JOB-EDUCATION MATCH & TENURE AMONG YOUNG CANADIANS: EVIDENCE FROM THE 1997 & 2014 LABOUR FORCE SURVEY

by

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Bachelor of Commerce, Ryerson University, 2015

A thesis

presented to Ryerson University

in partial fulfilment of the

requirements for the degree of

Master of Science in Management

in the program of

Master of Science in Management

Toronto, Ontario, Canada, 2018

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Abstract

In response to the growing supply of postsecondary education graduates and the persistence of overqualification in the Canadian labour market, this study investigates the relationship between the levels of job-education match and tenure among young workers, 25 to 34 years of age, relative to the remaining workforce ages 35 to 64, using a job analysis (JA) approach based on skill levels defined by the National Occupational Classification (NOC) 2011 and education credentials defined by Statistics Canada. Using the 1997 and 2014 Labour Force Survey (LFS) files, a significant negative relationship is observed between length of tenure and overqualified workers, and a significant positive relationship with underqualified workers, in addition to significant differences in the effect that being over/underqualified has on tenure based on respondents' age and survey year. Implications for individual, organizational, and societal stakeholders involved in the school-to-work transition are discussed.

Keywords: educational attainment, job analysis approach, job-education match, mismatch, overqualification, overeducation, tenure, underemployment.

Acknowledgements

I would like to express my sincere thanks to my supervisor, Dr. Danielle Lamb, for her support and guidance throughout the course of my research endeavors, as well as Dr. Rupa Banerjee and Dr. Margaret Yap of my supervisory committee for their feedback on several iterations of this project. I would also like to acknowledge Statistics Canada's Research Data Centre (RDC) at the University of Toronto for support and access to the data used for analysis. Any errors or views expressed in this thesis are solely those of the author and do not reflect the opinions of the aforementioned.

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Chapter 1: Introduction

Postsecondary education is an area of interest for a variety of stakeholders: students, teaching faculty, career advisers, employers, educational institutions, and government (Scurry & Blenkinsopp, 2011). A persisting topic in the discourse has been the labour market outcomes of graduates; several Canadian studies, for example, have utilized cross-sectional datasets to estimate the returns to education (Finnie, 2000; Finnie & Frenette, 2003; Walters, 2004; Boudarbat, Lemieux, & Riddel, 2010; Betts et al., 2013; Fenesi & Sana, 2015). There is growing interest in educational attainment, and a growing supply of postsecondary graduates. Enrollment in higher education continues to increase in Canada, particularly at the university level. According to a recent Statistics Canada (2016) report, 515,865 graduates obtained a credential from a post-secondary education institution between 2014 to 2015 (trades certificate, diploma, or degree), which is a 3.2% increase from the previous academic year, an upward trend since 2000 (Tal & Enenajor, 2013); on a global scale, Canada ranks highest in the proportion of post-secondary degree or diploma holders among OECD countries (OECD, 2016).

What raises concerns for labour economists, management scholars, and employers alike, however, is the level of congruence or 'fit' between job seekers and jobs; recent estimates suggest that "35.1% of graduates are in a job that is not closely related to their education" (Boudarbat & Chernoff, 2009). The present study defines overqualification as a situation in which "an individual possesses more education than required by the main employer" (Frenette, 2001, p. 41). The phenomenon of overqualification, also termed *underemployment*, will be measured through *job-education match*, which refers to the differences between required and attained levels of education (Allen et al., 2003). In the Higher Education Quality Council of Ontario's (HEQCO) 2015 report on postsecondary performance, overqualification rates were estimated by province, which ranged

from 34% (Newfoundland and Labrador, Québec) to 44% (Saskatchewan) for university graduates (Weingarten et al., 2015). Canada's Parliamentary Budget Office measured labour utilization based on education credentials, relative to educational requirements in occupations, and estimates "the proportion of workers aged 25 to 34 with a university degree who were overqualified in their current position has been on an upward trend since the early 1990s, reaching 40% in 2014" (Office of the Parliamentary Budget Office, 2015, p. 2). These findings reiterate the prevalence of overqualification as a substantial element of the labour market experience for young Canadian workers. The Canadian Labour Congress has also raised questions regarding underemployment, considering that "the proportion of individuals who are at school but want a job has increased from 20% to nearly 30% over the past 15 years" (CLC, 2014, p. 4). According to the Conference Board of Canada's summary findings, the full-time employment rate of the 15-to-24-year-old cohort was at 45% in 1972, compared to 27% in 2014, which suggests Canada's system of skill development has transitioned from work/experiential learning toward longer school stays (Grant, 2016). The reasons for increasing enrollment can be explained partly by individuals' desire for successful careers. Ontario's Ministry of Education and Training found in a survey that "more than 80% of high school graduates pursue postsecondary education to increase employment opportunities and income" (King, Warren, Boyer, & Chin, 2002).

This study investigates the incidence of underemployment based on the match between education credentials and job requirements in Canada. This job-education match measure is of interest to employers, particularly Human Resources Management (HRM) professionals, as the results can provide direction on the future allocation of resources in order to attract, select, and retain the right employees (HRPA, 2016). From the employer perspective, industry reports have regularly cited skills shortages as a key business challenge, despite the growing supply of

postsecondary graduates (Grant, 2016). In a recent survey conducted by the Human Resources Professionals Association (HRPA), the regulatory body for HR practitioners in Ontario, members were asked whether employees hired in the past year were adequately prepared by their pre-hire education and/or training; of the respondents, 43% agreed, and the remaining 57% either disagreed or were unsure, at 35% and 22% respectively (HRPA, 2016).

Using a deductive approach, this study intends to contribute a better explanation of the fit between educational attainment and job requirements among young Canadians, and address a gap in the current literature which does not investigate underemployment patterns across time and between the young age cohort and the remaining working population. Labour market outcomes for young Canadians continues to be relevant in management and economics literature; "a major limitation of the past research on the earnings and employment outcomes of postsecondary graduates is that little attention has been devoted to making comparisons over time, for both graduates of different levels of schooling and fields of study" (Walters, 2004, p. 19). Based on the five-dimension framework created by Feldman (1996), an appropriate measure of underemployment is the extent to which individuals "possess more formal education than their current job requires" (Feldman, 1996). Within congruence literature, it is suggested that there are two main perspectives of underemployment: the objective and the subjective (Scurry & Blenkinsopp, 2011). To reflect the intended contribution of the present study to explain overqualification levels and tenure patterns, an objective measure is adopted, rather than a subjective, self-report measure reflecting individuals' perceptions of their employment situation. In this study, the *job analysis* approach is adopted, in which formal education credentials are compared to job requirements, and the outcomes of job-education match levels are used to estimate

whether overqualified individuals are more likely to have a shorter length of service in their primary job, across time and between age cohorts.

For the purpose of this study, *educational attainment* or *education credentials* refer to the highest level of schooling completed by respondents of the Labour Force Survey (Statistics Canada, 2016). Based on the National Occupational Classification (NOC) 2011, occupations are defined as "a collection of jobs, sufficiently similar in work performed to be grouped under a common label for classification purposes", and a job is defined as "all the tasks carried out by a particular worker to complete their duties" (Statistics Canada, 2012, p. 7). While the occupational categories of the NOC are formed based on the most common tasks, duties, and responsibilities of each occupation, the employment requirements, specifically the details on the type and level of formal education associated with each occupation, are broad and often include a wide range of relevant education credentials. To allow for consistency in categorizing occupations based on education, the NOC 2011 skills matrix (see Appendix 3) is used, rather than the requirement details of each individual occupation.

This thesis is organized as follows: Chapter 2 provides a review of the underemployment literature, with a focus on the measures, outcomes, theoretical approaches to interpreting underemployment, and prior empirical studies which focus on the phenomenon of educational attainment outcomes. Chapter 3 outlines the primary research question, with a set of supporting questions and hypotheses, as well as the dataset and methods used for analysis, followed by the summary results for each of the models (1997, 2014, and pooled) in Chapter 4. Chapter 5 provides a detailed discussion of these results as they relate to the hypotheses, and the implications of these results on key stakeholders, with an explanation of the limitations of the present study and

opportunities for future research. To conclude, Chapter 6 offers a few brief remarks to summarize the contributions of this study to the literature on underemployment.

Chapter 2: Literature Review

2.1 Definition & Measures of Underemployment

Labour economists, management scholars, and sociologists use a variety of measurements to investigate underemployment, also termed *overqualification* or *underutilization*. Individuals working in a job that is below their full capacity, or inferior by some standard, are deemed *underemployed* or *overqualified* (McKee-Ryan & Harvey, 2011). The management perspective of underemployment, which focuses primarily on individual and organizational-level outcomes, investigates the fit between individuals' skills and job requirements. There are two main perspectives from which underemployment is assessed: the objective (Feldman, 1996) and the subjective (Khan & Morrow, 1991). The objective perspective, outlined by Feldman (1996), measures underemployment based on how an individual uses their accumulated skills, relative to an accepted standard, such as the necessary education or accumulated skills to perform a job. The subjective perspective, conversely, considers an individual's perceptions of their employment situation, specifically whether their inherent skills and abilities are being utilized in the work performed (Khan & Morrow, 1991). Objective and subjective dimensions of underemployment are illustrated in Appendix 1.

The phenomenon of occupational mismatch is also distinguished as either vertical, horizontal, or in some cases both. Vertical mismatch refers to overeducation, specifically where an individual's education level exceeds the required education criteria of the individual's job. Horizontal mismatch, conversely, refers to cases where an individual's field of study is not aligned

with the individual's occupational field (Moore & Rosenbloom, 2016). Studies that investigate vertical mismatch in order to make inferences on underemployment focus specifically on educational attainment, using either an objective (e.g. job analysis) or subjective (e.g. self-assessment) measure. Horizontal mismatch studies, similarly, can be assessed using delineated classification schemes to form an objective measure, or by self-reporting measures which ask for respondents' perceptions of the relatedness between their field of study and job.

2.1.1 Objective Underemployment

Feldman (1996) identifies five objective dimensions of underemployment: 1) possessing more education than is required in the job; 2) being in a job outside one's area of formal training; 3) possessing skills that are not utilized in the job; 4) being involuntarily employed in a part-time, temporary, or intermittent job; and 5) earning 20% less than in one's previous job or than one's peers. The underlying assumption to the objective perspective is that all individuals strive to avoid underemployment, and therefore it is not desirable in any situation for an individual or organization; the present study will adopt this involuntary perspective to underemployment in the present analysis. It should be noted that in some situations individuals may be deemed underemployed on some or all of the aforementioned dimensions, however, due to non-economic reasons. The career mobility hypothesis (discussed further in 2.2.2), for example, suggests that individuals may intentionally remain in a job which would otherwise be considered a skills mismatch, as a means of career progression towards higher-level jobs in the long-term. The present analysis proceeds based on an economic set of assumptions regarding underemployment to align with the objective perspective, while acknowledging the limitations of this assumption which excludes individuals' career choice and trajectory considerations.

Specific to investigating overeducation as it relates to underemployment, Verhaest and Omey (2006) summarize four common measures: direct self-assessment (DSA), indirect self-assessment (ISA), job analysis (JA), and realized matches (RM). Of these measures, realized matches and job analysis are objective. Job analysis is a systematic approach which uses an established classification scheme, such as Canada's National Occupational Classification (NOC), to delineate occupational requirements allowing for individual credentials to be matched with job requirements. Due to the explicit nature of such classification schemes, this approach has the benefit of offering clear definitions of education and corresponding occupational requirements (Hartog, 2000). Wolbers (2003), for example, uses a European classification scheme to investigate mismatch based on the relatedness of individuals' field of study and industry of work. The job analysis approach, however, may rely on classifications that are infrequently updated or potentially ambiguous, and therefore do not necessarily reflect market conditions; the limitations of this approach will be revisited in Chapter 6 of the analysis.

The realized matches framework, outlined by Clogg and Shockey (1984), involves comparing the average education level within an occupation to job requirements. Occupational mismatch is assessed by comparing the most common years of education among individuals in the same occupation using the mean or mode; if, for example, an individual's education deviates significantly from this standard, the individual is deemed to be under or overeducated. A potential drawback to adopting the realized matches measure, however, is in how the results are interpreted, as observations are "based on the equilibrium realized by the interplay of supply and demand" (Hartog, 2000, p. 133). The realized matches approach, therefore, reflects the labour market conditions of a particular cohort by considering the average education credential requirements of the cohort, rather than the individual-level credentials within the cohort.

2.1.2 Subjective Underemployment

Subjective measures, such as the direct self-assessment approach, often assess underemployment from a micro level, measuring the perceptions of respondents using a self-reporting measure. Empirical studies which adopt subjective measures claim such an approach provides richer interpretations of mismatch, due to the job-specific reference points, rather than broader occupational taxonomies (Wald, 2005). Furthermore, important job-related characteristics such as intelligence, interpersonal skills, critical thinking skills, or motivation are often left unmeasured in large scale datasets, unless otherwise self-reported by the respondent. Additionally, such measures are subject to potentially biased results due to respondents' tendency to over-report qualifications required to perform their job (Hartog, 2000). Hartog (2000) suggests the choice of measurement is largely based on data availability; in ideal circumstances where no data collection limitations are present, the job analysis measurement is preferred, as it relies on the assessment of job analyst professionals to define requirements and associated skill and education levels. The underlying assumption of such procedures is that underemployment acts "as a discrepancy concept, reflecting the difference between the educational requirements of the job and employee educational attainment" (Khan & Morrow, 1991, p. 212). Sicherman (1991) notes "overeducated workers are found to be younger… and also have higher rates of firm and occupational mobility" (p. 101); the levels of overeducation and occupational mobility are therefore relevant to further investigating underemployment, particularly among young people.

2.2 Theoretical Perspectives on Underemployment

Four prominent theoretical perspectives in prior underemployment research include human capital theory (Becker, 1975), person-environment (P-E) and person-job (P-J) fit (Edwards, 1991), relative deprivation theory (Crosby, 1976), and the coping and control theory model of re-

employment (Latack, Kinicki, & Prussia, 1995). *Human capital theory* is used extensively by labour economists, and suggests that individuals make investments in themselves through obtaining education and training; employers then make hiring decisions based on an individual's acquired capital (Weiss, 1995). *Relative deprivation theory* is concerned with the subjective experience of underemployed workers, and research under this framework investigates underemployment based on the subjects' (e.g. employees') perceptions and beliefs that they desire better jobs than the one he/she currently holds (Crosby, 1976). The *coping and control theory model of re-employment* notes the importance of equilibrium in an individual's search for employment, which is met when an individual's skills are equal to the skills necessary to perform in a job. Displaced workers, it is argued, will not return to a state of equilibrium until the worker is re-employed in a job similar to the one the individual lost (McKee-Ryan et al., 2009). Within the theoretical approaches to underemployment, *person-job* (P-J) *fit theory* claims that "when there are differences between employees' abilities (measured through education, skills, experience) and the actual job requirements, there is a discrepancy or lack of fit" (McKee-Ryan & Harvey, 2011, p. 971). This discrepancy or 'mismatch' can be determined on a number of dimensions, one of which is an individual's level of education, which has further implications for job outcomes, particularly turnover, discussed further in Section 2.3.

2.2.1 Person-Job Fit Model

The perceived fit between individuals and the workplace has been contextualized in management and organizational behaviour literature using *person-environment* (P-E) fit as a theoretical framework, to determine "the degree of congruence or match between a person and environment" (Muchinsky & Monahan, 1987, p. 268). The theoretical literature on congruence is wide-ranging across disciplines, and includes an array of variations on P-E to assess fit at different

levels of analysis, including vocation (P-V), organization (P-O), coworker/group (P-G), and job (P-J) (Lauver & Kristof-Brown, 2001). In the context of overeducation, the most directly applicable variant from congruence theories is *person-job fit*, the narrowest level of analysis, which determines "the match between the abilities of a person and the demands of a job or the desires of a person and the attributes of a job" (Edwards, 1991, p. 284). The P-J fit model emphasizes congruence specifically between a person and job in order to predict individual and organizational outcomes (Edwards, 1991). This perspective is relevant to the present study as an individual's level of education may contribute to whether or not an employee is a 'fit' for his/her job with respect to the knowledge and skill requirements specific to a particular job. "P-J fit is relevant to an individual's compatibility with a specific job, whereas P-O fit pertains to how an individual matches an organization's values, goals, and mission" (Lauver & Kristoff-Brown, 2001, p. 455). Kristof (1996) notes that fit may be a viable construct at many levels of analysis, as identified above. The level at which a researcher decides to examine fit is determined by the researcher's rationale for a particular model to be relevant. The present study will adopt P-J fit in order to determine congruence between education credentials obtained by individuals and the education requirements of occupations, in order to address the research question pertaining to overqualification levels, a phenomenon to be observed at the individual level.

