally does not have a large impact on the incidences of job-related education or training. Data does show that women have higher job-related education participation rates than men regardless of education attainment, age group or provinces. There is only one exception in Alberta, where women have slightly lower job-related education participation rate than men. However, there is no such pattern for job-related training. And most importantly, patterns of job-related education and training are generally similar among women and men.

Though descriptive analysis is useful for a first look at the differences across various groups, these results do not control or isolate confounding effects. Thus, we can not take these results for granted. More rigorous and more robust analysis is conducted in the Multivariate Analysis section.

5.2 Multivariate Analysis

In section 5.1, we have seen that the incidence of participating in job-related education and training varies across individuals by, for example, gender and education level. This section is then devoted to examining what factors are correlated with the likelihood of participating in job-related education and training.

As discussed in Chapter 4, three models are estimated, OLS, probit and logit. Regression results show that the three models produce similar and generally consistent estimates. This thesis will discuss the results mainly using the probit marginal effect estimation for the sake of simplicity and easy interpretation. We report the detailed OLS results in Tables 7, 8, and 9. We summarize logit results in Tables 10, 11 and 12.

Table 3 shows probit marginal effects on participation in job-related education or job-related training using 4 specifications. Column 1 is the most parsimonious

specification, which includes age group, marital status, education attainment, main activity between July 2007 and June 2008, whether the respondent holds a job in the public sector, whether the respondent holds a permanent job as the independent variables.

The multivariate analysis results suggest that older workers are less likely to take up job-related education or training for both men and women. In most cases, age decreases the possibility of getting job-related education or training by 0.4% when workers are 10 years older, all else held constant. The age effect we find is in the same order of magnitude as those in other cross sectional studies, such as Hui and Smith (2002), but much smaller than those in longitudinal studies, such as Drewes (2008).

The age effect seems to disappear as more and more explanatory variables are included, though the age effect remains negative. For men, the interaction term "Age group × search succeeded" becomes significant, It is most likely that the age effect is picked up by this interaction term.

Married men are more likely to take part in job-related education or training and this is fairly consistent across specifications 1-4. According to the regression results, married men are at least 5.8% more likely to get job-related education or training than a single men with similar characteristics. However, this marriage "premium" is not observed for married women.

Education attainment is the largest significant factor in terms of magnitude. All else held constant, a man with post-secondary degree or higher is 18.1% more likely to get job-related education or training than one with a high school degree or lower, and a woman with post-secondary degree or higher is 17.3% more likely to get job-related education or training than one with a high school degree or lower. This education attainment effect is fairly consistent in all specifications. The only exception is when

interaction terms are included and this education effect becomes insignificant for women. We also notice that when more and more explanatory variables are included the magnitude of the education effect decreases, which suggests that newly included terms, such as "computer ability", dilute education's explanatory power. This comes at no surprise, since education attainment and computer ability are highly correlated.

Labour market attachment is an important factor in determining women's but not men's participation in job-related education or training. Women whose main activity from July 2007 to June 2008 was working at a job or business are more likely to be enrolled in job-related education or training. On average, women who were mainly working during the survey period are 7% more likely to get job-related education or training.

Working in the public sector is associated with a larger likelihood of job-related education or training. Other things equal, a man working in the public sector is 13.2% more likely to participate in job-related education or training than his counterpart who works in the private sector. The public sector effect for woman is even larger, a 21.1% premium over the private sector.

Holding a permanent job is also positively correlated with the probability of taking up job-related education or training for both men and women. The size of this correlation is larger for men, ranging from 10% to 11.7%, than for women, ranging from 6.7% to 9%.

We add 7 industry dummies and 9 occupation dummies to column 2. Further we adds respondent's computer ability and education or training search behaviour to column 3. Finally, we introduce a few interaction terms with age in column 4 to pick up any potential differences in slope coefficients by age.

Using Nova Scotia as the base province, we see that though the signs of the

provincial coefficients correctly confirm our findings in the descriptive analysis, although most of them are not significant. This suggests that after controlling for various other factors there are no significant differences across provinces. The only exception is Quebec, which consistently performs worse than Nova Scotia in both pooled job-related education/training and job-related training only. In terms of job-related education, only New Brunswick's performance is statistically lower than Nova Scotia.

