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Three Essays on Intertemporal Substitution of Labour Supply:
Annually, Quarterly and Hours-Wage Simultaneously

By

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©

Submitted in partial fulfillment of the requirements
for the degree of Ph. D
at

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To Bing Bing and Han, for many reasons!

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ABSTRACT

This volume consists of three independent but interrelated studies on intertemporal substitution of labour supply.

Chapter Two develops and estimates three nested models of intertemporal substitution of annual hours. Chapter Three estimates two nested models of short-run intertemporal substitution of labour supply by breaking down the two-year data into eight successive quarters. Chapter Four develops and estimates three nested simultaneous models of changes in annual hours and hourly wages, and performs a formal test (the Wu-Hausman Test) of the interdependence of changes in annual hours and hourly wages. The data used are the 1986-1987 and 1988-1989 waves of the Labour Market Activity Survey of Statistics Canada.

The following can be observed from the empirical results:

1. The unemployment-underemployment doubly constrained models are preferred to the unemployment constrained models, and the unemployment constrained models are preferred to the unconstrained model, i.e., quantity constraints in the labour market are, in practice, very important factors affecting the intertemporal substitution of labour supply.

2. Labour market constrained workers (either unemployed or underemployed) are off their intertemporal labour supply functions, rejecting the real business cycle (RBC) view that variations in measured unemployment represent individuals adjusting their labour supply behavior in response to fluctuations in real wages and that unemployment time represents voluntary consumption of leisure.

3. The hypothesis that workers make labour supply decisions without money illusion is rejected.

4. The wage intertemporal substitution elasticity of annual hours is empirically small and statistically significant but highly variable over time and across regional labour markets in Canada. We can not, therefore, rely upon this estimate as a general explanation of fluctuations in unemployment across labour markets.

5. There is no simultaneity of changes in annual hours and hourly wages --- changes in hourly wages significantly affect changes in annual hours but changes in annual hours are not significant in explaining changes in hourly wages.

6. The models of assuming wage exogeneity correctly estimate the intertemporal substitution behavior of labour supply.

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Chapter One

Introduction

This volume consists of three independent but interrelated studies on intertemporal substitution of labour supply (Chapter Two: Intertemporal Substitution of Annual Hours; Chapter Three: Short-Run Intertemporal Substitution of Labour Supply; and Chapter Four: Simultaneous Models of Changes in Annual Hours and Hourly Wages).

Chapter Two starts with the assumption that an individual maximizes an intertemporally separable lifetime utility function subject to the expected lifetime budget constraint and develops an unconstrained model of intertemporal substitution of annual hours. By allowing the possibility of involuntary unemployment the unemployment-constrained models nest the unconstrained model. Furthermore, by allowing the possibility of involuntary underemployment the unemployment-constrained models are expanded into unemployment and underemployment doubly constrained models. And these models are econometrically estimated with the 1986-1987 and 1988-1989 waves of the Labour Market Activity Survey of Statistics Canada.

The chapter adds to the literature explicit consideration of the effects of quantity constraints in the labour market on labour supply behavior in four successive periods (two separate data sets), which enables a direct and strong test of the quantity constrained models. In addition, by directly entering nominal wages and consumer price index as

two independent regressors instead of converting them into real wages the chapter allows the direct test of the hypothesis of no money illusion.

The empirical results on annual hours from both data sets¹ for Canada as well as for the five regional labour markets (The Atlantic, Quebec, Ontario, Prairie and British Columbia) all indicate three things: i) labour market constrained workers (either unemployed or underemployed) are off their intertemporal labour supply functions, rejecting the real business cycle (RBC) view that variations in measured unemployment represent individuals adjusting their labour supply behavior in response to fluctuations in real wages and that unemployment time represents voluntary consumption of leisure; ii) the hypothesis is rejected that workers make labour supply decisions without money illusion; and iii) the wage intertemporal substitution elasticity of annual hours is empirically small and statistically significant but highly variable over time and across regional labour markets in Canada, suggesting that we can not rely upon this estimate as a general explanation of fluctuations in unemployment across labour markets.

Chapter Three starts with the observation that a year is an arbitrary period of time over which to examine labour supply behavior. Could it be that intertemporal substitution of labour supply operates on

1 Because of the lack of household linkage in LMAS male and female functions have to be estimated separately. The disadvantage is that family effects on hour supply decisions can not be examined. However, if we assume that men and women make their labour supply decisions independently these results provide the possibility of gender comparison since functions of identical structure are estimated.

a shorter time-scale? Since quarter to quarter variations in economic activities can be quite significant and are, indeed, often used to measure swings in the business cycle, it seems appropriate to examine the short-run intertemporal substitution of labour supply on a quarterly basis.

The detailed questioning of the Labour Market Activity Survey on the characteristics of each job held allows the estimation of the models of intertemporal substitution of labour supply in Chapter Two in the short-run by breaking down of the two-year (1988-1989) data into eight successive quarters.²

All the empirical results strongly support the three main conclusions drawn in Chapter Two.

The models of intertemporal substitution of labour supply in Chapters Two and Three assume that expected hourly wages are determined by prior human capital investment decisions and ability endowments but that hourly wages vary randomly from period to period due to stochastic shocks of technology and other changes, i.e., the models assume wage exogeneity. As has been frequently noted in the literature, the assumption of wage exogeneity is suspect, and the resulting estimates of labour supply may be wage-endogeneity biased.

2 We are unfortunately unable to consider the unemployment and underemployment doubly constrained model due to the lack of underemployment information in the derived quarterly data (which is available only on an annual basis).

In Chapter Four, therefore, the assumption of wage exogeneity is relaxed and three nested simultaneous models of changes in annual hours and hourly wages are formulated. These simultaneous systems are then estimated with the 1988-1989 waves of the Labour Market Activity Survey of Statistics Canada.

The estimated results indicate that there is no simultaneity of changes in annual hours and hourly wages --- changes in hourly wages significantly affect changes in annual hours but changes in annual hours are not significant in explaining changes in hourly wages, which is also confirmed by a formal test (the Wu-Hausman Test) of the exogeneity of changes in annual hours in the determination of changes in hourly wages.

Besides the contributions of Chapters Two and Three, Chapter Four adds to the literature explicit consideration of the possibility of the interdependence of hours of work and wages, and a formal test of this interdependence for the first time, in models of intertemporal substitution of labour supply.

In addition to strongly supporting the conclusions drawn in Chapters Two and Three, the empirical results in Chapter Four indicate that i) there is no simultaneity of changes in annual hours and hourly wages --- changes in hourly wages significantly affect changes in annual hours but changes in annual hours are not significant in explaining changes in hourly wages; ii) models assuming wage exogeneity correctly estimate the intertemporal substitution behavior of labour supply.

Chapter Two

Intertemporal Substitution of Annual Hours

2.0 Introduction

The real business cycle literature (e.g., Lucas and Rapping, 1969) argues that unemployed workers are really on an intertemporal labour supply function and that variations in measured unemployment are due to individuals adjusting their labour supply behavior in response to fluctuations in real wage rates over the business cycle. Over the past decade or so there have been numerous empirical investigations of this hypothesis using micro data in both the United States and the United Kingdom,¹ and strong evidence has been found against this interpretation of unemployment.² However, empirical studies using Canadian micro data have been rare.³

Using the Labour Market Activity Survey: 1986-1987 and 1988-1989, of Statistics Canada, this chapter tests the real business cycle interpretation of unemployment by empirically estimating three groups (unconstrained, unemployment constrained and unemployment and underemployment doubly constrained) of nested intertemporal labour supply

1 A partial list of American studies on intertemporal labour supply includes MaCurdy (1981, 1983), Altonji (1986), Ham (1986), Abowd and Card (1989); examples of British work include Browning, Deaton and Irish (1985).

2 See, for example, Ham (1986).

3 Reilly (1989) uses a data set from the Maritime provinces (Prince Edward Island, Nova Scotia and New Brunswick).

models in Canada as well as in the five regional markets: the Atlantic, Quebec, Ontario, the Prairie and British Columbia (male and female separately). It adds to the literature explicit consideration of quantity constraints on labour supply in four successive periods (two data sets), which enables a direct and strong test of the quantity constrained model. It also tests directly the hypothesis of no money illusion by directly entering the nominal wages and annual consumer price index as independent regressors instead of converting nominal wages into real wages.⁴

The chapter is framed in four sections. Section 2.1 develops the theoretical framework. Section 2.2 introduces the major features of the data set, sample selection criteria and the variables used in the empirical estimation. Section 2.3 presents and analyzes the estimated results. Section 2.4 summarizes and concludes the chapter.

4 In the regional markets, however, this test is relaxed because of the constant consumer price index in Quebec, Ontario and British Columbia. Nominal wages are converted into real wages as one regressor.

2.1 Theoretical Framework

We consider three groups of alternative nested models of intertemporal labour supply. First, we develop an unconstrained intertemporal labour supply model (the real business cycle model) in which unemployment is interpreted as being entirely voluntary consumption of leisure. Second, by allowing the possibility of involuntary unemployment as a labour market constraint we develop an unemployment-constrained model of intertemporal labour supply which nests the unconstrained model. And finally, the unemployment-constrained model is expanded into a fully constrained model of intertemporal labour supply by introducing a direct measure of underemployment as an additional measure of labour market constraints.

2.1.1 An Unconstrained Model of Intertemporal Labour Supply

We begin with the assumption that an individual maximizes an intertemporally separable lifetime utility function subject to the expected lifetime budget constraint. This utility maximizing behaviour can be expressed as in Equations 2.0 and 2.1.

$$(2.0) \quad \max \sum_{t=0}^T \frac{U_t(C_t, H_t)}{(1+p)^t}$$

$$(2.1) \quad \text{s.t. } A_{T+1} + \sum_{t=0}^T \frac{P_t(W_t H_t^e) + (1-P_t)W_t H_t^e}{(1+r)^t} = \sum_{t=0}^T \frac{C_t}{(1+r)^t}$$

where C_{it} = consumption in period t ;

H_{it} = hours of paid employment in period t ;

A_{i0} = initial assets;

W_{it} = real hourly wage rates in period t ;

H_{it}^a = actual hours of paid employment in period t ;

H_{it}^* = desired hours of paid employment in period t ;

P_{it} = probability of labour market constraint [in the unconstrained model $P_{it} = 0$, and $H_{it}^a = H_{it}^*$, by assumption];

ρ = rate of time preference; and

r = real interest rate in period t .

We assume that expected hourly wages are determined by prior human capital investment decisions and ability endowments but that hourly wages vary randomly from period to period, due to the stochastic shocks of technology and other changes, as per the "real business cycle" model (see Equation 2.2).

$$(2.2) \quad W_{it} = E(W_{it}) + u_{it}, \quad u_{it} \sim \text{I.I.D}(0, \sigma^2)$$

We follow Ham (1986:561) in the utility function specification expressed in Equation 2.3.

$$(2.3) \quad U_{it}(C_{it}, H_{it}) = \gamma_{1it} C_{it}^{\alpha_1} - \gamma_{2it} H_{it}^{\alpha_2}$$

where $0 < \beta_1 < 1$ and $\beta_2 > 1$. And to allow for taste variations across individuals we also follow Ham (1986:561) by assuming that γ_{it} takes the form of Equation 2.4.

$$(2.4) \quad \gamma_{it} = \exp(-\gamma_{it} - \phi'X_{it} - e_{it})$$

where γ_{it} = individual fixed effect of taste towards leisure;

X_{it} = a vector of demographic characteristics;

ϕ = a vector of fixed parameters; and

e_{it} = an error term.

Implicit in the above utility maximizing model is an intertemporal labour supply function taking the form of Equation 2.5.

$$(2.5) \quad \ln H_{it} = F_{it} + \alpha t + \phi'X_{it} + \delta \ln W_{it} + \epsilon_{it}$$

where $\delta = \frac{1}{\beta_2 - 1}$;

$$\alpha = \delta(\rho - r);$$

t = time trend;

$$F_{it} = \delta(\ln \lambda_{it} + \gamma_{it} - \ln \beta_{it});$$

λ_{it} = marginal utility of wealth;

$\phi = \phi\delta$; and

$$\epsilon_{it} = \delta e_{it}.$$

The parameter of interest is δ , the intertemporal substitution elasticity of labour supply. If involuntary unemployment does not exist and holding the marginal utility of wealth constant,⁵ working in first difference will yield Equation 2.6 for the direct estimation of δ :

$$(2.6) \quad \Delta \ln H_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \Delta \epsilon_{it}$$

In words, Equation 2.6 represents the real business cycle (unconstrained) model of intertemporal labour supply. Changes in hours of paid employment depend upon changes in real hourly wage rates and any change in personal characteristics. In this model observed hours of labour supply are identical to desired hours of labour supply, and unemployment time represents entirely voluntary consumption of leisure.

In calculating the standard errors we follow Ham (1986:562) by employing standard stochastic assumptions. That is, we assume that

$$(2.7) \quad E(\Delta \epsilon, \Delta \epsilon') = V^*$$

is an unrestricted variance-covariance matrix, which allows for flexibility in the pattern of autocorrelation and heteroscedasticity in an

5 The marginal utility of wealth is a function of initial assets and all expected wage rates over the remainder of the life cycle. In case of involuntary unemployment, individuals have to recalculate their utility maximizing option each period. On the other hand, in the absence of involuntary unemployment the marginal utility of wealth is, in fact, constant and Equation 2.6 follows.

individual's first-differenced error term. We also assume that error terms are independent across individuals:

$$(2.8) \quad E(\Delta\epsilon_i, \Delta\epsilon_j) = 0, \quad i \neq j$$

2.1.2 Involuntary Unemployment as a Labour Market Constraint

At any given point in time, an individual will have a history of actual labour market experience. Allowing the possibility of being involuntarily unemployed (i.e., $P_{it} > 0$ in Equation 2.1) will imply that the individual's marginal utility of wealth will not be constant over time, and $\Delta \ln \lambda_{it}$ will not be equal to zero. Let L_{it-1} , (0,1), denote whether an individual was involuntarily unemployed in the past period, Equation 2.6 can be rewritten as a constrained model of intertemporal labour supply in Equation 2.9a.

$$(2.9a) \quad \Delta \ln H^*_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1 \cdot \Delta \ln \lambda_{it} \cdot L_{it-1} + \Delta \epsilon_{it}$$

Although λ_{it} is unobservable, depending upon the initial assets and all expected wage rates over the remainder of the life cycle, the coefficient of past involuntary unemployment can be directly estimated from Equation 2.9b:

$$(2.9b) \quad \Delta \ln H^*_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_2 L_{it-1} + \Delta \epsilon_{it}$$

where $\theta_2 = \theta_1 \cdot \Delta \ln \lambda_{it}$.

Equation 2.9b nests Equation 2.6 and implies that desired hours of paid employment will increase in the current period if an individual was constrained in the labour market by involuntary unemployment in the past period, as the individual would like to make up for the income lost because of unemployment (but may not necessarily be able to).

Further, one can allow the possibility of being involuntarily unemployed in the current period and let L_{it} , (0,1), represent this possibility, and write desired labour supply as in Equation 2.10:

$$(2.10) \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1' \Delta L_{it} + \Delta \epsilon_{it}$$

There are in total four possibilities for ΔL_{it} : (i) unemployment in the current period but not in the past period, (ii) unemployment in the past period but not in the current period, (iii) no unemployment in both periods, and (iv) unemployment in both periods.

If involuntary unemployment does, indeed, have effects on desired hours of labour supply (the hypothesis to be tested), these four unemployment statuses should be theoretically distinguished from each other because of the different effects they may have. We can introduce four dummy variables to make such a distinction: $D_{it1} = 1$ if $L_{it} = 0$ and $L_{it-1} = 1$ (the individual was unemployed in the past period but not in the current period), $D_{it1} = 0$ otherwise; $D_{it2} = 1$ if $L_{it} = 1$ and $L_{it-1} = 0$ (the individual is unemployed in the current period but not in the past period), $D_{it2} = 0$ otherwise; $D_{it3} = 1$ if $L_{it} = 0$ and $L_{it-1} = 0$ (the individual

does not experience any unemployment in both periods), $D_{11} = 0$ otherwise; and $D_{11} = 1$ if $L_{11} = 1$ and $L_{12} = 1$ (the individual experiences unemployment in both periods), $D_{11} = 0$ otherwise.