The demands-abilities perspective for the P-J fit model can be interpreted as follows: on the 'demands' side, an employer asks, "what do I want of the employee?", while on the 'abilities' side, an employee asks, "what am I expected to provide in order to keep this job?" (Caplan, 1987, p. 250). The employer sets a level of education required to perform the job, while the employee then offers a set of abilities to match these demands (Caldwell & O'Reilly, 1990). In some cases, however, a job seeker is hired for a job with education requirements below their abilities, which

constitutes *underemployment* for the purposes of this study. The P-J fit model considers the combined effects of the person and the job on outcomes, rather than assessing these variables in isolation. "The domain of P-J fit research is characterized by commensurate person and job constructs hypothesized to jointly influence various individual and organizational outcomes" (Edwards, 1991, p. 284). Distinct from P-O fit research, P-J fit should be determined relative to the tasks performed in a specific job, rather than the organization in which the job exists (Edwards, 1991). In this study, overqualification and tenure are explored at the individual level, in order to better explain the relationship between an individual's fit with their job and their likelihood of remaining in their job (see Appendix II). Maynard et al. (2006) claims the P-J fit model is well suited for the purpose of underemployment research, as each dimension of underemployment outlined by Feldman (1996), such as overeducation, can reflect a poor P-J fit. Based on the scope of this perspective, therefore, person-job fit is an appropriate framework to investigate congruence at the individual (job) level.

2.2.2 Matching Theory

As illustrated in Appendix 1, overeducation represents one dimension of underemployment, which is associated with several job and career-related outcomes. Specific to job-related outcomes at the individual level, prior literature which focuses on *job search* or *intention to quit* as an outcome have adopted one of three frameworks: *matching theory* (Jovanovic, 1979), *differential overqualification theory* (Frank, 1978), and the *career mobility hypothesis* (Sicherman, 1991). Matching theory claims that job search intentions lower with increasing job tenure, as the employee is more likely to be a 'match' with their employer. This job-matching approach to turnover makes three major assumptions: 1) productivity levels do not decline across different jobs, 2) employers and employees contract on an individual level (which

precludes the effect of collective agreements), and 3) imperfect information exists on the 'optimal' assignment for individuals in the job market (Jovanovic, 1979).

Contrary to this assumption of imperfect information, Frank (1978) and Sicherman (1991) claim overqualified workers can be hired for positions even where perfect information in the job market exists. The differential overqualification theory suggests the job search of married women is constrained geographically, and must compromise and accept employment, even if it is less than optimal, based on their accumulated human capital within the same labour market as their spouse, resulting in mismatch (Frank, 1978). Similar to the theory of differential overqualification which follows the assumption that mismatch can occur even with perfect information, the career mobility hypothesis claims some instances of mismatch are intentionally sought by individuals as a temporary means to obtain necessary work experience, in order to progress towards higher-level jobs (Sicherman, 1991). In the Canadian market, however, empirical evidence from Frenette (2004) finds stable overqualification rates two and five years following graduation, which does not corroborate the temporary stays of recent graduates implied by the career mobility hypothesis.

Of these theoretical perspectives, matching theory has gained empirical support for investigating job search or intentions to quit as an outcome of underemployment, outlined by Feldman (1996). Using a self-reporting measure, Burke (1997) finds a significant relationship between underemployment levels and age among a sample of Canadian business school graduates; moreover, a significant relationship is reported between higher underemployment levels and negative work outcomes, such as intentions to quit. Allen and van der Velden (2001) distinguishes between educational and skill mismatches: mismatch based on education is determined by comparing an individual's level and field of education with the most appropriate level and field for the job; mismatch based on skill is determined by asking respondents whether their job allows

them to use their accumulated knowledge and skills. Self-reporting results found that while both measures had an effect, skills mismatch had a stronger influence on job search intentions (Allen & van der Velden, 2001). Holtom, Lee, and Tidd (2002) develop a measure of 'work status congruence' which includes "employee preferences for full-time or part-time status, schedule, shift, and number of hours" (p. 903), and find a positive relationship between work status congruence and employee retention. Holtom et al. (2002) supports the use of underemployment measures as a method for predicting job-related outcomes, including voluntary turnover.

2.3 Consequences of Underemployment

Underemployment has been associated with job, career, and personal-related outcomes at the individual level (Erdogan, Baur, Peiró, & Truxillo, 2011). Previous management literature which use overeducation as a measure, for example, suggest that employees deemed to be overqualified tend to exhibit negative job attitudes (Johnson & Johnson, 1996; Maynard et al., 2006). Wald (2005) finds a strong relationship between overqualified workers and job search intentions. The study adopts the economic assumption that individuals make job search decisions based on a cost-benefit analysis; overqualification, under this assumption, represents a less than ideal state from the employee's perspective, akin to matching theory (Jovanovic, 1979). Using a subjective measure of fit based on respondents' perceptions of mismatch which considers accumulated experience, education, and training, Wald (2005) also notes the presence of several employee perceptions, such as perceived satisfaction and fairness, which lowered job search intentions. Maynard, Joseph, and Maynard (2006) develop a 'scale of perceived overqualification', and find a positive relationship between employee perceptions of being overqualified and turnover intentions. The results concur with the P-J fit model, where "negative outcomes are only predicted

when there is a mismatch between the needs of the employee and the characteristics of the position" (Maynard et al., 2006, p. 530).

Consequences have also been associated with career-related effects for overqualified individuals. Verdugo and Verdugo (1989), for example, implement a realized matches measure to investigate the effect of overeducation on wages, and find lower wages among the overeducated, compared to those deemed under or adequately-qualified. Robst (2007) observed the effects of horizontal mismatch on wages, and suggests individuals working in an occupational industry that is not aligned with their field of study are more likely to earn lower wages than horizontal match counterparts. Tsai (2010), uses a similar measure similar to Verdugo and Verdugo (1989) based on U.S. Census occupation codes and corroborates the notion that the positive relationship observed between earnings and education does not have the same effect on those deemed to be overeducated, contrary to the human capital perspective (Becker, 1975).

With regards to personal outcomes, Khan and Morrow (1991) find subjective underemployment to be the result of poor person-job fit, and claim a poor match cannot be changed by solely matching higher-educated individuals in jobs which require higher educational attainment (objective fit), but is more explained by the subjective factors of underemployment. The prevalence of subjective factors is evidenced by empirical studies investigating subjective, personal outcomes (see Appendix 1). Burris (1983), for example, used subjective perceptions of overqualification through self-reported results on psychological well-being, and finds a positive relationship between perceived mismatch and feelings of personal dissatisfaction. Johnson and Johnson (1996) find similar results for the effect of perceived overqualification on psychological well-being, one of the outcomes of underemployment identified by Feldman (1996).

2.4 Voluntary Turnover and Underemployment

Turnover is a widely researched topic in organizational behaviour literature, which encompasses both *voluntary* (employee-initiated) and *involuntary* (employer-initiated) turnover. Specific to voluntary turnover, one of the following three attitudinal constructs or antecedents are commonly observed: job satisfaction (Porter & Steers; 1973; Mobley, 1977), perceived alternatives (Muchinsky & Morrow, 1980), and job embeddedness (Mitchell & Lee, 2001). A guiding principle in turnover research has been the notion that turnover is "a function of negative job attitudes combined with an ability to secure employment elsewhere" (Steers & Mowday, 1981, p. 237). In an early study on turnover, March and Simon (1958) refer to an 'equilibrium', in which individuals remain in an organization where inducements (such as wages) either match or exceed the individual's contributions or effort expended on-the-job. Subsequent research has adopted job *satisfaction* and job *alternatives* as concepts for investigating turnover. For the purpose of this study, voluntary turnover refers to an individual voluntarily deciding to terminate employment from an organization (Mobley, 1977). Not captured in the present study are employee *intentions* (to stay or quit) nor employee *withdrawal*. Since individuals' perceptions are beyond the scope of the present study, this review will provide a theoretical background relevant for addressing the concept of voluntary turnover as it relates to congruence or 'fit' between individuals and job requirements.

2.4.1 Turnover-Satisfaction Relationship

The most frequently referenced determinant in turnover research is job satisfaction. An early study from Porter and Steers (1973) finds a consistent and inverse relationship between job satisfaction and turnover, using organization-wide, immediate work environment, job-related, and personal factors for analysis. The results are aggregated and presented as the *Met Expectations*

Model, which claims that "organizational, work, and personal factors can be associated with the decision to withdraw" (Porter and Steers, 1973, p. 167). In this conceptual model, satisfaction is not caused by a specific level of pay or opportunity, but rather the extent to which pay and opportunity meet an individual's expectations. Following this model, therefore, voluntary turnover is less likely when an individual's prior expectations are met on the job. Price (1975) supports the inclusion of economic indicators, and notes the net balance of benefits over costs involved with a change in employment for individuals as a moderating variable in estimating the relationship between job satisfaction and turnover. Continuing the logic of Porter and Steers (1973) in which 'intention to leave' follows job dissatisfaction, Mobley (1977) extends the concept of intention to leave as the last step of a withdrawal process that concludes with voluntary turnover. Job dissatisfaction and an individual's turnover decision bookend this multi-stage process, in which the individual considers potential mediating variables prior to a decision to terminate employment; for example, individuals evaluate several aspects of their circumstances: his/her existing job, the expected utility of searching for new employment; and the available alternatives in the labour market, compared to their current employment situation (Mobley, 1977).

2.4.2 Turnover-Alternatives Relationship

Muchinsky and Morrow (1980) present a multidisciplinary model of turnover, with the intention of gathering psychological and economic factors determined in previous research. The model adopts three main determinants of turnover empirically tested in prior literature: *individual*, *work-related*, and *economic opportunity* factors, which consists of: 1) the state of the labour market, 2) the sector of activity, and 3) the geographical location of the organization (Muchinsky & Morrow, 1980). This model suggests, therefore, that the opportunity to find work (as evidenced by employment rates, for example) serve as an antecedent of voluntary turnover. The work-related

determinant includes person-job congruence as a variable in predicting turnover (Muchinsky & Morrow, 1980). In addition to determinants, the model also looks to further understand the potential consequences of turnover, explored previously by Price (1975). Four classes of consequences regarding turnover are outlined: *individual*, *organizational-social*, *organizational-economic*, and *societal* (Muchinsky & Morrow, 1980). These consequences contextualize the implications of the present study; voluntary turnover presents implications for the individual (job holders), organization (job creators), and society (job seekers) are met with sociological and economic consequences.

2.4.3 Job Embeddedness

In contrast to the Mobley (1977) model of turnover which outlines a rational decision making path for individuals, Mitchell and Lee (2001) expand upon the constructs used to understand voluntary turnover and retention by identifying a new construct, *job embeddedness*, of which there are three dimensions: *links*, which refers to "the formal or informal connections an individual has with other individuals or groups either on or off-the-job"; *fit*, which refers to "an individual's compatibility with their work and non-work settings"; and *sacrifice*, which refers to "the perceived loss of material or psychological benefits that currently are available or will be available in the future" (p. 216 – 219). Based on these dimensions, various on-and-off-the-job forces form an aggregate construct to interpret voluntary turnover (Mitchell & Lee, 2001). Of interest to this study is the *fit* dimension, which resembles the person-organization and person-job fit theoretical framework discussed earlier. Mitchell and Lee (2001) conjecture, much like the person-environment literature, that the better the fit between an individual and their work, the less likely the individual is to leave the organization. Job embeddedness distinguishes, however, a need to assess on-and-off-the-job factors (rather than solely matching individuals' skills with a job) to

further understand the dynamic between fit and retention. The job embeddedness model presents three considerations to future turnover research: first, individuals leave jobs in different ways; second, the process of staying is different from the process of leaving; and third, the decision to stay is associated with a sense of 'embeddedness' with the job (Mitchell & Lee, 2001). In summary, individuals can become 'stuck' or embedded in their jobs due to organizational (on-the-job) and community (off-the-job)-related forces. Job embeddedness may therefore moderate the relationship between overqualification and turnover in that overqualified individuals may elect to remain in their current position for various reasons if and when a more suitable job for their level of education is available.

One of the observed factors of job embeddedness includes job tenure, suggesting that an individual's duration of employment in itself can affect one's 'embeddedness' within an organization. Length of service is a common measure of turnover; in Price's (1975) codification of turnover measures, for example, 'average length of service' is the first of four possible measures. Mobley, Horner, and Hollingsworth (1978), similarly, use tenure as a variable to compare with intention to quit and actual turnover. Person-job fit, as discussed above, is an important measure for retention. Kristoff (1996), for example, finds that perceptions of 'mis-fit' increases instances of voluntary turnover. The present study proceeds with tenure as a measurement of turnover; however, the analysis does not observe the differences between voluntary and involuntary forms of turnover, as the Labour Force Survey (LFS) datasets do not capture this distinction. While job satisfaction and organizational commitment measures are beyond the scope of this study, elements of job embeddedness provide theoretical backing for the connection between skill requirements and tenure: this study hypothesizes lower tenure rates will be observed where a poor fit exists.

2.5 Overqualification Levels among Postsecondary Graduates

Several empirical studies have investigated the labour market outcomes of Canadian graduates and underemployment levels. Vahey (2000) claims the returns to post-secondary education in Canada have varied due to two factors: required education levels and gender. Using Statistics Canada's National Survey of Class Structure and Labour Process (NSCS), evidence from the 1982 cohort suggests over-education to be more prevalent than under-educated graduates; specifically, 30% of males and 32% of females self-reported as being over-educated, compared to those who self-reported as being under-educated, at 24% and 17% respectively (Vahey, 2000). While this study involves job-specific self-reporting, limited inferences can be made due to the subjective nature of the measure, which is prone to bias. Individuals may, for example, overstate their responses in a way that does not accurately reflect his/her labour market circumstances, relative to their cohort.

Frenette (2004) investigates returns to post-secondary education, particularly the role field of study has on the incidence and persistence of overqualification among Canadian graduates. The study pools three cohorts (1982, 1986, and 1990) and finds that more than 30% of graduates were overqualified for his/her current job (Frenette, 2004). While overqualification trended downward over the three cohorts sampled, Frenette (2004) notes a persistence of overqualification from two to five years following graduation, as only 25% of overqualified graduates in the initial survey were no longer considered overqualified in the subsequent survey. Overqualification was found to fluctuate based on field of study; for example, graduates of fine arts, humanities, social sciences, and agricultural and biological sciences are the most likely to be overqualified, compared to graduates of education, engineering, computer science, law, and medicine fields at the bachelor's level of study (Frenette, 2004). Finnie (2000) reports similar findings, and notes the increase in

temporary work among graduates, which illustrates a change in labour market conditions away from permanent jobs.

Walters (2004) compares both earnings and employment levels as a measure of labour market outcomes for postsecondary education. Using four cohorts of the NGS (1982, 1986, 1990, and 1995), Walters (2004) argues that the labour market experiences of postsecondary education graduates have remained relatively stable across credential levels. "Graduates of university undergraduate programs generally have a higher probability of being employed full time than do graduates of college programs, who, in turn, have a greater probability of being employed full time than do graduates of trades programs" (Walters, 2004, p. 15). The probability of university graduates having full time employment declined steadily over the four cohorts analyzed, from approximately 85 to 80% (Walters, 2004); this result could be influenced by the study analyzing only one set of responses, 2 years following graduation, and not including the responses from the same cohort 5 years following graduation. In terms of earnings, the results corroborate the commonly held concept that higher levels of education equate to higher earnings (Becker, 1975).

Drewes (2010) also identifies a skills mismatch, in which the "pattern of enrolments does not match the pattern of skill needs in the labour market" (p. 2). In order to assess the level of fit between postsecondary education and labour market needs, Drewes (2010) uses data from the National Graduates Survey (NGS), supplemented with 2006 Canada Census data to determine the presence of overqualification as a symptom of over-supply among graduates. The study utilizes a self-reported measure of the NGS, in which respondents indicate themselves as being over-qualified for their jobs, based on their level of education, experience, and training. The self-reported levels of overqualification among five cohorts of graduates do not demonstrate an upward trend in overqualification; additionally, male bachelor's respondents are least likely and male

college respondents are most likely to report themselves as overqualified (Drewes, 2010). Drewes (2010) claims that despite the growth in supply of Ontario graduates, there is no evidence of over-education among Ontario's young labour force. Fenesi and Sana (2015) use the most recent NGS cohort of 2005 and find that an individual's field of study offers a unique set of knowledge and skills, some of which are less marketable in the workplace. Similar to the results of Frenette (2004), Fenesi and Sana (2015) also report differences based on field of study; humanities graduates, in particular, were more likely to be unemployed at 35%, compared to all other programs surveyed at under 17% (Fenesi & Sana, 2015). In terms of overqualification rates, "the odds of being overqualified decreased by 50% for education, 38% for science, and 65% for math and computer science" (Fenesi & Sana, 2015, p. 391). These findings corroborate the notion that employers are increasingly shifting towards job seekers that offer technical skills that are closely related to the discipline, rather than fields of study such as humanities, which produce more general skills that are "more likely to produce unrelated, overqualified employment" (Fenesi & Sana, 2015, p. 394).

When observing an earlier cohort from 1993 to 2001, Moore and Rosenbloom (2016) estimate the skill levels of workers with a university education, and found an increase in overqualification between 1993 and 2001. The study examined those with a 'strong attachment' to the labour market, defined as those individuals who worked for 4.5 of the 6 years observed, and a minimum tenure of one month in a position that required a high school education; within this group, approximately 30% of the sample held a position that required at most a high school diploma, despite having a university degree (Moore & Rosenbloom, 2016). However, Moore and Rosenbloom (2016) also note higher education levels were associated with less overqualification, as only one in five workers with a bachelor's degree or higher experienced overqualification. No significant finding was reached regarding mismatch between men or women, with

overqualification rates at around 31% and 26% respectively (Moore & Rosenbloom, 2016). Frank et al. (2015) found inconclusive results to support a mismatch between education and employment. When viewed holistically, the labour market outcomes of young graduates have not decreased substantially, with some exceptions based on gender. Full-year, full-time employment among male bachelor's degree holders, for example, decreased from 2005 to 2010, but this decrease was not experienced by the female cohort during the same time period (Frank et. al, 2015).

