Multiple Job Holding in Canada and Education: Evidence from the Canadian Labour Force Survey

By Brittany Feor

(5269327)

Major paper presented to the Department of Economics of the University of Ottawa in partial fulfillment of the requirements of the M.A. Degree

Supervisor: Pierre Brochu

ECO 6999

Ottawa, Ontario

August 2015

Abstract

This paper explores the evolution over time in the marginal effects of age and education on moonlighting in Canada using the Labour Force Survey public-use files for the 1987/88, 1998/99, 2005/06, and 2013/14 periods. A discrete choice model is estimated by gender for the full sample and separately for each period. I find that the marginal effects of college and university education are larger in the later sample periods. The results also show significant differences across gender.

I. Introduction

Between 1976 and 1996, the number of Canadians engaged in moonlighting had increased from 208,000 to 699,000.[1] By 1996, roughly 5% of Canadian workers held multiple jobs with an average work-week of 46.2 hours.[2] In 1997, Canadian moonlighters were more likely to be women and have a post-secondary education. A Statistics Canada report on moonlighting trends in Canada, based on data from the Labour Force Survey (LFS), reported that while 19% of single-jobholders had a university degree, 22% of multiple-job holders held one.[3] Kimmel and Powell (1999) also report a significant increase in the incidence of moonlighting between the 1980s and 1990s of 1.7 percentage points from 3.4% in 1981 to 5.04% in 1991.

It is often argued that moonlighting is a by-product of financial pressure and, as a result, it should be driven by a counter-cyclical pattern since an improvement in economic conditions is likely to lead to increased labour hours on the primary job, or at least an increase in the maximum hours allowed on the primary job or the primary wage (Kimmel and Amuedo-Dorantes, 2009). There is also convincing evidence, however, of pro-cyclical moonlighting (see Stinson, 1987; Partridge, 2002; and Kimmel and Amuedo-Dorantes, 2009).

On the demand side, moonlighting rates may fall during an economic downturn simply because there are fewer jobs available. On the supply side, moonlighting rates may increase during an economic downturn as workers try to compensate for rising unemployment and falling real wages by diversifying their employment in order to obtain income and employment stability (Kimmel and Amuedo-Dorantes, 2009). Despite the theoretical arguments for either side,

[1] Moonlighting is defined as holding more than one job, where these jobs can be full-time, part-time, or any combination thereof.

[2] According to the 1997 Statistics Canada daily release, *Moonlighting: One in 20 workers held a second job in 1996*. The content of this release is based on the results of the Labour Force Surveys administered in 1996.

[3] According to the 1997 Statistics Canada publication, *Moonlighting: A growing way of life* by Deborah Sussman.

moonlighting rates do not consistently appear to be pro or counter cyclical. Although several studies confirm counter or pro-cyclicality of moonlighting rates over a period of economic contraction or expansion, the results cannot be replicated for alternative upswings or downswings (Kimmel and Amuedo-Dorantes, 2009). Perhaps moonlighting is a by-product of financial pressure but not the type that would be encountered solely during an economic downturn. Rather, moonlighting is induced by a temporary circumstance that places a financial strain on the worker, which need not necessarily stem from an economic decline.

If the financial strain introduced were permanent, a rational individual would seek a permanent adjustment to their income or labour hours, such as renegotiating their contract or finding a new job. Workers need only be hours-constrained or face employment instability in the short run because, in the long run, those who prefer to supply more labour hours can find jobs with a higher upper limit on labour hours, and generally employment stability rises with tenure (Conway and Kimmel, 1998). If the financial strain is only temporary, a worker may seek a temporary (or short run) adjustment to the quantity of labour they supply. Moonlighting is an avenue through which workers adjust their short run labour supply in response to temporary financial pressure in the face of labour constraints at their primary employment or a perceived lack of job stability.[4]

The most significant financial strain that educated Canadians in their twenties and thirties face today is student loan debt. Over the past four decades the growth in student tuition fees and corresponding debt has greatly outpaced the growth of Canadian incomes. In 1995, Canadian graduates owed 130% to 140% more than their 1982 counterparts, even after adjusting for

[4] This argument assumes that the worker can also perceive that the financial strain is temporary. This is a reasonable assumption in the case of student loans since there is a quantifiable financial burden with a foreseeable and well-defined end date.

inflation; with 22% of loan-possessing university graduates owing more than 20,000$.[5] In 2013, a Canadian student having graduated with a bachelors' degree in 2010 earned an average annual salary of 53,000$, and fifty percent of them possessed student loan debt, averaging 26,000$, at the time of graduation; only a third had repaid their loan within three years of graduating.[6]

As the rise in student debt outpaces the growth in graduates' incomes, an increasingly significant but temporary financial strain is placed on graduates upon entering the workforce. This paper will examine whether or not there is a corresponding rise, over the past four decades, in the likelihood of individuals with a post-secondary degree in their twenties and thirties to moonlight. A weighted discrete-choice model of the choice to moonlight will be estimated for four separate periods over the past four decades. Four periods covering two consecutive years each have been selected such that each period occurs at a similar point in the business cycle. I use the unemployment rate as a measure of macroconditions. The sample periods for this study are 1987/88, 1998/99, 2005/06, and 2013/14.

There are two types of moonlighters identified in the literature: the hours-constrained worker and the heterogeneous-jobs holder. The typical demographic profile of a moonlighter has not been clearly associated to either motive. Empirical results have repeatedly shown that the tendency to moonlight rises with the level of education, but it has yet to be determined if the heterogeneous-jobs moonlighters or hours-constrained moonlighters tend to be more educated. [7]

[5] These data are derived from the National Graduates Survey and were presented by Warren Clark in *Paying off student loans*, and published on the Statistics Canada website.
[6] According to the 2014 Statistics Canada daily release, *Graduating in Canada: Profile, labour market outcomes and student debt of the class of 2009/2010, 2013*. The release uses data from the National Graduates survey for the class of 2009/2010.
[7] See Friesen (2002), Conway and Kimmel (1998) or Averett (2001).

The main findings of this paper are as follows. First both men and women are more likely to moonlight if they have a post-secondary degree, and there is evidence that these effects have increased over time, particularly for men and women ages 20 to 29, which generally supports the idea that the likelihood of multiple job holding has increased for recent graduates over the past four decades.

Furthermore, individuals that work at least 30 hours a week at their main job are less likely to moonlight, as are individuals who work in the service industry. While this is true for both men and women, there are also some significant differences in the profiles of male and female moonlighters. For example, being married increases the likelihood of moonlighting among men and decreases the likelihood of moonlighting for women. The marginal effects of having children under the age of 6 are also positive for men and negative for women.

The paper is organized as follows. Section 2, the literature review covers job stability, the hours-constrained and heterogeneous-jobs moonlighters, differences among moonlighters by gender, and moonlighting trends that have been discerned in Britain and Canada. Section 3 provides summary statistics of selected socio-demographic, employment, and industry variables drawn from the LFS. The methodology and econometric model of this paper are presented in section 4 with a detailed description of each variable used in estimation. The marginal effects are presented and discussed in section 5, followed by several robustness checks. Section 6 concludes the paper.

II. Literature Review

Previous research shows that the likelihood of a worker moonlighting is increasing in the number of years of education. However, it has not been determined whether or not the educated moonlighter is driven by the heterogeneous-jobs of hours-constrained motive. When estimating a human capital wage equation, education is an effective proxy for the unobserved *ability*; individuals with higher abilities tend to pursue higher education. Perhaps education plays a similar role in estimating the likelihood of moonlighting. Higher ability individuals may be more driven to advance their careers and enhance their credentials by working multiple jobs; such as a young academic who teaches part-time at a university and moonlights as a consultant.

On the other hand, several authors (Whu et al., 2009; Averett, 2001) have cited a desire to repay debt, including student loans, as a motive for young people to moonlight. Nonetheless, Conway and Kimmel (1998) find that including labour supply constraints in their model of the observed labour supply greatly decreases the education effect on moonlighting, suggesting that workers with higher education generally face fewer constraints and are significantly motivated by the desire to hold heterogeneous jobs.

Conway and Kimmel (1998) focus on building a model of the choice to moonlight for heterogeneous-jobs holders as well as the hours-constrained moonlighters. Previous work, such as Shishko and Rostker (1976), models the choice to moonlight assuming that all moonlighters are hours-constrained, but Conway and Kimmel (1998) perform an exogeneity test for the variable of primary job hours to show that this assumption is not appropriate. Based on Averett's (2001) definitions of hours-constrained and heterogeneous-jobs moonlighters, 66% of men and 63% of women in Averett's (2001) sample are classified as hours-constrained moonlighters.

Averett (2001) finds significant differences in the decisions of men and women to moonlight, especially with respect to marital status and children. For example, female moonlighters are less likely to be married than their male counterparts, and their children tend to be older. As a result Averett (2001) suggests that estimation of the choice to moonlight be done separately for men and women. Kimmel and Amuedo-Dourantes (2009) also estimate moonlighting models separately by gender, and their results also show significant differences in the moonlighting profiles of men and women. Whu et al. (2009) estimate a model of moonlighting using the British Household Panel Survey from 1991 to 2001, and Friesen (2002) estimates a model of moonlighting using the Canadian LFS from June 1997, with similar results; moonlighting is increasing in years of education, varies by industry, and the moonlighting profiles of men and women are quite different.

Job stability

Moonlighting rates have increased since the 1980s, and during this time job stability is said to have declined. However, some researchers argue that aggregate job stability has not declined; rather, there have been compositional changes that have adversely affected blue-collar workers more than white-collar workers. Moonlighting could be a means of hedging precarious employment or compensating for inconsistent hours of work, which would most often be faced by part-time workers. More precisely, changes in job stability would lead to moonlighting through the hours-constrained motive.