Controlling for the non-unemployed group, $D_{11} = 1$, therefore, we have the unemployment constrained model of intertemporal labour supply as in Equation 2.11:

$$(2.11) \quad \Delta \ln H_{11}^* = \alpha + \delta \Delta \ln W_{11} + \phi' \Delta X_{11} + \theta_1 D_{11} + \theta_2 D_{12} + \theta_3 D_{11} + \Delta \epsilon_{11}$$

If an individual is not involuntarily unemployed in either period (the control case) they supply their desired hours of labour in both periods and the change in hours worked can be ascribed solely to the change in wages and personal characteristics. If they were involuntarily unemployed last year but not this year, their labour supply this year will reflect a desire to "make up for" lost income last year, hence we expect the coefficient on D_{11} to be positive and statistically significant. If they are involuntarily unemployed this year but not last year, then the change in actual hours will be less than would have been predicted on the basis of changes in wages and personal characteristics (i.e., the coefficient is expected to be negative and significant). If they are constrained in both periods, then desired labour supply increases because of last period's constraint, but actual labour supply falls short of desired supply because of the current period's constraint --- i.e., the coefficient on D_{11} can be either positive or negative and statistically significant, depending upon which period's constraint dominates. Of

course, if measured unemployment is really voluntarily chosen leisure, hours of labour supply change only because wages and personal characteristics change --- hence none of the coefficients on D_{1t} , D_{2t} , or D_{3t} should be statistically significant as predictors of changes in labour supply.

Equation 2.11 only considers the effects on labour supply behaviour of the incidence of unemployment. It may be argued that unemployment as a proxy for labour market constraint should be measured by the actual duration, U_{1t} , instead of the incidence of unemployment, L_{1t} . Therefore, replacing ΔL_{1t} in Equation 2.10 by ΔU_{1t} we have an alternative unemployment constraint model of intertemporal labour supply as in Equation 2.12:

$$(2.12) \quad \Delta \ln H^*_{1t} = \alpha + \delta \Delta \ln W_{1t} + \phi' \Delta X_{1t} + \theta_1 \Delta U_{1t} + \Delta \epsilon_{1t}$$

In words, Equations 2.11 and 2.12 represent alternative unemployment-constrained models of intertemporal labour supply. More precisely, the model of unemployment as binding labour market constraint on quantity of labour supply implies:

$$\theta_1 > 0;$$

$$\theta_1 < 0;$$

$$\theta_1 > 0 \text{ or } < 0; \text{ and}$$

$$\theta_1 < 0.$$

2.1.3 Underemployment as an Additional Measure of Labour Market Constraint

In the LMAS, individuals were asked whether they experienced underemployment in the sense that they were unable to supply as much paid employment as they desired when employed. Respondents were asked whether they were full-time or part-time workers. All workers were asked whether or not they were satisfied with the number of weeks worked in the year and if not, would they have preferred to work more or fewer weeks, while part-time workers were also asked if they wanted more hours of work per week. Using this information we can explicitly distinguish between underemployment-constrained and underemployment-unconstrained sub-samples.

Let A_{it} denote the possibility of being underemployed in period t and define $A_{it} = 1$ if the individual is a full-time worker and prefers more weeks of work or if the individual is a part-time worker and wants more hours of work in period t , $A_{it} = 0$ otherwise.⁶

Including the possibility of underemployment, as defined by A_{it} , in the unemployment-constrained models we have the following two alternative fully constrained models of intertemporal labour supply.

$$(2.13) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1 D_{it} + \theta_2 D_{it} + \theta_3 D_{it} + \alpha_1 \Delta A_{it} + \Delta \epsilon_{it}$$

$$(2.14) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1 \Delta U_{it} + \alpha_1 \Delta A_{it} + \Delta \epsilon_{it}$$

6 Obviously the measurement of underemployment used here does not include the underemployment of workers' skills.

Again, we construct four dummy variables to allow for the four logical possibilities of ΔA_{it} : $K_{i,1} = 1$ if $A_{it} = 0$ and $A_{i,t-1} = 1$ [the individual was underemployed in the past period only], $K_{i,1} = 0$ otherwise; $K_{i,2} = 1$ if $A_{it} = 1$ and $A_{i,t-1} = 0$ [the individual is underemployed in the current period only], $K_{i,2} = 0$ otherwise; $K_{i,3} = 1$ if $A_{it} = 0$ and $A_{i,t-1} = 0$ [the individual does not experience underemployment in both periods], $K_{i,3} = 0$ otherwise; and $K_{i,4} = 1$ if $A_{it} = 1$ and $A_{i,t-1} = 1$ [the individual experiences underemployment in both periods], $K_{i,4} = 0$ otherwise.

Controlling for the non-underemployed group, $K_{i,4} = 1$, Equations 2.13 and 2.14 can be rewritten as:

$$(2.15) \quad \Delta \ln H^*_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_0 D_{it} + \theta_1 D_{i,2} + \theta_2 D_{i,4} \\ + a_1 K_{i,1} + a_2 K_{i,2} + a_3 K_{i,4} + \Delta \epsilon_{it}$$

$$(2.16) \quad \Delta \ln H^*_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_0 \Delta U_{it} + a_1 K_{i,1} + a_2 K_{i,2} \\ + a_3 K_{i,4} + \Delta \epsilon_{it}$$

Again, as discussed earlier, the model of possible involuntary underemployment predicts:

- (a) $a_1 > 0$;
- (b) $a_2 < 0$; and
- (c) $a_3 > 0$ or < 0 .

Equations 2.15 and 2.16 represent the unemployment and underemployment doubly constrained models of intertemporal variations in

labour supply. They nest Equations 2.11 and 2.12, as well as Equation 2.6. In the real business cycle view underemployment constraints do not influence intertemporal labour supply behavior, hence a_1 , a_2 and a_3 should all be statistically insignificantly different from zero and Equations 2.15 and 2.16 reduce into Equations 2.11 and 2.12, respectively. And further, if unemployment does represent voluntary intertemporal labour supply behavior θ_1 , θ_2 , θ_3 , and θ_4 should not be statistically significantly different from zero and Equations 2.11 and 2.12 collapse into Equation 2.6.

2.2 Data Set

This chapter uses the Labour Market Activity Survey: 1986-1987 and 1988-1989, conducted by Statistics Canada, in which 30916 males and 32516 females were interviewed in January/February 1987 and January/February 1988, and 27957 males and 29287 females were interviewed in January/February 1989 and January/February 1990, in regards to their labour market activities in each of the previous four years. The LMAS is administered to five of the six rotation groups interviewed in the monthly Labour Force Survey of Statistics Canada. It is, therefore, drawn from a stratified random sample of Canadian individuals.'

In this section, we briefly discuss the major features of the data, the sample selection criteria and the variables used in the empirical estimation.

2.2.1 Distinct Features of the Data Set

In the data set, respondents were interviewed about demographic characteristics such as province of residence, age; personal characteristics such as marital status, home language, country of birth, educational level; household characteristics such as relationship to head of the family, number of dependent children in specific age group; job-related characteristics such as the start and finish date of each job,

7 For further details on the construction of the LMAS, see Statistics Canada, The Labour Market Activity Survey: Microdata Users Guide.

union status and pension plan (in addition to Canada Pension Plan) of each job, hourly wage rates of each job; the history of job search activities such as what was done to locate the employment of each job, difficulties and reasons, if any, in getting each job, etc.

Compared to many other data sets used in previous studies this data possesses a number of distinct advantages - for example, its large number of observations available for analysis. Gordon, Osberg and Phipps (1991) demonstrate the empirical importance of sampling variability in estimation of the wage elasticity of individual labour supply by estimating identical specifications of labour supply models on sub-samples randomly drawn from the same large sample of micro data, and conclude that micro data samples of at least 5000 observations are required for reasonable certainty regarding the wage elasticity of male labour supply.⁸ That is a sample size considerably larger than that available in most existing micro-econometric studies of labour supply.⁹ Since this chapter uses samples of between 10,000 and 16,000 observations, sampling variability is unlikely to be a problem.

The LMAS covers all Canadian, non-institutionalized persons, 16 to 69 years of age who were the residents of the ten provinces of Canada in

8 See Gordon, Osberg and Phipps (1991) for details.

9 For example, Ham (1986) uses 8 years of data on 473 continuously-married, prime-aged males, resulting in a sample of 3784, Reilly's (1989) sample size is 333 for non-tenure models and 300 for tenure models, respectively.

1986 and 1988. Table A1 shows the provincial distribution of the sample in 1986 and 1988 (see Appendix 1).

In the estimation of labour supply functions, the dependent variable (annual hours of work) is usually calculated as the product of reported weeks of work and the "conventional" number of hours of work per week. The independent variable (hourly wage rate) is then derived by dividing reported annual total earnings by calculated annual hours of work. Any measurement error in the hours of work calculation, which seems very possible, will introduce a specious negative correlation between this wage measure and the dependent variable.¹⁰ That is, if the annual hours of work are over-estimated, by either an error in the weeks of work or an error in the hours of work per week, the hourly wage rates will be systematically under-estimated, and vice versa.

In the LMAS data, however, respondents were asked to recall each job (up to five in each year) at which they worked for any specific information, and the two main variables are independently constructed. They were asked about hours of work per day, days of work per week and total number of weeks worked at each job held in each year. As a result, hours of work at each job were calculated, and by summation over all jobs held annual total hours of work were built up. Similarly, hourly wage rates for each job were independently derived from dividing reported pay dollars per pay cheque by hours of work in that pay period.

10 Mroz (1987) has a very detailed discussion on this negative relationship.

Of course, the LMAS data does have its own deficiencies. For the purpose of this chapter the main deficiency is the missing information on dependent children in 1987, which implies that changes in the number of dependent children can not be used as a regressor in the estimation of intertemporal labour supply models, particularly important for female workers.

2.2.2 Sample Inclusion Criteria

There are two criteria applied to determine inclusion of observations in the sample. The first is that the individual is not self-employed in one of the two years, and the second is that the individual has some paid employment in both years. Individuals who are either self-employed or completely outside the labour market for at least one of the two years are excluded since their paid hours of labour supply and wage rates are both not observable (for each of the two data sets).

We empirically investigate intertemporal labour supply behavior in Canada in two samples: prime-age (25-54) and all-age (16-69). Table 2.2.1 shows the number of observations in each sample for analysis after the above sample inclusion criteria are applied.

Table 2.2.1
Number of Observations for Analysis

Sample	Males		Females	
	1986-1987	1988-1989	1986-1987	1988-1989
25-54	12056	10710	10038	9470
16-69	16407	14279	13770	12425

While the former sample avoids the issue of retirement for older workers¹¹ and of school attendance for younger workers, the latter possesses more variation in both the dependent variable and the independent variables.

The commonly imposed criterion of continuous marriage (e.g., MaCurdy, 1981; Ham, 1986) is not applied. We intend to include in the models changes in marital status and investigate their impacts on intertemporal labour supply.

2.2.3 Variables

The theoretically appropriate variable for intertemporal labour supply analysis is not the nominal but the real hourly wage rates. Since direct estimation of $\delta \Delta \ln(W_{it}/CPI_{it})$ would impose the maintained hypothesis of no money illusion, we prefer to specify $\delta \Delta \ln W_{it} - \delta' \Delta \ln CPI_{it}$ as two independent variables and directly test the hypothesis $\delta = \delta'$, with CPI being the annual averages of consumer price index for the province of

11 Osberg (1989) has a very detailed discussion on the labour supply behavior of older Canadians.

residence." Therefore, the models to be estimated are written as: Equation 2.17 for the unconstrained, Equations 2.18 and 2.19 for the unemployment constrained, and Equations 2.20 and 2.21 for the unemployment and underemployment doubly constrained. In Equations 2.18 and 2.20 unemployment is measured by incidence, and in 2.19 and 2.21 by the actual duration of weeks.

$$(2.17) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(2.18) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1 D_{it} + \theta_2 D_{it} + \theta_3 D_{it} \\ - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(2.19) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_4 \Delta U_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(2.20) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1 D_{it} + \theta_2 D_{it} + \theta_3 D_{it} \\ + a_1 K_{it} + a_2 K_{it} + a_3 K_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(2.21) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_4 U_{it} + a_1 K_{it} + a_2 K_{it} + a_3 K_{it} \\ - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

Most of the personal characteristics affecting individual tastes considered in one-period labour supply models (e.g., educational levels, age) cancel out in first differences. The variables contained in the

12 The annual averages of consumer price index are obtained from Statistics Canada: Consumer Prices and Price Indexes, January-March, 1989 and 1990, pp. 96-100, Table 14: Consumer Price Indexes, Major Components, (Not seasonally adjusted), by Province, 1986-1989, 1981 = 100.

vector of X affecting changes in individual tastes towards leisure are as follows: (i) change in province of residence; (ii) change in marital status --- getting married or getting divorced; (iii) change in union status --- becoming unionized or becoming non-unionized; (iv) change in industry; and (v) change in occupation.¹³

For the construction of changes in hourly wage rates, union status, industry and occupation, if more than one job was held in a year we count the first job in 1986 and the last in 1987, and the first in 1988 and the last in 1989, respectively.

In Appendix 1, Table A2 itemizes the definitions of variables, and in Appendix 2A Tables A3(1), A3(2), A4(1) and A4(2) present descriptive statistics of variables used in the chapter for the prime-aged and all-aged samples, respectively.

13 The group of no change in residence, marital status, union status, industry and occupation being the control case, respectively.

2.3 Empirical Results¹⁴

2.3.1 The Prime-Aged Sub-Sample

Tables 2.3.1M(1), 2.3.1M(2), 2.3.1F(1) and 2.3.1F(2) present the estimated differenced log hours equations when changes in personal characteristics are not taken into consideration for males and females for 1986-1987 and 1988-1989, respectively. Column 1 is the unconstrained model, Columns 2 and 3 the unemployment-constrained models, and Columns 4 and 5 the unemployment-underemployment doubly constrained models. Columns 2 and 4 measure unemployment by the incidence and Columns 3 and 5 by actual weeks of unemployment.

For the prime-aged males the difference in log wages is positively significant in all the five models in both data sets, implying in magnitude a small intertemporal substitution elasticity of labour supply. The difference in log consumer price index is statistically insignificant throughout the five models in 1986-1987 and statistically significant with a very big negative coefficient in 1988-1989, rejecting the no money illusion hypothesis. The changes in unemployment variables are all significant - at very high levels of statistical significance --- implying strong evidence against the real business cycle hypothesis that unemployment represents voluntary intertemporal variations in labour

14 Method of estimation: Ordinary Least Square (OLS); Computer program: K.J. White's SHAZAM, Version 6.0, Dalhousie University, Halifax, Nova Scotia. Results reported are weighted results by record weight. Unweighted results are similar.

supply behavior. And the high significance of changes in the underemployment variables strongly rejects the hypothesis that underemployed workers are not constrained in the labour market.

The prime-aged female results provide even stronger evidence against the real business cycle interpretation of unemployment as the difference in log wages plays no significant role in explaining the difference in log hours of labour supply in all five models in 1986-1987, and very small positive role in 1988-1989. Changes in log consumer price index is not significant in all the five models for both data sets. And the results for changes in unemployment and underemployment variables are very similar to those of prime-aged males.

A more complete model of intertemporal labour supply would take into account the changes in personal and job-related characteristics which may affect individual tastes towards leisure, as in Tables 2.3.2M(1), 2.3.2M(2), 2.3.2F(1) and 2.3.2F(2).

For the prime-aged males for 1986-1987, when changes in personal characteristics are included the difference in log wages retains its high positive statistical significance throughout the five models with the intertemporal substitution elasticity of labour supply slightly increased. The difference in log consumer price index remains insignificant. The changes in unemployment and underemployment variables are again highly significant, rejecting the real business cycle interpretation of unemployment. While change in residence, getting unionized and change in

industry as well as in occupation are insignificant throughout, getting married and getting non-unionized in all five models, getting divorced when unemployment is measured by actual weeks are significant.

For 1988-1989 the only difference is the estimated elasticity of intertemporal substitution doubled, and the changes in log consumer price index negatively significant.

For the prime-aged females for 1986-1987, when changes in personal characteristics are added the difference in log wages gains positive significance in the doubly constrained models with an intertemporal substitution elasticity of labour supply much smaller than that of their male counterparts. Changes in log consumer price index, unemployment and underemployment variables remain the same as when changes in personal characteristics are not taken into account. While changes in marital status are not significant, changes in residence, union status, industry and occupation are significant in most of the five models. And the 1988-1989 results are qualitatively similar with the estimated substitution elasticity increased.

In every case, our data strongly confirms the hypotheses that

- (a) $a_s > 0$ and $\theta_s > 0$;
- (b) $a_s < 0$ and $\theta_s < 0$;
- (c) $a_s > 0$ and $\theta_s > 0$; and
- (d) $\theta_s < 0$.

As well, it is notable that the coefficients associated with the variables measuring labour market constraints are empirically much larger in magnitude than the coefficients associated with other explanatory variables.

Summing up, both the prime-aged male and female results, with or without taking into account changes in personal characteristics, provide strong evidence against the real business cycle interpretation of unemployment and the no money illusion hypothesis. The high significance of changes in the unemployment and underemployment variables suggest that the unemployment/underemployment doubly constrained models represent superior models of intertemporal labour supply. And although the change in log money wages is a statistically significant determinant of changes in male labour supply, the coefficient is empirically small but highly variable over time.