2.5.1 Non-Standard Employment

Relevant to studies of overqualification are job-specific indicators such as permanent or temporary job status. In some instances, a worker's job status can be deemed *precarious*, which refers to a form of non-standard work which differs from the a more traditional standard of employment, characterized by a worker having "one employer; employed full-year, full time on the employer's premises; enjoys extensive statutory benefits and entitlements; and expects to be employed indefinitely" (Vosko, Zukewich, & Cranford, 2003, p. 16). The present study adopts the broad definition by Krahn (1995) which defines non-standard work as individuals engaged in temporary employment (which includes term or contract, seasonal, casual, temporary agency, and all other jobs with a specific pre-determined end date); all responses in the Labour Force Survey (LFS) of such forms of employment are collapsed into one 'temporary' job status category. Workers engaged in non-standard work can be the result of voluntary or involuntary reasons. For example, workers may take on part-time or temporary work, despite preferring more traditional employment, due to poor business conditions or a lack of permanent employment opportunities. Conversely, workers may elect to take on part-time work to satisfy needs beyond the workplace, such as pursuing higher education or family obligations (Vosko, Zukewich, & Cranford, 2003).

In Canada, a trend of *casualization* has been observed, whereby the labour force has experienced growth in the proportion of individuals engaged in casual work arrangements. Empirical findings based on the Labour Force Survey (LFS) reveal a decrease in the proportion of employees with full-time, permanent work, from 67% in 1989 to 63% in 2002 (Vosko, Zukewich, & Cranford, 2003). Young workers, in particular, face precarious employment situations more than those in the later stages of their careers. The share of young workers ages 15 to 24 with full-time permanent employment decreased by 18 and 13 percentage points for females and males respectively from 1989 to 2002 (Vosko, Zukewich, & Cranford, 2003). These trends have implications for the outcomes of more recent graduates in Canada. Based on the 2006 Census and 2011 National Household Survey (NHS), the proportion of young workers ages 25 to 34 engaged in full-year, full-time employment has slightly decreased overall in 2010, relative to 2005, particularly for those with a high school diploma as his/her highest level of education attained (Frank, Frenette, & Morisette, 2015). These employment patterns indicate a skills mismatch is more likely for young workers, given the decreasing proportion of permanent, full-time employment opportunities in addition to the increasing supply of higher education graduates.

Chapter 3: Methodology

3.1 Research Question

In this study, the primary research question asks: w*hat is the relationship between job-education match and job tenure levels among young Canadians, 25 to 34 years of age?* Investigating the match between education credentials and job requirements in Canada can inform employers of the need to implement adequate succession planning or increased training and development to retain talent in the event of overqualified or underqualified employees

respectively. Moreover, such findings can address the need for implementing targeted HR policies and practices for particular age cohorts in the workplace. Such findings are also of interest to young Canadians, considering future higher education and/or job market decisions. A set of supporting questions will also be explored, including: 1) what is the effect of job-education match on the tenure rates of the remaining working population, 35 to 64 years of age, relative to young workers? and 2) has the relationship between job-education match and tenure changed for the respective age groups across time? To address these research objectives, this study will investigate tenure and education credentials 1) across time, comparing the 1997 and 2014 LFS datasets, and 2) between age cohorts, by using two age cohorts of 25 to 34 and 35 to 65 year olds to represent young workers, relative to the remainder of the working population.

3.1.1 Hypotheses

Hypothesis 1a: a negative relationship exists between overqualification (relative to job-education match) and tenure (in months) for young Canadians, ages 25 to 34.

Hypothesis 1b: a positive relationship exists between underqualification (relative to job-education match) and tenure (in months) for young Canadians, ages 25 to 34.

The null hypothesis (H_0) assumes there is no significant relationship between job-education match and tenure, and vice versa with the alternative hypothesis (H_1). A negative relationship is predicted between overqualification and tenure; specifically, young Canadians with higher education credentials than what is required for his/her occupational category will report lower tenure, or length of service in months in his/her primary job. Conversely, young Canadians with lower than required educational credentials will experience higher rates of tenure (relative to those with a job matching their education). This hypothesis is based on Canadian trends in employment across age groups. The full-time employment rate among young Canadians aged 25 to 29 years

with a university education has declined from 1976 to 2014, particularly among men by approximately 10 percentage points, according to Labour Force Survey results (Morisette, Hou, & Schellenberg, 2015). This can be attributed to rising levels of temporary (part-time and/or casual) employment, which is a traditionally a more precarious employment relationship than full-time, and therefore more challenging to sustain longer job tenure levels. Additionally, this study acknowledges that young Canadians, in particular, may use such precarious work as a bridge to sustaining higher quality employment, especially if high levels of education allow for such mobility (Heisz, 1999).

Hypothesis 2a: Young Canadians, ages 25 to 34, who are overqualified (relative to job-education match) will have shorter tenures (in months) than those ages 35 to 64 who are overqualified.

Hypothesis 2b: Young Canadians, ages 25 to 34, who are underqualified will have longer tenures than those ages 35 to 64 who are overqualified.

Hypothesis 2 predicts young workers will exhibit a shorter relationship to tenure than the remaining working population, whereas workers who are underqualified will exhibit a longer relationship to tenure, which will be observed from the results of the pooled 1997 and 2014 model. Labour force survey results indicate participation rates among Canadians 55 years and over has increased since 1996, from approximately 24% to 38% in 2016 (Fields, Uppal, & LaRochelle-Côté, 2017). Due to rising participation rates among older workers in Canada over time, there is consequently more opportunity for older workers captured in the present study to accrue job tenure, considering participation rates among young workers has declined due to increased school stays (Fields, Uppal, & LaRochelle-Côté, 2017). In addition, older workers have more time to invest in

educational attainment, and more opportunity to gain experience by nature of longer time spent in the labour market.

Hypothesis 3a: All overqualified respondents, ages 25 to 64, will have shorter tenures in the 2014 survey, compared to the 1997 survey.

Hypothesis 3b: All underqualified respondents, ages 25 to 64, will have longer tenures in the 2014 survey, compared to the 1997 survey.

Hypothesis 3 predicts workers of all ages in the 2014 sample will exhibit a stronger relationship to tenure than those in the 1997 sample, which will be observed from the results of the pooled 1997 and 2014 model. This hypothesis reflects the changing nature of the labour market in Canada; the rise of increasing global competition, technological change, and other economic influences have created a more competitive job market, which means that, overall, workers are more likely to have shorter-term employment in recent years, compared to the 1997 cohort due to the changing nature of work (Morisette, Hou, & Schellenberg, 2015).

3.2 Data & Methods

Based on existing theoretical frameworks utilized in the underemployment research, the present study adopts the *person-job* (P-J) *fit* model (see Appendix 2) as a theoretical perspective to investigate the relationship between job-education match and tenure levels among young Canadians, relative to the remaining working population. From the wide scope of literature pertaining to the fit between employees and their work, P-J fit narrows the scope to the individual level, which allows for a better understanding of the match between an individual's skills and the requirements of a job (Edwards, 1991). The P-J fit model suggests that a discrepancy between employees and their job can be understood by comparing the education, skills, or experience of an individual with the demands of a job (McKee-Ryan & Harvey, 2011). Overeducation, one of the

dimensions of underemployment outlined by Feldman (1996), is used as a measure of individual mismatch outcomes. This study also adopts the *job analysis* (JA) approach (Hartog, 2000) to objectively measure underemployment using the National Occupational Classification (NOC) 2011 as a reference for occupational categories and corresponding education levels to measure overeducation. The NOC 2011 was created by Statistics Canada and Human Resources and Skills Development Canada as an update to integrate the formerly distinct NOC-S (Statistics Canada) and NOC (HRSDC) coding systems into a unified version. This taxonomy provides a Canada-wide framework for organizing occupations into broad categories, based on the type of work performed, and by the occupations' tasks, duties, and responsibilities (Statistics Canada, 2012).

This study uses archival data from the 1997 and 2014 master files of the Labour Force Survey (LFS), conducted monthly by Statistics Canada. The questionnaire for the LFS includes relevant data regarding individuals' highest level of education and labour force information, such as occupation and industry (Statistics Canada, 2016). Coverage of the LFS excludes: "persons living on reserves and other Aboriginal settlements in the provinces, full-time members of the Canadian Armed Forces, the institutionalized population, and households in extremely remote areas with very low population density", which represents approximately 2% of the working population aged 15 and over (Statistics Canada, p. 20). The sample design strata divide the population based on Census (2011) data and the National Household Survey (2011). While the LFS does include respondents from all provinces and territories, the sampling framework used in the territories is different from that used in the provinces; as such, the present study includes cases only from provinces (Statistics Canada, 2016). The LFS forms a sample using a rotating panel of households, which opens the potential for respondents to be included in the panel for up to six months at a time. To address possible overlap in survey data, the present analysis uses cases from

January and July. The non-response rate of selected households averages at 10%, while reaching approximately 56,000 households monthly (Statistics Canada, 2016), which allows for a representative sample of the intended working population.

As noted in the review of the underemployment literature, one of the challenges in implementing either objective or subjective measures is access to appropriate data. While the National Graduate Survey (NGS) is a popular dataset for research pertaining to Canadian graduates' activity, the NGS is currently inactive and the most recent survey data (2010) would not be representative of the current working population. For this reason, the LFS has been selected based on its sample size, cross-sectional scope and necessary variables: education level and occupation. Due to the limitations of the LFS questionnaire, a self-assessment measure is not feasible since respondents are not asked of their perceptions regarding work and education. Clogg and Shockey (1984) suggest a measure of mismatch is useful when it is "comprehensive, or applicable to broad categories of workers", and "able to deal with fluctuations in labour force behaviour over time" (p. 239). To reflect these considerations, the present study utilizes the NOC's broad classification scheme, and investigates two distinct points in time, 1997 and 2014, using the job analysis approach.

3.2 Research Design

For the purposes of this study, 'young workers' are represented by individuals 25 to 34 years of age, consistent with the age cohort established by Statistics Canada in demographic results within its economic reports. This distinction of age range also allows for the completion of at least a four-year degree and a few years of transition from school to work. For the purposes of comparison, individuals aged 35 to 64 are used as a benchmark, to represent the remaining group of individuals in the labour force up to age of 64, a commonly used upper limit of the working

population prior to the Canadian retirement age. Omitted from the sample are current students (full or part-time status) and unemployed individuals, to best reflect the intended demographic of young Canadians fully engaged in the workplace. Any remaining cases in the LFS based on the above sample restrictions which contain missing values for any of the variables used in the analysis (detailed in 3.3.2) are removed; as a result, 35,305 cases are omitted from the sample.

As noted, to account for the rotating panels of the LFS, the sample is restricted to responses obtained in the months of January and July from each LFS file, to ensure each case is unique. Edwards (1991) notes "more accurate estimates will be obtained by employing large samples drawn from a variety of jobs, occupations, and industries" (Edwards, 1991, p. 329). While most studies in P-J fit rely on small samples of 200 or under within a single job (Edwards, 1991), an advantage of the present study is the large sample of LFS survey respondents aged 25 to 34 across all education levels and occupational categories, in order to assess the trends in job-education match levels between age groups and across time. Based on these restrictions, the study will use a working sample of 160,737 total respondents between the 1997 and 2014 LFS files.[1]

In previous congruence literature, a common methodology for assessing fit is the reduction of person and job measures into a single index to identify the level of similarity between them (Edwards, 1991). As per the job analysis method, the present evaluation based on the level of education credentials in occupations is conducted using the National Occupational Classification, the nationally accepted taxonomy of occupations in Canada, developed by Employment and Social Development Canada (ESDC) and Statistics Canada. The 2011 version of the NOC is used for consistency with existing codes found in the LFS. The NOC is organized in a four-level hierarchy,

[1] All figures hereafter are presented in weighted figures to meet the output requirements of the Canadian Research Data Centre Network.

which includes 40,000 occupations categorized under 10 broad occupational categories, 40 major groups, and 140 minor groups, and 500 unit groups. The categories and titles of this taxonomy, while not exhaustive, are used to cover the most commonly understood occupation titles in the Canadian labour market.

The NOC contains detailed information compiled by job analysts regarding the main duties and employment requirements commonly found in each occupational category. Occupations may fluctuate in the type or level of requirements, however, and therefore each individual title includes a range of acceptable education requirements. Occupations with employment requirements listed as 'required' indicate a consistent requirement from employers, but may also include additional employment requirements listed as 'usually' or 'may be' required, which are used to describe qualifications not common across all employers. To address these ranges, this study adopts the NOC 2011 skill matrix as a way of organizing each occupation into a set of defined skill levels, which provide a range of education credentials to reflect "the most commonly accepted educational, training, or preparatory routes for entering employment" (Statistics Canada, 2012, p. 13). All occupations are then coded with an associated skill level, denoted by the second digit of the 4-digit NOC code. One exception to Table 1 is the sorting of all management occupations (NOC codes beginning with 00 to 09), which are all labeled as skill level A.

3.2.1 Job-Education Match Variable

The education requirements identified in the NOC skill matrix are matched with the response categories of the LFS to fit the four skill levels, illustrated in Table 2. A new set of dummy variables for *job-education match* are created to categorize all workers in the

Table 1: NOC Skill Variable Codes

NOC Skill Matrix	NOC Code
Skill Level A	NOC 2nd digit 0 or 1
Skill Level B	NOC 2nd digit 2 or 3
Skill Level C	NOC 2nd digit 4 or 5
Skill Level D	NOC 2nd digit 6 or 7

sample as one of the following: match, underqualified, or overqualified. An individual is deemed a *match* where his/her education level is equal to the employment requirements of the NOC skill matrix; *underqualified* where his/her education level is less than the employment requirements of the NOC skill matrix; and *overqualified* where his/her education level is more than the employment requirements of the NOC skill matrix (Frenette, 2004). Scurry and Blenkinsopp (2011) identify three approaches to measuring underemployment, one of which is "the educational requirements of an occupation" (p. 647) which supports the match measurement in this study.

Table 2: NOC 2011 Skill Level Matrix Criteria

NOC Skill Level Matrix	**Educational Requirement (NOC)**	**Education Credentials (LFS)**
Skill Level A	• University degree (Bachelor's, Master's, or Doctorate)	9 = Above Bachelor's degree 8 = Bachelor's degree
Skill Level B	• Community college, institute of technology or CEGEP • Apprenticeship training	7 = University certificate below Bachelor's 6 = Community college, CEGEP, etc. 5 = Trades certificate or diploma
Skill Level C	• High school diploma • Some secondary school education	4 = Some post-secondary education 3 = Grade 11-13, graduate
Skill Level D	• No formal educational requirements	2 = Grade 11-13, non-graduate 1 = Grade 9-10 0 = Grade 8 or lower

To illustrate this coding process, a sample occupation, *Retail Salesperson*, is coded as 6421 in the NOC 2011. This occupation falls under Skill Level C in the NOC skill matrix, which is associated with education credentials within the range of 'Grade 11 to 13, graduate' to 'some postsecondary education'. If, for example, an individual's highest education in the LFS is coded as 8 for a Bachelor's degree, then the individual would be deemed *overqualified* (since the NOC Skill Level was less than the individual's highest education credential). Similarly, if the same

individual's education was coded as 1 in the LFS for 'Grade 9 to 10', the individual would be deemed *underqualified* (since the NOC skill level exceeds individual's highest education level).

3.3 Procedure

The analysis involves estimating a series of ordinary least squares (OLS) regressions using the natural log of tenure, measured for individuals' primary job as the outcome variable. Models are estimated separately for young workers (25 to 34 years of age) and the remaining working sample (35 to 64 years of age) for the years 1997 and 2014, in order to observe the difference in the relationship between job-education match and tenure for young versus older workers as well as across time. The distribution of tenure is weighted and binned into a percentage scale in the histograms to comply with weighted output procedures from Statistics Canada's Research Data Centre (RDC). Based on the initial histogram of the tenure variable (Charts 1a and 1b), the data is left-skewed, as the majority of cases have relatively short tenures (measured in months). A log transformation of the tenure variable is used to pull outlying data closer to the bulk of the data to follow an approximately normal frequency distribution (Charts 2a and 2b), and to correct potential violations of the parametric assumptions associated with conducting an OLS regression (Winer, 1962). Appendix 4 includes weighted frequency tables for each age group by survey year; the working sample size was unchanged from the initial sample following the log transformation.