Heisz (2005) examines whether or not earlier findings on Canadian job stability reflect compositional effects or if job stability remains constant across groups. For example, as workers age, they also move into tenure categories that have greater job stability (Heisz, 2005). Increased educational attainment of workers, along with other key labour market trends, such as the ageing

of the workforce and increased participation by women, have played a significant role in determining the aggregate Canadian job stability pattern since the 1980s (Brochu, 2013). Jaeger and Stevens (1999) find that respondents in younger age groups have a higher tendency to be considered low-tenure. Low-tenure workers tend to have lower job stability and are more likely to be subject to involuntary job changes.

Using retention rates as a measure of job stability, Heisz (2005) finds a temporary increase in Canadian job stability during the 1990s. By extending Heisz's work into the 2000s, Brochu (2013) finds that the changes in job stability are cyclical. However, during the 1980s and 1990s, there was a perceived decrease in job stability in Canada, most likely due to compositional changes in the Canadian labour force.

Diebold et al. (1997) came to a similar conclusion about job stability in the United States. Despite significant changes in the wage patterns during the 1980s. Diebold et al. (1997) find no evidence of declining job stability as measured by 4-year retention rates, and only a minor decline in job stability as measured by 10-year retention rates. Diebold et al. (1997) also conclude that most of the changes in job stability during the 1980s were compositional in nature.

Valletta (1999) uses a model of implicit contracts with performance incentives and imperfect monitoring to show that between 1976 and 1993, there is evidence of declining job security for men and white-collar women in the United States. He also finds that the negative effect of tenure on the probability of voluntary and involuntary quits weakened over this time period.[8] The author also finds that changes in job security tend to reflect the economic climate of

[8] Involuntary quits are defined as dismissal by Valletta (1999).

the worker's industry, particularly for men. In general, a decline in job security is most evident among blue-collar workers.

Hours-constrained moonlighters

Most research addressing the issue of moonlighting motives focuses on deriving adequate theoretical and empirical techniques for estimating the total and moonlighting labour supply curves of each type of moonlighter, rather than on the choice to moonlight. Shishko and Rostker (1976) are among the first to combine the existing theoretical and empirical approaches to moonlighting to estimate a labour supply curve of the typical American moonlighter. These authors find that primary and secondary job hours and wage rates all impact the individual's decision to moonlight.

The hours-constrained worker moonlights to supplement their primary employment in order to achieve a preferred level of income, assuming the worker is maximizing utility by allocating their time between labour and leisure. The utility-maximizing worker's labour supply curve dictates that at the prevailing wage rate and given their individual preferences, they would choose L* labour hours; providing the income needed to obtain their preferred bundle of consumption and leisure.[9] An hours-constrained worker has a limit on the maximum labour hours they can choose for the period. If their employment contract sets hours worked at L^0 where $L^0 < L^*$; there is an incentive for the individual to moonlight as means of supplementing their primary income (Shishko and Rostker, 1976).

These same authors estimate the moonlighter's supply curve by combining the theory of the hours-constrained worker's labour supply curve and the demographic profile of the typical

[9] When maximizing utility an individual will choose a contract with a wage rate equal to their marginal rate of substitution of leisure for income.

moonlighter. According to their results, an increase in earnings at the primary job, due to either an increase in the primary wage rate or hours worked, leads to a decrease in the labour supply of moonlighting hours (i.e., the income effect dominates the substation effect). However, elasticity of moonlighting hours is more sensitive to a change in primary job hours than to a change in the primary wage rate. They explain that the quantity of moonlighting hours supplied is more sensitive to a change in the primary job hours because the total number of hours available for allocation to labour and leisure is strictly limited and directly affects the labour-leisure decision. On the other hand, an increase in the primary wage rate does not impact the actual number of hours that a worker can allocate to each job and leisure; the change only affects the worker's allocation of their time between leisure and labour through their relative prices. Similarly, an increase in the moonlighting wage rate increases the quantity of labour supplied by the individual in the secondary market and encourages new entrants into the moonlighting market through the substitution effect.

Heterogeneous-jobs moonlighters

The second type of moonlighter is the heterogeneous-jobs holder. This type of moonlighter pursues additional labour hours for its non-pecuniary benefits. When the worker maximizes the combination of monetary and psychic benefits, their optimal labour allocation may be to holding multiple jobs because of non-pecuniary benefits and costs. The primary job may allow the worker to acquire specific skills or credentials they deem necessary to work at a higher paying or preferred job. The second job, even if it pays less, may bring the worker some other type of pleasure or benefit, such as an artistic outlet, or to fulfill a philanthropic desire that is not satisfied at the primary job (Conway and Kimmel, 1998).

Both the heterogeneous-jobs and hours-constrained moonlighters are responsive to changes in their wages (Conway and Kimmel, 1998). The heterogeneous-jobs moonlighter tends to have longer episodes of multiple-job holding, without a clear relationship between primary employment and moonlighting wages. They propose a detailed empirical model from which to estimate the labour supply curves of each type of moonlighter separately.

Conway and Kimmel (1998) address a large flaw in the existing theoretical and empirical literature on moonlighting. Previous empirical work emphasizes the theoretical approach highlighted by Shishko and Rostker (1976), which only considers the case of the hours-constrained moonlighter, assuming away the significance of the heterogeneous-jobs holder. Previous empirical studies use primary job hours as an independent variable when estimating the moonlighting labour supply curve assuming exogeneity of primary job hours. However, the assumption that primary job hours are exogenous for all workers, both moonlighters and non-moonlighters, implies that all workers are hours-constrained. Conway and Kimmel (1998) argue this assumption is inconsistent with the economic theory and likely to lead to biased parameters.

Conway and Kimmel (1998) test the validity of the exogenous primary job hours assumption using a Hausman exogeneity test of observed primary job hours against a predicted upper bound on primary job hours.[10] As predicted, they reject exogeneity of observed primary job hours at the 10% level for the pooled model. However, they fail to reject exogeneity in the hours-constrained model, for which the sample is restricted to workers identified as being hours-constrained.[11] Since primary job hours are exogenous for hours-constrained moonlighters but not

[10] An upper bound of primary job hours was constructed using a vector of variables pertaining to the demographic profile and labour market conditions and an estimate of the probability of being constrained across all workers.

[11] Conway and Kimmel (1998) use a disequilibrium model of labour supply and demand to estimate which individuals are hours-constrained at their primary job. They use these results to construct a separation indicator, which separates all respondents by motive into hour-constrained workers and heterogeneous-jobs holders.

for heterogeneous-jobs moonlighters, it is not appropriate to assume exogeneity of primary job hours when estimating the labour supply curve for all moonlighters. Therefore, unless the sample is restricted to hours-constrained workers, not all moonlighters are hours constrained and primary job hours is not exogenous.

In response, Conway and Kimmel (1998) set out a theoretical model that allows for variation in the motives of moonlighters as well as in their labour supply decisions on both the primary and secondary jobs. All workers maximize utility over consumption and leisure subject to their time and budget constraints with choice variables h_1 (primary job hours) and h_2 (secondary job hours). In contrast to the theory presented by Shishko and Rostker (1976), Conway and Kimmel (1998) allow for two sets of moonlighting equations. The heterogeneous-jobs holder chooses both h_1 and h_2 but the hours-constrained moonlighter faces fixed primary job hours, H_1, and chooses only h_2. He/she then maximizes utility subject to their time and income constraints. Solving the optimality condition for h_2 gives the moonlighting equation for the hours-constrained moonlighter as a function of H_1, primary and secondary wages, and non-labour income. Therefore, the heterogeneous-jobs motive will produce a set of two moonlighting equations: $h_i = h_i^u (w_1, w_2, Y)$, where h_i^u is the labour supply of the unconstrained moonlighter to job_i, for i=1, 2.

This model includes four different types of workers: (1) the unconstrained moonlighters, (2) the constrained moonlighters, (3) the unconstrained non-moonlighters, and (4) the constrained non-moonlighters. In this model non-moonlighters (groups 3 and 4) choose $h_2 = 0$, the moonlighters (groups 1 and 2) choose $h_2>0$. In addition, the unconstrained workers (groups 1 and 3) choose h_1 while the constrained workers (groups 2 and 4) are restricted to $H_1= h_1$, where H_1 is fixed. Conway and Kimmel (1998) hypothesize that group 1 will moonlight for longer

periods of time without a significant relation between primary and secondary job wages, and group 2 will moonlight temporarily due to labour constraints on their primary job. By assuming exogenous primary job hours and that all workers are hours constrained, previous empirical work excluded groups one and three.

Conway and Kimmel find that moonlighters are actually less likely than non-moonlighters to be hours constrained, and that wage effects are stronger in the unconstrained moonlighting equation than in the constrained moonlighting equation. These results suggest that the heterogeneous-jobs motive is significant in the decision to moonlight. Furthermore, Conway and Kimmel (1998) posit that the unconstrained moonlighter is more responsive to wage effects because they are 'voluntarily' moonlighting, whereas the constrained moonlighter is 'forced' to moonlight due to labour constraints at the primary job.

Moonlighting and gender

Averett (2001) estimates the moonlighting labour supply curve simultaneously with the decision to enter the labour force, with consideration given for the moonlighter's motive. Similar to Conway and Kimmel (1998), Averett uses information on the moonlighter's reasons for moonlighting, along with hours worked and wages on the primary and secondary jobs.[12] In addition, her analysis of moonlighters in the United States argues that the moonlighting motives and profiles of men and women are different, and that these differences warrant estimating the labour supply functions of moonlighters separately by gender.