Table 2.3.1M(1)
 Estimated Differenced Log Hours Equations:
 Canada, Males, Aged 25-54, 1986-1987
 Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0659*** (9.93)	0.0648*** (10.2)	0.0581*** (9.9)	0.0652*** (10.5)	0.0592*** (10.2)
$\Delta \ln CPI$	-0.3827 (-0.79)	-0.0089 (-0.02)	0.1699 (0.39)	0.3502 (0.77)	0.4302 (1.01)
D_1		0.4738*** (23.4)		0.3803*** (17.8)	
D_2		-0.4019*** (-22.2)		-0.2834*** (-14.4)	
D_3		0.1675*** (7.62)		0.2255*** (9.28)	
ΔU			-0.035*** (-58.5)		-0.0317*** (-50.7)
K_1				0.3022*** (13.4)	0.2253*** (11.2)
K_2				-0.3052*** (-15.9)	-0.1759*** (-11.2)
K_3				0.1244*** (4.62)	0.132*** (5.72)
Constant	0.0148 (0.71)	-0.0054 (-0.27)	-0.0114 (-0.62)	-0.0207 (-1.04)	-0.0231 (-1.25)
N	12056				
Adj. R ²	0.008	0.095	0.227	0.133	0.244
F	33.4	212.2	886.9	206.1	557.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.1M(2)

Estimated Differenced Log Hours Equations:

Canada, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0942*** (10.7)	0.0947*** (11.1)	0.0948*** (11.5)	0.0955*** (11.2)	0.094*** (11.4)
$\Delta \ln CPI$	-1.999*** (-3.01)	-2.586*** (-3.98)	-2.225*** (-3.57)	-2.688*** (-4.15)	-2.308*** (-3.71)
D_1		0.0666*** (2.62)		0.0297 (1.12)	
D_2		-0.522*** (-23.4)		-0.506*** (-22.1)	
D_3		0.0525* (7.62)		0.0421 (1.31)	
ΔU			-0.031*** (-38.5)		-0.03*** (-37.1)
K_1				0.1109*** (5.63)	0.0229 (1.24)
K_2				-0.077*** (-4.09)	-0.071*** (-3.98)
K_3				0.0294 (1.19)	-0.0203 (-0.92)
Constant	0.0376 (1.17)	0.0899*** (2.84)	0.056* (1.86)	0.0926*** (2.91)	0.065** (2.14)
N	10710				
Adj. R ²	0.011	0.061	0.131	0.065	0.133
F	94.5	144.3	451.2	102.9	260.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.1F(1)

Estimated Differenced Log Hours Equations:

Canada, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0067 (0.51)	0.0078 (0.61)	0.0062 (0.49)	0.0118 (0.94)	0.0118 (0.96)
$\Delta \ln CPI$	-0.5768 (-0.73)	0.0118 (0.02)	0.2843 (0.38)	-0.0186 (-0.03)	0.3247 (0.43)
D_1		0.6399*** (22.6)		0.518*** (17.9)	
D_2		-0.4691*** (-16.9)		-0.3991*** (-13.7)	
D_3		0.2286*** (6.46)		0.1926*** (5.26)	
ΔU			-0.0313*** (-34.2)		-0.0271*** (-28.9)
K_1				0.4782*** (15.8)	0.4851*** (16.6)
K_2				-0.2211*** (-8.73)	-0.1663*** (-7.05)
K_3				0.1773*** (5.63)	0.1955*** (6.58)
Constant	0.0592* (1.72)	0.0181 (0.54)	0.0217 (0.67)	0.0089 (0.27)	-0.00001 (-0.0001)
N	10038				
Adj. R ²	0.001	0.081	0.104	0.115	0.136
F	9.08	153.5	299.7	149.2	230.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.1F(2)

Estimated Differenced Log Hours Equations:

Canada, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0431*** (2.98)	0.0496*** (3.54)	0.0498*** (3.62)	0.0548*** (3.94)	0.0566*** (4.08)
$\Delta \ln CPI$	-0.0266 (-0.03)	-0.7927 (-0.96)	-1.3153 (-1.62)	-0.8924 (-1.08)	-1.235 (-1.53)
D_1		0.4743*** (15.7)		0.3951*** (12.8)	
D_2		-0.5508*** (-19.4)		-0.5455*** (-18.9)	
D_3		0.1823*** (4.41)		0.1343*** (3.16)	
ΔU			-0.0322*** (-32.2)		-0.0305*** (-30.1)
K_1				0.2688*** (10.9)	0.2471*** (10.4)
K_2				-0.0689** (-2.54)	-0.0223 (-0.84)
K_3				0.1193*** (3.92)	0.1193*** (4.13)
Constant	-0.0016 (-0.04)	0.0385 (0.95)	0.0703* (1.78)	0.0233 (0.58)	0.0394 (0.99)
N	9470				
Adj. R^2	0.0007	0.068	0.099	0.081	0.111
F	3.1	115.7	262.5	94.1	169.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.2M(1)

Estimated Differenced Log Hours Equations:

Canada, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0663*** (9.13)	0.0689*** (9.93)	0.0609*** (9.51)	0.0704*** (10.4)	0.0631*** (9.94)
$\Delta \ln CPI$	-0.4085 (-0.83)	-0.0342 (-0.07)	0.1518 (0.35)	0.3509 (0.76)	0.4264 (0.99)
$\Delta \text{Residence}$	-0.0115 (-0.3)	-0.0114 (-0.31)	-0.0131 (-0.39)	0.0029 (0.08)	-0.0031 (-0.09)
Getmarry	0.0834*** (2.62)	0.0539* (1.77)	0.0645** (2.29)	0.0575* (1.93)	0.0634** (2.28)
Getdivorce	-0.0252 (-0.55)	-0.0383 (-0.88)	-0.0704* (-1.74)	-0.0579 (-1.35)	-0.0822** (-2.06)
Getunion	0.0228 (1.29)	0.0216 (1.29)	0.0212 (1.37)	0.0234 (1.43)	0.0219 (1.43)
Nounion	0.0242 (1.6)	0.0258* (1.79)	0.036*** (2.7)	0.0262* (1.85)	0.0347*** (2.63)
$\Delta \text{Industry}$	0.014 (0.66)	0.0259 (1.26)	0.009 (0.47)	0.0355* (1.76)	0.0185 (0.98)
$\Delta \text{Occupation}$	-0.0227 (-1.08)	-0.0121 (-0.59)	-0.0108 (-0.58)	-0.0142 (-0.72)	-0.012 (-0.65)
D_1		0.4709*** (23.4)		0.3779*** (17.7)	
D_2		-0.4063*** (-22.2)		-0.2872*** (-14.5)	
D_3		0.1624*** (7.31)		0.2219*** (9.11)	
ΔU			-0.0351*** (-58.5)		-0.0317*** (-50.7)
K_1				0.301*** (13.3)	0.2245*** (11.1)
K_2				-0.3099*** (-16.2)	-0.1799*** (-11.3)
K_3				0.1183*** (4.38)	0.1262*** (5.43)
Constant	0.123 (0.57)	-0.0089 (-0.43)	-0.015 (-0.79)	-0.0257 (-1.26)	-0.0276 (-1.46)
N	12056				
Adj. R ²	0.008	0.095	0.228	0.133	0.245
F	11.2	98.8	234.4	117.0	280.7

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.2M(2)

Estimated Differenced Log Hours Equations:

Canada, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.1287*** (12.8)	0.1373*** (13.9)	0.1291*** (13.7)	0.1382*** (14.1)	0.1301*** (13.8)
$\Delta \ln CPI$	-2.312*** (-3.47)	-2.8911*** (-4.45)	-2.509*** (-4.02)	-3.0079*** (-4.64)	-2.6167*** (-4.16)
$\Delta \text{Residence}$	-0.2974*** (-3.65)	-0.2056** (-2.59)	-0.2619*** (-3.43)	-0.2127*** (-2.69)	-0.2644*** (-3.47)
Getmarry	-0.046 (-1.29)	-0.048 (-1.17)	-0.0563* (-1.68)	-0.0478 (-1.38)	-0.0549 (-1.64)
Getdivorce	-0.0302 (-0.65)	0.0068 (0.15)	0.0229 (0.52)	0.0047 (0.1)	0.0227 (0.52)
Getunion	0.0645*** (2.91)	0.0593*** (2.75)	0.0515** (2.48)	0.062*** (2.88)	0.0529** (2.55)
Nounion	0.0794*** (3.7)	0.0762*** (3.65)	0.0909*** (4.53)	0.0729*** (3.49)	0.0914*** (4.55)
$\Delta \text{Industry}$	0.0603** (2.34)	0.1104*** (4.36)	0.0351 (1.45)	0.1109*** (4.39)	0.0414* (1.71)
$\Delta \text{Occupation}$	0.0511** (2.02)	0.0413* (1.68)	0.0645*** (2.73)	0.0463* (1.88)	0.0684*** (2.89)
D_1		0.0563** (2.22)		0.0225 (0.85)	
D_2		-0.5386*** (-24.1)		-0.5188*** (-22.6)	
D_3		0.0223 (0.74)		0.0198 (0.61)	
ΔU			-0.0307*** (-38.5)		-0.0301*** (-37.1)
K_1				0.1087*** (5.53)	0.0206 (1.11)
K_2				-0.0889*** (-4.72)	-0.0821*** (-4.6)
K_3				0.0137 (0.56)	-0.0388* (-1.76)
Constant	0.0365 (1.13)	0.0876*** (2.73)	0.054* (1.78)	0.0908*** (2.86)	0.0652** (2.14)
N	10710				
Adj. R ²	0.018	0.069	0.137	0.074	0.139
F	36.2	75.1	172.4	65.1	137.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.2F(1)

Estimated Differenced Log Hours Equations:

Canada, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0214 (1.55)	0.0247* (1.85)	0.0214 (1.63)	0.0262** (2.0)	0.0236* (1.82)
$\Delta \ln CPI$	-1.1764 (-1.45)	-0.5713 (-0.73)	-0.0639 (-0.08)	-0.5678 (-0.74)	-0.0577 (-0.08)
$\Delta \text{Residence}$	-0.1555*** (-2.67)	-0.1349** (-2.42)	-0.0747 (-1.36)	-0.1181** (-2.15)	-0.0704 (-1.3)
Getmarry	0.0076 (0.13)	0.0245 (0.44)	0.0058 (0.11)	0.0201 (0.37)	0.0051 (0.9)
Getdivorce	0.1327* (1.71)	0.1209 (1.63)	0.1343* (1.83)	0.0933 (1.28)	0.1054 (1.46)
Getunion	0.1118*** (3.88)	0.1042*** (3.77)	0.1057*** (3.88)	0.1016*** (3.74)	0.1018*** (3.79)
Nounion	-0.0389 (-1.45)	-0.0298 (-1.15)	-0.0466* (-1.83)	-0.0292 (-1.15)	-0.0444* (-1.77)
$\Delta \text{Industry}$	0.1016*** (2.93)	0.1096*** (3.28)	0.1185*** (3.61)	0.0986*** (2.99)	0.1011*** (3.12)
$\Delta \text{Occupation}$	0.0649** (1.96)	0.067** (2.11)	0.0556* (1.78)	0.061** (1.96)	0.0496 (1.61)
D ₁		0.6268*** (22.1)		0.5124*** (17.7)	
D ₂		-0.492*** (-17.7)		-0.4137*** (-14.2)	
D ₃		0.1982*** (5.57)		0.1751*** (4.78)	
ΔU			-0.0313*** (-34.3)		-0.027*** (-29.0)
K ₁				0.4621*** (15.3)	0.4663*** (15.9)
K ₂				-0.2332*** (-9.2)	-0.1841*** (-7.77)
K ₃				0.1565*** (4.95)	0.1717*** (5.73)
Constant	0.0662* (1.88)	0.026 (0.76)	0.0173 (0.52)	0.0185 (0.55)	0.0029 (0.09)
N	10038				
Adj. R ²	0.006	0.088	0.11	0.12	0.141
F	9.8	77.2	116.8	88.5	120.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.2F(2)

Estimated Differenced Log Hours Equations:

Canada, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0622*** (3.89)	0.0796*** (5.15)	0.0726*** (4.78)	0.0816*** (5.13)	0.0743*** (4.92)
$\Delta \ln CPI$	-0.6721 (-0.78)	-1.3324 (-1.59)	-1.7632** (-2.15)	-1.4025* (-1.69)	-1.6744** (-2.05)
$\Delta \text{Residence}$	-0.4456*** (-4.58)	-0.3351*** (-3.56)	-0.3032*** (-3.28)	-0.3219*** (-3.45)	-0.2986*** (-3.25)
Getmarry	-0.0339 (-0.59)	-0.0431 (-0.79)	-0.0285 (-0.53)	-0.063 (-1.58)	-0.0713 (-1.33)
Getdivorce	-0.0523 (-0.69)	-0.0435 (-0.6)	-0.0487 (-0.68)	-0.0351 (-0.49)	-0.0429 (-0.61)
Getunion	0.161*** (5.58)	0.1304*** (4.67)	0.131*** (4.78)	0.1281*** (4.62)	0.1279*** (4.46)
Nounion	-0.02 (-0.68)	-0.0293 (-1.03)	-0.0242 (-0.86)	-0.0318 (-1.12)	-0.0264 (-0.95)
$\Delta \text{Industry}$	0.0143 (0.39)	0.0695** (1.99)	0.0389 (1.14)	0.0605* (1.74)	0.0272 (0.79)
$\Delta \text{Occupation}$	0.1029*** (3.03)	0.0987*** (3.01)	0.0937*** (2.9)	0.0948*** (2.91)	0.0883*** (2.75)
D_1		0.4624*** (15.4)		0.3867*** (12.6)	
D_2		-0.565*** (-19.8)		-0.5559*** (-19.2)	
D_3		0.1639*** (3.97)		0.1238*** (2.92)	
ΔU			-0.0319*** (-32.1)		-0.0303*** (-29.8)
K_1				0.2647*** (10.8)	0.2435*** (10.2)
K_2				-0.0734*** (-2.71)	-0.0275 (-1.04)
K_3				0.1025*** (3.37)	0.1036*** (3.58)
Constant	0.0121 (0.28)	0.0468 (1.15)	0.0745* (1.87)	0.0332 (0.81)	0.0472 (1.18)
N	9470				
Adj. R^2	0.008	0.075	0.105	0.088	0.116
F	8.9	60.2	102.2	58.1	89.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

2.3.2 The All-Aged Full Sample

Tables 2.3.3M(1), 2.3.3M(2), 2.3.3F(1) and 2.3.3F(2) show the estimated results of the all-aged full sample without taking into consideration changes in personal characteristics, and Tables 2.3.4M(1), 2.3.4M(2), 2.3.4F(1) and 2.3.4F(2) with changes in personal characteristics taken into account for males and females, respectively. Again, Column 1 is the unconstrained model, Columns 2 and 3 the unemployment constrained models, and Columns 4 and 5 the unemployment and underemployment doubly constrained models. In Columns 2 and 4 unemployment is measured by incidence and in Columns 3 and 5 by actual weeks.

When the sample is expanded to cover all ages, for males with or without taking into account changes in personal characteristics, the coefficients on difference in log wages, in log consumer price index and changes in the unemployment and underemployment variables all remain qualitatively the same as in the prime-aged regression in both data sets, with the intertemporal substitution elasticity of labour supply slightly increased from that of their prime-aged counterparts.

For all-aged females, when changes in personal characteristics are not considered the difference in log wages, in log consumer price index and changes in the unemployment and underemployment variables again remain qualitatively the same as in their prime-aged counterparts. When changes in personal characteristics are taken into consideration the difference in

log wages becomes positively significant in all five models, with an intertemporal substitution elasticity of labour supply ranging around 0.038 in 1986-1987 and 0.12 in 1988-1989. All the other variables remain qualitatively the same.

In short, when the sample is expanded from the prime-aged to all-ages, for both males and females no substantial qualitative changes in the estimates take place, though the intertemporal substitution elasticity of labour supply slightly increases in both data sets (it varies over time).