Using the goods-producing industry as the base, female and male workers in the finance, insurance, real estate, and public administration sectors are more likely to have job-related education or training. Using management occupation as the base, both female and male workers in most other occupations are less likely to have job-related education or training, except those in natural and applied science related, health, or social science education, government, and religion occupations.

Computer ability is a self-declared variable and has five proficiency levels, from poor to excellent. Multivariate regression results show that computer ability is positively correlated with job-related education or training for men and women. Other things equal, if self-reported computer proficiency level is up by one level, such as from poor to fair or from good to very good, the probability of getting job-related education or training will increase by 2% for men and 3.7% for women. However, as interaction terms are included, this connection between computer ability and job-related education or training becomes insignificant.

The multivariate analysis result also suggests that successful information search for education and training opportunities is linked to a much larger probability of receiving job-related education or training for men and for women, though this link becomes negative and insignificant for men as interaction terms are added. This might

be because this positive link is mainly in effect for older male workers, as suggested by the positive and significant coefficient in front of the "age × search succeeded" interaction term. When the effect is significant, the magnitude is large. Other things equal, a successful searcher is at least 24.7% more likely to get job-related education or training than a worker who does not search at all.

We are also interested in finding out if there are any significant differences among "searchers". Are workers who searched and found information more likely to get job related education or training than those who searched but found nothing? A group of hypothesis tests show that successful searchers are indeed statistically more likely than unsuccessful searchers to get job-related education and training.

Tables 4 and 5 follow similar steps as Table 3 with the dependent variable being participation in job-related education and training, respectively. Below summarizes some of the main findings from these two tables.

We notice that older male and female workers are less likely to take job-related education, but this is not as clear for job-related training; married women are less likely to take job-related education, whereas married men are more likely to take job-related training. Also there is strong evidence that those men and women who were primarily working from July 2007 to June 2008 are less likely to receive job-related education but more likely to receive job-related training; women who work in the public sector are much more likely to receive job-related training, but not so much for job-related education; male and female workers with a permanent job are much more likely to have job-related training but not job-related education.

There is limited evidence that industry and occupation matter for job-related education, but strong evidence that they matter for job-related training. Relative to the goods-producing industries, female and male workers in the finance, insurance,

real estate, and public administration sectors are more likely to have job-related training. Relative to management occupations, both female and male workers in most other occupations are less likely to have job-related training, except those in natural and applied science related, health, social science education, government, and religion, or art, culture, recreation, and sport occupations.

Computer ability and successful information search for opportunities are positively correlated with job-related education. For men, when computer proficiency increases by one level, such as from poor to fair, or from good to very good, the probability of getting job-related education will increase by 0.8%. This increase for women is 1.1%. However, this effect weakens when interactions terms are included. Computer ability is positively linked to job-related training only for women. In this case, the probability will increase by 2.4% if the female worker's computer ability increases by one level in the proficiency scale. This relationship becomes insignificant once interaction terms are included.

There is evidence that information search on opportunities is positively related to education as well as training for both male and female workers. On average, successful searchers will increase its probability by 10% in terms of job-related education and 19% in terms of job-related training. However, the inclusion of interaction terms seems to weaken this relationship.

5.3 Analysis of Job-related Education Effectiveness

The survey also contains a question on the respondents' assessment of the effectiveness of the job-related education they take. This question enables us to find out what are the factors that are associated with higher self-perceived effectiveness. We regress the indicator of education effectiveness on the same set of independent variables as

in Tables 3 to 5, again in an incremental fashion. We report the results in Table 6.

The regression sample here is restricted to those who participated in job-related education. Given the smaller sample size, 899 observations in total, the regression is done with the pooled sample of men and women controlling for a gender dummy. As suggested in Table 6, those whose main activity was working in July 2007 to June 2008 are 13% more likely to report that their job-related education is effective than their counterparts.

Interestingly, we find that search behaviour also plays a significant role in determining the perceived job-related education effectiveness. The workers who searched job-related education information but found nothing are 32.8% less likely to report effectiveness. When we include interaction terms, the Search Failed term remains significant and the magnitude is even larger: now the unsuccessful searchers are 81.9% less likely to report effectiveness. One possible explanation for this surprising result is that the offered job-related education is not what the unsuccessful searchers really want, thus these unsuccessful searchers are reluctant to report effectiveness.

Relative to management occupations, those working in primary industry, processing and manufacturing occupations are less likely to consider job-related education effective.