Averett estimates a bi-variate Probit model for which the dependent variable is set to one for an hours-constrained moonlighter in order to identify characteristics of workers most likely to

[12] Averett (2001) uses data from the 1991 Current Population survey. As part of the survey respondents are asked why they moonlight.

be hours-constrained and determine if these characteristics vary across the three definitions of hours-constrained moonlighters or across genders. Women moonlighting at a job not classified as management or professional are most likely doing so because of an hours-constraint at their primary job. In addition, married women are much less likely to face an hours-constraint at their primary job, which the author attributes to the tendency for spouses to share financial resources and burdens. She also finds that women tend to work multiple part-time jobs, whereas men are more likely to have at least one full-time job.

Kimmel and Amuedo-Dorantes (2009) also argue that, despite female moonlighting rates in recent years being similar to those of men, there are still significant differences between male and female moonlighters. Their results also show that female moonlighters are most likely to work two part-time jobs, and that male moonlighters tend to hold a full-time and a part-time job. If female moonlighters are less likely to have at least one full-time job, then they also have decreased access to benefits and pension plans that often require full-time employment status and face greater income uncertainty since part-time hours are often subject to frequent and significant variations. These are important factors that would affect an individual's decision to moonlight.

Averett (2001) also suggests that the degree of cyclicality may differ by gender. Kimmel and Amuedo-Dorantes (2009) find that female moonlighters show a more significant response to business cycles than male moonlighters. The cyclicality of female moonlighting also varies greatly by region; suggesting that regional labour markets differ in their ability to absorb business cycle shocks (Partridge, 2002).

Kimmel and Amuedo-Dorantes (2009) note that some differences in the cyclicality of moonlighting by gender could stem from occupational segregation by gender, since some occupations lend themselves more easily to moonlighting. They refer to previous research showing that certain sectors, such as the services, may be less affected by a recession. Averett (2001) also finds that females tend to moonlight in technical, sales and administrative support occupations, whereas men tended to moonlight in professional occupations.

Moonlighting trends in Britain and Canada

Whu et al. (2009) draw heavily from the work of Shishko and Rostker (1976) in their more recent estimation of the labour supply curve of moonlighters in the United Kingdom using the British Household Panel Survey between 1991 and 2001. Whu et al. develop a demographic profile of the typical British moonlighter to determine the leading motive for British moonlighting. In 2001 about 10.5% of workers held multiple jobs, which they find to be around 3 million workers. The authors estimate the labour supply curve of males and females separately, as suggested by Conway and Kimmel (1998) and Averett (2001). They find that the substitution effect dominates the income effect; increases in wages at the secondary job leads to increased secondary labour supply.

Whu et al. (2009) report that between 1991 and 2001, the average workweek was 33.8 hours for the primary job and 25.4 for the second job, and that working hours at the second job varied significantly over this period, but main job hours remained fairly constant. Nearly half of the moonlighters in the sample were self-employed at their second job, but only 10% of moonlighters are self-employed at the primary job. They also find that many workers earn a higher wage at their second job; this may be because so many of these jobs are in self-

employment. Lending support to the heterogeneous-jobs hypothesis, they also found that more than 88% of moonlighters' second jobs were different from their first jobs.

Whu et al. (2009) report that male workers who report being unhappy with wages at their primary job have high moonlighting rates, and their primary moonlighting incentive is financial pressure. Similar to other studies, education increases the likelihood of moonlighting. However, given the result that young people are significantly more likely to moonlight and the likelihood of moonlighting declines with age, these authors suggest that a desire to pay off student debts and become established (e.g. buy a house or a car) lead to higher moonlighting rates in younger workers.

As part of a study of the effects of overtime pay regulation on usual hours worked across Canadian jurisdictions with different overtime pay regulations, Friesen (2002) estimates a Logit model of moonlighting using the June 1997 LFS. She uses dummy variables for each jurisdiction to test for variation in the probability of moonlighting across jurisdictions. The author's estimates suggest that workers constrained by the 40-hour workweek are more likely to work at a second job than workers covered by the 44-hour workweek or 48 hour workweek. Friesen finds that 7.5% of workers moonlighted in the jurisdiction requiring overtime pay after 40 hours of work, while only 4.8% of workers moonlighted in the 44 hour jurisdiction and 4.3% in the 48 hour jurisdiction. This suggests that the hours-constraint plays a very significant role in the decision to moonlight.

Friesen's (2002) results also show that the likelihood of moonlighting is positive but declining with age between 20 and 49 years of age, then negative and increasing in magnitude from 50 to 69 years of age. The coefficients on the binary education variables of high school,

some post-sec, certificate or diploma, and university degree are all positive; university degree has the largest coefficient. The results also show that women are less likely than men to moonlight.

In summary, there are two types of moonlighters, the hours constrained type and the heterogeneous-jobs holder, but earlier research focuses only estimating the labour supply of hours-constrained moonlighters, as presented empirically and theoretically by Shishko and Rostker (1976). Conway and Kimmel (1998) argue it is not reasonable to assume that all moonlighters are hours constrained, and estimate an empirical model of labour supply that accounts for both types of moonlighters. Furthermore, Averett (2001) and Kimmel and Amuedo-Dorantes (2009) each conclude that it is ideal to estimate models of moonlighting separately for men and women, since there are significant differences in the profiles of male and female moonlighters. Lastly, moonlighting trends in Britain and Canada show that education plays an important role in modelling the choice to moonlight, and that there is evidence of both hours-constrained and heterogeneous-jobs motives among moonlighters.

III. **Data**

This study uses data drawn from the Canadian LFS public use files for four sample periods: 1987/88, 1998/99, 2005/06, and 2013/14. The LFS collects labour market information at the household level, and is one of the primary sources of Canadian labour market statistics. The target population of the LFS is the civilian, non-institutionalized population of 15 years of age or older. The survey does not cover individuals living on reserves, aboriginal settlements, or in very remote areas, and does not include the territories.

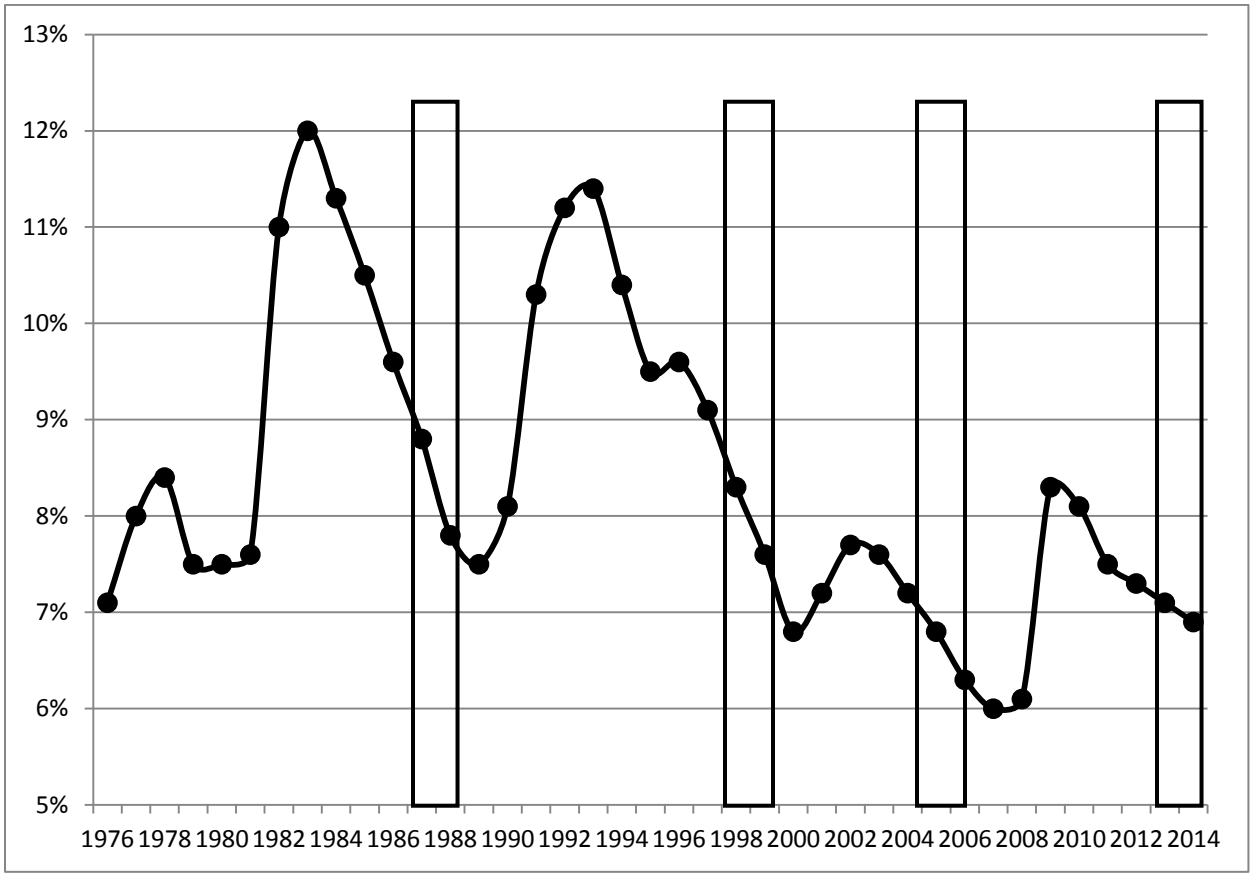
The LFS is a rotating panel survey; households are surveyed for six consecutive months and each month 1/6 of households rotate out of the survey. Hence, I rely on LFS surveys that are six months apart (i.e. September and March data) to ensure the same individual does not appear twice in my sample.[13] Figure 1 presents the annual Canadian unemployment rate from 1976 to 2014,[14] and is used to illustrate the choice of my four time periods. I chose four periods at similar stages of the business cycle – periods of strong expansion prior to a cyclical downturn. I chose two-year intervals to ensure sufficiently large samples, as it means that I will have four LFS surveys for each time period. It will also mean that my results will be less sensitive to the choice of years.