Chart 1a: Tenure in Months (% of Age 25-34 sample)

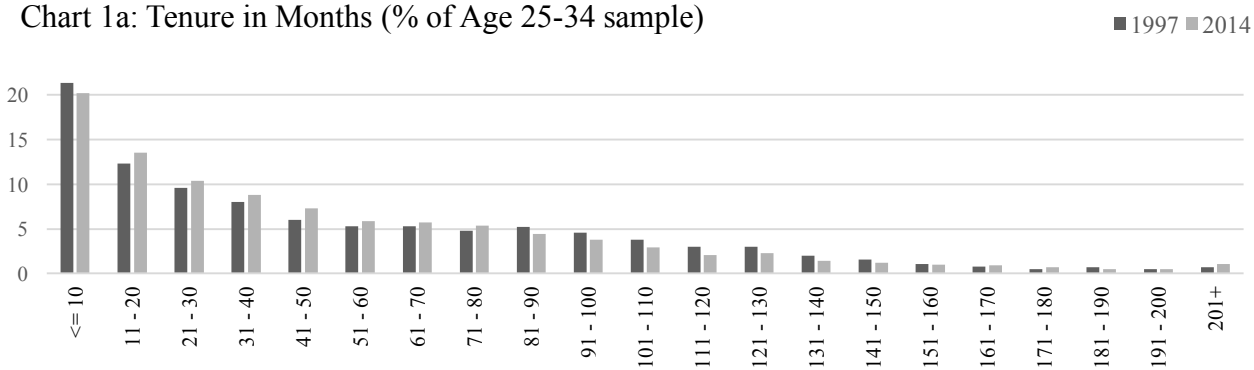


Chart 1b: Tenure in Months (% of Age 35-64 sample)

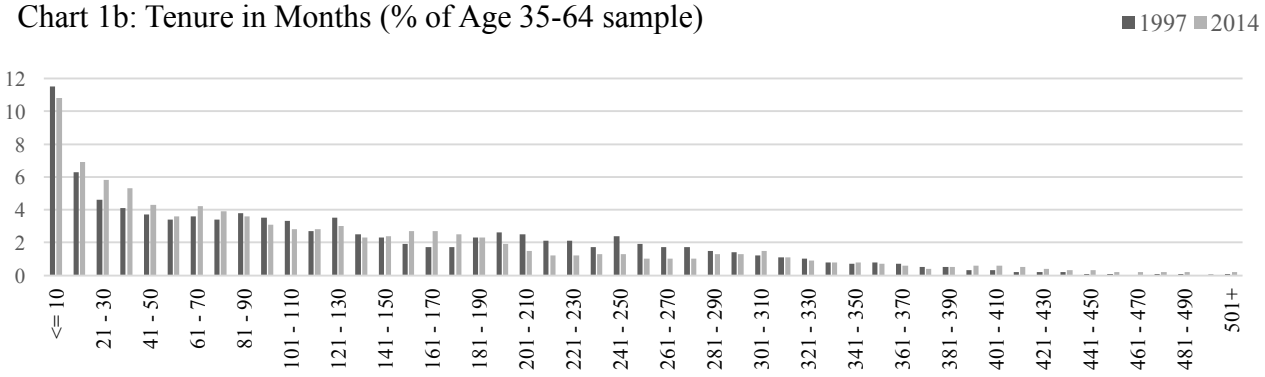


Chart 2a: Log Tenure (% of Age 25-34 Sample)

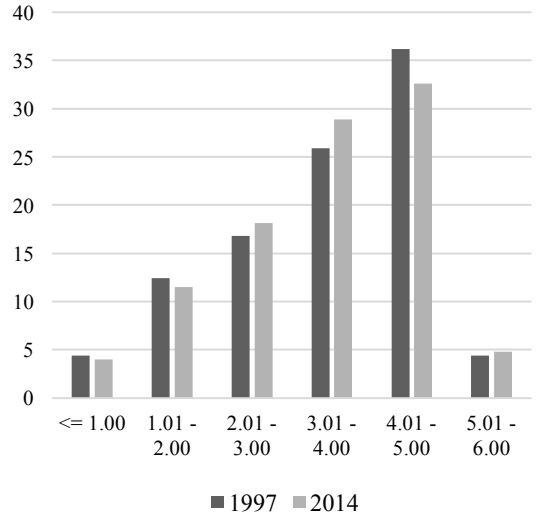
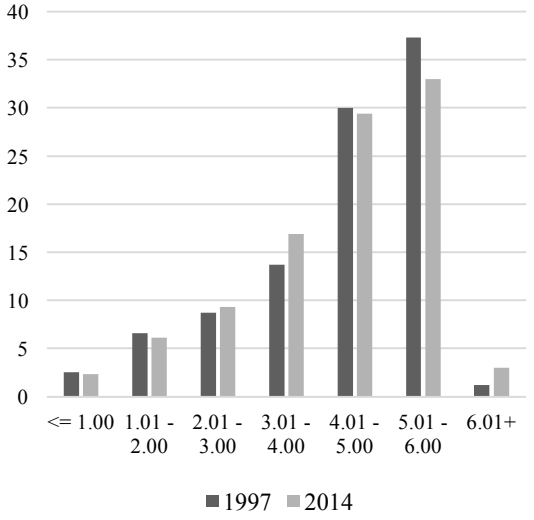


Chart 2b: Log Tenure (% of Age 35-64 Sample)



The key independent variable in the model is whether or not a respondent's education level matches his/her job as outlined above. As described above, two possible dummy variables are included, one denoting an *overqualified* respondent (i.e. where education credentials from LFS > NOC requirements for the job) and a second if the respondent is *underqualified* (i.e. education credentials from LFS < NOC requirements for the job) with job-education *match* (i.e. education credentials from LFS = NOC requirements for the job) as the omitted reference.

3.3.1 Control Variables

A number of control variables are included based on similar empirical research: *age* (Vahey, 2000; Walters, 2004; Drewes, 2010; Frank & Walters, 2012; Fenesi & Sana, 2015), *gender* (Vahey, 2000; Walters, 2004; Drewes, 2010), *province* (Vahey, 2000; Frenette, 2004; Walters, 2004), *highest level of education attained* (Vahey, 2000; Frenette, 2004; Drewes, 2010; Frank & Walters, 2012), *public or private status* (Vahey, 2000), *permanent or temporary job status* (Finnie, 2000; Fenesi & Sana, 2015), *union status* (Vahey, 2000), and *occupational classification* (Vahey, 2000; Frenette, 2004). Prior empirical research interpreting overqualification has also accounted for work experience (Frenette, 2004). In order to account for the effect of relevant work experience in the model, *age squared* is included as a proxy, since such information is not available in the LFS. The older an individual, the more years of work experience can likely be accumulated. Since age is highly correlated with work experience, age squared is commonly used where survey data does not have available information on work experience (Luong & Hébert, 2009).

Key control variables include those for whether or not an individual is covered by a collective agreement (union member) and if the respondent works in a public or private sector organization (class of worker). These variables are noteworthy in that they may capture some reasons why individuals may remain in a job that does not match their current level of education if public sector and/or unionized employment provide security or additional benefits not found in private and/or non-union employment. Empirical evidence from Freeman (1980), for example, suggests that job tenure increases where workers are unionized; such reductions in exits are argued to be the result of the grievance procedures and improvements in wages and working conditions of unionized environments. Green and Riddell (1997) found a 'hollowing out' of medium-term jobs in Canada, due to increases in short-term and long-term in-progress jobs from 1979 to 1991.

Heisz (2005) also found a polarization of job tenure, characterized by increases in 'short jobs' and 'long jobs'; based on LFS data, estimated retention rates were lowest for the youngest workers of the sample, and retention rates increased as young workers aged up to 55 years, at which point retention rates decreased. Heisz (2005) notes this reflects the labour market experience of young workers, who "have more opportunities to find a good job match and more time to accumulate tenure" (p. 13). Retention rates also saw slight decreases over time for the 15 to 24 age group, which might be attributed to the trend of increasing school participation rates among young people. In the same period of time, retention rates increased with educational attainment.

To avoid the potentially confounding effects of school attendance and labour force attachment, the sample is restricted to exclude current students and defines young workers at age 25 and up. While Healy, Lehman, and McDaniel (1995) found a weak relationship between age and voluntary turnover, Ng and Feldman (2009) find a moderately strong relationship between age and turnover, and calls for further research which investigates "*who* is more likely to voluntarily leave their organizations, not only among older workers but among younger workers as well" (Ng & Feldman, 2009, p. 290). Based on these findings, the age-turnover relationship is investigated by measuring tenure patterns for each age group to make inferences on voluntary turnover.

3.3.2 Interaction Terms

In order to test whether the relationship between job-education match and tenure is different for young versus older workers as well as across time, a pooled OLS regression is estimated using log tenure as the dependent variable. The pooled model includes both age groups and both years of survey data, with dummy variables denoting the 2014 survey year and whether the respondent falls within the 25 to 34 age cohort. In addition to the key independent variables for job-education match and control variables described above, the pooled model includes

interaction terms, which allow for statistically testing the differences in job-education match between age cohorts and over time, controlling for other observable characteristics. Specifically, the following 8 interaction terms are formed:

Figure 1: Interaction Terms

1) overyoung = overqualified * youngworkers;
2) underyoung = underqualified * youngworkers;
3) over2014 = underqualified * surveyyear2014;
4) under2014 = underqualified * surveyyear2014;
5) youngtime = youngworkers * surveyyear2014;
6) over3way = overqualified * surveyyear2014 * youngworkers; and
7) under3way = underqualified * surveyyear2014 * youngworkers.

The interactions between age cohort and job-education match (1 and 2) test for a difference in the relationship between turnover and mismatch between age cohorts (i.e. whether turnover is different for young workers, relative to older workers). The interaction between the 2014 survey year and mismatch (3 and 4) tests whether rates of overqualification have changed between 1997 and 2014 for the entire sample of workers. The interaction between age cohort and time (5) tests whether turnover rates have changed for young workers from 1997 to 2014. And finally the three-way interactions between mismatch, time, and age cohort (6 and 7) tests whether the rates of turnover are different for young workers over time, relative to older workers over time. Figure 2 illustrates the equations for each model of the analysis where each of the variables (with the exception of age and age squared, which is continuous, and over/underqualified) contains a set of dummy variables related to that category. For the purposes of interpretation, the category of these variables are listed, rather than the complete set of dummy variables contained in the model.

Figure 2: Model 1

$$\text{Log}(\text{tenure}_{1997\,/\,2014}) = b_0 + \beta_1\ \text{age} + \beta_2\ \text{age}^2 + \beta_3\ \text{sex} + \beta_4\ \text{province} + \beta_5\ \text{education level} + \beta_6\ \text{public/private sector} + \beta_7\ \text{job status} + \beta_8\ \text{union status} + \beta_9\ \text{occupation industry} + \beta_{10}\ \text{overqualified} + \beta_{11}\ \text{underqualified} + e$$

Figure 3: Model 2

$$\text{Log}(\text{tenure}_{\text{Pooled}}) = b_0 + \beta_1\ \text{age} + \beta_2\ \text{age}^2 + \beta_3\ \text{sex} + \beta_4\ \text{province} + \beta_5\ \text{education level} + \beta_6\ \text{public/private sector} + \beta_7\ \text{job status} + \beta_8\ \text{union status} + \beta_9\ \text{occupation industry} + \beta_{10}\ \text{overqualified} + \beta_{11}\ \text{underqualified} + \beta_{12}\ \text{overyoung} + \beta_{13}\ \text{underyoung} + \beta_{14}\ \text{over2014} + \beta_{15}\ \text{under2014} + \beta_{16}\ \text{youngtime} + \beta_{17}\ \text{over3way} + \beta_{18}\ \text{under3way} + e$$

Chapter 4: Results

4.1 Descriptive Statistics

Weighted frequency tables are provided in Appendix 4 of the variables used for analysis in each model. Bootstraps have recently been added to the LFS files, however, these are not used in the present analysis. Final survey sampling weights are rescaled to reflect the change from 12 to 2 survey months of data. As such, caution should be used when interpreting standard errors in the models. From the sample restrictions outlined in the Data & Methods section, the frequency results from the pooled model indicate the sample is comprised mostly of private sector workers (74.2%), individuals not bound by a collective agreement (64.4%), and individuals employed with a permanent job status (91.4%). The highest proportion of respondents are categorized as having a community college diploma (22.3%), a high school diploma (19.9%), or a Bachelor's degree (17.7%) as his/her highest level of education attained at the time of the survey. The sample is also in line with the trend of increasing post-secondary education graduates in Canada (Office of the

Parliamentary Budget Office, 2015); Bachelor's degree holders, for example, represented 25.3% of the sample of young workers in 2014, compared to 17.0% in the 1997 sample. The proportion of high school diploma holders among the young worker sample is less in 2014 than the 1997 survey, which corroborates prior evidence of longer school stays in Canada (Fields, Uppal, & LaRochelle-Côté, 2017).

Observing the sample frequencies by age cohort, the 25 to 34 group are mainly private employees, with a slight decrease in proportion between survey years, from 81.2% to 78.8%. Similarly, the proportion of young workers with permanent employment is lower in 2014 at 90.4%, relative to the 1997 sample at 88.3%. Young workers with non-union membership is relatively equal across survey years, at approximately 70% of the sample in both 1997 and 2014. For the 35 to 64 age cohort, the proportion of private employees remains relatively similar, with 70.5% and 72.5% of respondents in the 1997 and 2014 surveys respectively. Similar to the sample of young workers, the proportion of older workers with a permanent job status declined slightly between the 1997 and 2014 samples, from 93% to 91.9%. Union status shows a more pronounced decline in its proportion of older workers in the 2014 sample at 33.2%, relative to the 1997 sample, 39.3%. Across age cohorts, frequency tables indicate the following for both 1997 and 2014 samples: 1) the proportion of private sector status respondents is comprised of more young workers; 2) the proportion of permanent job status is comprised of more old workers; and 3) the proportion of union status is comprised of more old workers.

As noted in the Data & Methods section above, the dependent variable, tenure, is left-skewed across all samples. While a tobit regression is traditionally used for such distributions, a preliminary test found that the ordinary least squares method was a better fit of the data than the

tobit method based on the resulting R^2 values[2]. The allocation of the sample based on the criteria of the NOC 2011 skills matrix is provided in Tables 3a and 3b. For the 25 to 34 age group, skill level C had the highest proportion of respondents in the 1997 sample at 33.1%, and skill level B for the 2014 sample at 37.3%. For the 35 to 64 age group, skill level B had the highest proportion of respondents in the 1997 and 2014 samples, with 32% and 34% respectively. For both age groups in the 1997 and 2014 samples, the majority of respondents are categorized under skill levels B and C, while skill level D had the lowest proportion of respondents across both age groups in both samples. Relative to the 2014 sample, a higher proportion of respondents in the 1997 sample were categorized in lower skill levels. Skill level A, for example, saw a +1.8 percentage point difference between the 1997 and 2014 sample, which implies that a) young Canadians are now working in occupations with higher educational requirements, and b) more of this age cohort now has the education credentials to work in occupations with higher skill levels.

Table 3a: NOC Skill Matrix Levels, 1997 Sample by Age Group*

	25-34		35-64	
	Freq.	**%**	**Freq.**	**%**
Skill Level A	721,806	24.9	1,692,230	27.5
Skill Level B	936,319	32.3	1,969,141	32.0
Skill Level C	959,510	33.1	1,901,451	30.9
Skill Level D	281,186	9.7	590,742	9.6
*Weighted n	n = 2,898,821		n = 6,153,564	

Table 3b: NOC Skill Matrix Levels, 2014 Sample by Age Group*

	25-34		35-64	
	Freq.	**%**	**Freq.**	**%**
Skill Level A	861,631	26.7	2,365,263	27.4
Skill Level B	1,203,702	37.3	2,934,998	34.0
Skill Level C	897,129	27.8	2,581,072	29.9
Skill Level D	264,621	8.2	751,014	8.7
*Weighted n	n = 3,227,083		n = 8,632,347	

[2] Due to technical limitations with IBM SPSS Statistics 24, the tobit regression model was tested using Stata 15.

Based on the job-education match classification outlined in 3.2.1, Table 4 outlines the dispersion of respondents based on the objective match between the educational requirements of an occupation based on the NOC 2011 taxonomy, and the highest level of education attained based on the LFS questionnaire. Both 1997 and 2014 samples indicate that of the three categories, the highest proportion of respondents are deemed matches; however, more than half of the sample in each year are categorized as being either over or underqualified. For example, the proportion of respondents in the younger age group that are deemed over and underqualified is 27.3% and 27.6% respectively. Of note is the increase in the proportion of overqualified respondents in the 25 to 34 age group between the 1997 and 2014 samples, from 27.3% to 32.3%. The 35 to 64 age group also saw an increase in the proportion of overqualified respondents, from 18.8% to 29.4% of the sample. The proportion of overqualified respondents is higher for the younger age group compared to the older age group in both the 1997 and 2014 samples, and conversely for the proportion of underqualified respondents. Overall, the job-education match classification suggests the proportion of overqualified respondents has increased across all ages of the sample and between the 1997 and 2014 samples.