Chapter 6

Conclusion

This research uses rich information contained in the ASETS data to examine possible determinants of Canadian workers' job-related education and training take-ups. Most of our findings are consistent with the stylized facts found in previous research. For example, the patterns of job-related education and job-related training are indeed different. Older workers are less likely to take up job-related education or training and highly educated men and women are more likely to receive job-related education or training.

In terms of provincial differences, we find that job-related training participation rate is significantly lower in Quebec than in other provinces. In terms of gender difference, we find that job-related education rate is higher among women than among men, but this is not the case for job-related training. Job-related education rate is lower among married women than unmarried women. In contrast, job-related training rate is higher among married men than unmarried men. In terms of labour market attachment, we find that workers with strong labour market attachment, i.e. those whose primary activity was working between July 2007 and June 2008, are less likely to receive job-related education but more likely to receive job-related training. Furthermore, workers in permanent job positions are much more likely to receive job-related training than job-related education. In terms of industry and occupation, we find that there is limited evidence that industry and occupation matter for job-related education, but strong evidence that they matter for job-related training. In terms of

education effectiveness, we find that workers with strong labour market attachment are more likely to consider their job-related education effective.

Two additional new findings are worth mentioning. First, computer ability and successful information search for opportunities are positively correlated with job-related education both for men and for women. Second, successful searchers are more likely to participate in job-related education and/or training than non-searchers and are more likely to report effectiveness in job-related education.

The above-mentioned findings from this research are largely correlational rather than causal. However, such correlational results do shed some light on government policies and possible directions for more rigorous and focused future research. For example, the new findings about computer ability and information search behavior may have some policy implications. These results suggest that information availability and usage play a positive role in increasing participation rate. Thus, government, educational institutions and employers may want to consider investing more resources into making program information available on internet.

In addition, to perform more in-depth analysis, it will be useful in the future to gain access to the master file of the ASETS data via Statistics Canada's Research Data Centres, given that more information, e.g. the duration of job-related education or training, is available only in the master file.

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Appendix: Tables

Table 1: Weighted Means of Independent Variables, by Gender

	Male	**Female**
Received job-related education %	7.8	9.2
Received job-related training %	35.3	36.5
Age group	6.3	6.3
Marital Status %		
Single	15.3	13.6
Married	79.8	74.9
Divorced	4.9	11.5
Province %		
Newfoundland and Labrador	1.3	1.5
Prince Edward Island	0.4	0.5
Nova Scotia	2.7	2.8
New Brunswick	2.0	2.1
Quebec	23.4	22.4
Ontario	39.5	40.2
Manitoba	3.3	3.4
Saskatchewan	2.8	3.0
Alberta	11.5	11.0
British Columbia	13.2	13.2
Education attainment %		
High school or less	31.9	28.9
Post-secondary	68.1	71.1
Mainly working %	92.4	83.1
Job sector %		
Private	82.3	66.9
Public	17.7	33.1
Job type %		
Permanent job	71.1	73.5
Non-permanent job	8.0	12.0
Skip	20.9	14.5
Industry %		
Goods-producing	32.9	10.6
Trade, transportation, and warehousing	19.8	14.8
Finance, insurance, real estate, and public administration	13.1	15.0
Professional, scientific, and technical	9.8	8.1
Educational	5.8	13.1
Healthcare and social assistance	4.1	21.9
Other	14.7	16.6
Occupation %		
Management	14.1	8.2
Business, finance, and administrative	11.5	29.5
Natural and applied science related	13.9	4.1
Health	2.7	12.4
Social science education, government, and religion	7.0	16.5
Art, culture, recreation, and sport	2.7	3.7
Sales and service	15.1	20.1
Trades and transport equipment operator	22.0	1.8
Primary industry, processing and manufacturing	11.1	3.7
Searched for education or training opportunities %		
Did not search	61.1	54.8
Search failed	3.4	3.4
Search succeeded	35.4	41.9
Computer skills	3.5	3.5
N	5,594	6,472

Note: *Data Source: 2008 Access and Support to Education and Training Survey, public use micro data. Age group is a category variable, where 5 stands for thirties, 6 stands for forties, 7 stands for fifties, 8 stands for sixties. Computer skills are a category variable, where 1 represents poor, 2 represents fair, 3 represents good, 4 represents very good, 5 represents excellent.*