Table 2.3.3M(1)

Estimated Differenced Log Hours Equations:

Canada, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0754*** (10.0)	0.0779*** (10.8)	0.0723*** (10.3)	0.0807*** (11.3)	0.0759*** (10.9)
$\Delta \ln CPI$	-0.6178 (-1.15)	-0.0373 (-0.07)	-0.1648 (-0.33)	0.4225 (0.83)	0.46289 (0.94)
D_1		0.5795*** (30.4)		0.4703*** (23.5)	
D_2		-0.2809*** (-15.4)		-0.2185*** (-11.1)	
D_3		0.2663*** (12.1)		0.2398*** (9.92)	
ΔU			-0.0331*** (-52.0)		-0.0298*** (-45.0)
K_1				0.3299*** (15.1)	0.3091*** (15.1)
K_2				-0.2002*** (-10.7)	-0.0636*** (-3.88)
K_3				0.2498*** (9.44)	0.3015*** (12.7)
Constant	0.054** (2.33)	0.0039 (0.18)	0.0309 (1.44)	-0.0205 (-0.92)	-0.0139 (-0.65)
N	16407				
Adj. R ²	0.004	0.082	0.147	0.108	0.166
F	33.1	250.6	715.6	225.3	473.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.3M(2)

Estimated Differenced Log Hours Equations:

Canada, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.1154*** (12.6)	0.1173*** (13.1)	0.1145*** (13.2)	0.1198*** (13.4)	0.1163*** (13.4)
$\Delta \ln CPI$	-2.196*** (-3.42)	-2.587*** (-4.09)	-2.434*** (-3.98)	-2.602*** (-4.12)	-2.382*** (-3.89)
D_1		0.2297*** (10.1)		0.187*** (7.88)	
D_2		-0.392*** (-19.1)		-0.385*** (-18.2)	
D_3		0.1115*** (3.91)		0.081*** (2.67)	
ΔU			-0.029*** (-38.3)		-0.029*** (-36.7)
K_1				0.121*** (6.35)	0.066*** (3.68)
K_2				-0.051*** (-2.73)	-0.0191 (-1.08)
K_3				0.061*** (2.62)	0.065*** (2.74)
Constant	0.0724** (2.32)	0.1013*** (3.27)	0.0923*** (3.1)	0.096*** (3.08)	0.082*** (2.74)
N	14279				
Adj. R^2	0.012	0.046	0.104	0.049	0.105
F	76.7	125.2	429.5	90.1	249.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.3F(1)

Estimated Differenced Log Hours Equations:

Canada, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0169 (1.35)	0.0171 (1.43)	0.0145 (1.23)	0.0189 (1.61)	0.0186 (1.59)
$\Delta \ln CPI$	-1.0237 (-1.39)	-0.1472 (-0.21)	0.0299 (0.04)	0.0154 (0.02)	0.3737 (0.54)
D_t		0.689*** (28.8)		0.5792*** (23.5)	
D_t		-0.3619*** (-15.1)		-0.3043*** (-12.1)	
D_t		0.2709*** (8.57)		0.2353*** (7.17)	
ΔU			-0.032*** (-39.2)		-0.0283*** (-33.9)
K_t				0.4349*** (16.5)	0.4714*** (18.7)
K_t				-0.1974*** (-8.69)	-0.0972*** (-4.56)
K_t				0.1572*** (5.52)	0.201*** (7.47)
Constant	0.0962*** (3.02)	0.0263 (0.85)	0.0505* (1.67)	0.0081 (0.27)	0.0068 (0.22)
N	13770				
Adj. R ²	0.001	0.08	0.1	0.106	0.127
F	25.3	212.4	404.5	191.6	298.0

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.3F(2)

Estimated Differenced Log Hours Equations:

Canada, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0815*** (6.13)	0.0815 (6.36)	0.0823*** (6.51)	0.0896*** (7.04)	0.0906*** (7.22)
$\Delta \ln CPI$	-1.788** (-2.32)	-1.745** (-2.33)	-2.197*** (-2.98)	-1.756** (-2.29)	-1.98*** (-2.71)
D_1		0.5424*** (21.3)		0.4554*** (17.5)	
D_2		-0.494*** (-19.9)		-0.492*** (-19.5)	
D_3		0.1984*** (5.36)		0.1419*** (3.73)	
ΔU			-0.033*** (-36.4)		-0.0307*** (-33.5)
K_1				0.2972*** (13.4)	0.2822*** (13.2)
K_2				-0.055** (-2.27)	-0.0209 (-0.89)
K_3				0.1476*** (5.49)	0.1437*** (5.63)
Constant	0.103*** (2.72)	0.093** (2.54)	0.129*** (3.61)	0.067* (1.82)	0.0859** (2.39)
N	12425				
Adj. R ²	0.003	0.074	0.099	0.089	0.113
F	15.8	165.9	344.3	136.2	227.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.4M(1)

Estimated Differenced Log Hours Equations:

Canada, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0971*** (12.2)	0.0985*** (12.9)	0.0946*** (12.9)	0.0997*** (13.2)	0.0941*** (12.9)
$\Delta \ln CPI$	0.5737 (-1.06)	0.0276 (-0.05)	-0.0648 (-0.13)	0.4498 (0.87)	0.5079 (1.02)
$\Delta \text{Residence}$	0.0215 (0.54)	0.0439 (1.14)	0.0425 (1.12)	0.0671* (1.77)	0.0617* (1.69)
Getmarry	0.0919*** (2.77)	0.0646** (2.07)	0.0627** (2.04)	0.0609* (1.94)	0.0565* (1.86)
Getdivorce	-0.0667 (-1.19)	-0.0712 (-1.33)	-0.1032** (-1.99)	-0.0879* (-1.66)	-0.1115** (-2.18)
Getunion	-0.0044 (-0.24)	-0.0035 (-0.19)	-0.0047 (-0.27)	-0.0004 (-0.02)	-0.0041 (-0.24)
Nounion	-0.0356** (-2.15)	-0.0335** (-2.11)	-0.0258* (-1.68)	-0.0331** (-2.11)	-0.0263* (-1.73)
$\Delta \text{Industry}$	0.1323*** (6.01)	0.13*** (6.08)	0.129*** (6.33)	0.1279*** (6.05)	0.1149*** (5.64)
$\Delta \text{Occupation}$	0.0438** (2.26)	0.0456** (2.19)	0.0491** (2.46)	0.0384* (1.87)	0.0378* (1.91)
D_1		0.5612*** (29.5)		0.4626*** (23.1)	
D_2		-0.3207*** (-17.3)		-0.2447*** (-12.4)	
D_3		0.2211*** (9.92)		0.2161*** (8.94)	
ΔU			-0.0331*** (-52.2)		-0.0297*** (-45.1)
K_1				0.3114*** (14.2)	0.2881*** (14.1)
K_2				-0.2253*** (-11.9)	-0.0993*** (-5.96)
K_3				0.2125*** (7.99)	0.2565*** (10.7)
Constant	0.0324 (1.36)	-0.0104 (-0.45)	0.007 (0.32)	-0.0333 (-1.46)	-0.0277 (-1.26)
N	16407				
Adj. R^2	0.015	0.089	0.155	0.115	0.172
F	29.3	128.2	278.9	136.5	247.9

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.4M(2)

Estimated Differenced Log Hours Equations:

Canada, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.1617*** (16.2)	0.1703*** (17.3)	0.1642*** (17.3)	0.1724*** (17.6)	0.1655*** (17.4)
$\Delta \ln CPI$	-2.253*** (-3.67)	-2.807*** (-4.46)	-2.565*** (-4.21)	-2.856*** (-4.55)	-2.591*** (-4.25)
$\Delta \text{Residence}$	-0.1249* (-1.8)	-0.0616 (-0.91)	-0.0853 (-1.29)	-0.0726 (-1.07)	-0.0904 (-1.37)
Getmarry	-0.073** (-2.21)	-0.0529 (-1.63)	-0.058* (-1.85)	-0.0575* (-1.77)	-0.0603* (-1.91)
Getdivorce	-0.0464 (-0.96)	-0.0313 (-0.66)	-0.0139 (-0.3)	-0.0329 (-0.69)	-0.0151 (-0.33)
Getunion	0.102*** (4.86)	0.098*** (4.78)	0.0872*** (4.38)	0.1006*** (4.9)	0.089*** (4.47)
Nounion	0.0481** (2.31)	0.0464** (2.27)	0.0578*** (2.91)	0.0435** (2.13)	0.056*** (2.81)
$\Delta \text{Industry}$	0.0606** (2.47)	0.0929*** (3.83)	0.0499* (1.92)	0.0959*** (3.96)	0.0476** (2.03)
$\Delta \text{Occupation}$	0.1751*** (7.35)	0.1793*** (7.68)	0.2005*** (8.85)	0.1813*** (7.77)	0.2013*** (8.88)
D_1		0.2086*** (9.21)		0.174*** (7.4)	
D_2		-0.434*** (-21.1)		-0.416*** (-19.7)	
D_3		0.0624** (2.19)		0.0514* (1.71)	
ΔU			-0.0296*** (-38.9)		-0.029*** (-37.1)
K_1				0.1076*** (5.69)	0.0507*** (2.83)
K_2				-0.087*** (-4.72)	-0.059*** (-3.31)
K_3				0.0245 (1.05)	0.0205 (0.97)
Constant	0.0463 (1.48)	0.079** (2.55)	0.0631** (2.21)	0.0791** (2.56)	0.0636** (2.13)
N	14279				
Adj. R ²	0.028	0.066	0.121	0.07	0.122
F	48.5	82.9	186.1	71.6	147.9

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.4F(1)

Estimated Differenced log Hours Equations:

Canada, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.0378*** (2.93)	0.0379*** (3.06)	0.038*** (3.11)	0.0384*** (3.15)	0.0384*** (3.19)
$\Delta \ln CPI$	-1.3747* (-1.84)	-0.4837 (-0.68)	-0.0396 (-0.06)	-0.3465 (-0.49)	0.1795 (0.26)
$\Delta \text{Residence}$	-0.0793 (-1.55)	-0.0438 (-0.89)	0.0108 (0.22)	-0.0352 (-0.72)	0.0095 (0.19)
Getmarry	0.0257 (0.57)	0.0193 (0.45)	0.0238 (0.56)	0.0186 (0.44)	0.0238 (0.57)
Getdivorce	0.0908 (1.21)	0.0891 (1.23)	0.096 (1.35)	0.0631 (0.87)	0.0701 (0.99)
Getunion	0.107*** (4.14)	0.0977*** (3.73)	0.0948*** (3.87)	0.0971*** (3.97)	0.0929*** (3.84)
Nounion	-0.0547** (-2.16)	-0.0455* (-1.88)	-0.0506** (-2.11)	-0.0457* (-1.91)	-0.0507** (-2.15)
$\Delta \text{Industry}$	0.1318*** (4.43)	0.1304*** (4.55)	0.1478*** (5.25)	0.1267*** (4.48)	0.1343*** (4.81)
$\Delta \text{Occupation}$	0.1171*** (4.09)	0.1145*** (4.17)	0.1153*** (4.26)	0.1106*** (4.08)	0.1064*** (3.98)
D_1		0.6614*** (27.7)		0.5619*** (22.9)	
D_2		-0.4101*** (-16.9)		-0.3396*** (-13.4)	
D_3		0.2163*** (6.8)		0.1986*** (6.05)	
ΔU			-0.0322*** (-39.6)		-0.0284*** (-34.1)
K_1				0.4127*** (15.7)	0.4402*** (17.5)
K_2				-0.2228*** (-9.82)	-0.1376*** (-6.43)
K_3				0.1242*** (4.35)	0.1544*** (5.7)
Constant	0.0776*** (2.38)	0.0144 (0.46)	0.0174 (0.56)	0.0012 (0.04)	-0.0103 (-0.33)
N	13770				
Adj. R ²	0.012	0.091	0.113	0.116	0.137
F	25.2	112.5	168.4	119.3	163.4

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 2.3.4F(2)

Estimated Differenced log Hours Equations:

Canada, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln W$	0.1158*** (8.15)	0.1242*** (9.07)	0.1182*** (8.75)	0.1288*** (9.47)	0.1221*** (9.09)
$\Delta \ln CPI$	-2.329*** (-2.96)	-2.335*** (-3.08)	-2.634*** (-3.52)	-2.302*** (-3.05)	-2.47*** (-3.32)
$\Delta \text{Residence}$	-0.1258 (-1.61)	-0.0786 (-1.04)	-0.064 (-0.86)	-0.0673 (-0.9)	-0.0633 (-0.86)
$\Delta \text{Getmarry}$	-0.0683 (-1.61)	-0.0282 (-0.69)	-0.0212 (-0.53)	-0.0443 (-1.09)	-0.0401 (-0.99)
$\Delta \text{Getdivorce}$	-0.0804 (-1.24)	-0.1022 (-1.63)	-0.1203* (-1.94)	-0.1017 (-1.63)	-0.1196* (-1.95)
$\Delta \text{Getunion}$	0.1549*** (6.06)	0.1302*** (5.29)	0.1307*** (5.38)	0.1237*** (5.06)	0.1246*** (5.16)
$\Delta \text{Nounion}$	-0.0274 (-1.02)	-0.0365 (-1.41)	-0.0337 (-1.32)	-0.0411 (-1.6)	-0.0368 (-1.46)
$\Delta \text{Industry}$	0.0611** (1.97)	0.1037*** (3.47)	0.0779*** (2.65)	0.0989*** (3.33)	0.0696** (2.38)
$\Delta \text{Occupation}$	0.1492*** (5.03)	0.1516*** (5.31)	0.1409*** (4.99)	0.1441*** (5.08)	0.1323*** (4.72)
D_1		0.5259*** (20.7)		0.4459*** (27.2)	
D_2		-0.535*** (-21.1)		-0.524*** (-20.7)	
D_3		0.1595*** (4.33)		0.1176*** (3.11)	
ΔU			-0.033*** (-36.5)		-0.031*** (-33.5)
K_1				0.2816*** (12.8)	0.2669*** (12.5)
K_2				-0.074*** (-3.08)	-0.0435* (-1.85)
K_3				0.1203*** (4.49)	0.1153*** (4.51)
Constant	0.0963** (2.5)	0.0906** (2.43)	0.1187*** (3.24)	0.0702* (1.88)	0.0858** (2.34)
N	12425				
Adj. R ²	0.015	0.087	0.11	0.101	0.123
F	20.0	92.5	141.3	88.6	125.1

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

2.4 Summary and Conclusion

Using the Labour Market Activity Survey: 1986-1987 and 1988-1989, of Statistics Canada, this chapter empirically estimates three groups of nested models of intertemporal labour supply in Canada for the prime-aged males and females and for all ages. There are three ways in which this chapter adds to the literature. First, we theoretically distinguish between labour market constraints (unemployment and underemployment) experienced in the past period, in the current period and in both periods, which the literature has not done. As the empirical results show this distinction is indeed important. Those people who experienced labour market constraints last period, but not this period work significantly more hours than those who were never constrained - i.e., they "make up for", in part, their past constraint, holding wage changes constant. Constraints experienced in the current period are highly negatively significant in explaining the change in log hours of labour supply. Those who are constrained in both periods want to increase labour supply to make up for past income losses, but cannot do so - hence the effects of both-period constraints on the changes in log hours of labour supply are as seen either positive or negative, depending upon which period's constraint dominates.

The real business cycle literature would predict these variables to be statistically insignificant --- we find their influence to be empirically large, statistically significant and highly stable over time

and across regional labour markets in Canada", which shows strong evidence that labour market constrained workers (either unemployed or underemployed) are off their intertemporal labour supply functions, rejecting the real business cycle view that variations in measured unemployment represent individuals adjusting their labour supply behaviour in response to fluctuations in real wages and that unemployment time represents voluntary consumption of leisure.

Second, in the literature the hypothesis of no money illusion is usually directly imposed as nominal wages are converted into real wages, and the difference in log real wages is entered as a single independent variable. Instead of using real wages we specify the change in log nominal wages and in log consumer price index as two separate independent variables, and explicitly test the no money illusion hypothesis. The empirical results provide strong evidence against this hypothesis.

Third, as Tables 2.4.1 and 2.4.2 shows, the estimated wage substitution elasticity of annual hours is highly variable over time and across regional labour markets.¹⁶ This instability, in significance and in magnitude, suggests that we can not depend upon the estimated intertemporal substitution elasticity of labour supply as a general

15 The estimated results are presented in Appendices 2B, 2C, 2D, 2E and 2F for the five regional markets, respectively.

16 Because of the constant annual consumer price index in Quebec, Ontario and British Columbia nominal wages are converted into real wages and used a a single explanatory variable for the regional markets. This elasticity is, therefore, related to nominal wages for Canada and real wages for the regional markets.

explanation of fluctuations in unemployment across labour markets. By contrast, the estimated impacts of quantity constraints in the last period (D_t and K_t) and quantity constraints in the current period (D_t and K_t) are empirically relatively large, statistically significant and highly stable across regions."

The high statistical significance of changes in the unemployment and underemployment variables suggest that the unemployment and underemployment doubly constrained models represent superior models of labour market outcomes.

17 Recall that the coefficient on D_t and K_t is the sum of two conflicting tendencies and is predicted to be ambiguous in sign and significance.