[13] Unlike the LFS master files, which are only accessible at Research Data Centres, one cannot follow individuals over time in public use files.

[14] The unemployment rate was calculated by taking the average of the monthly national unemployment rates published by Statistics Canada which are derived from the Canadian LFS. See CANSIM Table 282-0087.

Figure 1

Canadian unemployment rate: 1976 to 2014



The sample for this study is restricted to employed respondents between 20 and 39 years of age currently at work and not in school. By restricting the sample to those aged 20 to 39, I can focus on the group most likely to be experiencing financial strain due to their student debt and most likely to be in the early stages of their careers. Individuals aged 40 or more are likely to face different types of temporary financial pressures, and these pressures are less likely to be related to the cost of post-secondary education. Individuals aged 40 or more are also in a different stage of their careers, making them less likely to moonlight to meet the experience or skills requirements of a desired or future position. Excluding respondents currently in school

ensures that the sample respondents are career focussed and not dividing their attention between work and school.[15]

This study includes both men and women but estimates separate models by gender. Previous research has commonly focussed on prime-aged men only and excluded female observations in estimation.[16] Kimmel and Powell (1999) cite increases in moonlighting among females as a major contributor for the increases in rates of moonlighting during the 1980s; during which time moonlighting rates among men were relatively flat. Moonlighting has changed and evolved differently for men and women since the 1980s, so it would not be appropriate to estimate a model of the choice to moonlight with men and women together.

Table 1 presents weighted summary statistics for each of my four sample periods. The fact that the sample size of the LFS has not increased with the Canadian population over the past four decades, and that the sum of the weights in each survey adds up to the target population, means that a simple weighted regression for the full sample would put more weight on the more recent periods. The weights for each year have been normalized to one to ensure equal weighting of each of the eight years in the sample. The restricted sample is fairly large, consisting of 385,267 observations with the number of observations per period ranging from 84,745 in 2013/14 to 112,982 in 1987/88.

[15] Conway and Kimmel (1998) only exclude students under the age of 26 in their sample, however, mature students are also simultaneously making decisions about investing in their own human capital investment and their labour supply so mature students have been excluded from my sample.

[16] See Dickey, Watson, and Zangelidis (2011); and Friesen (2002) for models of the choice to moonlight and/or moonlighting labour supply estimates that only include prime aged-men.

Table 1

Weighted sample means for each period

	1987/88 (1)	1998/99 (2)	2005/06 (3)	2013/14 (4)
Socio-demographic characteristics				
Male	0.5562	0.5430	0.5392	0.5353
	(0.4968)	(0.4981)	(0.4985)	(0.4988)
Married	0.6440	0.6583	0.5925	0.5744
	(0.4788)	(0.4743)	(0.4914)	(0.4944)
Age 20-24	0.2087	0.1563	0.1753	0.1664
	(0.4064)	(0.3631)	(0.3802)	(0.3725)
Age 25-29	0.2773	0.2369	0.2526	0.2633
	(0.4477)	(0.4252)	(0.4345)	(0.4404)
Age 30-34	0.2693	0.2815	0.2723	0.2888
	(0.4436)	(0.4497)	(0.4452)	(0.4532)
Age 35-39	0.2447	0.3253	0.2998	0.2815
	(0.4299)	(0.3253)	(0.4582)	(0.4497)
Child under 6 years old	0.2849	0.2847	0.2717	0.2861
	(0.4513)	(0.4513)	(0.4449)	(0.4519)
Child 6 to 18 years old	0.1707	0.1626	0.1386	0.1032
	(0.3763)	(0.3690)	(0.3455)	(0.3042)
Child 18 to 24 years old	0.0035	0.0041	0.0027	0.0021
	(0.0589)	(0.0636)	(0.0521)	(0.0459)
Education				
High school or less	0.6503	0.4287	0.3662	0.3095
	(0.4769)	(0.4949)	(0.4818)	(0.4622)
College	0.1877	0.3694	0.3787	0.3808
	(0.3904)	(0.4827)	(0.4851)	(0.4856)
University	0.1622	0.2018	0.2551	0.3097
	(0.3686)	(0.4014)	(0.4359)	(0.4624)
Regions				
West	0.2888	0.3106	0.3134	0.3408
	(0.4532)	(0.4627)	(0.4639)	(0.4740)
Central	0.6351	0.6191	0.6214	0.6017
	(0.4814)	(0.4856)	(0.4850)	(0.4896)
East	0.0761	0.0703	0.0652	0.0576
	(0.2652)	(0.2557)	(0.2469)	(0.2330)
Urban	0.3435	0.3555	0.3607	0.3570
	(0.4749)	(0.4787)	(0.4802)	(0.4791)
Employment				
Multiple job holder	0.0442	0.0535	0.0536	0.0565
	(0.2054)	(0.2250)	(0.2252)	(0.2308)
Full-time	0.8933	0.8717	0.8896	0.8778
	(0.3087)	(0.3344)	(0.3133)	(0.3275)
Unemployment rate	8.3424	7.9068	6.5457	6.9569
	(2.6397)	(2.0544)	(1.8533)	(1.4256)
Industries				
Agriculture, forestry, fishing	0.0515	0.0421	0.0380	0.0391
& hunting	(0.2211)	(0.2007)	(0.1913)	(0.1939)
Utilities & construction	0.0737	0.0636	0.0791	0.1002
	(0.2613)	(0.2440)	(0.2699)	(0.3003)
Manufacturing	0.1804	0.1683	0.1414	0.0910
	(0.3845)	(0.3742)	(0.3484)	(0.2876)

Trade, transportation & warehousing	0.2077 (0.4057)	0.2052 (0.4039)	0.2012 (0.4009)	0.1853 (0.3886)
Finance & professional services	0.1387 (0.3456)	0.1664 (0.3724)	0.1834 (0.3870)	0.1890 (0.3915)
Education & health services	0.1455 (0.3526)	0.1464 (0.3535)	0.1639 (0.3702)	0.1893 (0.3917)
Information & recreation	0.0931 (0.2906)	0.1122 (0.3156)	0.1063 (0.3082)	0.1117 (0.3150)
Other services	0.0477 (0.2132)	0.0497 (0.2173)	0.0445 (0.2062)	0.0456 (0.2087)
Public administration	0.0616 (0.2404)	0.0462 (0.2100)	0.0422 (0.2010)	0.0488 (0.2155)
Number of observations	112,982	100,065	87,475	84,745

NOTES: The sample means shown in Table 1 are weighted, using a normalized set of weights constructed from the weights provided in the LFS data sets. The standard deviation is presented in brackets directly underneath the mean.

Table 1 shows that slightly more than half the sample is male, and that the ratio has remained fairly constant across time, ranging from 53.5% to 55.6% over the four periods. The incidence of married respondents is 64.4% in 1987/88, and it increased slightly in 1998/99 to 65.8%. Over the subsequent two periods the rate of married respondents declined a total of 8.4 percentage points to 57.4% in 2013/14. It should be noted that I define marriage to include common law relationships, since both arrangements imply a degree of shared resources indicating that one individual's decision to enter the labour force or moonlight is affected by their partner's decisions as well.

The proportion in each of the four age groups (20-24, 25-29, 30-34 and 35-39) has changed due to the baby boom effect and the rising educational attainment over time.[17] For example, in the 1987/88 sample, the baby boomers are present in all age groups, and in the 1998/99 sample, they are only in the 30 to 34 and 35 to 39 age groups. By 2005/06 the baby boomers have aged out of the restricted sample. Rising educational attainment (i.e. rising attendance in post-secondary institutions) will also reduce the proportion of the sample that are

[17] Baby boomers are individuals born in the post world war II increase in births between 1946 and 1964.

in the 20 to 24 age bracket in later periods, as I exclude those currently in school from my sample.

In Table 1, the proportion of the sample with children has declined over time, but not across all age groups. In order to capture the presence of a child in the dwelling and represent the age of children, the LFS variable 'age of youngest child' was used to construct three fertility status variables by ages: less than 6 years, 6 to 17 years of age, and 18 to 24 years of age. Nearly 30% of respondents in each period have children under the age of 6. However, the proportion of respondents with school-aged children, 6 to 17 years, decreases from 17.1% in 1987/88 to 10.3% in 2013/14. There is also a decline the proportion of respondents with children aged 18 to 24, but it is less than 0.5% of the sample to start with.[18]

Three binary educational attainment variables have been constructed for this study; high school or less, college, and university. High school or less is limited to individuals who graduated from high school and went no further. College includes individuals that completed a college degree or a vocational or trade program. University degree captures both bachelors and graduate degrees.

As a result of survey changes, the LFS contains a break in the education series in 1990. Previously respondents indicated their years of education, but after a survey redesign in the 1990s, respondents were asked to provide their highest level of educational attainment. The categories were also expanded to include both university bachelors' and graduate degrees.[19]

[18] In the LFS individuals are only identified as having a child if he/she lives in the same dwelling as them.

[19] In Dave Gower's 1993 report, *The Impact of the 1990 Changes to the Education Questions on the Labour Force Survey*, he notes that more inclusive post-secondary diploma and degree categories allowed some people to more accurately or completely report their education levels, placing them in one of the post-secondary categories when they would have most likely ended up in the high school or some post-secondary categories previously. This

Table 1 shows that the proportion of individuals with a high school diploma or less declined over time but increased for those holding post-secondary degrees. The rate of respondents in the sample that have completed high school or less fell 34.1 percentage points over the sample period from 65% to 31%. The proportion of individuals with a college degree increased from 18.8% in 1987/88 to 38.1% in 2013/14. Similarly, those with a university degree increased from 16.2% to 31% over the same period.