Table 2: Weighted Means of Independent Variables, by Educational Attainment

	High School or Less	**Post-secondary**
Age group	6.5	6.3
Gender %		
Male	54.6	51.0
Female	45.4	49.0
Marital Status %		
Single	13.6	14.9
Married	77.9	77.3
Divorced	8.5	7.9
Province %		
Newfoundland and Labrador	1.3	1.4
Prince Edward Island	0.4	0.4
Nova Scotia	2.8	2.8
New Brunswick	2.0	2.0
Quebec	21.6	23.5
Ontario	39.7	39.9
Manitoba	3.5	3.3
Saskatchewan	3.8	2.5
Alberta	11.5	11.2
British Columbia	13.4	13.1
Mainly working %	86.6	88.5
Job sector %		
Private	86.1	70.0
Public	13.9	30.0
Job type %		
Permanent job	72.4	72.2
Non-permanent job	9.2	10.2
Skip	18.5	17.6
Industry %		
Goods-producing	29.2	19.1
Trade, transportation, and warehousing	26.2	13.6
Finance, insurance, real estate, and public administration	11.7	15.0
Professional, scientific, and technical	4.0	11.1
Educational	3.3	11.9
Healthcare and social assistance	6.2	15.4
Other	19.4	13.9
Occupation %		
Management	10.3	11.7
Business, finance, and administrative	23.6	18.6
Natural and applied science related	3.3	11.8
Health	2.1	9.6
Social science education, government, and religion	3.0	15.3
Art, culture, recreation, and sport	2.1	3.7
Sales and service	25.4	14.0
Trades and transport equipment operator	18.1	9.9
Primary industry, processing and manufacturing	12.2	5.5
Searched for education or training opportunities %		
Did not search	72.8	51.6
Search failed	2.9	3.6
Search succeeded	24.4	44.7
Computer skills	3.1	3.7
Employer sponsorship %		
Sponsored	2.0	5.7
Not sponsored	4.1	6.4
Skip	93.9	88.0
N	3,646	8,420

Note: *Data Source: 2008 Access and Support to Education and Training Survey, public use micro data. Age group is a category variable, where 5 stands for thirties, 6 stands for forties, 7 stands for fifties, 8 stands for sixties. Computer skills are a category variable, where 1 represents poor, 2 represents fair, 3 represents good, 4 represents very good, 5 represents excellent.*

Table 3: Determinants of Participation in Job-related Education or Training: Probit Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.004**	-0.005**	-0.002*	-0.005	-0.004**	-0.004**	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.070*	0.068*	0.061*	0.058*	-0.018	-0.023	-0.008	-0.009
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Divorced	-0.000	0.006	-0.004	-0.007	0.028	0.022	0.028	0.028
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Post-secondary education	0.181**	0.141**	0.114**	0.162+	0.173**	0.120**	0.067**	0.019
	(0.02)	(0.02)	(0.02)	(0.10)	(0.02)	(0.02)	(0.02)	(0.10)
Mainly working	0.001	-0.029	-0.007	-0.012	0.079**	0.064*	0.073**	0.074**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)
Public sector job	0.132**	0.033	0.042	0.045	0.211**	0.111**	0.093**	0.093**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
Permanent job	0.100**	0.111**	0.117**	0.115**	0.067**	0.081**	0.089**	0.090**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Computer ability			0.020*	0.001			0.037**	0.060
			(0.01)	(0.04)			(0.01)	(0.04)
Search succeeded			0.261**	0.002			0.278**	0.247**
			(0.02)	(0.10)			(0.02)	(0.08)
Search failed			0.035	-0.162			0.114*	-0.179
			(0.05)	(0.19)			(0.05)	(0.16)
Age group × Post-secondary education				-0.001				0.001
				(0.00)				(0.00)
Age group × search failed				0.005				0.007
				(0.01)				(0.00)
Age group × search succeeded				0.006**				0.001
				(0.00)				(0.00)
Age group × Computer ability				0.000				-0.001
				(0.00)				(0.00)
Constant								
Observations	5594	5594	5594	5594	6472	6472	6472	6472
BIC	9069061.8	8867654.2	8450263.0	8424901.9	8339764.1	8028273.3	7550787.5	7545703.5