Table 4: Job-Education Match by LFS Sample Year*

	1997 Sample				**2014 Sample**			
	25-34		**35-64**		**25-34**		**35-64**	
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Over	791,378	27.3	1,156,870	18.8	1,042,348	32.3	2,537,910	29.4
Match	1,307,368	45.1	2,750,643	44.7	1,571,589	48.7	3,988,144	46.2
Under	800,075	27.6	2,246,051	36.5	613,146	19.0	2,106,293	24.4
	n = 2,898,821		n = 6,153,564		n = 3,227,083		n = 8,632,347	

*Weighted n

Weighted descriptive statistics are provided for each of the models in Tables 5a and 5b. The mean age for the 25-34 and 35-64 age groups in 1997 are 29.8 and 45.3 respectively, while

the mean age for the 2014 age groups are 29.6 and 48.1 years. Mean tenure (in months) for both age groups are lower in the 2014 sample than the 1997 sample, with a 2.3-month difference for the 25 to 34 group, and a 3.5-month difference for the 35 to 64 group.

Table 5a: Weighted Descriptive Statistics, 1997 Sample*

	25-34		35-64	
	Mean	**Std. Dev**	**Mean**	**Std. Dev.**
Age	29.8	2.87	45.3	7.24
Age squared	893.5	169.72	2106.0	685.58
Tenure	53.6	47.77	133.0	109.37

*Weighted n n = 2,898,821 n = 6,153,564

Table 5b: Weighted Descriptive Statistics, 2014 Sample*

	25-34		35-64	
	Mean	**SD**	**Mean**	**SD**
Age	29.6	2.86	48.1	7.94
Age squared	882.5	168.99	2381.1	772.43
Tenure	51.3	47.52	129.5	115.99

*Weighted n n = 3,227,083 n = 8,632,347

4.2 Regression Output

4.2.1 Sample Output, 1997

Based on the regression model summary, the demographic and work-related predictors of the first two steps accounted for 20.3% of the variation in tenure for young workers in the 1997 sample; the inclusion of the job-education match overqualified and underqualified predictors had a marginal increase in the model's R^2 to 20.5%. The difference between the R^2 and adjusted R^2 is nominal, which supports the cross-validity of the *model*. The *F*-statistic for each step in the regression model indicate the change in R^2 is significant, $p < .001$. *F*-statistics for each step of the regression model, 9,611.15, $p < .001$; 22,449.69, $p < .001$; and 21,368.40, are all significant ($p <$

.001). Each step of the model significantly improves the ability to predict tenure, when compared to not fitting the model and using the mean of tenure.

Table 6: Regression Model, 1997 Sample

25-34 Age Group		35-64 Age Group	
	b		***b***
Constant	-2.494	Constant	-1.070
Underqualified	0.069***	Underqualified	0.138***
Overqualified	-0.114***	Overqualified	-0.221***
$R^2 = 0.065$ for Step 1		$R^2 = 0.053$ for Step 1	
$\Delta R^2 = 0.138$ for Step 2		$\Delta R^2 = 0.215$ for Step 2	
$\Delta R^2 = 0.002$ for Step 3		$\Delta R^2 = 0.004$ for Step 3	
***$p < .001$		***$p < .001$	

The model parameters are summarized in Table 6; the unstandardized *b*-values indicate 1) a positive relationship between the predictor of underemployed and tenure; and 2) a negative relationship between the predictor of overqualified and tenure. Therefore, *overqualification* is negatively related to log tenure in months, and *underqualification* is positively associated with log tenure, all other predictors held constant. The *t*-statistics associated with the *b*-values for underqualified, $t = 25.03$, $p < .001$, and overqualified, $t = -62.82$, $p < .001$, suggest these predictors are making a significant contribution to the model. In Model 3 for the 25 to 34 age cohort in 1997, all control variables are statistically significant, $p < .001$, with the exception of NOC category 7: trades, transport and equipment operators and related occupations.

For the older workers group, ages 35 to 65, the first two steps of the model accounted for 26.8% of the variation in log tenure in the 1997 sample, and the overqualified and underqualified predictors increased the model's R^2 to 27.2%. Similar to the young workers sample, the adjusted R^2 is marginally different from the R^2 of the model, and the *F*-statistic at each step of the model is significant, $p < .001$. *F*-statistics of 16,461.20, $p < .001$; 68,388.641, $p < .001$; and 65,956.393, *p*

< .001; suggest each step of the model is significant in predicting tenure. The model parameters indicate a similar pattern to the young age group sample: a positive relationship between underqualified (b = 0.138) and log of tenure, and a negative relationship between overqualified (b = -0.221) and log of tenure. t-statistics of the b-values for underqualified, t = 103.40 and overqualified t = -155.41 make significant contributions to the model, $p < .001$. In Model 3 for the 35 to 64 age cohort in 1997, all control variables are statistically significant, including the previously insignificant NOC category 7 with the sample of young workers.

4.2.2 Sample Output, 2014

The model accounted for 14.9% of the variation in log tenure for the 2014 sample of young workers; the inclusion of the underqualified and overqualified predictors slightly increased the predictive power of the model, to an R^2 value of 0.155%. The adjusted R^2 is again only marginally different from the R^2 value, and the F-statistics are significant at each level of the model: 9,046.43, $p < .001$; 17,099.02, $p < .001$; and 16,986, 21, $p < .001$. The model parameters indicate a positive relationship between log tenure and 'underqualified' (b = 0.125), and a negative relationship with 'overqualified' (b = -0.226). The t-statistics of these values (underqualified t = 60.87, and overqualified t = -141.53) are both significant, $p < .001$. In Model 3 of the 25 to 34 age cohort in 2014, all controls variables are statistically significant, with the exception of the 'Grade 11-13, non-graduate' education level and NOC category 5, 'Occupations in art, culture, recreation, and sport'. For the 35 to 64 age group, the model produced an R^2 value of 0.211, again with a marginally different adjusted R^2. F-statistics at each step (26,256.90, 66,444.22, and 66,127.61) are all significant, $p < .001$. The model parameters, as found in each of the previous samples above, found a positive unstandardized beta value for 'underqualified' (b = 0.103) and negative unstandardized beta value for 'overqualified' (b = -0.311). t-statistics for 'underqualified' t = 83.48

and overqualified t = -289.29, are both significant, $p < .001$. Control variables in the model for the 35 to 64 age group are all statistically significant, with the exception of the Nova Scotia dummy variable.

Table 7: Regression Model, 2014 Sample

25-34 Age Group		**35-64 Age Group**	
	b		***b***
Constant	-0.786	Constant	0.040
Underqualified	0.125***	Underqualified	0.103***
Overqualified	-0.226***	Overqualified	-0.311***
$R^2 = 0.056$ for Step 1		$R^2 = 0.60$ for Step 1	
$\Delta R^2 = 0.093$ for Step 2		$\Delta R^2 = 0.142$ for Step 2	
$\Delta R^2 = 0.007$ for Step 3		$\Delta R^2 = 0.009$ for Step 3	
***$p < .001$		***$p < .001$	

4.2.3 Sample Output, Pooled

For the pooled sample, the added interaction terms in the model are all significant, $p < .001$. The model produced a nominal R^2 change of 0.001, and almost identical adjusted R^2 value. The *F*-statistics (step 1 = 75303.05, step 2 = 119497.96, step 3 = 115807.88, step 4 = 92508.716) are significant, $p < .001$ for each step of the model. The model parameters, summarized in Table 8, produced similar to the previous iterations: a positive unstandardized beta value for *underqualified* (b = 0.138) and a negative value for *overqualified* (b = -0.274). Key control variables in the model are statistically significant, including all occupation-related variables, particularly job status, sector status (public/private), union status, and NOC category. In Model 4, the only control variables not statistically significant are dummy variables for Nova Scotia and Quebec.

The interaction terms produced positive beta values for *overyoung* (whether the incidence of overqualified is different for younger workers, relative to older workers), *underyoung* (whether the incidence of underqualified is different for younger workers, relative to older workers), *youngtime* (whether the incidence of tenure is different for younger workers in 2014, relative to younger workers in 1997), and *under3way* (whether the incidence of underqualified and tenure is different for younger workers, relative to older workers in 1997). Conversely, negative beta values are produced for *over2014* (whether the incidence of overqualified is different for all workers in 2014, relative to all workers in 1997), *under2014* (whether the incidence of underqualified is different for all workers in 2014, relative to 1997), and *over3way* (whether the incidence of overqualified and tenure is different for younger workers, relative to older workers in 1997). *t*-statistics (see Appendix 5) are all significant, $p < .001$. Detailed output from IBM SPSS Statistics 24 for each regression model iteration are found in Appendix 5. The effects of *underqualified* and *overqualified* are further explored in Chapter 5 using Halvorsen & Palmquist's (1980) equation[3] to transform the coefficients of both dummy variables to interpret their percentage effect on log tenure.

Table 8: Regression Model, Pooled Sample

	b
Constant	-0.723***
Underqualified	0.138***
Overqualified	-0.274***
overyoung	0.146***
underyoung	0.021***
over2014	-0.023***
under2014	-0.071***
youngtime	0.088***
over3way	-0.024***
under3way	0.072***

$R^2 = 0.131$ for Step 1
$\Delta R^2 = 0.142$ for Step 2
$\Delta R^2 = 0.005$ for Step 3
$\Delta R^2 = 0.001$ for Step 4
***$p < .001$

[3] The relative effect on Y is $g = \exp(c) - 1$, and the percentage effect is equal to $100g = 100 [\text{EXP}(c) - 1]$, where g = the relative effect on Y of the presence of the factor represented by the dummy variable, and c = the coefficient of the dummy variable.

Chapter 5: Discussion

5.1 Job-Education Match & Tenure Between Age Groups, Across Time

The first model testing the 1997 and 2014 survey year samples individually estimates the relationship between job-education match levels and tenure patterns for each age group individually, controlling for all observable characteristics in the model. For younger workers, 1) being overqualified *decreases* length of tenure by 10.8% in 1997 and 20.2% in 2014; and 2) being underqualified *increases* length of tenure by 7.1% in 1997 and 13.3% in 2014. For older workers, 1) being overqualified *decreases* length of tenure by 14.8% in 1997 and 26.7% in 2014; and 2) being underqualified *increases* length of tenure by 14.8% in 1997 and 10.8% in 2014. All else held constant, the pooled model shows length of tenure decreases by 24% when an individual's match level is *overqualified*; for *underqualified* individuals, length of tenure increases by 14.8%. Therefore, the model suggests being underqualified has a positive relationship with tenure levels, and being overqualified has a negative relationship with tenure levels. This result aligns with hypothesis 1a which anticipated a negative relationship between overqualification and tenure for young Canadians; an overqualified job-education match status is related to a decrease of tenure in months; conversely, an underqualified job-education march status constitutes an increase of tenure in months. The negative relationship found between overqualification (based on job-education match) and tenure represents less time in months for young workers' in his/her primary job. Qualitatively, the two survey years show stronger negative effects from overqualification on length of tenure for the 2014 sample, compared to the 1997 sample; young workers, specifically, show a difference of 9.4% between survey years.

As outlined in Chapter 3, a pooled sample of both survey years is tested to make statistical inferences and account for the differences between survey years and age groups. Step 4 of the

model, which includes the interaction terms, is statistically significant in improving the model's fit, $p < .001$; in addition, the effects of all interaction terms are statistically significant, $p < .001$, therefore the effect of job-education match (over/underqualified) has a different effect on tenure depending on the values of age and survey year. The *overyoung* interaction found a significant difference in the relationship between having an *overqualified* job-education match status and age. There is a positive relationship between the *overyoung* and *underyoung* interaction terms, which suggests that young workers are more likely to be overqualified relative to older workers (35 to 64), holding all controls and survey year constant. Therefore, over and underqualification is higher for younger workers, relative to older workers in the sample, which meets hypothesis 2a and 2b. The *over2014* interaction found a difference in the rate of over/underqualification between survey years; a negative relationship between tenure and over/underqualified. The *youngtime* interaction also finds a significant positive difference in tenure levels between the 1997 and 2014 survey years for young workers. When observing the interaction terms, tenure decreased significantly more for older workers. The interaction terms included in the pooled model are statistically significant, indicating age and survey year moderate the relationship between job-education match levels and tenure.

As per the person-job fit model, these estimates suggest the mismatch between the abilities of employees (e.g. education) and the demands of employers (e.g. job requirements) has produced reduced tenure levels as an outcome of such a mismatch, an effect which has become stronger across time between the 1997 and 2014 survey years. The findings of this study offer a number of implications for key stakeholders involved in the employment relationship, and more broadly, those involved in the school-to-work transition. The observed relationship between overqualification and tenure has consequences at the individual, organizational, and societal level.

At the individual level, job holders are faced with the incidence of a mismatch between his/her abilities and the demands of the employer. As per the person-job fit model, the lack of fit between these two elements produces the consequence of reduced length of tenure.

At the organizational level, lower tenure levels have implications for the employers of affected young workers. While voluntary turnover cannot be definitively ascertained by this study's results, lower tenure signals higher occupation mobility for young workers. HR professionals, for example, should acknowledge the potential for shorter stays among this cohort of young workers, and implement recruitment strategies with the flexibility to account for roles typically filled by candidates of this age group and skillset. In addition, if overqualified employees are more likely to leave their position, and underqualified employees are more likely to remain in their position, this presents a unique challenge for HR professionals to attract talent to remain with an organization. Learning and development costs could conceivably be an added cost of business for remaining employees, if job-education mismatch is an indicator of the skills individuals accumulate from education credentials. From the perspective of educational institutions, particularly at the post-secondary level, these findings signal the need for better alignment with employers with regards to skill development. Considering the rising number of graduates, the persistence of job-education mismatch suggests the acquired skills of many graduates (Frenette, 2004; Fenesi & Sana, 2015) are not fully utilized in the labour market.

At the societal level, the job-education match rates measured across survey years corroborates the observed trend of increasing school stays among young people in Canada (Grant, 2016); these estimates reiterate a mismatch not only between the job requirements and education credentials of young workers, but a mismatch between the accumulated skills from education credentials and skills sought in the labour market by employers. This discrepancy signals a need

for policy changes by provincial governments to improve the school-to-work transition experiences of young Canadians by promoting more collaboration between educational institutions, particularly at the post-secondary level, and employers. Experiential learning, for example, has been increasingly recognized for its tangible benefits for graduates in Ontario (Sattler & Peters, 2013).

5.2 Limitations & Areas for Future Research

A number of limitations regarding this study's analysis should be noted; first, the job-education match criteria used in this analysis is based on the job analysis approach using the NOC 2011 taxonomy, which is an inherently broad measure. The parameters of the education requirements for individual occupations are presented as a range of possible alternatives, with terminology such as 'usually required' and 'may be required' in addition to definite requirements (Statistics Canada, 2012). To ensure a more definitive classification, this analysis adopted the NOC 2011 skills matrix, which plots occupational categories into four skill levels with a clearer range of education credentials, which were paired with existing LFS survey response categories.

Second, due to the absence of LFS survey questions regarding individuals' field of study, this variable cannot be measured in the analysis. The lack of available data on field of study can be attributed to the inactive status of the National Graduates Survey (NGS), as noted in Chapter 3. While the NGS would have offered relevant survey data on key variables, particularly field of study, the survey has traditionally been used for subjective measures of overqualification, as the survey questions ask respondents of his/her perceptions of overqualification. The LFS was adopted to satisfy the most possible amount of necessary variables, and its large sample size for the age groups make it a suitable alternative for studies conducting an objective measure of overqualification. Also noted in Chapter 2, the LFS does not directly measure turnover, and

therefore the present study cannot make definitive conclusions regarding the distinction between voluntary and involuntary forms of turnover based on length of service. Future research using subjective measures would greatly benefit from utilizing a similar Canada-wide dataset with education-specific questions on individuals' perceptions of his/her employment situation.

Third, the sample size restriction of two survey months in order to avoid duplicate responses from participants in the LFS rotational survey could affect the number of people employed in the sample, due to non-standard employment (e.g. seasonal, casual, temporary positions). Considering the proportion of young people employed in a temporary work arrangement, the sample might not fully capture the number of young people employed at a given time in an entire year (Morisette, Hou, & Schellenberg, 2015). Seasonal employment, for example, might be a more common occurrence during peak business months, such as holiday hours for the sales and service industry, which are not captured by January and July survey months. The survey months are of nominal concern, however, considering the large sample size obtained for both age groups, and the scope of the LFS across all provinces, are representative of the working population in Canada in these survey years. In addition to the sample restriction based on survey months, the present analysis does not account for the number of hours worked, which may fluctuate between respondents, particularly those with non-permanent status. Job status is included as a control variable in the present analysis, while acknowledging the limited interpretability of the work experiences of individual respondents without the inclusion of hours worked.

In regards to future research on overqualification, it would be beneficial to incorporate the field of study individuals pursue (Frenette, 2001; Finnie, 2004; Walters, 2016), particularly among young Canadians, to measure match levels relative to the remaining working population. Further research might also include both field of study and graduates of all education levels across an

extended period of time to interpret the trends of education attainment across time, and the effect education choices have on length of service and other relevant employment outcomes for young people. While the present study has used education as a measure of overqualification, future research might incorporate other measures to produce a more holistic estimate. As per the person-job fit model, for example, an objective measurement might include relevant work experience and related field of study, in addition to education credentials that align with the individual's job requirements. Future research might also address the trend of increasing postsecondary graduates in Canada noted earlier by determining whether education credentials have gained or decreased in relevance with occupations held by young workers.