As shown in Table 1, the proportion of individuals living in the western region of Canada (i.e. British Columbia, Alberta, Saskatchewan and Manitoba) has increased at the expense of Central Canada (Ontario and Quebec) and eastern Canada (Maritimes and Newfoundland). More precisely, the share of respondents in the west has grown from 28.9% in 1987/1988 to 34.1% in 2013/2014. The proportion that live in Canada's three major cities (Vancouver, Toronto and Montreal), which I denote by the variable *urban*, has remained fairly stable over time at approximately 35% of the sample.

Of critical importance to this study, the LFS asks respondents if they held more than one job during the reference period. A subsequent question assigns their main job as the one at which the most hours are worked. No further questions are asked specifically about the respondent's second job, such as the industry or the wage.[20] The proportion of multiple-job holders (as defined by the *mjobs* variable) accounts for 4.4% of the restricted sample in 1987/88, increasing to 5.7% in 2013/14.

---

explains the large magnitude of the increase in the sample mean for the variable college between 1987/88 and 1998/99 in Table 1.

[20] However, respondents are asked to provide the usual hours worked at their main job and usual hours worked at all jobs; the difference between these data points could be attributed to hours worked at other jobs, i.e. moonlighting hours.

In order to capture the effect of a time constraint due to labour hours, a binary variable is constructed from the LFS question asking the respondent to categorize their main job as full-time or part-time. Full-time work is defined as a minimum of thirty hours and, for moonlighters, the main job is the one at which they usually work the most hours. Table 1 shows that between 87.2% and 89.3% of the restricted sample's primary job is full-time.

The monthly unemployment rate for the respondent's province of residence has been added into the selected surveys as a relative measure of the strength of the employment market.[21] Each selected survey month is from a similar point in the business cycle, based on the national unemployment rate during that period. However, the provincial unemployment rates vary greatly across Canada; in particular, the eastern provinces tend to have consistently higher unemployment rates than the rest of the country.

Table 1 shows summary statistics for nine broad industry categories as defined by the 2002 North American Classification System (NAICS). Industry classifications have changed over the four decades, going from the Standard Industry Classification (SIC) to the NAICS, and even within each classification, there have been regular changes (e.g. 1997 NAICS and 2002 NAICS). Fortunately, the LFS public-use files provides a uniform series based on the 2002 NAICS, and as such the researcher does not need to carry out industry crosswalks, as is the case when using multiple Canadian Censuses.[22] The nine industry categories are as follows; (1) agriculture, forestry, fishing and hunting; (2) utilities and construction; (3) manufacturing; (4)

[21] I have selected sample years from similar areas in the business cycle, periods of strong expansion just prior to an economic downturn. However, as Figure 1 shows, the economy was doing a little better in the last two periods as denoted by the lower unemployment rate. So by including a control for unemployment rate in my later regressions I can capture such changes.

[22] NAICS is the standard used for publications by Statistics Canada and the Bureau of Economic Analysis. NAICS replaced the previous industry classification system Standard Occupation Classification (SOCC). SOCC is also available in any LFS administered prior to January 1999.

trade, transportation and warehousing; (5) finance and professional services; (6) education and health services; (7) information and recreation; (8) other services; and (9) public administration.[23]

There have been some notable changes to certain Canadian industries, such as the decline of manufacturing. While 18.04% of the sample reported that their main job was in manufacturing in 1987/88, this figure fell to 9.1% for the 2013/14 period. Agricultural workers comprise a small portion of the sample population: less than 5% after 1990. However, this industry also shows a decline over the past four decades. The decline in these industries has been compensated for by increases in white-collar industries such as finance and professional services and education and health services. Interestingly, 20% of the sample reported that their main industry is in trade, transportation and warehousing in each sample period; this is the most significant industry group in the sample.

Since the link between moonlighting (i.e. having more than one job) and educational attainment is the main interest of this paper, I present summary statistics of educational attainment for moonlighters and non-moonlighters separately. Table 2 presents the weighted summary statistics of the education variables for the moonlighting and non-moonlighting sub-samples.[24] Table 1 shows that the rate of multiple-job holding among the sample's respondents increased 1.2 percentage points between 1987/88 and 2013/14. During this interval there was a decline in the proportion of respondents without a post-secondary education and a corresponding increase in respondents having completed a post-secondary program.

[23] Manufacturing includes both durables and non-durables. Trade includes both retail trade and wholesale trade. Finance and professional services includes the following NAICS industries: (1) finance and insurance; (2) professional, scientific and technical services; and (3) management and administrative support.
[24] The education categories follow the same definitions as in Table 1.

Table 2

Weighted sample means of educational attainment for moonlighters and non-moonlighters by period

	1987/88 (1)	1998/99 (2)	2005/06 (3)	2013/14 (4)
Moonlighters				
High school or less	0.5710	0.3803	0.3147	0.2481
	(0.4950)	(0.4855)	(0.4644)	(0.4320)
College	0.2249	0.3978	0.4048	0.4027
	(0.4175)	(0.4895)	(0.4909)	(0.4905)
University	0.2042	0.2219	0.2805	0.3491
	(0.4031)	(0.4156)	(0.4493)	(0.4767)
Total moonlighters	5,644	5,789	4,957	5,033
Non-moonlighters				
High school or less	0.6539	0.4314	0.3691	0.3131
	(0.4757)	(0.4953)	(0.4826)	(0.4638)
College	0.1858	0.3678	0.3772	0.3795
	(0.3890)	(0.4822)	(0.4847)	(0.4853)
University	0.1602	0.2007	0.2537	0.3073
	(0.3668)	(0.4005)	(0.4351)	(0.4614)
Total non-moonlighters	107,338	94,276	82,518	79,712

NOTES: The sample means shown in Table 2 are weighted using a normalized set of weights constructed from the weights provided in the LFS data sets. The standard deviation is presented in brackets directly underneath the mean.

Table 2 shows that over each period university graduates account for 16.02%, 20.1%, 25.4%, and 30.7% of the non-moonlighting sample. This follows very closely with the rate of university degree holders in Table 1; a difference of less than a quarter percentage point per sample period. The distribution for the other educational categories among non-moonlighters also mirrors the distribution in Table 1. However, in the moonlighting sub-sample, *high school or less* tends to be underrepresented, relative to the pooled sample, by between 4.8 and 7.9 percentage points each sample period. On the other hand, respondents with a college diploma or post-secondary certificate tend to be overrepresented in the moonlighting sub-sample by between 2.2 and 3.7 percentage points, relative to the pooled sample. University graduates are the most overrepresented among moonlighters. In 1987/88 the proportion of university graduates is nearly 26% more than in the pooled sample; 16.2% compared to 20.4%. In the 1998/99 and 2005/06

samples, university graduates are about 10% over represented, and in the 2013/14 sample, the proportion of university graduates is nearly 13% higher than would be expected.

IV. **Methodology for empirical analysis**

The regression analysis for this paper is based on a discrete choice model. The parametric specification is the Probit model and takes the following form:

$$\Pr(mjobs_{it} = 1) = \Phi(\beta_0 + educ_{it}\phi_1 + age_{it}\phi_2 + \beta_1 university*20\ to\ 29_{it} + \beta_2 married_{it} + child_{it}\phi_3 + geo_{it}\phi_4 + employment_{it}\phi_5 + \theta_p) \quad (1)$$

where $\Phi(.)$ is the cumulative normal distribution and $mjobs_{it}$ is a binary variable set to one for individual *i* in year *t* if he/she is holding multiple jobs, and zero otherwise. The parameters of interest are the marginal effects, i.e. how a change in an explanatory variable affects the probability of holding multiple jobs. There are a total of 25 dummy variables captured by the vectors and variables in equation (1) including; two education dummies, three age dummies, an age-education interaction dummy, a dummy variable for marital status, three fertility status dummies, three regional dummies, eight industry dummies, a full-time work dummy, and three time period dummies.[25]

The vector $educ_{it}$ consists of educational attainment dummies for college and university, with high school or less as the reference group. The age_{it} vector includes dummies for five-year age groupings, 20 to 24, 25 to 29, and 30 to 34; the reference group is 35 to 39 years of age. $University*20\ to\ 29_{it}$ is the key variable of interest - it is an interaction variable that assumes a value of one if the individual has a university degree and is 20 to 29 years of age, and a value of

[25] The only continuous variable in equation (1) is the provincial unemployment rate at time t, which is included in the employment vector.

zero otherwise. I would expect the marginal effect of *university·20 to 29*$_{it}$ to be positive, since moonlighting activity is declining in age and increasing in years of education. Furthermore, if the moonlighting activity has increased for recent university graduates over the past four decades, then the marginal effect should be increasing in magnitude across the four sample periods.

As previously defined, *married*$_{it}$, is a binary variable for being married or in a common-law relationship. The *child*$_{it}$ vector includes three binary variables capturing the presence of a child in the home as indicated by the age of the youngest child, with the reference group being no children in the home. *Geo*$_{it}$ is a vector of geographic indicators with three regional dummies, east and central (west is the reference region), and an *urban* dummy, which indicates that the respondent lives in one of Canada's three major cities. The vector *employment*$_{it}$ includes ten variables: the provincial monthly unemployment rate, a binary variable for full-time work, and 8 industry dummies.

First I will estimate the marginal effects of the pooled model as presented in equation (1), and include θ_p, which is a vector of three time period dummies (1998/99, 2005/06, and 2013/14). Since the objective of this paper is to observe changes in the marginal effects of education and age over time, I will also estimate the marginal effects of equation (1) for each sample period separately. The time-period dummies in vector θ_p are dropped for the second set of estimations. In all cases estimation is carried out for men and women separately and weighted.[26]

[26] The weights provided in the LFS data sets have been normalized to one for each sample year, or two for each two-year sample period. There is a more thorough discussion of the weighting in the Data section of this paper.