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 4: Determinants of Participation in Job-related Education: Probit Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.003**	-0.003**	-0.002**	-0.002*	-0.004**	-0.004**	-0.002**	-0.004**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.013	-0.011	-0.015	-0.014	-0.045**	-0.045**	-0.035**	-0.035**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Divorced	-0.012	-0.009	-0.009	-0.008	-0.000	-0.003	-0.001	-0.002
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Post-secondary education	0.051**	0.044**	0.029**	0.025	0.041**	0.037**	0.019*	-0.039
	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.05)
Mainly working	-0.139**	-0.137**	-0.116**	-0.115**	-0.057**	-0.060**	-0.054**	-0.051**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)
Public sector job	0.014	-0.011	-0.009	-0.008	0.031**	0.019	0.008	0.008
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Permanent job	-0.001	0.001	0.002	0.002	-0.013	-0.011	-0.010	-0.010
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Computer ability			0.008*	0.010			0.011**	0.012
			(0.00)	(0.01)			(0.00)	(0.02)
Search succeeded			0.096**	0.037			0.111**	0.045
			(0.01)	(0.04)			(0.01)	(0.04)
Search failed			0.000	-0.020			0.036	-0.056**
			(0.02)	(0.04)			(0.03)	(0.01)
Age group × Post-secondary education				0.000				0.001
				(0.00)				(0.00)
Age group × search failed				0.001				0.004*
				(0.00)				(0.00)
Age group × search succeeded				0.001				0.001
				(0.00)				(0.00)
Age group × Computer ability				-0.000				-0.000
				(0.00)				(0.00)
Constant								
Observations	5594	5594	5594	5594	6472	6472	6472	6472
BIC	3531219.1	3461885.8	3175004.8	3170761.7	3738837.2	3688551.1	3375451.1	3362853.6

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 5: Determinants of Participation in Job-related Training: Probit Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.002	-0.002*	-0.000	-0.005	0.000	0.000	0.002*	0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.091**	0.089**	0.082**	0.079**	0.027	0.023	0.034	0.032
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Divorced	0.016	0.022	0.013	0.010	0.031	0.028	0.033	0.032
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Post-secondary education	0.152**	0.115**	0.094**	0.154+	0.163**	0.109**	0.071**	0.074
	(0.02)	(0.02)	(0.02)	(0.09)	(0.02)	(0.02)	(0.02)	(0.09)
Mainly working	0.150**	0.129**	0.144**	0.141**	0.149**	0.138**	0.143**	0.143**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Public sector job	0.124**	0.034	0.041	0.044	0.199**	0.105**	0.092**	0.092**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Permanent job	0.114**	0.123**	0.125**	0.124**	0.080**	0.092**	0.098**	0.099**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Computer ability			0.013	-0.022			0.024**	0.038
			(0.01)	(0.04)			(0.01)	(0.04)
Search succeeded			0.189**	-0.122			0.192**	0.075
			(0.02)	(0.08)			(0.02)	(0.08)
Search failed			0.069	-0.058			0.125**	-0.162
			(0.05)	(0.22)			(0.05)	(0.14)
Age group × Post-secondary education				-0.002				-0.000
				(0.00)				(0.00)
Age group × search failed				0.003				0.007
				(0.01)				(0.00)
Age group × search succeeded				0.007**				0.003
				(0.00)				(0.00)
Age group × Computer ability				0.001				-0.000
				(0.00)				(0.00)
Constant								
Observations	5594	5594	5594	5594	6472	6472	6472	6472
BIC	8704028.7	8523382.3	8299357.6	8258469.5	7945568.8	7640352.8	7401257.4	7394074.5

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 6: Determinants of Job-related Education Effectiveness: Probit Regression

	1	2	3	4
Age group	0.003	0.003	0.003	0.011
	(0.00)	(0.00)	(0.00)	(0.01)
Male	0.008	0.045	0.052	0.057
	(0.04)	(0.04)	(0.04)	(0.03)
Married	-0.036	-0.015	-0.022	-0.027
	(0.04)	(0.04)	(0.04)	(0.04)
Divorced	0.041	0.053	0.055	0.051
	(0.06)	(0.05)	(0.05)	(0.05)
Post-secondary education	0.032	0.018	0.019	-0.097
	(0.05)	(0.05)	(0.05)	(0.13)
Mainly working	0.148*	0.134**	0.135**	0.127**
	(0.06)	(0.05)	(0.05)	(0.05)
Public sector job job	0.014	-0.043	-0.040	-0.042
	(0.03)	(0.04)	(0.04)	(0.04)
Permanent job	-0.023	-0.039	-0.039	-0.035
	(0.04)	(0.03)	(0.03)	(0.03)
Computer Ability			-0.006	0.064
			(0.02)	(0.07)
Search Succeeded			-0.017	0.230
			(0.04)	(0.24)
Search Failed			-0.328*	-0.819**
			(0.15)	(0.18)
Age group × Post-secondary education				0.004
				(0.01)
Age group × search failed				0.010
				(0.01)
Age group × search succeeded				-0.006
				(0.00)
Age group × Computer ability				-0.002
				(0.00)
constant				
Observations	899	899	899	899
BIC	1030402.4	973930.6	963116.7	953936.7