Chapter 6: Conclusion

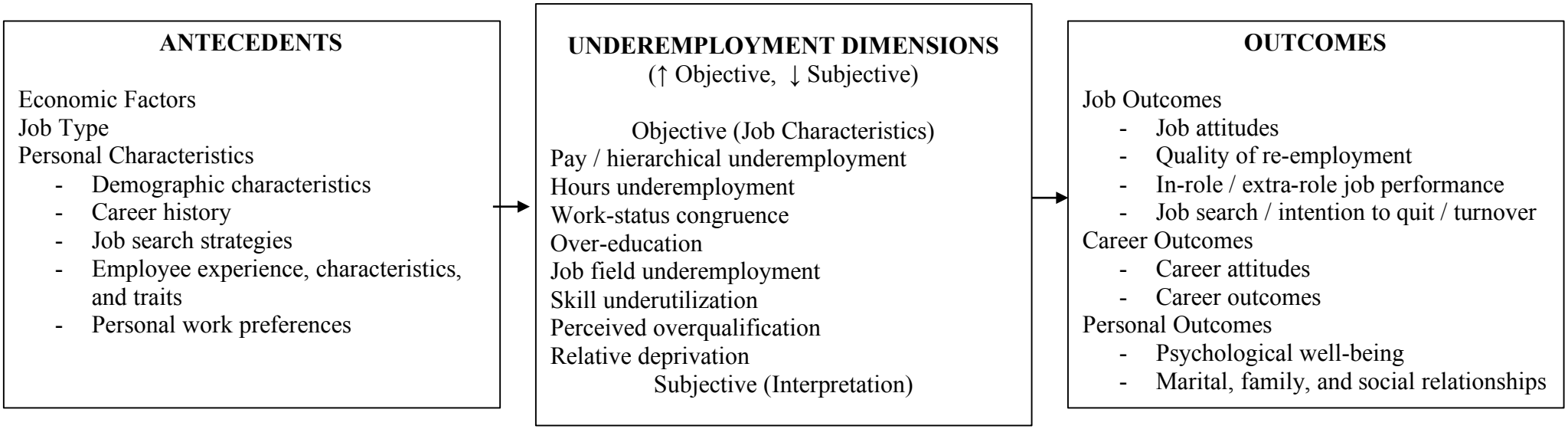
In summation, this study investigated the relationship between job-education match and tenure levels for young workers in Canada, which is found to be statistically significant for both age cohorts sampled: young workers, ages 25 to 34, and older workers, aged 35 to 64. Of note are the negative relationships observed for both age cohorts between length of service and workers deemed overqualified, in addition to the moderating effects of age and survey year on tenure. As per the person-job fit model, the job-related outcome of tenure was associated with a mismatch between the demands of the employer, observed using NOC 2011 job requirements, and the abilities of the employee, observed using individuals' highest education credentials measured in the LFS. While several studies have estimated the returns to educational attainment, particularly among postsecondary graduates, the present analysis offers a large sample of LFS survey respondents in the 25 to 34 age group at all education levels and occupations, which provides a wider scope for interpreting the persistence of overqualification in the Canadian labour market.

The findings of this study contribute to the theoretical perspectives on overqualification research, particularly from a management perspective. First, these findings support the *person-job fit model* which includes tenure as an outcome of fit (or mis-fit) at the individual level, by determining the compatibility between an individual's abilities and employer's demands (Edwards, 1991). Additionally, the significant results obtained for the over/underqualified job-education match levels supports the use of *overeducation* as a framework for investigating congruence. Second, based on the set of economic assumptions and definition of objective overqualification established by Feldman (1996), this study's findings corroborate the measurement of underemployment based on individuals possessing more education than is required in the job using a *job analysis* approach (Hartog, 2000) to compare an individual's accumulated skills to the most common formal requirements in a given occupation. Third, these findings provide support for future research to account for both age and survey year when investigating vertical mismatch.

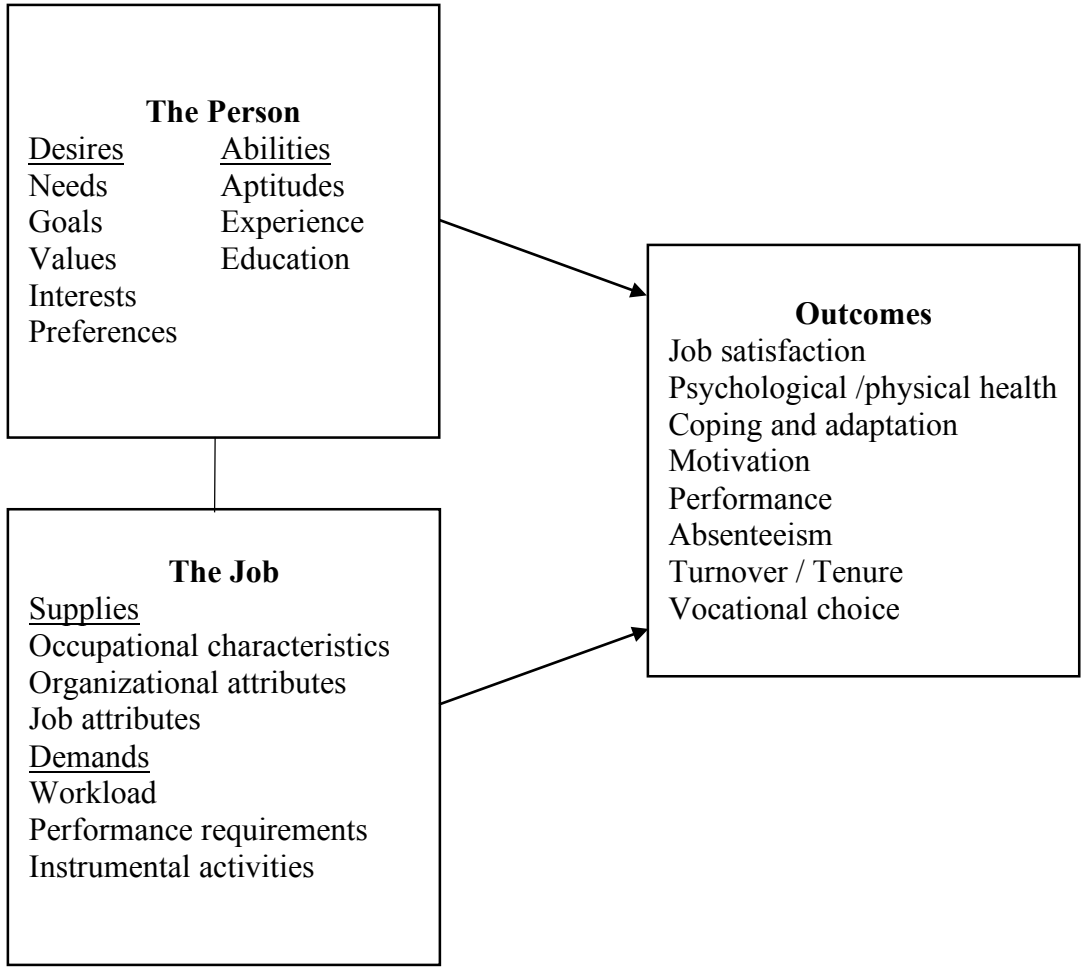
A number of practical implications arise from these findings, particularly for stakeholders involved in the school-to-work transition. Based on the effect of job-education mismatch observed between the 2014 and 1997 surveys, job holders may accrue tenure from several rather than a few organizations in his/her career, as evidenced by shorter length of service patterns among young overqualified workers. The effects of mismatch on tenure also has implications for HR professionals, tasked with attracting and retaining talent within an organization. In addition to recruitment strategies to address such occupational mobility, an organization's approach to learning and development may also require modifications by offering the necessary opportunities for professional development to bring underqualified workers to a 'match'. More broadly, the incidence of job-education mismatch can serve as an indicator for the need to better align the demands of the workplace with the abilities of graduates in Canada.

Appendices

Appendix 1: Theoretical Approaches to Underemployment
Adapted from Feldman (1996) and McKee-Ryan & Harvey (2011).



Appendix 2: Person-Job Fit Model
Adapted from Edwards (1991)



Appendix 3: NOC 2011 Major Groups & Skill Matrix Levels

NOC 2011 Major Groups	**NOC Skills Matrix 2011**
0 = Management 1 = Business, Finance, and Administration 2 = Natural and applied sciences and related fields 3 = Health occupations 4 = Occupations in social science, education, government service, and religion 5 = Occupations in art, culture, recreation, and sport 6 = Sales and service occupations 7 = Trades, transport, and equipment operators and related 8 = Occupations unique to primary industry 9 = Occupations unique to processing, manufacturing, and utilities	A = Occupations usually require university education B = Occupations usually require college education or apprenticeship training C = Occupations usually require secondary school and/or occupation-specific training D = On-the-job training is usually provided for occupations

Appendix 4: Weighted Frequency Tables

Appendix 4a: Weighted Frequency Tables, 1997 Sample

Tenure

25-34			35-64					
	Freq	**%**		**Freq**	**%**		**Freq**	**%**
<= 10	617,449	21.3	**<= 10**	701,506	11.5	104,611	**261 - 270**	1.7
11 - 20	356,555	12.3	**11 - 20**	369,214	6.3	104,611	**271 - 280**	1.7
21 - 30	278,287	9.6	**21 - 30**	283,064	4.6	92,303	**281 - 290**	1.5
31 - 40	231,906	8.0	**31 - 40**	252,296	4.1	86,150	**291 - 300**	1.4
41 - 50	173,929	6.0	**41 - 50**	227,682	3.7	73,843	**301 - 310**	1.2
51 - 60	153,638	5.3	**51 - 60**	209,221	3.4	67,689	**311 - 320**	1.1
61 - 70	153,638	5.3	**61 - 70**	221,528	3.6	61,536	**321 - 330**	1.0
71 - 80	139,143	4.8	**71 - 80**	209,221	3.4	49,229	**331 - 340**	0.8
81 - 90	150,739	5.2	**81 - 90**	233,835	3.8	43,075	**341 - 350**	0.7
91 - 100	133,346	4.6	**91 - 100**	215,375	3.5	49,229	**351 - 360**	0.8
101 - 110	110,155	3.8	**101 - 110**	203,068	3.3	43,075	**361 - 370**	0.7
111 - 120	86,965	3.0	**111 - 120**	166,146	2.7	30,768	**371 - 380**	0.5
121 - 130	86,965	3.0	**121 - 130**	215,375	3.5	30,768	**381 - 390**	0.5
131 - 140	57,976	2.0	**131 - 140**	153,839	2.5	18,461	**391 - 400**	0.3
141 - 150	46,381	1.6	**141 - 150**	141,532	2.3	18,461	**401 - 410**	0.3
151 - 160	28,988	1.1	**151 - 160**	116,918	1.9	12,307	**411 - 420**	0.2
161 - 170	23,191	0.8	**161 - 170**	104,611	1.7	12,307	**421 - 430**	0.2
171 - 180	14,494	0.5	**171 - 180**	104,611	1.7	12,307	**431 - 440**	0.2
181 - 190	20,292	0.7	**181 - 190**	141,532	2.3	6,154	**441 - 450**	0.1
191 - 200	14,494	0.5	**191 - 200**	159,993	2.6	6,154	**451 - 460**	0.1
201+	20,292	0.7	**201 - 210**	153,839	2.5	0.00	**461 - 470**	0.0
n = 2,898,821			**211 - 220**	129,225	2.1	6,154	**471 - 480**	0.1
			221 - 230	129,225	2.1	6,154	**481 - 490**	0.1
			231 - 240	104,611	1.7	0.00	**491 - 500**	0.0
			241 - 250	147,686	2.4	6,154	**501+**	0.1
			251 - 260	116,918	1.9			
			n = 6,153,564					

Log Tenure

25-34			35-64		
	Freq	**%**		**Freq**	**%**
<= 1.00	127,548	4.4	**<= 1.00**	153,839	2.5
1.01 - 2.00	359,454	12.4	**1.01 - 2.00**	406,135	6.6
2.01 - 3.00	487,002	16.8	**2.01 - 3.00**	535,360	8.7
3.01 - 4.00	750,795	25.9	**3.01 - 4.00**	843,038	13.7
4.01 - 5.00	1,046,474	36.2	**4.01 - 5.00**	1,846,069	30.0
5.01 - 6.00	127,548	4.4	**5.01 - 6.00**	2,295,279	37.3
n = 2,898,821			**6.01+**	73,843	1.2
			n = 6,153,564		

Age

25-34			35-64					
	Freq	**%**		**Freq**	**%**		**Freq**	**%**
25	246,400	8.5	**35**	332,292	5.4	**50**	246,143	4.0
26	275,388	9.5	**36**	319,985	5.2	**51**	196,914	3.2
27	257,995	8.9	**37**	319,985	5.2	**52**	184,607	3.0
28	278,287	9.6	**38**	332,292	5.4	**53**	166,146	2.7
29	275,388	9.5	**39**	307,678	5.1	**54**	153,839	2.5
30	292,781	10.1	**40**	319,985	5.2	**55**	135,378	2.2
31	301,477	10.4	**41**	307,678	5.0	**56**	116,918	1.9
32	318,870	11.0	**42**	307,678	5.1	**57**	104,611	1.7
33	330,466	11.4	**43**	295,371	4.8	**58**	98,457	1.6
34	321,769	11.1	**44**	276,910	4.5	**59**	86,150	1.4
n = 2,898,821			**45**	276,910	4.5	60	67,689	1.1
			46	258,450	4.2	**61**	55,382	0.9
			47	252,296	4.1	**62**	49,229	0.8
			48	258,450	4.2	**63**	43,075	0.7
			49	246,143	4.0	**64**	36,921	0.6
			n = 6,153,564					

Gender

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Male	1,524,780	52.6	3,236,775	52.6
Female	1,374,041	47.4	2,916,789	47.4
	n = 2,898,821		n = 6,153,564	

Province

	25-34		36-64	
	Freq	**%**	**Freq**	**%**
Newfoundland and Labrador	43,482	1.5	92,303	1.5
Prince Edward Island	11,595	0.4	24,614	0.4
Nova Scotia	84,066	2.9	178,453	2.9
New Brunswick	69,572	2.4	147,686	2.4
Quebec	658,032	22.7	1,526,084	24.8
Ontario	1,165,326	40.2	2,375,276	38.6
Manitoba	104,358	3.6	227,682	3.7
Saskatchewan	81,167	2.8	178,453	2.9
Alberta	304,376	10.5	578,435	9.4
British Columbia	376,847	12.9	824,578	13.4
	n = 2,898,821		n = 6,153,564	

Highest Level of Education Completed

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Grade 8 or lower	46,381	1.6	356,907	5.8
Grade 9 - 10	139,143	4.8	529,207	8.6
Grade 11 - 13, non-graduate	121,750	4.2	289,218	4.7
Grade 11 - 13, graduate	579,764	20.1	1,310,709	21.3
Some postsecondary education	266,692	9.2	424,596	6.9
Trades certificate or diploma	356,555	12.3	830,731	13.5
Community college, CEGEP, etc	675,425	23.3	1,052,259	17.1
University certificate below Bachelor's	75,369	2.6	196,914	3.2
Bachelor's degree	492,800	17.0	744,581	12.1
Above Bachelor's degree	144,941	5.0	418,442	6.8
	n = 2,898,821		n = 6,153,564	

Class of Worker, Main Job

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Public employee	544,978	18.8	1,815,301	29.5
Private employee	2,353,843	81.2	4,338,263	70.5
	n = 2,898,821		n = 6,153,564	

Job Status

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Permanent	2,620,534	90.4	5,722,815	93.0
Non-permanent	278,287	9.6	430,749	7.0
	n = 2,898,821		n = 6,153,564	

Union Status

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Union member	773,985	26.7	2,418,351	39.3
Non-union member but CA	92,762	3.2	190,760	3.1
Non-union member, no CA	2,032,074	70.1	3,544,453	57.6
	n = 2,898,821		n = 6,153,564	

NOC 2011 Skill Matrix Level

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Skill Level A	721,806	24.9	1,692,230	27.5
Skill Level B	936,319	32.3	1,969,140	32.0
Skill Level C	959,510	33.1	1,901,451	30.9
Skill Level D	281,186	9.7	590,742	9.6
	n = 2,898,821		n = 6,153,564	

Job-Education Match

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Match	1,307,368	45.1	2,750,643	44.7
Underqualified	800,075	27.6	2,246,051	36.5
Overqualified	791,378	27.3	1,156,870	18.8
	n = 2,898,821		n = 6,153,564	