V. Estimation & Results

This section presents the marginal effects from weighted estimation of equation (1) for the pooled model and separately for each sample period. In Table 3 the estimated marginal effects of the pooled model are presented separately for men and women. In Table 4 the estimated marginal effects are presented separately for each time-period and separately for men and women. These results allow us to see whether there have been changes in the marginal effects of key variables over time – particularly education.[27]

[27] The full sample regression does include time dummies, but this will only allow for a level effect. It will not, for example, allow for the effect of education to change over time.

Pooled model: all time-periods together

Table 3

Estimated marginal effects for men and women in the pooled model

	Male (1)	Female (2)
Socio-demographic characteristics		
Married	-0.0008	-0.0138**
	(0.0017)	(0.0017)
Age 20-24	0.0012	0.0113***
	(0.0022)	(0.0025)
Age 25-29	0.0007	0.0061**
	(0.0019)	(0.0024)
Age 30-34	0.0032*	0.0052***
	(0.0016)	(0.0020)
Child under 6 years old	0.0071***	-0.0311***
	(0.0018)	(0.0020)
Child 6 to 18 years old	0.0070***	-0.0073***
	(0.0022)	(0.0023)
Child 18 to 24 years old	-0.0072	-0.0074
	(0.0108)	(0.0107)
College	0.0079***	0.0174***
	(0.0014)	(0.0017)
University	0.0048***	0.0158***
	(0.0022)	(0.0025)
University*20 to 29 years	0.0086***	0.0032
	(0.0033)	(0.0034)
Regions		
East	-0.0111***	-0.0096***
	(0.0024)	(0.0029)
Central	-0.0067***	-0.0132***
	(0.0013)	(0.0015)
Urban	-0.0079***	-0.0115***
	(0.0016)	(0.0018)
Employment		
Full-time	-0.0555**	-0.0649***
	(0.0022)	(0.0017)
Unemployment rate	0.0020***	-0.0034***
	(0.0004)	(0.0004)
Industries		
Agriculture, forestry, fishing & hunting	-0.0314***	-0.0117***
	(0.0027)	(0.0041)
Utilities & construction	-0.0502***	-0.0155***
	(0.0028)	(0.0055)
Manufacturing	-0.0457***	-0.0317***
	(0.0026)	(0.0034)
Trade, transportation & warehousing	-0.0311***	-0.0187***
	(0.0024)	(0.0022)
Finance & professional services	-0.0295***	-0.0207***
	(0.0026)	(0.0022)
Information & recreation	-0.0141***	-0.0087***
	(0.0028)	(0.0024)

Other services	-0.0362***	-0.0140***
	(0.0036)	(0.0032)
Public administration	-0.0229***	-0.0261***
	(0.0032)	(0.0035)
Periods		
1998/99	-0.0028	0.0121***
	(0.0017)	(0.0021)
2005/06	-0.0058***	0.0081***
	(0.0020)	(0.0024)
2013/14	-0.0066***	0.0109***
	(0.0019)	(0.0023)
Number of observations	206,057	178,760
Log pseudolikelihood	-0.7838	-0.7630
Prob > chi2	0.0000	0.0000

NOTES: The dependent variable is *mjobs*, which assumes a value of one if the respondent holds more than one full-time or part-time job, and a value of zero if they hold only one job, either part-time or full-time. The marginal effects are based on weighted estimation of Probit equations. The weighted standard error is provided in the brackets directly underneath each marginal effect. The statistical significance of the marginal effects are denoted by the following: * for the 10% level, ** for the 5% level, *** for the 1% level.

Table 3 presents the marginal effects by gender for all sample periods pooled together. The marginal effect of being married is only statistically and economically significant for women; a married woman is 1.4% less likely to moonlight than an unmarried woman. Similarly, age only appears to matter for women. Women between the ages of 20 and 24 are 1.1% more likely to moonlight than women between the ages of 35 and 39. For women, the likelihood of moonlighting decreases to 0.6% between ages 25 and 29 and to 0.5% between age 30 to 34, compared to women between ages 35 and 39.

The marginal effects in Table 3 show that women are less likely to moonlight if they have young children but men are more likely to moonlight if they have young children at home. Women with a child under the age of 6 are 3.1% less likely to moonlight than women without children at home but, under the same circumstances, men are 0.7% more likely to moonlight. The marginal effect of *child 6 to 17 years old* is also positive for men and negative for women; men with a child between 6 and 17 years at home are 0.7% more likely to moonlight then men

without children at home, but women are 0.7% less likely to moonlight in the same situation. The marginal effect of *child 18 to 24 years old* is not economically significant or statistically significant at the 10% level for either men or women.

As the results presented in Table 3 show, those with higher education (college and university) are more likely to have multiple jobs compared to those with a high school education or less. This result holds true for both men and women, but the marginal effects are larger for women. Between the ages of 30 and 39 there is a 1.6% university-high school differential for women, whereas for men it is only 0.5%. Between the ages of 20 and 29, the gender differential is smaller, i.e. 1.3% for men and 1.9% for women.[28] The marginal effect of *university*20 to 29 years* is expected to be positive since the marginal effects on moonlighting should be decreasing in age and increasing in years of education. The interaction, *university*20 to 29 years*, is only economically and statistically significant for men. As such, one cannot reject the hypothesis that there is no difference in the education effect across age groups for women. The primary purpose of the interaction variable is to observe changes in its marginal effect over time, which is presented in Table 4.

Table 3 shows that both men and women are less likely to moonlight if they live in eastern Canada (as opposed to western Canada); the marginal effect is approximately 1% less for both genders. The marginal effect is also negative if the person lives in central Canada, but more muted for men. Finally, both men and women are less likely to moonlight if the live in one of Canada's three major cities, but the marginal effect is slightly larger for women at -1.1%. In all cases the marginal effects are statistically significant at the 1% level.

[28] Between ages 30 and 39 the marginal effect of having a university degree rather than a high school diploma or less is captured by the marginal effect of university. However, between the ages of 20 and 29 the marginal effect of having a university degree over a high school diploma or less is obtained by adding the marginal effects of *university* and the marginal effect of the interaction variable, *university*20 to 29 years.*

In Table 3, the marginal effect of having a full-time main job is both economically and statistically significant for men and for women. Males and females are, respectively, 5.6% and 6.5% less likely to moonlight if their main job is full-time instead of part-time, and these findings are statistically significant at the 1% level. The provincial employment rate does seem to matter, but the effect varies across gender. Males are 0.2% more likely to moonlight, while females are 0.3% less likely to moonlight when their provincial unemployment rate increases one percentage point.

Table 3 shows important industry differences. Both males and females are most likely to moonlight if they work in the education and health services. They are also less likely to have multiple jobs if they work in manufacturing. As compared to education and health services (the reference group), men and women are 4.6% and 3.2%, respectively, less likely to hold multiple jobs. There are some gender differences. Two industries, *public administration* and *finance and professional services*, have larger marginal effects for women than for men. Males are least likely to moonlight if their primary job is in utilities or construction, and females are least likely to moonlight if they work in manufacturing.

Compared to 1987/88, the reference year, women are more likely to moonlight, and men are less likely to moonlight. The marginal effects are also more economically significant for women. For example, women in 2013/14 are 1.1% more likely to moonlight than women in 1987/88, while men in 2013/14 are 0.7% less likely to moonlight than their 1987/88 counterparts. Estimation of the pooled model only allows time to have a level effect through the time-period dummies but the purpose of this paper is to observe changes in the marginal effects over time. As such, the next subsection discusses the marginal effects estimated separately for each time period.

Results for each sample period

Table 4 shows the marginal effects by gender estimated separately for each. The results in Table 4 show the marginal effects of education have changed for individuals with a post-secondary degree over a high school diploma since the 1980s. There are also significant differences in the marginal effects of the explanatory variables by gender.