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 4, control for province dummies. All the regressions, in columns 2 to 4, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 7: Determinants of Participation in Job-related Education or Training: OLS Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.004**	-0.004**	-0.002*	-0.004	-0.003**	-0.003**	-0.001	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.065*	0.062*	0.054*	0.052*	-0.016	-0.019	-0.004	-0.004
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Divorced	0.000	0.006	-0.004	-0.005	0.025	0.019	0.025	0.025
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Post-secondary education	0.173**	0.130**	0.099**	0.170+	0.163**	0.107**	0.055**	0.028
	(0.02)	(0.02)	(0.02)	(0.09)	(0.02)	(0.02)	(0.02)	(0.08)
Mainly working	0.001	-0.024	-0.006	-0.010	0.072**	0.056*	0.062**	0.063**
	(0.04)	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Public sector job	0.128**	0.032	0.039	0.041	0.203**	0.105**	0.084**	0.084**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Permanent job	0.094**	0.103**	0.102**	0.100**	0.063**	0.075**	0.077**	0.077**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Computer ability			0.017*	0.008			0.030**	0.053
			(0.01)	(0.03)			(0.01)	(0.03)
Search succeeded			0.248**	0.015			0.255**	0.238**
			(0.02)	(0.09)			(0.02)	(0.08)
Search failed			0.033	-0.150			0.094*	-0.160
			(0.05)	(0.21)			(0.04)	(0.17)
Age group × Post-secondary education				-0.002				0.001
				(0.00)				(0.00)
Age group × search failed				0.004				0.006
				(0.00)				(0.00)
Age group × search succeeded				0.006**				0.000
				(0.00)				(0.00)
Age group × Computer ability				0.000				-0.001
				(0.00)				(0.00)
constant	0.361**	0.511**	0.276**	0.355*	0.335**	0.476**	0.168*	0.118
	(0.07)	(0.08)	(0.08)	(0.15)	(0.06)	(0.07)	(0.07)	(0.14)
Observations	5594	5594	5594	5594	6472	6472	6472	6472
R^2	0.079	0.106	0.160	0.163	0.097	0.139	0.203	0.204

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 8: Determinants of Participation in Job-related Education: OLS Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.004**	-0.004**	-0.003**	0.001	-0.004**	-0.004**	-0.003**	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.025	-0.023	-0.027	-0.025	-0.060**	-0.061**	-0.054**	-0.051**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Divorced	-0.028	-0.025	-0.028	-0.028	-0.017	-0.019	-0.016	-0.014
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Post-secondary education	0.054**	0.047**	0.033**	0.099+	0.038**	0.033**	0.009	-0.004
	(0.01)	(0.01)	(0.01)	(0.05)	(0.01)	(0.01)	(0.01)	(0.06)
Mainly working	-0.151**	-0.150**	-0.143**	-0.140**	-0.068**	-0.070**	-0.067**	-0.065**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Public sector job	0.015	-0.019	-0.016	-0.018	0.033**	0.020	0.010	0.010
	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
Permanent job	-0.004	-0.000	-0.001	-0.001	-0.015	-0.014	-0.013	-0.014
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Computer ability			0.009*	0.025			0.014**	0.034
			(0.00)	(0.02)			(0.01)	(0.02)
Search succeeded			0.111**	0.212**			0.121**	0.246**
			(0.01)	(0.06)			(0.01)	(0.06)
Search failed			-0.012	0.006			0.014	-0.086
			(0.02)	(0.10)			(0.02)	(0.08)
Age group × Post-secondary education				-0.002				0.000
				(0.00)				(0.00)
Age group × search failed				-0.000				0.002
				(0.00)				(0.00)
Age group × search succeeded				-0.002+				-0.003*
				(0.00)				(0.00)
Age group × Computer ability				-0.000				-0.000
				(0.00)				(0.00)
constant	0.353**	0.352**	0.244**	0.105	0.329**	0.354**	0.211**	0.101
	(0.05)	(0.05)	(0.05)	(0.08)	(0.04)	(0.05)	(0.05)	(0.10)
Observations	5594	5594	5594	5594	6472	6472	6472	6472
R^2	0.060	0.070	0.108	0.112	0.048	0.054	0.097	0.100