Appendix 4b: Weighted Frequency Tables, 2014 Sample

Tenure

25-34			35-64					
	Freq	**%**		**Freq**	**%**		**Freq**	**%**
<= 10	651,871	20.2	**<= 10**	923,661	10.8	**261 - 270**	86,323	1.0
11 - 20	435,656	13.5	**11 - 20**	595,632	6.9	**271 - 280**	86,323	1.0
21 - 30	335,617	10.4	**21 - 30**	500,676	5.8	**281 - 290**	112,221	1.3
31 - 40	283,983	8.8	**31 - 40**	457,514	5.3	**291 - 300**	112,221	1.3
41 - 50	235,577	7.3	**41 - 50**	371,191	4.3	**301 - 310**	129,485	1.5
51 - 60	190,398	5.9	**51 - 60**	310,764	3.6	**311 - 320**	94,956	1.1
61 - 70	183,944	5.7	**61 - 70**	362,559	4.2	**321 - 330**	77,691	0.9
71 - 80	174,262	5.4	**71 - 80**	336,662	3.9	**331 - 340**	69,059	0.8
81 - 90	141,992	4.4	**81 - 90**	310,764	3.6	**341 - 350**	69,059	0.8
91 - 100	122,629	3.8	**91 - 100**	267,603	3.1	**351 - 360**	60,426	0.7
101 - 110	93,585	2.9	**101 - 110**	241,706	2.8	**361 - 370**	51,794	0.6
111 - 120	67,769	2.1	**111 - 120**	241,706	2.8	**371 - 380**	34,529	0.4
121 - 130	74,223	2.3	**121 - 130**	258,970	3.0	**381 - 390**	43,162	0.5
131 - 140	45,179	1.4	**131 - 140**	198,544	2.3	**391 - 400**	51,794	0.6
141 - 150	38,725	1.2	**141 - 150**	207,176	2.4	**401 - 410**	51,794	0.6
151 - 160	32,271	1.0	**151 - 160**	233,073	2.7	**411 - 420**	43,162	0.5
161 - 170	29,044	0.9	**161 - 170**	233,073	2.7	**421 - 430**	34,529	0.4
171 - 180	22,590	0.7	**171 - 180**	215,809	2.5	**431 - 440**	25,897	0.3
181 - 190	16,135	0.5	**181 - 190**	198,544	2.3	**441 - 450**	25,897	0.3
191 - 200	16,135	0.5	**191 - 200**	164,015	1.9	**451 - 460**	17,265	0.2
201 - 210	6,454	0.2	**201 - 210**	129,485	1.5	**461 - 470**	17,265	0.2
211 - 220	6,454	0.2	**211 - 220**	103,588	1.2	**471 - 480**	17,265	0.2
221 - 230	6,454	0.2	**221 - 230**	103,588	1.2	**481 - 490**	17,265	0.2
231+	16,135	0.5	**231 - 240**	112,221	1.3	**491 - 500**	8,632	0.1
n = 3,227,083			**241 - 250**	112,221	1.3	**501+**	17,265	0.2
			251 - 260	86,323	1.0			
			n = 8,632,347					

Log Tenure

25-34			35-64		
	Freq	**%**		**Freq**	**%**
<= 1.00	129,083	4.0	**<= 1.00**	198,544	2.30
1.01 - 2.00	371,115	11.5	**1.01 - 2.00**	526,573	6.10
2.01 - 3.00	584,102	18.1	**2.01 - 3.00**	802,808	9.30
3.01 - 4.00	935,854	28.9	**3.01 - 4.00**	1,458,867	16.90
4.01 - 5.00	1,052,029	32.6	**4.01 - 5.00**	2,537,910	29.40
5.01 - 6.00	154,900	4.8	**5.01 - 6.00**	2,848,675	33.00
n = 3,227,083			**6.01+**	258,970	3.00
			n = 8,632,347		

Age

	25-34		35-64					
	Freq	**%**		**Freq**	**%**		**Freq**	**%**
25	309,800	9.6	**35**	328,029	3.7	**50**	371,191	4.3
26	303,346	9.4	**36**	328,029	3.7	**51**	353,926	4.1
27	319,481	9.9	**37**	310,764	3.6	**52**	345,294	4.0
28	322,708	10.1	**38**	310,764	3.6	**53**	353,926	4.1
29	319,481	9.9	**39**	310,764	3.6	**54**	336,662	3.9
30	342,071	10.6	**40**	310,764	3.6	**55**	319,397	3.7
31	319,481	9.9	**41**	302,132	3.5	**56**	293,500	3.4
32	335,617	10.4	**42**	319,397	3.7	**57**	258,970	3.0
33	319,481	9.9	**43**	319,397	3.7	**58**	250,338	2.9
34	335,617	10.4	**44**	319,397	3.7	**59**	233,073	2.7
n = 3,227,083			**45**	310,764	3.6	**60**	215,809	2.5
			46	302,132	3.5	**61**	172,647	2.0
			47	319,397	3.7	**62**	146,750	1.7
			48	319,397	3.7	**63**	138,118	1.6
			49	336,662	3.9	**64**	103,588	1.2
			n = 8,632,347					

Gender

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Male	1,661,948	51.5	4,342,071	50.3
Female	1,565,135	48.5	4,290,276	49.7
n = 3,227,083			n = 8,632,347	

Province

	25-34		36-64	
	Freq	**%**	**Freq**	**%**
Newfoundland and Labrador	41,952	1.3	138,118	1.6
Prince Edward Island	9,681	0.3	34,529	0.4
Nova Scotia	77,450	2.4	233,073	2.7
New Brunswick	58,087	1.8	189,912	2.2
Quebec	719,640	22.3	2,037,234	23.6
Ontario	1,223,064	37.9	3,366,615	39.0
Manitoba	112,948	3.5	302,132	3.5
Saskatchewan	106,494	3.3	258,970	2.8
Alberta	477,608	14.8	1,001,352	11.6
British Columbia	400,158	12.4	1,070,411	12.4
	n = 3,227,083		n = 8,632,347	

Highest Level of Education Completed

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Grade 8 or lower	25,817	0.9	146,750	1.7
Grade 9 - 10	70,996	2.2	302,132	3.5
Grade 11 - 13, non-graduate	70,996	2.2	233,073	2.7
Grade 11 - 13, graduate	538,923	16.7	1,726,469	20.0
Some postsecondary education	177,490	5.5	379,823	4.4
Trades certificate or diploma	380,796	11.8	984,088	11.4
Community college, CEGEP, etc	787,408	24.4	2,158,087	25.0
University certificate below Bachelor's	74,223	2.3	258,970	2.9
Bachelor's degree	816,452	25.3	1,648,778	19.1
Above Bachelor's degree	283,983	8.8	794,176	9.2
	n = 3,227,083		n = 8,632,347	

Class of Worker, Main Job

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Public employee	684,142	21.2	2,347,998	27.2
Private employee	2,542,941	78.8	6,284,349	72.8
	n = 3,227,083		n = 8,632,347	

Job Status

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Permanent	2,849,514	88.3	7,933,127	91.9
Non-permanent	377,569	11.7	699,220	8.1
	n = 3,227,083		n = 8,632,347	

Union Status

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Union member	861,631	26.7	2,865,939	33.2
Non-union member but CA	70,996	2.2	164,015	1.9
Non-union member, no CA	2,294,456	71.1	5,602,393	64.9
	n = 3,227,083		n = 8,632,347	

NOC 2011 Skill Matrix Level

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Skill Level A	861,631	26.7	2,365,263	27.4
Skill Level B	1,203,702	37.3	2,926,366	33.9
Skill Level C	897,129	27.8	2,589,704	29.9
Skill Level D	264,621	8.2	751,014	8.7
	n = 3,227,083		n = 8,632,347	

Job-Education Match

	25-34		35-64	
	Freq	**%**	**Freq**	**%**
Match	1,571,589	48.7	3,988,144	46.2
Underqualified	613,146	19.0	2,106,293	24.4
Overqualified	1,042,348	32.2	2,537,910	29.4
	n = 3,227,083		n = 8,632,347	

Appendix 4c: Weighted Frequency Tables, 1997 & 2014 Sample

Tenure

	Freq	%		Freq	%
<= 10	1,445,681	13.9	**251 - 260**	104,760	1.0
11 - 20	890,456	8.5	**261 - 270**	94,284	0.9
21 - 30	701,889	6.7	**271 - 280**	94,284	0.9
31 - 40	607,605	5.8	**281 - 290**	104,760	1.0
41 - 50	502,846	4.8	**291 - 300**	104,760	1.0
51 - 60	429,514	4.1	**301 - 310**	104,760	1.0
61 - 70	460,942	4.4	**311 - 320**	83,808	0.8
71 - 80	429,514	4.1	**321 - 330**	73,332	0.7
81 - 90	419,038	4.0	**331 - 340**	52,380	0.5
91 - 100	366,658	3.5	**341 - 350**	52,380	0.5
101 - 110	324,755	3.1	**351 - 360**	52,380	0.5
111 - 120	282,851	2.7	**361 - 370**	52,380	0.5
121 - 130	314,279	3.0	**371 - 380**	31,428	0.3
131 - 140	230,471	2.2	**381 - 390**	31,428	0.3
141 - 150	219,995	2.1	**391 - 400**	31,428	0.3
151 - 160	209,519	2.0	**401 - 410**	31,428	0.3
161 - 170	199,043	1.9	**411 - 420**	31,428	0.3
171 - 180	178,091	1.7	**421 - 430**	20,952	0.2
181 - 190	188,567	1.8	**431 - 440**	20,952	0.2
191 - 200	178,091	1.7	**441 - 450**	10,476	0.1
201 - 210	146,663	1.4	**451 - 460**	10,476	0.1
211 - 220	125,711	1.2	**461 - 470**	10,476	0.1
221 - 230	125,711	1.2	**471 - 480**	10,476	0.1
231 - 240	115,235	1.1	**481+**	31,428	0.3
241 - 250	136,187	1.3			

n = 10,475,952

Log Tenure

	Freq	%
<= 1.00	303,803	2.9
1.01 - 2.00	827,600	7.9
2.01 - 3.00	1,204,734	11.5
3.01 - 4.00	2,000,907	19.1
4.01 - 5.00	3,247,545	31.0
5.01 - 6.00	2,723,748	25.9
6.01+	167,615	1.6

n = 10,475,952

Age

	Freq	%		Freq	%
25	282,851	2.7	**45**	293,327	2.8
26	293,327	2.8	**46**	282,851	2.7
27	293,327	2.8	**47**	282,851	2.7
28	303,803	2.9	**48**	293,327	2.8
29	293,327	2.8	**49**	293,327	2.8
30	314,279	3.0	**50**	314,279	3.0
31	314,279	3.0	**51**	272,375	2.6
32	324,755	3.1	**52**	261,899	2.5
33	324,755	3.1	**53**	261,899	2.5
34	335,230	3.2	**54**	240,947	2.3
35	324,755	3.1	**55**	230,471	2.2
36	324,755	3.1	**56**	199,043	1.9
37	314,279	3.0	**57**	178,091	1.7
38	324,755	3.1	**58**	178,091	1.7
39	314,279	3.0	**59**	157,139	1.5
40	314,279	3.0	**60**	136,187	1.3
41	303,803	2.9	**61**	104,760	1.1
42	314,279	3.0	**62**	94,284	0.9
43	314,279	3.0	**63**	94,284	0.9
44	303,803	2.9	**64**	73,321	0.7

n = 10,475,952

Gender

	Freq	%
Male	5,395,115	51.5
Female	5,080,837	48.5

n = 10,475,952

Province

	Freq	%
Newfoundland and Labrador	157,139	1.5
Prince Edward Island	52,380	0.4
Nova Scotia	282,851	2.7
New Brunswick	230,471	2.2
Quebec	2,472,325	23.6
Ontario	4,075,145	38.9
Manitoba	377,134	3.6
Saskatchewan	303,803	2.9
Alberta	1,183,783	11.3
British Columbia	1,340,922	12.8

n = 10,475,952

Highest Level of Education Completed

	Freq	%
Grade 8 or lower	293,327	2.8
Grade 9 - 10	523,798	5.0
Grade 11 - 13, non-graduate	356,182	3.4
Grade 11 - 13, graduate	2,095,190	19.9
Some postsecondary education	628,557	6.0
Trades certificate or diploma	1,278,066	12.2
Community college, CEGEP, etc	2,336,137	22.3
University certificate below Bachelor's	293,327	2.8
Bachelor's degree	1,854,244	17.7
Above Bachelor's degree	817,124	7.8

n = 10,475,952

Class of Worker, Main Job

	Freq	%
Public employee	2,702,796	25.8
Private employee	7,773,156	74.2

n = 10,475,952

Job Status

	Freq	%
Permanent	9,428,357	91.4
Non-permanent	1,047,595	10.5

n = 10,475,952

Union Status

	Freq	%
Union member	3,467,540	33.1
Non-union member but CA	261,899	2.5
Non-union member, no CA	6,746,513	64.4

n = 10,475,952

NOC 2011 Skill Matrix Level

	Freq	%
Skill Level A	2,828,507	27.0
Skill Level B	3,530,396	33.7
Skill Level C	3,174,213	30.3
Skill Level D	942,836	9.1

n = 10,475,952

Job-Education Match

	Freq	%
Match	4,818,938	46.0
Underqualified	2,891,363	27.6
Overqualified	2,765,651	26.4

n = 10,475,952

Appendix 5: Regression Output

Appendix 5a: Summary of Regression Analysis for 25-34, 1997 Sample

	Model 1			Model 2			Model 3		
Variable	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***
Constant	-2.675***	0.087	-30.757	-2.434***	0.080	-30.308	-2.494***	0.080	-31.058
Age	0.304***	0.006	51.431	0.218***	0.005	39.973	0.221***	0.005	40.574
Age squared	-0.004***	0.000	-35.422	-0.002***	0.000	-25.980	-0.002***	0.000	-26.682
Female	0.035***	0.001	24.236	0.001**	0.002	0.876	0.005***	0.002	3.241
Newfoundland & Labrador	-0.172***	0.006	-29.013	-0.091***	0.006	-16.490	-0.090***	0.006	-16.347
Prince Edward Island	-0.407***	0.011	-36.513	-0.181***	0.010	-17.586	-0.181***	0.010	-17.586
Nova Scotia	-0.032***	0.004	-7.421	0.060***	0.004	14.883	0.062***	0.004	15.336
New Brunswick	-0.132***	0.005	-27.630	0.001	0.004	0.210	0.005**	0.004	1.056
Quebec	0.017***	0.002	8.939	0.028***	0.002	15.689	0.027***	0.002	15.510
Manitoba	0.026***	0.004	6.612	0.004**	0.004	1.168	0.003**	0.004	0.932
Saskatchewan	-0.047***	0.004	-10.665	-0.060***	0.004	-14.658	-0.058***	0.004	-14.243
Alberta	-0.316***	0.002	-126.532	-0.267***	0.002	-115.391	-0.268***	0.002	-115.784
British Columbia	-0.166***	0.002	-71.948	-0.170***	0.002	-79.515	-0.169***	0.002	-78.725
Grade 9-10	0.136***	0.007	20.560	0.127***	0.006	20.689	0.127***	0.006	20.678
Grade 11-13, non-grad	0.142***	0.007	21.071	0.041***	0.006	6.605	0.041***	0.006	6.551
Grade 11-13, grad	0.404***	0.006	67.403	0.234***	0.006	41.955	0.287***	0.006	50.955
Some postsecondary	0.222***	0.006	35.551	0.069***	0.006	11.943	0.118***	0.006	20.189
Trades certificate/diploma	0.233***	0.006	38.085	0.087***	0.006	15.224	0.194***	0.006	32.737
Community college, CEGEP	0.327***	0.006	54.690	0.105***	0.006	18.710	0.209***	0.006	36.114
University certificate	0.227***	0.007	31.142	0.041***	0.007	5.978	0.134***	0.007	19.363
Bachelor's degree	0.118***	0.006	19.484	-0.100***	0.006	-17.446	0.043***	0.006	7.008
Above bachelor's degree	-0.091***	0.007	-13.766	-0.278***	0.006	-44.088	-0.146***	0.007	-21.961
Public sector				0.147***	0.002	67.154	0.143***	0.002	65.271
Permanent status				1.269***	0.002	549.685	1.260***	0.002	545.811
Union member				0.537***	0.002	302.578	0.543***	0.002	305.654
Management				0.459***	0.003	165.511	0.347***	0.003	108.643
Business finance/admin				0.233***	0.002	109.254	0.190***	0.002	85.929

Natural/applied sciences			0.191***	0.003	65.514	0.098***	0.003	31.001
Health			0.268***	0.003	80.867	0.190***	0.003	54.702
Education, law, govt.			0.154***	0.003	50.898	0.069***	0.003	21.471
Art, culture, recreation, sport			-0.011***	0.005	-2.159	-0.085***	0.005	-16.542
Trades, transport, equipment			0.047***	0.002	19.639	0.004	0.002	1.824
Natural resources, agriculture			-0.048***	0.005	-9.424	-0.061***	0.005	-11.955
Manufacturing and utilities			0.150***	0.003	54.619	0.148***	0.003	53.917
Underqualified						0.069***	0.002	35.030
Overqualified						-0.114***	0.002	-62.819
R^2	0.065		0.203			0.205		
F for change in r^2	9611.15***		41998.81***			2810.53***		