Table 4

Marginal effects estimated separately for each sample period by gender

	1987/88		1998/99		2005/06		2013/14	
	Male (1)	Female (2)	Male (3)	Female (4)	Male (5)	Female (6)	Male (7)	Female (8)
Socio-demographic characteristics								
Married	-0.0030	-0.0131**	0.0067**	-0.0099***	-0.0040	-0.0183***	-0.0020	-0.0122***
	(0.0035)	(0.0030)	(0.0032)	(0.0031)	(0.0034)	(0.0034)	(0.0036)	(0.0036)
Age 20-24	0.0058	0.0050	0.0036	0.0215***	-0.0004	0.0111**	-0.0042	0.0065
	(0.0041)	(0.0045)	(0.0040)	(0.0046)	(0.0044)	(0.0052)	(0.0048)	(0.0060)
Age 25-29	-0.0007	0.0044	0.0038	0.0119***	0.0011	-0.0015	-0.0005	0.0089
	(0.0036)	(0.0042)	(0.0035)	(0.0043)	(0.0040)	(0.0050)	(0.0042)	(0.0055)
Age 30-34	0.0044	0.0058*	0.0059**	0.0042	0.0033	0.0003	-0.0006	0.0096**
	(0.0031)	(0.0035)	(0.0029)	(0.0036)	(0.0034)	(0.0041)	(0.0036)	(0.0046)
Child under 6 years old	0.0097***	-0.0192***	0.0026	-0.0356***	0.0078**	-0.0357***	0.0073*	-0.0340***
	(0.0034)	(0.0035)	(0.0032)	(0.0037)	(0.0036)	(0.0042)	(0.0039)	(0.0043)
Child 6 to 18 years old	0.0088**	-0.0030	0.0089**	-0.0084**	0.0002	-0.0043	0.0079	-0.0142**
	(0.0040)	(0.0038)	(0.0040)	(0.0041)	(0.0047)	(0.0046)	(0.0056)	(0.0055)
Child 18 to 24 years old	0.0023	-0.0021	-0.0061	-0.0194	-0.0130	-0.0184	-0.0210	0.0074
	(0.0234)	(0.0141)	(0.0174)	(0.0180)	(0.0201)	(0.0272)	(0.0282)	(0.0287)
College	0.0092***	0.0158***	0.0048*	0.0146***	0.0086***	0.0179***	0.0089***	0.0216***
	(0.0031)	(0.0031)	(0.0025)	(0.0031)	(0.0029)	(0.0036)	(0.0031)	(0.0043)
University	0.0074*	0.0185***	-0.0015	0.0184***	0.0039	0.0107**	0.0081*	0.0178***
	(0.0041)	(0.0045)	(0.0041)	(0.0050)	(0.0044)	(0.0053)	(0.0046)	(0.0057)
University* 20 to 29 years	0.0019	-0.0031	0.0102*	-0.0070	0.0102	0.0182***	0.0096	0.0010
	(0.0072)	(0.0067)	(0.0062)	(0.0069)	(0.0067)	(0.0069)	(0.0064)	(0.0067)
Regions								
East	-0.0103***	-0.0106***	-0.0175***	0.0218***	-0.0073	-0.0011	0.0024	0.0080
	(0.0035)	(0.0039)	(0.0051)	(0.0059)	(0.0070)	(0.0078)	(0.0096)	(0.0115)
Central	-0.0214***	-0.0292***	-0.0142***	0.0216***	0.0004	-0.0051	0.0022	-0.0041
	(0.0025)	(0.0027)	(0.0025)	(0.0030)	(0.0038)	(0.0052)	(0.0050)	(0.0061)
Urban	-0.0046	-0.0034	-0.0131***	-0.0159***	-0.0082***	-0.0121***	-0.0044	-0.0125***
	(0.0031)	(0.0033)	(0.0030)	(0.0036)	(0.0031)	(0.0037)	(0.0034)	(0.0042)
Employment								
Full-time	-0.0429***	-0.0426***	-0.0578***	-0.0663***	-0.0572**	-0.0684***	-0.0580***	-0.0793***
	(0.0047)	(0.0029)	(0.0039)	(0.0031)	(0.0046)	(0.0034)	(0.0043)	(0.0037)
Unemploy-ment rate	-0.0045***	-0.0057***	-0.0022***	-0.0039***	-0.0017	-0.0034***	-0.0024	-0.0042*
	(0.0006)	(0.0007)	(0.0007)	(0.0009)	(0.0011)	(0.0012)	(0.0018)	(0.0022)
Industries								
Agriculture, forestry, fishing & hunting	-0.0132***	0.0117*	-0.0358***	-0.0157**	-0.0329***	-0.0214**	-0.0515***	-0.0414***
	(0.0048)	(0.0060)	(0.0052)	(0.0073)	(0.0058)	(0.0095)	(0.0062)	(0.0114)
Utilities & construction	-0.0353***	0.0089	-0.0446***	-0.0098	-0.0578***	-0.0410***	-0.0607***	-0.0246**
	(0.0054)	(0.0086)	(0.0054)	(0.0107)	(0.0059)	(0.0115)	(0.0058)	(0.0125)
Manufactur-ing	-0.0395***	-0.0161***	-0.0469***	-0.0393***	-0.0466***	-0.0340***	-0.0471***	-0.0392***
	(0.0051)	(0.0053)	(0.0048)	(0.0061)	(0.0054)	(0.0073)	(0.0058)	(0.0089)
Trade, transportation & warehousing	-0.0244***	-0.0083**	-0.0300***	-0.0205***	-0.0321***	-0.0218***	-0.0378***	-0.0239***
	(0.0049)	(0.0037)	(0.0048)	(0.0041)	(0.0050)	(0.0045)	(0.0051)	(0.0051)
Finance & professional services	-0.0167***	-0.0080**	-0.0308***	-0.0299***	-0.0375***	-0.0206***	-0.0326***	-0.0242***
	(0.0054)	(0.0040)	(0.0049)	(0.0043)	(0.0051)	(0.0045)	(0.0050)	(0.0049)
Information & recreation	-0.0022	-0.0049	-0.0189***	-0.0231***	-0.0170***	-0.0019	-0.0181***	-0.0055
	(0.0057)	(0.0045)	(0.0051)	(0.0047)	(0.0055)	(0.0048)	(0.0055)	(0.0051)
Other services	-0.0142**	-0.0045	-0.0469***	-0.0145**	-0.0447***	-0.0225***	-0.0403***	-0.0141*
	(0.0070)	(0.0052)	(0.0065)	(0.0058)	(0.0079)	(0.0066)	(0.0072)	(0.0074)
Public administrat-ion	-0.0230***	-0.0167***	-0.0159***	-0.0237***	-0.0232***	-0.0388***	-0.0267***	-0.0278***
	(0.0059)	(0.0054)	(0.0061)	(0.0070)	(0.068)	(0.0082)	(0.0067)	(0.0077)

Number of observations	62,635	50,347	53,077	46,988	46,116	41,359	44,679	40,066
Log pseudo-likelihood	-0.1966	-0.1501	-0.1955	-0.1960	-0.1943	-0.1999	-0.1941	-0.2136
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

NOTES: The dependent variable is *mjobs*, which assumes a value of one if the respondent holds more than one full-time or part-time job, and a value of zero if they hold only one job, either part-time or full-time. The marginal effects are based on weighted estimation of Probit equations. The standard error is provided in the brackets directly underneath each marginal effect. The statistical significance of the marginal effects are denoted by the following: * for the 10% level, ** for the 5% level, *** for the 1% level.

The estimated marginal effects presented in Table 4 show that married women are less likely to moonlight in each sample period than single women; however, the marginal effect of being married is not consistently statistically significant for men. Married women in 1998/99 are 1% less likely to moonlight than single women, and in 2005/06 they are 1.8% less likely to moonlight.[29]

The estimated marginal effects of the age variables are not consistently significant for either gender. If the likelihood of moonlighting is decreasing in age then, relative to the reference group (age 35 to 39), I expect that the marginal effect of each age variable should be positive, and decreasing in magnitude with age. In the 1998/99 sample, women between ages 20 and 24 are 2.1% more likely to moonlight, and women aged 25 to 29 years are 1.2% more likely to moonlight compared with women aged 35 to 39 years. Similarly, women in the 2005/06 sample aged 20 to 24 years and in the 2013/14 sample aged 30 to 34 years are both 1% more likely to moonlight. None of the age variables are statistically significant at the 10% level for men.

The results in Table 4 show that men and women have opposite patterns with respect to the marginal effects of having young children in the home; in each period the marginal effects are negative for women and positive for men. The 1987/88 sample shows that women with at

[29] Table 4 column 3 shows that men in 1998/99 are 0.7% more likely to moonlight if they are married but, in the remaining periods, the marginal effects of *married* are negative and not statistically significant at the 10% level for men.

least one child under 6 years old are 1.9% less likely to moonlight than women without children, whereas men are 1% more likely to moonlight under the same circumstances. For men, this marginal effect decreases to 0.7% in the 2013/14 sample period. Conversely, in the 2005/06 sample period women are 3.6% less likely to moonlight if they have a child under 6 years old. The marginal effects of having a child between 6 and 17 years are also positive for men and negative for women.

Table 4 contains the estimated marginal effects of *college, university,* and *university*20 to 29 years,* which are the primary interest of this paper. More precisely, the main interest of this study is whether or not university graduates between ages 20 and 29 are increasingly likely to moonlight in each sample period; as indicated through changes in the combined marginal effect of *university* and *university*20 to 29 years* over time. I expect each of the estimated education effects to be positive because the likelihood of moonlighting should be increasing in years of education. In addition, the likelihood of moonlighting should be decreasing in age, so I expect that the estimated marginal effect of holding a university degree will be larger for individuals aged 20 to 29 than for those aged 30 to 39.

Table 4 shows that the estimated marginal effects of education are generally positive, statistically significant, and larger for women. The marginal effect of having a college degree compared with a high school diploma or less, for women, is smallest in the 1998/99 sample period at 1.5%, and increases 0.7 percentage points to 2.2% in the 2013/14 sample period. On the other hand, the marginal effect of *college* for men is 0.9% in three of the four sample periods. For individuals aged 20 to 29, the effect of holding a university degree compared with a high school diploma or less is positive for both men and women in each sample period. In addition, this effect is largest in the 2013/14 and 2005/06 sample periods for both men and women.

Compared to women aged 20 to 29 with a high school diploma or less, women aged 20 to 29 with a university degree are 1.5%, 1.1%, 2.1%, and 1.9% more likely to moonlight in each of the respective sample periods. Their male counterparts are 0.9%, 0.9%, 1.4%, and 1.8% more likely to moonlight respectively; an increase of 0.9 percentage points in the likelihood of moonlighting over time.

For respondents aged 30 to 39 years, the marginal effect of holding a university degree over a high school diploma or less is similar in the 1987/88 and 2013/14 sample periods for both men and women, but the marginal effects are larger for women. Women aged 30 to 39 years with a university degree are 1.8% more likely to moonlight than women with a high school diploma or less in the 1987/88, 1998/99 and 2013/14 sample periods. Furthermore, they are and 1.1% more likely to moonlight in the 2005/06 sample period. The marginal effect for their male counterparts is 0.7% in the 1987/88 sample period and 0.8% in the 2013/14 sample period; the marginal effects of *university* are not statistically significant for men in the remaining sample periods.