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 9: Determinants of Participation in Job-related Training: OLS Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.002+	-0.002*	-0.000	-0.003	0.000	0.000	0.002*	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
married	0.083**	0.080**	0.074**	0.071**	0.027	0.024	0.035	0.033
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
EverMarried	0.011	0.017	0.009	0.008	0.030	0.026	0.030	0.029
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Post-secondary education	0.145**	0.104**	0.082**	0.143+	0.153**	0.097**	0.061**	0.067
	(0.02)	(0.02)	(0.02)	(0.08)	(0.02)	(0.02)	(0.02)	(0.08)
Mainly working	0.135**	0.110**	0.125**	0.118**	0.136**	0.120**	0.124**	0.123**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Public sector job	0.123**	0.036	0.041	0.045	0.195**	0.106**	0.092**	0.091**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Permanent job	0.109**	0.115**	0.115**	0.112**	0.077**	0.087**	0.090**	0.090**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Computer ability			0.012	-0.011			0.019**	0.030
			(0.01)	(0.03)			(0.01)	(0.03)
Search succeeded			0.180**	-0.117			0.177**	0.056
			(0.02)	(0.09)			(0.02)	(0.07)
Search failed			0.063	-0.046			0.103**	-0.158
			(0.05)	(0.21)			(0.04)	(0.16)
Age group × Post-secondary education				-0.001				-0.000
				(0.00)				(0.00)
Age group × search failed				0.002				0.006
				(0.00)				(0.00)
Age group × search succeeded				0.007**				0.003+
				(0.00)				(0.00)
Age group × Computer ability				0.001				-0.000
				(0.00)				(0.00)
constant	0.060	0.220**	0.048	0.201	0.046	0.212**	0.001	0.016
	(0.06)	(0.07)	(0.08)	(0.14)	(0.05)	(0.07)	(0.07)	(0.13)
Observations	5594	5594	5594	5594	6472	6472	6472	6472
R^2	0.079	0.103	0.132	0.137	0.102	0.144	0.176	0.177

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 10: Determinants of Participation in Job-related Education or Training: Logit Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.004**	-0.005**	-0.002*	-0.006+	-0.004**	-0.004**	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
married (d)	0.069*	0.067*	0.060*	0.057*	-0.018	-0.023	-0.007	-0.008
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
EverMarried (d)	-0.001	0.005	-0.007	-0.010	0.027	0.021	0.028	0.028
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Post-secondary education	0.181**	0.142**	0.116**	0.148	0.175**	0.123**	0.070**	0.012
	(0.02)	(0.02)	(0.02)	(0.10)	(0.02)	(0.02)	(0.02)	(0.10)
Mainly working	0.001	-0.029	-0.009	-0.015	0.079**	0.066*	0.075**	0.076**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)
Public sector job	0.134**	0.034	0.044	0.047	0.213**	0.113**	0.096**	0.096**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
Permanent job	0.100**	0.112**	0.117**	0.116**	0.069**	0.083**	0.091**	0.092**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Computer ability			0.021*	0.001			0.037**	0.061
			(0.01)	(0.04)			(0.01)	(0.04)
Search succeeded			0.264**	-0.002			0.283**	0.255**
			(0.02)	(0.10)			(0.02)	(0.09)
Search failed			0.039	-0.160			0.118*	-0.164
			(0.05)	(0.19)			(0.05)	(0.16)
Age group × Post-secondary education				-0.001				0.001
				(0.00)				(0.00)
Age group × search failed				0.005				0.007
				(0.01)				(0.00)
Age group × search succeeded				0.006**				0.001
				(0.00)				(0.00)
Age group × Computer ability				0.000				-0.001
				(0.00)				(0.00)
constant								
Observations	5594	5594	5594	5594	6472	6472	6472	6472
BIC	9070309.3	8868725.6	8453224.7	8427926.0	8340322.2	8026799.1	7552246.3	7547402.1