Table 2.4.1

Estimated Substitution Elasticity of Annual Hours: 1986-1987, Canada

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.0704* (10.4)	0.0631* (9.95)	0.0997* (13.2)	0.0941* (12.9)
Females	0.0262* (2.0)	0.0236* (1.82)	0.0384* (3.15)	0.0384* (3.19)

Atlantic				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.0267 (1.47)	0.0235 (1.39)	0.0402* (2.11)	0.0364* (1.99)
Females	-0.0438 (-1.29)	-0.0446 (-1.35)	-0.0617* (-1.94)	-0.0649* (-2.11)

Quebec				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.0657* (3.31)	0.0498* (2.69)	0.0735* (3.28)	0.0651* (3.0)
Females	-0.0403 (-0.99)	-0.0633 (-1.6)	0.0096 (0.26)	-0.0062* (-0.17)

Ontario				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.0631* (4.14)	0.0609* (4.26)	0.1069* (6.43)	0.1042* (6.44)
Females	0.0278 (0.94)	0.0348 (1.18)	0.0289 (1.06)	0.0391 (1.45)

Prairie				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.0515* (3.71)	0.0284* (2.19)	0.0956* (6.38)	0.0794* (5.53)
Females	0.0466* (2.09)	0.0409* (1.87)	0.0518* (2.43)	0.0469* (2.25)

British Columbia				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.1192* (5.86)	0.1269* (6.81)	0.1431* (5.99)	0.1477* (6.45)
Females	0.0391 (0.86)	0.0424 (0.96)	0.0408 (0.91)	0.046 (1.03)

Note: t-ratio is given in parentheses;

Column A - unemployment is measured by incidence;

Column B - unemployment is measured by actual weeks;

* --- significant at standard level of confidence.

Table 2.4.2

Estimated Substitution Elasticity of Annual Hours: 1988-1989, Canada

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.1382* (14.1)	0.1301* (13.8)	0.1724* (17.6)	0.1655* (17.4)
Females	0.0816* (5.31)	0.0743* (4.92)	0.1288* (9.47)	0.1221* (9.09)
Atlantic				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.1553* (5.18)	0.1374* (4.91)	0.2096* (7.28)	0.1857* (6.82)
Females	0.2464* (4.81)	0.2372* (4.75)	0.2597* (5.81)	0.2351* (5.36)
Quebec				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.1147* (4.03)	0.1121* (4.25)	0.1727* (6.16)	0.1682* (6.35)
Females	0.1589* (3.21)	0.1538* (3.19)	0.198* (4.46)	0.1985* (4.55)
Ontario				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.1812* (6.78)	0.1716* (6.42)	0.2128* (8.17)	0.2025* (7.82)
Females	-0.0083 (-0.23)	-0.0174 (-0.49)	0.0764* (2.39)	0.0637* (2.02)
Prairie				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.126* (7.67)	0.1231* (7.75)	0.1338* (7.68)	0.1377* (8.09)
Females	0.1335* (4.3)	0.1338* (4.37)	0.1856* (6.7)	0.1866* (6.83)
British Columbia				
	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.1564* (5.29)	0.1417* (4.92)	0.219* (6.41)	0.2064* (6.14)
Females	0.1441* (2.39)	0.1381* (2.32)	0.1401* (2.69)	0.1388* (2.69)

Note: t-ratio is given in parentheses;

Column A - unemployment is measured by incidence;

Column B - unemployment is measured by actual weeks;

* --- significant at standard level of confidence.

Chapter Three

Short-Run Intertemporal Substitution of Labour Supply

3.0 Introduction

Using the Labour Market Activity Survey: 1986-1987 and 1988-1989, of Statistics Canada, the previous chapter tests the real business cycle interpretation of unemployment by empirically estimating three groups (unconstrained, unemployment constrained and unemployment and underemployment doubly constrained) of nested intertemporal labour supply models in Canada (male and female separately). The empirical results all rejected the real business cycle view of unemployment and the hypothesis of no money illusion.

However, a year is an arbitrary period of time over which to examine labour supply behavior. Could it be that intertemporal substitution of labour supply operates on a shorter time-scale? Since quarter to quarter variations in economic activities can be quite significant and are, indeed, often used to measure swings in the business cycle, it seems appropriate to examine the short-run intertemporal substitution of labour supply on a quarterly basis.

The detailed questioning of the Labour Market Activity Survey on the characteristics of each job held allows this chapter to test the real business cycle interpretation of unemployment in a detailed manner by breaking down the two-year data into eight successive quarters and

3.1 Theoretical Framework

This chapter uses the theoretical framework formulated in the previous chapter in the estimation of models of short-run intertemporal substitution of labour supply. We are unable to consider the unemployment and underemployment doubly constrained models due to the lack of underemployment information in the derived quarterly data (which is only available on an annual basis). The unconstrained and unemployment constrained models are therefore rewritten in the following:

$$(3.1) \quad \Delta \ln H_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \Delta \epsilon_{it}$$

$$(3.2) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1 D_{it} + \theta_2 D_{it} + \theta_3 D_{it} + \Delta \epsilon_{it}$$

$$(3.3) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_4 \Delta U_{it} + \Delta \epsilon_{it}$$

3.2 Data Set

This chapter breaks down the two-year data of the Labour Market Activity Survey: 1988 and 1989 of Statistics Canada into eight quarters and estimates the unconstrained and unemployment constrained models of short-run intertemporal substitution of labour supply. See the previous chapter for distinct features, sample inclusion criteria of the data set used in this chapter.

estimating two groups of nested intertemporal labour supply models in the short run in Canada.

The following is the plan for the chapter: Section 3.1 develops the theoretical models for the subsequent empirical estimation. Section 3.2 introduces the major features of the data set, the sample selection criteria and the variables used in the empirical estimation. Section 3.3 presents and analyzes the estimated results. Section 3.4 summarizes and concludes the chapter.

3.1 Theoretical Framework

This chapter uses the theoretical framework formulated in the previous chapter in the estimation of models of short-run intertemporal substitution of labour supply. We are unable to consider the unemployment and underemployment doubly constrained models due to the lack of underemployment information in the derived quarterly data (which is only available on an annual basis). The unconstrained and unemployment constrained models are therefore rewritten in the following:

$$(3.1) \quad \Delta \ln H_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \Delta \epsilon_{it}$$

$$(3.2) \quad \Delta \ln H^*_t = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_3 D_{1t} + \theta_4 D_{12t} + \theta_5 D_{13t} + \Delta \epsilon_{it}$$

$$(3.3) \quad \Delta \ln H^*_t = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_6 \Delta U_{it} + \Delta \epsilon_{it}$$

3.2 Data Set

This chapter breaks down the two-year data of the Labour Market Activity Survey: 1988 and 1989 of Statistics Canada into eight quarters and estimates the unconstrained and unemployment constrained models of short-run intertemporal substitution of labour supply. See the previous chapter for distinct features, sample inclusion criteria of the data set used in this chapter.

3.2.1 Construction of the Data

In the LMAS respondents are asked about their weekly labour force status (one for working and zero for not working) at each job (a total possible of 5 different jobs for each year). For working interviewees hours of work per day, days of work per week at each job held are then asked. The quarterly hours of labour supply can, therefore, be derived by summing up the product of the weekly labour force status multiplied by hours of work per day and days of work per week at each job held across 13 weeks (Weeks 1 to 13 for Quarter 1, Weeks 14 to 26 for Quarter 2, Weeks 27 to 39 for Quarter 3 and Weeks 40 to 52 for Quarter 4, for each of the two years). Other job-related variables are built up based on the job with most hours worked in the quarter, which is discussed in more detail in Sub-Section 3.2.2.

3.2.2 Variables

The theoretically appropriate variable for intertemporal labour supply analysis is not the nominal but the real hourly wage rates. Since direct estimation of $\delta \Delta \ln(W_{it}/CPI_{it})$ would impose the maintained hypothesis of no money illusion, we prefer to specify $\delta \Delta \ln W_{it} - \delta' \Delta \ln CPI_{it}$ as two independent variables and directly test the hypothesis $\delta = \delta'$, with CPI being the quarterly averages of consumer price index for the province of

residence.' Therefore, the models are written as: Equation 3.4 for the unconstrained, 3.5 and 3.6 for the unemployment constrained. In Equation 3.5 unemployment is measured by incidence and in 3.6 by the actual weeks of duration.

$$(3.4) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(3.5) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_1 D_{it} + \theta_2 D_{it} + \theta_3 D_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(3.6) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_4 \Delta U_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

Most of the personal characteristics affecting individual tastes considered in one-period labour supply models (e.g., educational levels, age, number of dependent children, etc.) cancel out in first differences. The variables contained in the vector of X are changes in job-related characteristics and quarterly transition dummy variables.

Economic theory predicts that the reason why people move from one job to another is to increase their total well-being.' Since total wealth changes, the marginal utility of wealth must also change. Changes in job-related pension plan, union status, industry and occupation are,

1 The Quarterly averages of consumer price index are obtained from Statistics Canada: Consumer Prices and Price Indexes, January-March, 1990, pp. 96-100, Table 14: Consumer Price Indexes, Major Components, (not seasonally adjusted), by Province, 1987-1989, 1981=100.

2 Osberg, Gordon and Lin (1992) document in detail the economic returns to inter-regional migration and inter-industry mobility.

therefore, markers for changes in marginal utility of life-time wealth and accordingly, quarterly hours of work.

Getting a job with a pension plan in addition to the Canada pension plan provides more security of income upon retirement and thus increases expected life-time wealth as compared to a job without a pension plan. For individuals moving from one job to another there are two possibilities: getting into a job-related pension plan or losing it, and their effects on changes of quarterly hours of work should therefore be distinguished: $Getpen = 1$ if the individual is covered by a job-related pension plan in period t but not in $t-1$; and $Getnopen = 1$ if the individual is covered by a job-related pension plan in period $t-1$ but not in t .

The same argument can be made with respect to changes in union status. Becoming unionized provides more job security and increases expected life-time wealth in comparison with losing union status. We can distinguish them by two dummy variables: $Getunion = 1$ if the individual is a union member in period t but not in $t-1$; and $Nounion = 1$ if the individual is a union member in period $t-1$ but not in t .

When individuals move from one job to another their industry and occupation may also be changed, which also affects expected life-time income; and therefore, the marginal utility of life-time wealth and quarterly hours of work: $\Delta Industry = 1$ if industry in period $t \neq$ industry

in period $t-1$; and $\Delta\text{Occupation} = 1$ if occupation in period $t \neq$ occupation in period $t-1$.³

In short, changes in job-related characteristics affecting changes in the quarterly hours of work considered in this chapter include: i) changes in job-related pension plan --- getting into a job-related pension plan or getting out of it; ii) changes in union status --- becoming unionized or becoming non-unionized; iii) changes in industry; and iv) changes in occupation.

It is a well-known fact that in Canada the marginal utility of leisure is much higher in the summer than in the winter (except for skiing lovers). Seasonality can hence be expected to affect the changes in the quarterly hours of work. We can introduce dummy variables to control for changes in the marginal utility of leisure corresponding to particular seasons of the year: i) $\text{Tran23} = 1$ denotes the transition between Quarters 2 and 3 of each year; ii) $\text{Tran34} = 1$ denotes the transition between Quarters 3 and 4 of each year; and iii) $\text{Tran45} = 1$ denotes the transition between the fourth quarter in 1988 and the first quarter in 1989 (transition between Quarters 1 and 2 being the control case).

In the LMAS, weeks of paid vacation are counted in the same way as in the Labour Force Survey of Statistics Canada on employment and unemployment --- i.e., a week of paid vacation, if the individual had a

3 The group of no change in pension plan, union status, industry and occupation being the control case, respectively.

job to return to, is counted as a week of employment. This implies that our model of quarterly variations in desired hours of work should, if the real business cycle theory is correct, explain quarterly variations in unemployment. Therefore, our dummy variables for transition between quarters measure the extent to which individuals take unemployment weeks, in different seasons of the year, over and above their entitlement of paid vacations.

In the construction of job-related variables (i.e., changes in hourly wage rates, changes in pension plan, changes in union status, changes in industry and occupation) if more than one job is held in one quarter we count the job with most hours worked in the quarter.⁴

3.3 Empirical Results⁵

3.3.1 The Prime-Aged Sub-Sample

Tables 3.3.1M and 3.3.1F present the estimated differenced log hours equations when changes in job-related characteristics are not taken into consideration for males and females, respectively. Column 1 is the

4 We also try the average wages weighted by hours across jobs. But because most people have only one job in a quarter the results are identical.

5 Method of estimation: Ordinary Least Square (OLS); Computer program: K.J. White's SHAZAM, Version 6.0, Dalhousie University, Halifax, Nova Scotia. Results reported are weighted results by record weight. Unweighted results are similar, available upon request.

unconstrained model, Columns 2 and 3 the unemployment-constrained models. Column 2 measures unemployment by the incidence and Column 3 by actual weeks of unemployment.

For prime-aged males the difference in log wages is negatively significant in all three models, implying in magnitude a small negative intertemporal substitution elasticity of labour supply (around -0.07). According to the real business cycle theory this elasticity should be positively significant and "large" in magnitude, especially for nominal wages. The difference in log consumer price index is positively significant throughout the three models, rejecting the no money illusion hypothesis. The changes in unemployment variables are all significant - at very high levels of statistical significance. Together, these results are evidence against the real business cycle hypothesis that unemployment represents voluntary intertemporal variations in labour supply behavior in response to changes in real wages.

In the prime-aged female results the difference in log wages plays no significant role in explaining the difference in log hours of labour supply in all three models. The changes in log consumer price index is not significant, and the results for unemployment variables are very similar to those of prime-aged males.

A more complete model of intertemporal labour supply would take into account the changes in job-related characteristics which may affect the

marginal utility of expected life-time wealth and individual tastes towards leisure, as in Tables 3.3.2M and 3.3.2F.

For prime-aged males, when changes in job-related characteristics are included the difference in log wages maintains its highly negative statistical significance throughout the three models with the intertemporal substitution elasticity of labour supply slightly increased (to around -0.06). The difference in log consumer price index remains positively significant. The changes in unemployment variables are again highly significant, strongly rejecting the real business cycle interpretation of unemployment. Getting into a job-related pension plan and getting out of it are both negatively significant throughout as compared to no changes in pension plan. Becoming unionized and non-unionized are positively significant in comparison with the control case (no change in union status). Change in industry as well as in occupation are insignificant throughout. Although all the quarterly transition dummy variables are negatively significant in the unconstrained model, only the transition between Quarter 4 in 1988 and Quarter 1 in 1989 is negatively significant, as compared to the control case (transition between Quarters 1 and 2).

For prime-aged females, when changes in job-related characteristics are added the difference in log wages remains insignificant in all three models. Changes in log consumer price index, unemployment and underemployment variables remain the same as changes in personal characteristics are not taken into account. Getting out of a job-related

pension plan is negatively significant in all the three models while getting into it is insignificant. Becoming unionized is always positively significant and becoming non-unionized all negatively significant throughout. While changes in industry is positively significant in all three models changes in occupation is always insignificant. For the quarterly transition dummy variables only the transition between Quarters 2 and 3 is negatively significant --- i.e., prime-aged females decrease labour supply in the summer months (July to September) probably because dependent child(ren) leaves school.

In every case, the data strongly confirms the hypotheses that:

- (a) $a_1 > 0$;
- (b) $a_2 < 0$; and
- (c) $a_3 > 0$.

As well, it is notable that the coefficients associated with the variables measuring labour market constraints are empirically much larger in magnitude than the coefficients associated with other explanatory variables.

In summing up, both the prime-aged male and female results provide evidence against the real business cycle view that unemployment is voluntary consumption of leisure and the hypothesis of no money illusion.