*** p < .05*, ****p < .001*

Appendix 5b: Summary of Regression Analysis for 35-64, 1997 Sample

	Model 1			Model 2			Model 3		
Variable	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***
Constant	-1.165***	0.021	-55.505	-1.125***	0.019	-60.546	-1.070***	0.019	-57.656
Age	0.197***	0.001	218.106	0.113***	0.001	141.484	0.109***	0.001	137.113
Age squared	-0.002***	0.000	-178.453	-0.001***	0.000	-102.367	-0.001***	0.000	-98.093
Female	-0.148***	0.001	-135.954	-0.124***	0.001	-110.197	-0.116***	0.001	-103.921
Newfoundland & Labrador	-0.310***	0.004	-69.554	-0.190***	0.004	-48.338	-0.189***	0.004	-48.193
Prince Edward Island	-0.438***	0.008	-51.677	-0.261***	0.007	-35.019	-0.260***	0.007	-34.986
Nova Scotia	-0.056***	0.003	-17.132	0.001	0.003	0.245	0.004**	0.003	1.520
New Brunswick	-0.151***	0.004	-42.202	-0.035***	0.003	-11.008	-0.037***	0.003	-11.647
Quebec	0.065***	0.001	46.641	0.023***	0.001	18.598	0.018***	0.001	14.994
Manitoba	-0.002	0.003	-0.757	-0.066***	0.003	-25.652	-0.061***	0.003	-23.820
Saskatchewan	-0.041***	0.003	-12.513	-0.084***	0.003	-29.397	-0.084***	0.003	-29.347
Alberta	-0.261***	0.002	-133.272	-0.200***	0.002	-115.663	-0.205***	0.002	-119.270
British Columbia	-0.223***	0.002	-130.649	-0.229***	0.002	-151.782	-0.227***	0.002	-150.803

Grade 9-10	0.096***	0.003	33.002	0.010***	0.003	3.792	0.010***	0.003	3.979
Grade 11-13, non-grad	0.194***	0.003	57.345	0.053***	0.003	17.807	0.055***	0.003	18.566
Grade 11-13, grad	0.321***	0.003	124.785	0.104***	0.002	45.256	0.195***	0.002	82.797
Some postsecondary	0.240***	0.003	78.069	-0.004**	0.003	-1.310	0.081***	0.003	29.050
Trades certificate/diploma	0.168***	0.003	61.979	-0.050***	0.002	-20.487	0.148***	0.003	55.785
Community college, CEGEP	0.297***	0.003	112.206	-0.051***	0.002	-21.085	0.133***	0.003	50.606
University certificate	0.331***	0.004	87.612	-0.022***	0.003	-6.523	0.138***	0.004	39.283
Bachelor's degree	0.355***	0.003	128.355	-0.085***	0.003	-32.659	0.179***	0.003	59.409
Above bachelor's degree	0.317***	0.003	103.359	-0.139***	0.003	-47.278	0.107***	0.003	32.511
Public sector				0.326***	0.001	247.072	0.322***	0.001	244.309
Permanent status				1.778***	0.002	948.240	1.755***	0.002	937.311
Union member				0.650***	0.001	564.821	0.659***	0.001	574.449
Management				0.559***	0.002	291.260	0.355***	0.002	160.721
Business finance/admin				0.330***	0.002	209.446	0.240***	0.002	146.214
Natural/applied sciences				0.406***	0.002	174.359	0.239***	0.002	96.263
Health				0.354***	0.002	149.857	0.201***	0.002	80.672
Education, law, govt.				0.244***	0.002	116.857	0.083***	0.002	36.925
Art, culture, recreation, sport				0.429***	0.004	101.784	0.269***	0.004	62.764
Trades, transport, equipment				0.099***	0.002	55.880	0.014***	0.002	7.890
Natural resources, agriculture				0.156***	0.004	40.331	0.118***	0.004	30.497
Manufacturing and utilities				0.273***	0.002	138.780	0.245***	0.002	124.727
Underqualified							0.138***	0.001	103.400
Overqualified							-0.221***	0.001	-155.414
R^2	0.053			0.268			0.272		
F for change in r^2	16461.20***			150808.18***			18905.89***		

*** p < .05, ***p < .001*

Appendix 5c: Summary of Regression Analysis for 25-34, 2014 Sample

	Model 1			Model 2			Model 3		
Variable	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***
Constant	-1.111***	0.079	-14.021	-0.809***	0.075	-10.742	-0.786***	0.075	-10.476
Age	0.223***	0.005	41.336	0.152***	0.005	29.747	0.148***	0.005	29.075
Age squared	-0.002***	0.000	-25.133	-0.001***	0.000	-15.712	-0.001***	0.000	-15.071
Female	0.055***	0.001	40.693	0.011***	0.001	7.475	0.024***	0.001	15.912
Newfoundland & Labrador	-0.207***	0.006	-35.065	-0.159***	0.006	-28.415	-0.163***	0.006	-29.192
Prince Edward Island	-0.122***	0.011	-10.754	-0.042***	0.011	-3.857	-0.037***	0.011	-3.407
Nova Scotia	-0.126***	0.004	-28.402	-0.085***	0.004	-20.242	-0.080***	0.004	-18.939
New Brunswick	-0.012**	0.005	-2.319	0.023***	0.005	4.688	0.021***	0.005	4.444
Quebec	0.008***	0.002	4.371	-0.016***	0.002	-9.110	-0.017***	0.002	-9.956
Manitoba	-0.064***	0.004	-17.298	-0.120***	0.004	-33.844	-0.117***	0.004	-33.153
Saskatchewan	-0.134***	0.004	-35.070	-0.175***	0.004	-48.336	-0.177***	0.004	-49.009
Alberta	-0.317***	0.002	-154.996	-0.274***	0.002	-140.349	-0.278***	0.002	-142.876
British Columbia	-0.119***	0.002	-54.626	-0.099***	0.002	-47.698	-0.098***	0.002	-47.339
Grade 9-10	-0.103***	0.008	-12.431	-0.115***	0.008	-14.506	-0.108***	0.008	-13.703
Grade 11-13, non-grad	-0.010**	0.008	-1.149	-0.005	0.008	-0.690	0.000	0.008	-0.063
Grade 11-13, grad	0.062***	0.007	8.543	0.005	0.007	0.769	0.100***	0.007	14.556
Some postsecondary	-0.065***	0.008	-8.581	-0.109***	0.007	-15.049	-0.024***	0.007	-3.285
Trades certificate/diploma	0.011**	0.007	1.452	-0.101***	0.007	-14.625	0.088***	0.007	12.388
Community college, CEGEP	0.016**	0.007	2.280	-0.120***	0.007	-17.503	0.085***	0.007	12.186
University certificate	0.047***	0.008	5.657	-0.106***	0.008	-13.360	0.075***	0.008	9.371
Bachelor's degree	-0.033***	0.007	-4.652	-0.211***	0.007	-30.675	0.059***	0.007	8.294
Above bachelor's degree	-0.294***	0.007	-39.900	-0.444***	0.007	-62.415	-0.196***	0.007	-26.575
Public sector				0.308***	0.002	149.358	0.293***	0.002	142.198
Permanent status				0.987***	0.002	494.875	0.966***	0.002	484.834
Union member				0.292***	0.002	165.440	0.301***	0.002	170.957

Management			0.290***	0.003	93.998	0.081***	0.003	24.140
Business finance/admin			0.102***	0.002	48.657	0.033***	0.002	15.262
Natural/applied sciences			0.137***	0.003	54.485	-0.021***	0.003	-7.679
Health			0.072***	0.003	25.723	-0.053***	0.003	-18.080
Education, law, govt.			0.143***	0.003	55.944	-0.008**	0.003	-2.840
Art, culture, recreation, sport			0.124***	0.004	28.265	0.003	0.004	0.710
Trades, transport, equipment			0.017***	0.002	7.447	-0.052***	0.002	-22.552
Natural resources, agriculture			0.039***	0.005	8.567	0.024***	0.005	5.248
Manufacturing and utilities			0.112***	0.003	33.626	0.109***	0.003	32.868
Underqualified						0.125***	0.002	60.867
Overqualified						-0.226***	0.002	-141.534
R^2	0.056		0.149			0.155		
F for change in r^2	9046.43***		29459.65***			12877.06***		

** $p < .05$, ***$p < .001$

Appendix 5d: Summary of Regression Analysis for 35-64, 2014 Sample

	Model 1			Model 2			Model 3		
Variable	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***
Constant	0.282***	0.017	16.561	0.030***	0.016	1.893	0.040***	0.016	2.531
Age	0.114***	0.001	162.641	0.070***	0.001	108.129	0.070***	0.001	107.906
Age squared	-0.001***	0.000	-108.677	0.000***	0.000	-52.633	0.000***	0.000	-51.884
Female	0.044***	0.001	48.854	-0.035***	0.001	-36.808	-0.020***	0.001	-20.530
Newfoundland & Labrador	-0.175***	0.004	-48.204	-0.095***	0.003	-28.278	-0.096***	0.003	-28.642
Prince Edward Island	-0.137***	0.007	-20.400	-0.075***	0.006	-12.082	-0.079***	0.006	-12.785
Nova Scotia	-0.020***	0.003	-7.257	0.002	0.003	0.786	0.003	0.003	1.141
New Brunswick	-0.004**	0.003	-1.343	0.055***	0.003	19.488	0.053***	0.003	18.852
Quebec	0.034***	0.001	29.096	-0.006***	0.001	-5.614	-0.010***	0.001	-9.290
Manitoba	-0.021***	0.002	-8.427	-0.116***	0.002	-50.647	-0.110***	0.002	-48.165

Saskatchewan	-0.013***	0.003	-4.842	-0.077***	0.003	-30.575	-0.080***	0.003	-31.816
Alberta	-0.271***	0.001	-181.504	-0.231***	0.001	-166.982	-0.238***	0.001	-173.223
British Columbia	-0.117***	0.001	-80.460	-0.111***	0.001	-82.786	-0.107***	0.001	-80.469
Grade 9-10	0.113***	0.004	27.336	0.044***	0.004	11.480	0.042***	0.004	11.212
Grade 11-13, non-grad	0.208***	0.004	48.037	0.126***	0.004	31.593	0.120***	0.004	30.037
Grade 11-13, grad	0.373***	0.004	105.661	0.202***	0.003	62.022	0.294***	0.003	90.081
Some postsecondary	0.313***	0.004	78.515	0.077***	0.004	20.741	0.163***	0.004	44.135
Trades certificate/diploma	0.246***	0.004	67.816	0.066***	0.003	19.649	0.291***	0.003	83.935
Community college, CEGEP	0.422***	0.004	120.295	0.095***	0.003	28.941	0.321***	0.003	95.152
University certificate	0.506***	0.004	118.473	0.191***	0.004	47.948	0.391***	0.004	97.076
Bachelor's degree	0.447***	0.004	126.107	0.047***	0.003	14.034	0.351***	0.004	99.074
Above bachelor's degree	0.350***	0.004	94.702	-0.097***	0.004	-27.632	0.176***	0.004	47.818
Public sector				0.345***	0.001	283.172	0.337***	0.001	278.051
Permanent status				1.324***	0.002	869.746	1.298***	0.002	855.719
Union member				0.446***	0.001	411.593	0.458***	0.001	424.684
Management				0.485***	0.002	275.573	0.226***	0.002	114.189
Business finance/admin				0.301***	0.001	225.010	0.201***	0.001	146.422
Natural/applied sciences				0.316***	0.002	180.290	0.108***	0.002	57.641
Health				0.210***	0.002	111.078	0.059***	0.002	30.054
Education, law, govt.				0.337***	0.002	200.416	0.136***	0.002	75.584
Art, culture, recreation, sport				0.320***	0.004	90.307	0.139***	0.004	38.669
Trades, transport, equipment				-0.005***	0.002	-3.439	-0.095***	0.002	-61.674
Natural resources, agriculture				0.115***	0.003	33.443	0.064***	0.003	18.628
Manufacturing and utilities				0.315***	0.002	165.292	0.293***	0.002	154.172
Underqualified							0.103***	0.001	83.481
Overqualified							-0.311***	0.001	-289.286
R^2	0.060			0.202			0.211		
F for change in r^2	26256.90***			128574.25***			48585.23***		

*** p < .05*, ****p < .001*

Appendix 5e: Summary of Regression Analysis for 25-64, 1997 & 2014 Sample

	Model 1			Model 2			Model 3			Model 4		
Variable	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***	***b***	***Std. Error***	***t***
Constant	-0.039***	0.007	-5.436	-0.431***	0.007	-64.624	-0.419***	0.007	-62.709	-0.723***	0.011	-65.530
Age	0.144***	0.000	438.890	0.097***	0.000	320.289	0.095***	0.000	315.484	0.107***	0.000	232.211
Age squared	-0.001***	0.000	-301.325	-0.001***	0.000	-189.343	-0.001***	0.000	-184.187	-0.001***	0.000	-154.212
Female	-0.015***	0.001	-18.635	-0.056***	0.001	-65.715	-0.045***	0.001	-53.124	-0.045***	0.001	-52.984
Newfoundland & Labrador	-0.225***	0.003	-67.842	-0.144***	0.003	-47.099	-0.143***	0.003	-47.202	-0.141***	0.003	-46.605
Prince Edward Island	-0.265***	0.006	-42.454	-0.149***	0.006	-26.066	-0.149***	0.006	-26.154	-0.147***	0.006	-25.922
Nova Scotia	-0.046***	0.002	-18.479	-0.004	0.002	-1.742	-0.001	0.002	-0.343	-0.001	0.002	-0.439
New Brunswick	-0.071***	0.003	-26.007	0.007**	0.003	2.659	0.007	0.003	2.678	0.006**	0.003	2.566
Quebec	0.038***	0.001	36.341	0.005***	0.001	4.767	0.002	0.001	1.720	0.002	0.001	1.714
Manitoba	-0.018***	0.002	-8.262	-0.088***	0.002	-43.681	-0.085***	0.002	-42.019	-0.084***	0.002	-41.531
Saskatchewan	-0.047***	0.002	-19.366	-0.096***	0.002	-43.398	-0.097***	0.002	-43.723	-0.097***	0.002	-43.884
Alberta	-0.290***	0.001	-214.645	-0.234***	0.001	-188.442	-0.239***	0.001	-193.146	-0.238***	0.001	-192.524
British Columbia	-0.154***	0.001	-119.209	-0.151***	0.001	-127.154	-0.148***	0.001	-125.469	-0.148***	0.001	-125.889
Grade 9-10	0.083***	0.003	27.825	0.034***	0.003	12.408	0.036***	0.003	13.066	0.046***	0.003	16.824
Grade 11-13, non-grad	0.153***	0.003	47.281	0.074***	0.003	25.065	0.075***	0.003	25.326	0.093***	0.003	31.413
Grade 11-13, grad	0.289***	0.003	112.264	0.151***	0.002	63.411	0.242***	0.002	100.666	0.264***	0.002	108.954
Some postsecondary	0.208***	0.003	71.145	0.031***	0.003	11.610	0.116***	0.003	42.819	0.138***	0.003	50.667
Trades certificate/diploma	0.165***	0.003	61.649	0.009***	0.002	3.566	0.209***	0.003	80.526	0.231***	0.003	88.244
Community college, CEGEP	0.276***	0.003	107.597	0.021***	0.002	8.712	0.222***	0.003	87.831	0.247***	0.003	96.957
University certificate	0.328***	0.003	97.093	0.068***	0.003	21.706	0.244***	0.003	76.236	0.266***	0.003	82.693
Bachelor's degree	0.260***	0.003	99.800	-0.057***	0.002	-23.160	0.215***	0.003	79.493	0.239***	0.003	87.339
Above bachelor's degree	0.159***	0.003	56.768	-0.181***	0.003	-67.524	0.068***	0.003	23.568	0.090***	0.003	30.789
Public sector				0.316***	0.001	289.608	0.308***	0.001	283.183	0.305***	0.001	281.093
Permanent status				1.372***	0.001	1035.077	1.350***	0.001	1020.847	1.348***	0.001	1019.621
Union member				0.513***	0.001	542.533	0.523***	0.001	554.547	0.521***	0.001	551.795

Management		0.486***	0.002	314.059	0.269***	0.002	153.979	0.265***	0.002	151.187
Business finance/admin		0.270***	0.001	225.724	0.184***	0.001	149.592	0.183***	0.001	148.166
Natural/applied sciences		0.284***	0.002	176.868	0.109***	0.002	63.356	0.110***	0.002	63.896
Health		0.217***	0.002	126.063	0.077***	0.002	42.626	0.077***	0.002	42.896
Education, law, govt.		0.255***	0.002	165.341	0.087***	0.002	52.828	0.087***	0.002	52.676
Art, culture, recreation, sport		0.268***	0.003	89.064	0.117***	0.003	38.389	0.115***	0.003	37.870
Trades, transport, equipment		0.031***	0.001	23.186	-0.049***	0.001	-35.659	-0.048***	0.001	-34.773
Natural resources, agriculture		0.085***	0.003	29.148	0.051***	0.003	17.649	0.050***	0.003	17.254
Manufacturing and utilities		0.252***	0.002	155.535	0.235***	0.002	145.173	0.234***	0.002	144.782
Underqualified					0.118***	0.001	108.522	0.138***	0.002	84.401
Overqualified					-0.247***	0.001	-249.170	-0.274***	0.002	-144.684
25-34 cohort								-0.033***	0.002	-14.420
2014 survey year								-0.025***	0.001	-18.987
overyoung								0.146***	0.003	48.637
underyoung								0.021***	0.003	7.613
over2014								-0.023***	0.002	-9.998
under2014								-0.071***	0.002	-34.584
youngtime								0.088***	0.002	37.032
over3way								-0.024***	0.004	-6.122
under3way								0.072***	0.004	18.053
R^2	0.13	0.27			0.28			0.28		
F for change in r^2	75303.05***	171022.93***			39901.84***			1370.83***		

** $p < .05$, ***$p < .001$

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