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 11: Determinants of Participation in Job-related Education: Logit Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.003**	-0.003**	-0.002**	-0.003**	-0.003**	-0.003**	-0.002**	-0.004**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
married (d)	-0.011	-0.009	-0.013	-0.011	-0.042**	-0.042**	-0.030*	-0.027**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
EverMarried (d)	-0.012	-0.009	-0.012	-0.010	0.003	-0.000	0.001	0.000
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Post-secondary education	0.046**	0.040**	0.026**	0.017	0.037**	0.032**	0.015+	-0.036
	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.05)
Mainly working	-0.133**	-0.128**	-0.099**	-0.093**	-0.057**	-0.058**	-0.048**	-0.043**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.01)	(0.01)
Public sector job	0.012	-0.011	-0.008	-0.007	0.030**	0.018	0.008	0.007
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Permanent job	-0.003	-0.001	0.002	0.002	-0.013	-0.011	-0.009	-0.008
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Computer ability			0.007*	0.008			0.010**	0.006
			(0.00)	(0.01)			(0.00)	(0.01)
Search succeeded			0.085**	0.007			0.102**	0.008
			(0.01)	(0.03)			(0.01)	(0.03)
Search failed			0.000	-0.024			0.033	-0.050**
			(0.02)	(0.03)			(0.03)	(0.01)
Age group × Post-secondary education				0.000				0.001
				(0.00)				(0.00)
Age group × search failed				0.001				0.004**
				(0.00)				(0.00)
Age group × search succeeded				0.001*				0.002*
				(0.00)				(0.00)
Age group × Computer ability				-0.000				0.000
				(0.00)				(0.00)
constant								
Observations	5594	5594	5594	5594	6472	6472	6472	6472
BIC	3525418.4	3455969.5	3177737.0	3167644.3	3733972.7	3682053.8	3379741.2	3360623.6

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*

Table 12: Determinants of Participation in Job-related Training: Logit Regression

	Male				**Female**			
	1	2	3	4	5	6	7	8
Age group	-0.002+	-0.002*	-0.000	-0.005	0.000	0.000	0.002*	0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
married (d)	0.089**	0.088**	0.082**	0.078**	0.028	0.024	0.033	0.031
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
EverMarried (d)	0.015	0.022	0.013	0.009	0.031	0.028	0.029	0.028
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Post-secondary education	0.152**	0.115**	0.094**	0.140	0.165**	0.112**	0.075**	0.082
	(0.02)	(0.02)	(0.02)	(0.09)	(0.02)	(0.02)	(0.02)	(0.09)
Mainly working	0.154**	0.133**	0.144**	0.141**	0.149**	0.139**	0.143**	0.142**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Public sector job	0.124**	0.034	0.042	0.046	0.200**	0.104**	0.092**	0.092**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Permanent job	0.116**	0.124**	0.125**	0.124**	0.083**	0.094**	0.100**	0.100**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Computer ability			0.013	-0.023			0.023**	0.038
			(0.01)	(0.04)			(0.01)	(0.04)
Search succeeded			0.189**	-0.123			0.195**	0.080
			(0.02)	(0.08)			(0.02)	(0.08)
Search failed			0.072	-0.065			0.131**	-0.140
			(0.06)	(0.22)			(0.05)	(0.15)
Age group × Post-secondary education				-0.001				-0.000
				(0.00)				(0.00)
Age group × search failed				0.003				0.007
				(0.01)				(0.00)
Age group × search succeeded				0.007**				0.003
				(0.00)				(0.00)
Age group × Computer ability				0.001				-0.000
				(0.00)				(0.00)
constant								
Observations	5594	5594	5594	5594	6472	6472	6472	6472
BIC	8704473.7	8524013.5	8303332.5	8262719.9	7943008.2	7636778.6	7399966.4	7393691.2

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: *We implement robust method to control for standard error. All the regressions, in columns 1 to 8, control for province dummies. All the regressions, in columns 2 to 4 and 6 to 8, control for 6 industry dummies and 8 occupations dummies. The regression coefficients on these province, industry and occupation dummies are omitted due to limited space, but the main results are mentioned in Chapter 5 Main Results.*