Table 3.3.1M

Estimated Differenced Log Hours Equations: Canada, Males, Aged 25-54
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0698*** (-6.82)	-0.0761*** (-8.19)	-0.0744*** (-8.9)
$\Delta \ln CPI$	1.9654*** (9.47)	1.4406*** (7.66)	1.0039*** (5.92)
D_1		0.746*** (90.8)	
D_2		-0.6728*** (-80.2)	
D_3		-0.0238* (-1.89)	
ΔU			-0.1576*** (-186.8)
Constant	-0.0247*** (-9.26)	-0.0192*** (-7.91)	-0.0138*** (-6.31)
N	69713		
Adj. R^2	0.0019	0.1805	0.3348
F	47.13	2561.0	8771.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

Table 3.3.1F

Estimated Differenced Log Hours Equations: Canada, Females, Aged 25-54
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0183 (1.24)	0.0073 (0.52)	0.0202 (1.55)
$\Delta \ln CPI$	-0.1666 (-0.59)	-0.2867 (-1.09)	-0.2239 (-0.91)
D_t		0.7375*** (62.7)	
D_t		-0.7464*** (-62.0)	
D_t		0.1035*** (5.53)	
ΔU			-0.148*** (-125.7)
Constant	0.0022 (0.61)	0.0029 (0.86)	0.0027 (0.86)
N	55636		
Adj. R ²	0.00	0.1245	0.2211
F	0.67	1319.2	3947.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 3.3.2M

Estimated Differenced Log Hours Equations: Canada, Males, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0589*** (-5.61)	-0.0628*** (-6.59)	-0.0692*** (-8.06)
$\Delta \ln CPI$	0.9197*** (3.62)	1.0286*** (4.47)	0.8056*** (3.89)
D_t		0.7464*** (90.4)	
D_t		-0.6739*** (-81.7)	
D_t		-0.0245* (-1.92)	
ΔU			-0.1577*** (-186.8)
Getpen	-0.0466*** (-5.85)	-0.0623*** (-8.64)	-0.0595*** (-9.15)
Getnopen	-0.0268*** (-2.86)	-0.0183** (-2.16)	-0.0208*** (-2.72)
Getunion	0.0416*** (4.2)	0.0258*** (2.87)	0.0339*** (4.21)
Nounion	0.0133 (1.23)	0.0207** (2.12)	0.0095 (1.08)
$\Delta \text{Industry}$	0.0019 (0.19)	-0.0009 (-0.09)	0.0141* (1.71)
$\Delta \text{Occupation}$	-0.0126 (-1.24)	0.0053 (0.58)	0.0107 (1.29)
Tran23	-0.0105*** (-3.49)	-0.0029 (-1.07)	-0.0017 (-0.71)
Tran34	-0.0182*** (-5.64)	-0.0028 (-0.96)	0.0011 (0.41)
Tran45	-0.0297*** (-7.62)	-0.0204*** (-5.77)	-0.0128*** (-4.02)
Constant	0.0009 (0.19)	-0.009** (-2.19)	-0.0091** (-2.44)
N	69713		
Adj. R ²	0.0038	0.1823	0.3362
F	23.44	1037.1	2717.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 3.3.2F

Estimated Differenced Log Hours Equations: Canada, Females, Aged 25-54
Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0039 (-0.25)	-0.0122 (-0.86)	-0.0009 (-0.07)
$\Delta \ln CPI$	-0.7726** (-2.24)	-0.5359* (-1.66)	-0.0405 (-1.33)
D_t		0.7304*** (61.9)	
D_t		-0.7487*** (-62.1)	
D_t		0.098*** (5.2)	
ΔU			-0.1478*** (-125.4)
Getpen	0.0032 (0.28)	-0.0035 (-0.33)	0.0024 (0.24)
Getnopen	-0.0515*** (-4.22)	-0.0358*** (-3.13)	-0.0481*** (-4.45)
Getunion	0.0517*** (3.83)	0.0647*** (5.11)	0.0707*** (5.93)
Nounion	-0.0451*** (-3.15)	-0.0459*** (-3.43)	-0.0475*** (-3.76)
$\Delta \text{Industry}$	0.0516*** (3.55)	0.0372*** (2.73)	0.0454*** (3.54)
$\Delta \text{Occupation}$	-0.0064 (-0.48)	-0.0033 (-0.26)	-0.0046 (-0.39)
Tran23	-0.0368*** (-9.97)	-0.0243*** (-6.39)	-0.0143*** (-3.97)
Tran34	-0.0047 (-1.05)	0.0015 (0.35)	0.0002 (0.05)
Tran45	-0.0087* (-1.67)	-0.0052 (-1.06)	-0.0036 (-0.77)
Constant	0.0223*** (3.62)	0.0131** (2.26)	0.0091* (1.67)
N	55636		
Adj. R^2	0.0031	0.1265	0.2227
F	15.36	537.93	1226.7

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

3.3.2 The All-Aged Full Sample

Tables 3.3.3M and 3.3.3F show the estimated results of the all-aged full sample without taking into consideration changes in job-related characteristics, and Tables 3.3.4M and 3.3.4F with changes in job-related characteristics taken into account for males and females, respectively. Again, Column 1 is the unconstrained model, Columns 2 and 3 the unemployment constrained models. In Column 2 unemployment is measured by incidence and in Column 3 by actual weeks.

When the sample is expanded to cover all ages, for males without taking into account changes in job-related characteristics and quarterly transition dummy variables, difference in log wages is negatively significant throughout with the substitution elasticity of labour supply around -0.15. Changes in log consumer price index is positively significant with large coefficient in magnitude in all the three models. The hypothesis of no money illusion is again rejected. Changes in the unemployment variables all remain qualitatively the same as in the prime-aged regression, rejecting the real business cycle view of unemployment.

When changes in job-related characteristics are considered, changes in log wages retain its negative significance in every case. Differences in log consumer price index is only marginally significant with the coefficient decreased dramatically to around 0.4. Changes in pension plan are negatively significant in all three models. While becoming unionized is positively significant, becoming non-unionized is insignificant

throughout. Changes in occupation is insignificant and in industry positively significant in all three models. The dummy variables for transition between quarters are all negatively significant in every case.

For all-aged females, when changes in job-related characteristics are not considered the difference in log wages is positively significant with a small positive estimated substitution elasticity of labour supply (around 0.02). Change in log consumer price index is all insignificant. Changes in the unemployment variables again remain qualitatively the same as in their prime-aged counterparts.

When changes in job-related characteristics are taken into consideration the difference in log wages becomes insignificant in explaining the changes in quarterly hours of labour supply in all three models. The difference in log consumer price index is negatively significant. Changes in unemployment status all remain qualitatively the same as in the prime-aged sample. While getting into a job-related pension plan and becoming unionized are positively significant, getting out of a job-related pension plan and becoming non-unionized are the opposite in all the three models. Change in industry is positively significant and change in occupation is insignificant throughout. While the transition between Quarter 4 in 1988 and Quarter 1 in 1989 is insignificant transition between Quarters 2 and 3, 3 and 4 is negatively significant in every case.

In short, when the sample is expanded from the prime-aged to all ages for both males and females, no substantial qualitative changes have

been observed. That is to say, the main qualitative empirical findings remain unchanged: i) the real business cycle hypothesis that changes in quarterly hours of work are strongly and positively related to changes in wages is rejected; ii) the hypothesis of no money illusion in making labour supply decisions is rejected; and iii) the high significance of changes in the unemployment variables strongly suggest that the unemployment constrained models represent superior models of intertemporal labour supply.

Table 3.3.3M

Estimated Differenced Log Hours Equations: Canada, Males, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1478*** (-16.7)	-0.1499*** (-18.4)	-0.1464*** (-19.6)
$\Delta \ln CPI$	2.3962*** (11.3)	1.7997*** (9.37)	1.2656*** (7.17)
D_t		0.7106*** (94.3)	
D_{t-1}		-0.6499*** (-86.1)	
D_{t-2}		-0.0053 (-0.47)	
ΔU			-0.1537*** (-190.5)
Constant	-0.026*** (-9.68)	-0.0202*** (-8.14)	-0.0133*** (-5.87)
N	89845		
Adj. R ²	0.0045	0.1595	0.291
F	137.4	2843.2	9221.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

Table 3.3.3F

Estimated Differenced Log Hours Equations: Canada, Females, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0302** (2.46)	0.0209* (1.81)	0.0223** (2.03)
$\Delta \ln CPI$	-0.0498 (-0.19)	-0.1209 (-0.51)	-0.1181 (-0.51)
D_1		0.7121*** (69.6)	
D_2		-0.6572*** (-63.3)	
D_3		0.0439*** (2.83)	
ΔU			-0.144*** (-133.7)
Constant	0.0035 (1.07)	0.0031 (1.0)	0.0044 (1.49)
N	71988		
Adj. R^2	0.0001	0.111	0.1989
F	4.21	1500.0	4471.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 3.3.4M

Estimated Differenced Log Hours Equations: Canada, Males, Aged 16-69
Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1593*** (-17.6)	-0.1568*** (-18.8)	-0.1597*** (-20.9)
$\Delta \ln CPI$	0.4219* (1.65)	0.4193* (1.78)	0.1852 (0.86)
D_t		0.7022*** (92.5)	
D_{t-1}		-0.6542*** (-86.0)	
D_{t-2}		-0.0217* (-1.87)	
ΔU			-0.1534*** (-190.4)
Getpen	-0.0334*** (-4.27)	-0.0423*** (-5.88)	-0.0378*** (-5.73)
Getnopen	-0.0611*** (-6.64)	-0.0401*** (-4.74)	-0.0399*** (-5.15)
Getunion	0.077*** (8.27)	0.0699*** (7.81)	0.0629*** (8.01)
Nounion	0.0072 (0.71)	0.0109 (1.16)	-0.0023 (-0.26)
Δ Industry	0.0349*** (3.75)	0.0394*** (4.55)	0.0519*** (6.59)
Δ Occupation	0.0023 (0.24)	-0.0056 (-0.66)	0.0029 (0.37)
Tran23	-0.0194*** (-6.41)	-0.0105*** (-3.75)	-0.0086*** (-3.35)
Tran34	-0.0433*** (-13.2)	-0.0298*** (-9.91)	-0.0237*** (-8.58)
Tran45	-0.0328*** (-8.39)	-0.0268*** (-7.46)	-0.0186*** (-5.65)
Constant	0.019*** (4.14)	0.0112*** (2.65)	0.0103*** (2.65)
N	89845		
Adj. R ²	0.0083	0.162	0.2934
F	63.43	1158.6	2870.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;
 *** - significant at 1%;
 ** - significant at 5%; and
 * - significant at 10%.

Table 3.3.4F

Estimated Differenced Log Hours Equations: Canada, Females, Aged 16-69
Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0037 (0.29)	-0.0025 (-0.21)	-0.0062 (-0.55)
$\Delta \ln CPI$	-0.8437*** (-2.68)	-0.6173** (-2.08)	-0.5409* (-1.92)
D_1		0.7053*** (68.8)	
D_2		-0.6603*** (-63.3)	
D_3		0.0316** (2.01)	
ΔU			-0.144*** (-133.6)
Getpen	0.0264*** (2.64)	0.0229** (2.44)	0.0231*** (2.59)
Getnopen	-0.0506*** (-4.52)	-0.0429*** (-4.07)	-0.0572*** (-5.71)
Getunion	0.0459*** (3.94)	0.0541*** (4.92)	0.0522*** (5.01)
Nounion	-0.321*** (-2.59)	-0.0238** (-2.03)	-0.0321*** (-2.89)
Δ Industry	0.0291** (2.48)	0.0227** (2.04)	0.0441*** (4.19)
Δ Occupation	0.0132 (1.18)	0.0119 (1.14)	0.0125 (1.25)
Tran23	-0.0331*** (-8.85)	-0.0214*** (-6.07)	-0.0133*** (-3.97)
Tran34	-0.0133*** (-3.29)	-0.0082** (-2.14)	-0.0093*** (-2.58)
Tran45	-0.0068 (-1.41)	-0.0047 (-1.02)	-0.0003 (-0.07)
Constant	0.0261*** (4.61)	0.173*** (3.22)	0.0146*** (2.87)
N	71988		
Adj. R^2	0.0025	0.1125	0.2008
F	16.41	609.85	1392.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

3.4 Summary and Conclusion

Using the detailed information on respondents' weekly labour force status, hours of work per day and days of work per week this chapter breaks down the two-year data of the Labour Market Activity Survey: 1988 and 1989, of Statistics Canada, into eight quarters and empirically estimates two groups of nested models of short-run intertemporal labour supply in Canada for prime-aged males and females and for all ages. There are three aspects in which this chapter adds to the literature. First, we theoretically distinguish between quantity constraints in labour market experienced in period $t-1$, period t , and in both periods, which the literature has not done. As the empirical results show this distinction is indeed important. Those people who experienced labour market constraints in period $t-1$, but not period t work significantly more hours than those who were never constrained - i.e., they "make up for", in part, their past constraint, holding wage changes constant. Constraints experienced in period t only are highly negatively significant in explaining the change in log hours of labour supply. Those who are constrained in both periods want to increase labour supply to make up for past income losses, but can not do so --- hence the effects of both-period constraints on the changes in log hours of labour supply are as seen either positive or negative, depending upon which period's constraint dominates.

The real business cycle literature would predict these variables to be statistically insignificant --- we find their influence to be

empirically large, statistically significant and highly stable across regions', which strongly support the empirical findings in the previous chapter that labour market constrained workers are off their intertemporal labour supply functions, rejecting the real business cycle view that variations in measured unemployment represent individuals adjusting their labour supply behaviour in response to fluctuations in real wages and that unemployment time represents voluntary consumption of leisure.

Second, in the literature the hypothesis of no money illusion is usually directly imposed as nominal wages are converted into real wages, and the difference in log real wages is entered as a single independent variable. Instead of using real wages we specify the change in log nominal wages and in log consumer price index as two separate independent variables, and explicitly test the no money illusion hypothesis. The empirical results provide strong evidence against this hypothesis.

Third, as Table 3.4.1 shows, the estimated wage elasticity of intertemporal labour supply is usually negative (contrary to the real business cycle theory), often statistically insignificant and highly variable across regions. By contrast, the estimated impacts of unemployment in the last period (D_t) and unemployment in the current period (D_t) are empirically large, statistically significant and highly stable across regions.⁷ This instability, in sign, in significance and in

6 The estimated results for the five regional labour markets are shown in Appendices 3B, 3C, 3D, 3E and 3F, respectively.

7 Recall that the coefficient on D_t is the sum of two conflicting tendencies and is predicted to be ambiguous in sign.

magnitude --- when the same data set is used, within the same country, in the same years --- suggests that the intertemporal substitution elasticity of labour supply can not be relied upon to explain variations in unemployment over time or across labour markets.

Table 3.4.1

Estimated Substitution Elasticity of Quarterly Hours: Canada

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	-0.0628* (-6.59)	-0.0692* (-8.06)	-0.1568* (-18.8)	-0.1597* (-20.9)
Females	-0.0122 (-0.86)	-0.0009 (-0.07)	-0.0025 (-0.21)	-0.0061 (-0.55)

Atlantic

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	-0.035 (-1.43)	-0.0447* (-2.12)	0.01944 (0.93)	-0.0209 (-0.36)
Females	-0.256* (-7.21)	-0.26* (-7.94)	-0.2162* (-7.43)	-0.2434* (-9.04)

Quebec

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	0.1152* (4.54)	0.1092* (4.98)	-0.3604* (-18.5)	-0.3704* (-20.9)
Females	0.0205 (0.47)	0.0019 (0.05)	-0.0144 (-0.43)	-0.0168 (-0.55)

Ontario

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	-0.1503* (7.93)	-0.1583* (-8.89)	-0.0635* (-3.55)	-0.0547* (-3.27)
Females	-0.0343 (-1.16)	0.0015 (0.05)	-0.0075 (-0.29)	-0.0029 (-0.12)

Prairie

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	-0.0505* (-3.09)	-0.0414* (-2.82)	-0.0451* (-3.03)	-0.0442* (-3.21)
Females	-0.0916* (-3.81)	-0.0839* (-3.87)	-0.0415* (-2.09)	-0.0454* (-2.39)

British Columbia

	Aged 25-54		Aged 16-69	
	A	B	A	B
Males	-0.1271* (-4.0)	-0.1436* (-5.08)	-0.1171* (-4.31)	-0.1176* (-4.75)
Females	0.1739* (4.45)	0.1586* (4.26)	0.168* (4.93)	0.1445* (4.42)

Note: t-ratio is given in parentheses;

Column A - unemployment is measured by incidence;

Column B - unemployment is measured by actual weeks.

* --- significant at standard level of confidence.

Chapter Four

Simultaneous Models of Changes in Annual Hours and Hourly Wages

4.0 Introduction

In previous chapters, the models of intertemporal substitution of labour supply assume that expected hourly wages are determined by prior human capital investment decisions and ability endowments but that hourly wages vary randomly from period to period due to the stochastic shocks of technology and other changes, i.e., the models assume that an individual maximizes an intertemporally separable lifetime utility function subject to the expected lifetime budget constraint resulting from an exogenous wage rate. As has been frequently noted in the literature, the assumption of wage exogeneity in models of labour supply is suspect, and resulting estimates of labour supply functions may be wage-endogeneity biased.