Table 4 shows that men living in eastern Canada are less likely to moonlight in the 1987/88 and 1998/99 sample periods than men living in central or western Canada. Similarly, women living in eastern Canada are less likely to moonlight in the 1987/88 sample period, but women living in western Canada are less likely to moonlight in the 1998/99 sample period. Neither of the regional marginal effects is statistically significant at the 10% level for men nor for women in either of the later periods. Moreover, both men and women are less likely to moonlight in each sample period if they live in one of Canada's three major cities compared with the rest of the country. The marginal effect of *urban* is consistently negative and largest in 1998/99 at -1.3% for men, and -1.6% for women.

In Table 4, an individual holding a full-time primary job is less likely to moonlight in each sample period than if their primary job is part-time; in 1987/88 both men and women are 4.3% less likely to moonlight if their main job is full-time. For men, the marginal effect of *full-time* on moonlighting increases 1.4 percentage points to -5.8% in the 1998/99 and 2013/14 sample periods. The marginal effect of *full-time* increases 3.4 percentage points for women to -7.9% in the 2013/14 sample period.[30] An increase in the unemployment rate also decreases the likelihood of moonlighting for both men and women in each sample period, and the marginal effect is consistently larger for women; in 1987/88 the marginal effect is -0.4% and -0.6% for men and women respectively.

In Table 4, men are less likely to moonlight if their main job is in utilities, construction, or manufacturing, and women are less likely to moonlight if they work in public administration or other services: the industry effects tend to be larger for males except in public administration. For men, in 1987/88 the industry effects are each negative and vary from 0.2% to 3.9%. The industry effects each remain negative for men, but increase such that in 2013/14 the industry effects vary from 1.8% to 6.1%. For men, most industry marginal effects increase between 1987/88 and 2005/06 and level off in 2013/14. For women, the effect of public administration also follows this pattern but most of the industry effects increase substantially between 1987/88 and 1998/99 and then fluctuate over the next two periods.[31]

[30] The marginal effect of *full-time* is statistically significant at the 1% or 5% level for men and women in each period.

[31] Increasing participation rates of women in the labour force during the 1980s and 1990s may have influenced the change in the industry effects between 1987/88 and 1998/99. In Table 4, the increase in the industry effects is much larger for women than for men over this period.

Robustness Check

In this section I carry out three sets of robustness checks. More precisely, I check whether my results are sensitive to the choice of education and regional groupings, and also whether the choice of weighting strategy matters.

As previously mentioned, there is a reporting break in the education series in 1990. A distinction between a bachelor's degree and graduate degree is only made in the post-1990 period. In addition, the pre-1990 period did not ask if the respondent had graduated from high school - only the years of schooling were recorded. As such, one can only cleanly separate high school graduates from those that dropped out since 1990. To verify the robustness of my results to the change in the definition of low and high education groupings, I drop the 1987/88 period and re-estimate equation (1) using more narrowly defined education groupings; more precisely, I now make a distinction between high school dropouts and high school graduates, and between those that stopped at a bachelor's degree and those that went on to do a graduate degree.

Table 5

Marginal effects by gender for the education robustness check

	Full Sample		1998/99		2005/06		2013/14	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
High school	0.0127***	0.0238***	0.0167***	0.0193***	0.0069	0.0275***	0.0180***	0.0387***
	(0.0021)	(0.0031)	(0.0040)	(0.0057)	(0.0047)	(0.0072)	(0.0054)	(0.0099)
College	0.0165***	0.0397***	0.0169***	0.0301***	0.0138***	0.0411***	0.0235***	0.0555***
	(0.0021)	(0.0031)	(0.0039)	(0.0056)	(0.0046)	(0.0071)	(0.0052)	(0.0097)
Bachelor	0.0155***	0.0349***	0.0143***	0.0264***	0.0099	0.0327***	0.0257***	0.0501***
	(0.0028)	(0.0038)	(0.0053)	(0.0073)	(0.0061)	(0.0084)	(0.0065)	(0.0106)
Graduate	0.0105***	0.0473***	0.0089	0.0396***	0.0064	0.0498***	0.0190***	0.0578***
	(0.0036)	(0.0044)	(0.0070)	(0.0085)	(0.0071)	(0.0095)	(0.0070)	(0.0110)
Bachelor*20	0.0075*	0.0054	0.0054	0.0043	0.0122*	0.0157**	0.0081	0.0006
to 29 years	(0.0036)	(0.0036)	(0.0067)	(0.0073)	(0.0073)	(0.0074)	(0.0071)	(0.0074)
Number of observations	62,635	50,347	53,077	46,988	46,116	41,359	44,679	40,066
Log pseudo-likelihood	-0.5855	-0.06111	-0.1956	-0.1960	-0.1943	-0.1920	-0.1940	-0.2136
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

NOTES: The marginal effects are based on weighted Probit estimation of equation (1), including the controls presented in Tables 3 and 4. The standard error is provided in the brackets directly underneath each marginal effect. The statistical significance of the marginal effects are denoted by the following: * for the 10% level, ** for the 5% level, *** for the 1% level.

Table 5 shows the marginal effects of weighted Probit estimation of equation (1) using five education variables where *dropout* is the reference group. Column 1 of Table 5 shows the marginal effects for the pooled sample, whereas columns 3 through 8 are for the 1998/99, 2005/06, and 2013/14 periods, respectively. The general education pattern does not change with the expanded education categories. Not surprisingly, however, the magnitudes of the marginal effects of higher education groupings are much larger when the reference group is *dropout* instead of *high school or less*. For example, women with a graduate degree are 5.8% more likely to moonlight than women who dropped out of high school in 2013/14.

In addition, the differential between the marginal effects of education for men and women is a little more pronounced with the more detailed education groupings. For example, women are now 4.1% more likely to moonlight if they have a college degree as opposed to

having dropped out of high school in 2005/06, while the marginal effect is only 1.4% for men. Because of the more detailed education breakdown, the education-age interaction term was changed to *bachelor*20 to 29 years*. However, the economic and statistical significance of the interaction variable is very similar to those in Table 4.

Although my main specification has broad region controls, some researchers have defined regions more narrowly by focusing on provincial boundaries. As a robustness check I re-estimate equation (1) using nine provincial dummies (instead of my two region dummies). The regional patterns remain unchanged. The western provinces (British Columbia, Alberta, Saskatchewan, and Manitoba), for example, have consistently larger marginal effects than the rest of the country. Most importantly, my main findings with respect to education and age remain unchanged.

Finally, I re-estimated equation (1) using two different weighting strategies: (1) using the LFS weights as is (without normalizing them) and (2) using an unweighted approach. Neither approach materially impacts my main results. For example, the marginal effects for the variables of interest, *college*, *university*, and *university*20 to 29 years* are identical or a tenth of a percentage point away from the marginal effects estimated using the normalized weights.

VI. Conclusion

The purpose of this study is to observe changes in the likelihood of moonlighting as measured by the event of holding multiple jobs over time for men and women between 20 and 39 years of age. The impact of the variables of educational attainment is the primary focus. Weighted estimation of Probit equations is done by gender for the pooled sample and then separately for each sample period, in order to obtain estimates of the marginal effects of various

socio-demographic, education, and employment variables, and to see if there have been changes over time.

My results indicate that both men and women are more likely to moonlight if they have a post-secondary degree. There is some evidence that the education pattern has increased over time, and is more pronounced for individuals in their twenties. As a whole, these findings are generally in line with the interpretation that the increase in student debt over this period (maybe due to higher tuition fees) has increased the need for multiple-job holding among recent graduates.

Other findings include a decreased probability of moonlighting if the main job is full-time, and if it is in the service industry; these findings hold true for both men and women. The largest differences between men and women are for the impact of marital status and the presence of young children in the home. The trait of being married tends to increase the likelihood of moonlighting among men and to decrease the likelihood of moonlighting for women; this is also the case for having children under the age of 6.

Bibliography

Averett, S.L. (2001) Moonlighting: multiple and gender differences. *Applied Economics*, 33(11): 1391 – 1410.

Brochu, P. (2013) The source of new Canadian job stability patterns. *Canadian Journal of Economics*, 46(2): 412 – 440.

Conway, K.S. and Kimmel, J. (1998) Male labour supply estimates and the decision to moonlight. *Labour Economics*, 5(2): 135 – 166.

Dickey, H., Watson, V. and Zangelidis, A. (2011) Is it all about money? An examination of the motives behind moonlighting. *Applied Economics*, 43(26): 3767 – 3774.

Diebold, F.X., Neumark, D. and Polsky, D. (1997) Job stability in the United States. *Journal of Labor Economics*, 15(2): 206 – 233.

Friesen, J. (2002) Overtime pay regulation and weekly hours of work in Canada. *Labour Economics*, 8(6): 691 – 720.

Heisz, A. (2005) The evolution of job stability in Canada: trends and comparisons with the U.S. results. *Canadian Journal of Economics*, 38(1): 105 – 127.

Kimmel, J. and Amuedo-Dorantes, C. (2009) Moonlighting over the business cycle. *Economic Inquiry*, 47(4): 754 – 765.

Kimmel, J. and Powell, L.M. (1999) Moonlighting trends and related policy issues in Canada and the United States. *Canadian Public Policy*, 25(2): 207 – 231.

Partridge, M. (2002) Moonlighting in a high growth economy: evidence from the U.S. state-level data. *Growth and Change*, 33(4): 424 – 452.

Shishko, R and Rostker, B. (1976) The economics of multiple job holding. *The American Economic Review*, 66(3): 298 – 308.

Stinson, J.F. Jr. (1987) Moonlighting: a key to differences in measuring employment growth. *Monthly Labor Review*, 110(2): 30 – 31.

Valletta, R. (1999) Declining job security. *Journal of Labor Economics*, 17(S4): S170 – S197.

Whu, Z., Baimbridge, M. and Zhu, Y. (2009) Multiple job holding in the United Kingdom: evidence from the British Household Panel Survey. *Applied Economics*, 41(21): 2751 – 2766.