Theoretical justifications for the simultaneous determination of hours of work and wages have been provided by many [e.g., Barzel (1973); Cogan (1981); Cohen and Stafford (1974); Killingsworth (1983); Larson (1979); Moffitt (1984); Oi (1962); Owen (1969); Pencavel (1977); Rosen (1976); Tummers and Woittiez (1991)]. For example, Oi (1962) argued that labour is a quasi-fixed factor, generating quasi-fixed costs to the firm, implying that lower wages are paid at low hours of work. Barzel (1973) added that marginal productivity declines at sufficiently high hours of work, implying that lower wages are paid at high hours of work. The

combination of fixed or quasi-fixed costs at low hours of work¹ and declining marginal productivity at high hours of work² implies that marginal wages rise initially as hours of work increase and fall eventually at sufficiently high hours of work,³ i.e., there is an interdependence between hours of work and wages.⁴

Empirical results supporting the hypothesis of the simultaneous determination of hours of work and wages have also been obtained by a number of studies [e.g., Baffoe-Bonnie (1985); Moffitt (1984); Tummers and Woittiez (1991)]. For example, using married women data from the National Longitudinal Survey of Older Women Moffitt claimed that "the results indicate significant effects of hours of work on the wage" (1984:551). Baffoe-Bonnie (1985) obtained similar results for all the three samples (the whole sample, the primary segment and the secondary segment) from the

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- 1 These costs can take the form of the so-called "warm-up" effects or the costs associated with the employment of labour which do not vary with the length of employment such as hiring costs, costs of job training required to start up, calling roll or handing out assignments, putting the employee on the payroll, etc.
 - 2 This is also known as the "fatigue" effects.
 - 3 Even if gross marginal productivity is constant over the entire period of employment, the marginal productivity net of such cost is a function of hours of work.
 - 4 In the context of annual hours the argument of the interdependence between hours of work and wages may also be rationalized. Low hours of work may be the result of unemployment, which unavoidably causes human capital depreciation as skills are not utilized at full capacity. On the other hand, high hours of work imply more on-the-job training or "learning by doing" as well as more full utilization of skills. Therefore, low (high) hours of work imply declining (increasing) marginal productivity, and hence wages.

General Segmentation Survey conducted in the Maritime provinces of Canada (Prince Edward Island, Nova Scotia and New Brunswick).

In this chapter the assumption of wage exogeneity in the previous chapters is relaxed and simultaneous models of changes in annual hours and hourly wages are formulated and estimated, using the 1988 and 1989 waves of Labour Market Activity Survey (LMAS) of Statistics Canada. It adds to the literature explicit consideration of the possibility of the interdependence of hours of work and wages in models of intertemporal substitution of labour supply. It also explicitly considers quantity constraints on labour supply in two successive periods, which enables a direct and strong test of the quantity constrained model. In addition, it tests directly the hypothesis of no money illusion by directly entering the nominal wages and annual consumer price index as independent regressors instead of converting nominal wages into real wages.

The chapter is framed in four sections. Section 4.1 develops the theoretical framework, starting with the three nested models of intertemporal substitution of labour supply developed in Chapter One, followed by the model of changes in hourly wages, ending with the simultaneous models of changes in annual hours and hourly wages. Section 4.2 introduces the major features of the data set, sample selection criteria and the variables used in the empirical estimation. Section 4.3 presents and analyzes the estimated results. Section 4.4 summarizes and concludes the chapter.

4.1 Theoretical Framework

4.1.1 Nested Models of Intertemporal Substitution of Labour Supply

This chapter uses the theoretical framework of intertemporal substitution of labour supply developed in Chapter Two. The models are rewritten as the following: Equation 4.1 for the unconstrained, Equations 4.2 and 4.3 for the unemployment constrained, and Equations 4.4 and 4.5 for the unemployment and underemployment doubly constrained. In Equations 4.2 and 4.4 unemployment is measured by incidence, and in 4.3 and 4.5 by the actual weeks of duration.

$$(4.1) \quad \Delta \ln H_{it} = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \Delta \epsilon_{it}$$

$$(4.2) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_3 D_{i1} + \theta_4 D_{i2} + \theta_5 D_{i4} + \Delta \epsilon_{it}$$

$$(4.3) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_6 \Delta U_{it} + \Delta \epsilon_{it}$$

$$(4.4) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_3 D_{i1} + \theta_4 D_{i2} + \theta_5 D_{i4} \\ + a_3 K_{i1} + a_4 K_{i2} + a_5 K_{i4} + \Delta \epsilon_{it}$$

$$(4.5) \quad \Delta \ln H_{it}^* = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_6 \Delta U_{it} + a_3 K_{i1} + a_4 K_{i2} \\ + a_5 K_{i4} + \Delta \epsilon_{it}$$

4.1.2 A Model of Changes in Hourly Wages

If we allow the possibility of the interdependence between hours of work and wages, the wage equation for individual i in period t will be:

$$(4.6) \quad W_{it} = f(H_{it}, S_{it})$$

where W_{it} = hourly wage rate in period t ;

H_{it} = total hours of work in period t ; and

S_{it} = personal and employer's characteristics in period t .

We specify the wage equation in 4.7:

$$(4.7) \quad \ln W_{it} = B_0 + B_1 \ln H_{it} + B_2 S_{it} + v_{it}$$

where v_{it} is an unobservable disturbance term.

Working in first differences we have Equation 4.8 for the model of changes in hourly wages:

$$(4.8) \quad \Delta \ln W_{it} = b_0 + b_1 \Delta \ln H_{it} + b_2 \Delta S_{it} + \Delta v_{it}$$

In calculating the standard errors we follow the hours equations in the last section by employing standard stochastic assumptions, i.e., we assume that

$$(4.9) \quad E(\Delta v_i \Delta v_i') = Z^*$$

is an unrestricted variance-covariance matrix, which allows for flexibility in the pattern of autocorrelation and heteroscedasticity in an individual's first-differenced error term. We also assume that error terms are independent across individuals:

$$(4.10) \quad E(\Delta v_i \Delta v_j') = 0, \quad i \neq j$$

4.1.3 Simultaneous Models of Changes in Annual Hours and Hourly Wages

By allowing the possibility of the interdependence between hours of work and wages and entering nominal wages and the consumer price index separately, we therefore have the following simultaneous models of changes in annual hours and wages: Equations 4.11 and 4.12 for the unconstrained; 4.13, 4.14, 4.15 and 4.16 for the unemployment-constrained, where in the former system unemployment is measured by incidence and in the latter by actual weeks of duration; 4.17, 4.18, 4.19 and 4.20 for the unemployment and underemployment doubly constrained, where in the former system unemployment is measured by incidence and in the latter by actual weeks of duration.

$$(4.11) \quad \Delta \ln H_{it}^A = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(4.12) \quad \Delta \ln W_{it} = b_0 + b_1 \Delta \ln H_{it} + b_2 \Delta S_{it} + \Delta v_{it}$$

$$(4.13) \quad \Delta \ln H_{it}^A = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_3 D_{i1} + \theta_4 D_{i2} + \theta_5 D_{i4} \\ - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(4.14) \quad \Delta \ln W_{it} = b_0 + b_1 \Delta \ln H_{it} + b_2 \Delta S_{it} + \Delta v_{it}$$

$$(4.15) \quad \Delta \ln H_{it}^A = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_6 \Delta U_{it} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(4.16) \quad \Delta \ln W_{it} = b_0 + b_1 \Delta \ln H_{it} + b_2 \Delta S_{it} + \Delta v_{it}$$

$$(4.17) \quad \Delta \ln H_{it}^A = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_3 D_{i1} + \theta_4 D_{i2} + \theta_5 D_{i4} \\ + a_3 K_{i1} + a_4 K_{i2} + a_5 K_{i4} - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(4.18) \quad \Delta \ln W_{it} = b_0 + b_1 \Delta \ln H_{it} + b_2 \Delta S_{it} + \Delta v_{it}$$

$$(4.19) \quad \Delta \ln H_{it}^A = \alpha + \delta \Delta \ln W_{it} + \phi' \Delta X_{it} + \theta_6 U_{it} + a_3 K_{i1} + a_4 K_{i2} + a_5 K_{i4} \\ - \delta' \Delta \ln CPI_{it} + \Delta \epsilon_{it}$$

$$(4.20) \quad \Delta \ln W_{it} = b_0 + b_1 \Delta \ln H_{it} + b_2 \Delta S_{it} + \Delta v_{it}$$

If there is no interdependence between hours of work and wages the coefficient on $\Delta \ln H_{it}$ in the wage equation, b_1 , will be statistically insignificant and the above simultaneous systems collapse into the single hours equations developed and estimated in the previous chapters. This can also be confirmed by a formal test (the Wu-Hausman Test) of the simultaneity of changes in annual hours and hourly wages.

4.2 Data Set

This chapter uses the 1988 and 1989 waves of the Labour Market Activity Survey of Statistics Canada for the estimation, see Chapter Two for the distinct features and sample inclusion criteria of the data set.

We empirically investigate the possibility of the simultaneous determination of changes in annual hours and hourly wages in Canada with males of all-ages (16-69). After hours and wage outliers (individuals with annual hours of more than 3000 or with hourly wages of less than \$3.00 or more than \$50.00) are excluded there are 12428 observations in the sample for analysis.

4.2.1 Variables

The theoretically appropriate variable for intertemporal labour supply analysis is not the nominal but the real hourly wage rates. Since direct estimation of $\delta \Delta \ln(W_{it}/CPI_{it})$ would impose the maintained hypothesis of no money illusion, we prefer to specify $\delta \Delta \ln W_{it} - \delta' \Delta \ln CPI_{it}$ as two independent variables and directly test the hypothesis $\delta = \delta'$, with CPI being the annual averages of consumer price index for the province of residence.⁵

5 The annual averages of consumer price index are obtained from Statistics Canada: Consumer Prices and Price Indexes, January-March, 1990, pp. 96-100, Table 14: Consumer Price Indexes, Major Components, (Not seasonally adjusted), by Province, 1986-1989, 1981 = 100.

Most of the personal characteristics affecting individual tastes considered in one-period labour supply models (e.g., educational levels, age) cancel out in first differences. The variables contained in the vector of X affecting changes in individual tastes towards leisure are as follows: (i) change in province of residence, (ii) change in marital status --- getting married or getting divorced; (iii) change in union status --- becoming unionized or becoming non-unionized; (iv) change in industry, and (v) change in occupation.⁶

Most of the personal characteristics affecting one-period wage determination (e.g., educational levels, age,) also cancel out in first differences. The variables contained in the vector of S affecting changes in hourly wages are as follows: (i) change in province of residence; (ii) change in union status --- becoming unionized or becoming non-unionized; (iii) change in industry; (iv) change in occupation; and (v) change in employer's size --- moving from big employer to small one or moving from small employer to big one.⁷

Identification of the systems requires that at least one explanatory variable in the hours equation not be in the wages equation, or vice versa. In fact, the systems are overidentified as $\Delta \ln CPI_{it}$, change in marital status, ΔU_{it} , D_1 , D_2 , D_4 , K_1 , K_2 and K_4 in the hours equations are

6 The group of no change in residence, marital status, union status, industry and occupation being the control case, respectively.

7 The group of no change in residence, union status, industry, occupation, employer's size being the control case, respectively.

not in the wages equation, and change in employer's size in the wages equation is not in the hours equations.

For the construction of changes in hourly wage rates, union status, industry and occupation, employer's size, if more than one job was held in a year we count the first job in 1988 and the last in 1989.⁸

4.3 Empirical Results⁹

4.3.1 Structural-Form Results

4.3.1.1 The Wage Equations

Table 4.3.1.1 presents the estimated structural-form models of changes in log hourly wages. Column 1 is for the single-equation model, Columns 2 to 6 for the simultaneous models, corresponding to the five changes in log annual hours equations: Column 2 corresponds to the unconstrained model, Columns 3 and 4 to the unemployment-constrained models, and Columns 5 and 6 to the unemployment and underemployment doubly constrained models. Columns 3 and 5 correspond to the constrained models in which unemployment is measured by the incidence and Columns 4 and 6 to

8 The main job (the job with the longest hours) was also tried. Because most people had only one job in a year there is practically no difference. The hour-weighted average of hourly wages was also tried, and for the same reason there is no difference.

9 Method of estimation: Ordinary Least Squares (OLS) for single-equation models and Three Stage Least Squares (3SLS) for simultaneous models; Computer program: K.J. White's SHAZAM, Version 6.0, Dalhousie University, Halifax, Nova Scotia.

the constrained models in which unemployment is measured by actual duration of weeks.

As can be seen, changes in log annual hours are not significant throughout all five simultaneous models, which suggests the single equation model assuming no simultaneity between changes in annual hours and hourly wages correctly estimate the changes in hourly wages, and Column 1 of Table 4.3.1.1 represents the correct model of changes in hourly wages. Our analysis is therefore focused on the single equation model.

Change in residence is not significant. Becoming unionized is positively and nonunionized negatively significant, which confirms the positive effects of unionization on wages predicted by theory of trade union. Change in industry is not significant and in occupation positively significant. Moving from a small employer to a bigger one is positively significant and from a big employer to a smaller one negatively significant, which suggests there are positive employer-size effects on wages.

4.3.1.2 The Hours Equations

Table 4.3.1.2 presents the estimated structural-form models of changes in log annual hours. Columns 1 and 2 are the unemployment and underemployment doubly constrained models; 3 and 4 the unemployment constrained models; and 5 the unconstrained model. Each column has two

components --- the single equation model is followed by the simultaneous model.

The hourly wages equation results show that changes in log annual hours are not significant in explaining changes in log hourly wages. The single equation models in the previous chapters, therefore, correctly estimate the intertemporal substitution behavior of labour supply and our analysis focuses on the single equation models.¹⁰

The difference in log nominal wages is positively significant in all five models, implying in magnitude a small intertemporal substitution elasticity of labour supply. The difference in log consumer price index is always insignificant, rejecting the hypothesis of no money illusion. The variables indicating labour market constraints are all significant --- at very high levels of statistical significance --- implying strong evidence the real business hypothesis that unemployment represent voluntary intertemporal variations in labour supply behavior. Change in residence and in marital status are insignificant throughout. Becoming unioined is always positively significant and becoming non-unionized insignificant. Changes in industry as well as in occupation are positively significant.

10 These results differ slightly from Chapter Two because i) hours and wage outliers are excluded here but not in Chapter Two; and ii) reported here are unweighted results but weighted in Chapter Two (the weight option is available for OLS but not for 3SLS in Shazam. To be consistent with the simultaneous models unweighted OLS is used in this Chapter for the single-equation models.).

In short, as the variables indicating labour market constraints are all significant, the unemployment and underemployment doubly constrained models are preferred to the unemployment constrained, and to the unconstrained. In other words, it is believed that the unemployment and underemployment doubly constrained models represent superior models of intertemporal substitution of labour supply.

Table 4.3.1.1

Estimated Structural-Form Models of Changes in Log Hourly Wages

Ind. Var.	Single 1	Simultaneous	
		2	3
$\Delta \ln H$	N/A	0.2988 (0.85)	0.0099 (0.91)
$\Delta \text{Residence}$	0.0185 (1.02)	0.0383 (1.12)	0.191 (1.05)
ΔUnion	0.0496*** (7.1)	0.0268 (1.0)	0.0406*** (6.92)
$\Delta \text{Nounion}$	-0.0862*** (-11.7)	-0.089*** (-8.87)	-0.0866*** (-11.7)
$\Delta \text{Industry}$	-0.0029 (-0.31)	-0.0582 (-0.94)	-0.0054 (-0.58)
$\Delta \text{Occupation}$	0.0232*** (2.68)	-0.0217 (-0.41)	0.0216** (2.44)
SMLBIG	0.036*** (5.79)	0.0287 (1.2)	0.0382*** (6.22)
BIGSML	-0.0298*** (-4.77)	-0.0203** (-2.39)	-0.0265*** (-4.35)
Constant	0.0399*** (21.2)	0.0581** (2.49)	0.0402*** (20.0)
Adj. R^2	0.0239	-0.7874	0.0252
N	12428		

Table 4.3.1.1 (continued)

Estimated Structural-Form Models of Changes in Log Hourly Wages

Ind. Var.	Simultaneous		
	4	5	6
$\Delta \ln H$	0.0074 (1.02)	0.0111 (1.1)	0.0078 (1.1)
$\Delta \text{Residence}$	0.0189 (1.04)	0.0192 (1.06)	0.0189 (1.05)
Getunion	0.0488*** (6.97)	0.0485*** (6.91)	0.0488*** (6.97)
Nounion	-0.0866*** (-11.7)	-0.0866*** (-11.7)	-0.0865*** (-11.7)
$\Delta \text{Industry}$	-0.0049 (-0.53)	-0.0056 (-0.61)	-0.0049 (-0.54)
$\Delta \text{Occupation}$	0.0219** (2.51)	0.0214** (2.53)	0.0219** (2.51)
SMLBIG	0.0379*** (6.16)	0.0381*** (6.2)	0.0379*** (6.15)
BIGSML	-0.0269*** (-4.39)	-0.0266*** (-4.37)	-0.027*** (-4.4)
Constant	0.0401*** (20.7)	0.0403*** (20.2)	0.0401*** (20.7)
Adj. R_2	0.0251	0.0252	0.0251
N	12428		

Note: Asymptotic t-ratio is given in parentheses;

a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 4.3.1.2

Estimated Structural-Form Models of Changes in Log Annual Hours:

Unemployment and Underemployment Doubly Constrained

Ind. Var.	(1) Unemployment Measured by Incidence		(2) Unemployment Measured by Actual Weeks	
	Single	Simultaneous	Single	Simultaneous
$\Delta \ln W$	0.1127*** (4.12)	0.8217** (2.1)	0.1082*** (4.14)	0.6485* (1.76)
$\Delta \ln CPI$	-0.1145 (-0.17)	-0.0108 (-0.01)	-0.1438 (-0.22)	-0.0773 (-0.11)
$\Delta \text{Residence}$	-0.0152 (-0.27)	-0.0295 (-0.51)	-0.0209 (-0.39)	-0.0318 (-0.59)
Getmarry	-0.0189 (0.51)	0.0189 (0.52)	0.0123 (0.35)	0.0122 (0.35)
Getdivorce	-0.0304 (-0.63)	-0.0274 (-0.57)	-0.0122 (-0.26)	-0.0102 (-0.22)
Getunion	0.0705*** (3.32)	0.0317 (1.03)	0.0528*** (2.59)	0.0232 (0.8)
Nounion	0.0173 (0.77)	0.0814* (1.94)	0.0124 (0.58)	0.0614 (1.54)
$\Delta \text{Industry}$	0.2158*** (7.8)	0.2179*** (7.68)	0.1619*** (6.15)	0.1638*** (6.12)
$\Delta \text{Occupation}$	0.1554*** (5.85)	0.1379*** (4.77)	0.1668*** (6.57)	0.1535*** (5.61)
D_1	0.303*** (13.1)	0.3001*** (12.9)		
D_2	-0.4518*** (-22.3)	-0.4485*** (-21.6)		
D_4	0.0191 (0.74)	0.0195 (0.76)		
ΔU			-0.0297*** (-44.5)	-0.0295*** (-43.3)
K_1	0.1961*** (10.3)	0.1946*** (10.3)	0.1406*** (7.91)	0.14*** (7.91)
K_2	-0.0771*** (-4.22)	-0.0765*** (-4.21)	-0.0429** (-2.51)	-0.0428** (-2.5)
K_4	0.0319 (1.45)	0.0313 (1.44)	0.0256* (1.85)	0.0353* (1.85)
Constant	-0.0609* (-1.93)	-0.0942*** (-3.01)	-0.0562* (-1.87)	-0.081*** (-2.71)
Adj. R^2	0.1024	0.0537	0.1796	0.1513
N	1,428			

Table 4.3.1.2 (continued)

Estimated Structural-Form Models of Changes in Log Annual Hours:

Unemployment Constrained

Ind. Var.	(3) Unemployment Measured by Incidence		(4) Unemployment Measured by Actual Weeks	
	Single	Simultaneous	Single	Simultaneous
$\Delta \ln W$	0.1149*** (4.18)	0.8484** (2.16)	0.1092*** (4.17)	0.6553* (1.77)
$\Delta \ln CPI$	-0.0447 (-0.07)	0.0503 (0.07)	-0.188 (-0.29)	-0.1239 (-0.17)
$\Delta \text{Residence}$	-0.0016 (-0.03)	-0.0165 (-0.29)	-0.011 (-0.21)	-0.0219 (-0.4)
Getmarry	0.0333 (0.9)	0.0331 (0.9)	0.0232 (0.66)	0.0231 (0.66)
Getdivorce	-0.0233 (-0.48)	-0.0205 (-0.42)	-0.005 (-0.11)	-0.0032 (-0.07)
Getunion	0.072*** (3.37)	0.0318 (1.03)	0.0532*** (2.62)	0.0233 (0.8)
Nounion	0.0201 (0.88)	0.0865** (2.04)	0.0145 (0.67)	0.0639* (1.6)
$\Delta \text{Industry}$	0.2154*** (7.76)	0.2176*** (4.74)	0.1654*** (6.3)	0.1672*** (6.26)
$\Delta \text{Occupation}$	0.1557*** (5.84)	0.1376*** (15.5)	0.1692*** (6.65)	0.1557*** (5.63)
D_1	0.3534*** (15.8)	0.2504*** (15.5)		
D_2	-0.4706*** (-23.7)	-0.4674*** (-22.8)		
D_4	0.0458* (1.93)	0.0458* (1.92)		
ΔU			-0.0308*** (-47.1)	-0.0307** (-45.7)
Constant	-0.0561* (-1.78)	-0.09*** (-2.87)	-0.0446 (-1.49)	-0.0695** (-2.34)
Adj. R^2	0.0924	0.0402	0.1747	0.1458
N	12428			

Table 4.3.1.2 (continued)
 Estimated Structural-Form Models of Changes in Log Annual Hours:
 Unconstrained

Ind. Var.	(5)	
	Single	Simultaneous
$\Delta \ln W$	0.1211*** (4.25)	0.8408** (2.08)
$\Delta \ln CPI$	0.1163 (0.17)	1.0975** (1.98)
$\Delta \text{Residence}$	-0.0721 (-1.24)	-0.0913 (-1.54)
Getmarry	0.0372 (0.97)	0.0226 (0.67)
Getdivorce	-0.0319 (-0.64)	0.0074 (0.2)
Getunion	0.0732*** (3.31)	0.034 (1.07)
Nounion	0.0162 (0.69)	0.0815* (1.87)
$\Delta \text{Industry}$	0.1837*** (6.45)	0.1862 (6.38)
$\Delta \text{Occupation}$	0.1478*** (5.32)	0.1299*** (4.34)
Constant	-0.0718** (-2.22)	-0.1453*** (-7.04)
Adj. R^2	0.0272	-0.0234
N	12428	

Note: Asymptotic t-ratio is given in parentheses;

a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

4.3.2 Test Results for Exogeneity of Changes in Annual Hours

The estimated results in the above sub-section show that there is no simultaneity between changes in annual hours and hourly wages --- changes in hourly wages significantly affect changes in annual hours but changes in annual hours are not significant in explaining changes in hourly wages. In this sub-section, we follow Maddala (1992:395) and perform a formal test for the exogeneity of changes in annual hours in the changes in hourly wages models.

The test consists of a two-stage OLS procedure. As an illustration, we quote Maddala (1992:395):

"We have a simultaneous equations model with three endogenous variables y_1 , y_2 and y_3 , and three exogenous variables z_1 , z_2 and z_3 . Suppose that the first equation of the model is

$$y_1 = B_2 y_2 + B_3 y_3 + A_1 z_1 + u_1$$

We want to test whether y_2 and y_3 can be treated as exogenous for the estimation of this equation. To test this hypothesis, we obtain the predicted values $\hat{y}_2$ and $\hat{y}_3$ of y_2 and y_3 , respectively, from the reduced form equations for y_2 and y_3 . We then estimate the model

$y_1 = B_2 y_2 + B_3 y_3 + A_1 z_1 + c_2 \hat{y}_2 + c_3 \hat{y}_3 + u_1$
by OLS and test the hypothesis: $c_2 = c_3 = 0$. If the hypothesis is rejected, y_2 and y_3 cannot be treated as exogenous. If it is not rejected, y_2 and y_3 can be treated as exogenous."¹¹

The full structural-form simultaneous models in the above sub-section are rewritten (i.e., the variables in vectors X and S are

11 The test procedure described here is Hausman's test, equivalent to tests suggested by Wu (1973) and Revankar (1978).

explicitly expressed) in the following (for notational convenience subscripts i for individuals and t for time period are dropped): Equations 4.21 and 4.22 for the unconstrained; 4.23, 4.24, 4.25 and 4.26 for the unemployment-constrained; 4.27, 4.28, 4.29 and 4.30 for the unemployment and underemployment doubly constrained. In Equations 4.23 and 4.27 unemployment is measured by incidence; in 4.25 and 4.29 by actual weeks of duration. For definitions of variables see Appendix 4A (Table 4A1).

$$(4.21) \quad \Delta \ln H = a_0 + a_1 \Delta \ln W - a_2 \Delta \ln CPI + a_3 \Delta \text{Residence} + a_4 \text{Getmarry} \\ + a_5 \text{Getdivorce} + a_6 \text{Getunion} + a_7 \text{Nounion} + a_8 \Delta \text{Industry} \\ + a_9 \Delta \text{Occupation} + \epsilon_1$$

$$(4.22) \quad \Delta \ln W = b_0 + b_1 \Delta \ln H + b_2 \Delta \text{Residence} + b_3 \text{Getunion} + b_4 \text{Nounion} \\ + b_5 \Delta \text{Industry} + b_6 \Delta \text{Occupation} + b_7 \text{SMLBIG} + b_8 \text{BIGSML} + \epsilon_2$$

$$(4.23) \quad \Delta \ln H = a_0 + a_1 \Delta \ln W - a_2 \Delta \ln CPI + a_3 \Delta \text{Residence} + a_4 \text{Getmarry} \\ + a_5 \text{Getdivorce} + a_6 \text{Getunion} + a_7 \text{Nounion} + a_8 \Delta \text{Industry} \\ + a_9 \Delta \text{Occupation} + a_{10} D_1 + a_{11} D_2 + a_{12} D_4 + \epsilon_1$$

$$(4.24) \quad \Delta \ln W = b_0 + b_1 \Delta \ln H + b_2 \Delta \text{Residence} + b_3 \text{Getunion} + b_4 \text{Nounion} \\ + b_5 \Delta \text{Industry} + b_6 \Delta \text{Occupation} + b_7 \text{SMLBIG} + b_8 \text{BIGSML} + \epsilon_2$$

$$(4.25) \quad \Delta \ln H = a_0 + a_1 \Delta \ln W - a_2 \Delta \ln CPI + a_3 \Delta \text{Residence} + a_4 \text{Getmarry} \\ + a_5 \text{Getdivorce} + a_6 \text{Getunion} + a_7 \text{Nounion} + a_8 \Delta \text{Industry} \\ + a_9 \Delta \text{Occupation} + a_{13} \Delta U + \epsilon_1$$

$$(4.26) \quad \Delta \ln W = b_0 + b_1 \Delta \ln H + b_2 \Delta \text{Residence} + b_3 \text{Getunion} + b_4 \text{Nounion} \\ + b_5 \Delta \text{Industry} + b_6 \Delta \text{Occupation} + b_7 \text{SMLBIG} + b_8 \text{BIGSML} + \epsilon_2$$

$$\begin{aligned}
 (4.27) \quad \Delta \ln H = & a_0 + a_1 \Delta \ln W - a_2 \Delta \ln CPI + a_3 \Delta \text{Residence} + a_4 \text{Getmarry} \\
 & + a_5 \text{Getdivorce} + a_6 \text{Getunion} + a_7 \text{Nounion} + a_8 \Delta \text{Industry} \\
 & + a_9 \Delta \text{Occupation} + a_{10} D_1 + a_{11} D_2 + a_{12} D_4 + a_{14} K_1 \\
 & + a_{15} K_2 + a_{16} K_4 + \epsilon_1
 \end{aligned}$$

$$\begin{aligned}
 (4.28) \quad \Delta \ln W = & b_0 + b_1 \Delta \ln H + b_2 \Delta \text{Residence} + b_3 \text{Getunion} + b_4 \text{Nounion} \\
 & + b_5 \Delta \text{Industry} + b_6 \Delta \text{Occupation} + b_7 \text{SMLBIG} + b_8 \text{BIGSML} + \epsilon_2
 \end{aligned}$$

$$\begin{aligned}
 (4.29) \quad \Delta \ln H = & a_0 + a_1 \Delta \ln W - a_2 \Delta \ln CPI + a_3 \Delta \text{Residence} + a_4 \text{Getmarry} \\
 & + a_5 \text{Getdivorce} + a_6 \text{Getunion} + a_7 \text{Nounion} + a_8 \Delta \text{Industry} \\
 & + a_9 \Delta \text{Occupation} + a_{13} \Delta U + a_{14} K_1 + a_{15} K_2 + a_{16} K_4 + \epsilon_1
 \end{aligned}$$

$$\begin{aligned}
 (4.30) \quad \Delta \ln W = & b_0 + b_1 \Delta \ln H + b_2 \Delta \text{Residence} + b_3 \text{Getunion} + b_4 \text{Nounion} \\
 & + b_5 \Delta \text{Industry} + b_6 \Delta \text{Occupation} + b_7 \text{SMLBIG} + b_8 \text{BIGSML} + \epsilon_2
 \end{aligned}$$

The reduced-form models changes in annual hours for stage One estimation are therefore as follows: Equations 4.31 for the unconstrained; 4.32 and 4.33 for the unemployment-constrained, in the former system unemployment is measured by incidence and in the latter by actual weeks of duration; 4.34 and 4.35 for the unemployment and underemployment doubly constrained, in the former system unemployment is measured by incidence and in the latter by actual weeks of duration.

$$\begin{aligned}
 (4.31) \quad \Delta \ln H = & c_0 - c_1 \Delta \ln CPI + c_2 \Delta \text{Residence} + c_3 \text{Getmarry} + c_4 \text{Getdivorce} \\
 & + c_5 \text{Getunion} + c_6 \text{Nounion} + c_7 \Delta \text{Industry} + c_8 \Delta \text{Occupation} \\
 & + c_9 \text{SMLBIG} + c_{10} \text{BIGSML} + \epsilon_3
 \end{aligned}$$

$$(4.32) \Delta \ln H = c_0 - c_1 \Delta \ln \text{CPI} + c_2 \Delta \text{Residence} + c_3 \text{Getmarry} + c_4 \text{Getdivorce} \\ + c_5 \text{Getunion} + c_6 \text{Nounion} + c_7 \Delta \text{Industry} + c_8 \Delta \text{Occupation} \\ + c_9 \text{SMLBIG} + c_{10} \text{BIGSML} + c_{11} D_1 + c_{12} D_2 + c_{13} D_4 + \epsilon_3$$

$$(4.33) \Delta \ln H = c_0 - c_1 \Delta \ln \text{CPI} + c_2 \Delta \text{Residence} + c_3 \text{Getmarry} + c_4 \text{Getdivorce} \\ + c_5 \text{Getunion} + c_6 \text{Nounion} + c_7 \Delta \text{Industry} + c_8 \Delta \text{Occupation} \\ + c_9 \text{SMLBIG} + c_{10} \text{BIGSML} + c_{14} \Delta U + \epsilon_3$$

$$(4.34) \Delta \ln H = c_0 - c_1 \Delta \ln \text{CPI} + c_2 \Delta \text{Residence} + c_3 \text{Getmarry} + c_4 \text{Getdivorce} \\ + c_5 \text{Getunion} + c_6 \text{Nounion} + c_7 \Delta \text{Industry} + c_8 \Delta \text{Occupation} \\ + c_9 \text{SMLBIG} + c_{10} \text{BIGSML} + c_{11} D_1 + c_{12} D_2 + c_{13} D_4 + c_{15} K_1 \\ + c_{16} K_2 + c_{17} K_4 + \epsilon_3$$

$$(4.35) \Delta \ln H = c_0 - c_1 \Delta \ln \text{CPI} + c_2 \Delta \text{Residence} + c_3 \text{Getmarry} + c_4 \text{Getdivorce} \\ + c_5 \text{Getunion} + c_6 \text{Nounion} + c_7 \Delta \text{Industry} + c_8 \Delta \text{Occupation} \\ + c_9 \text{SMLBIG} + c_{10} \text{BIGSML} + c_{14} \Delta U + c_{15} K_1 \\ + c_{16} K_2 + c_{17} K_4 + \epsilon_3$$

$$\text{where } c_0 = (a_0 + a_1 b_0) / (1 - a_1 b_1);$$

$$c_1 = a_2 / (1 - a_1 b_1);$$

$$c_2 = (a_3 + a_1 b_2) / (1 - a_1 b_1);$$

$$c_3 = a_4 / (1 - a_1 b_1);$$

$$c_4 = a_5 / (1 - a_1 b_1);$$

$$c_5 = (a_6 + a_1 b_3) / (1 - a_1 b_1);$$

$$c_6 = (a_7 + a_1 b_4) / (1 - a_1 b_1);$$

$$c_7 = (a_8 + a_1 b_5) / (1 - a_1 b_1);$$

$$c_8 = (a_9 + a_1 b_8) / (1 - a_1 b_1);$$

$$c_9 = a_1 b_7 / (1 - a_1 b_1);$$

$$c_{10} = a_1 b_8 / (1 - a_1 b_1);$$

$$c_{11} = a_{10} / (1 - a_1 b_1);$$

$$c_{12} = \hat{a}_{11} / (1 - a_1 b_1);$$

$$c_{13} = a_{12} / (1 - a_1 b_1);$$

$$c_{14} = a_{13} / (1 - a_1 b_1);$$

$$c_{15} = a_{14} / (1 - a_1 b_1);$$

$$c_{16} = a_{15} / (1 - a_1 b_1);$$

$$c_{17} = a_{16} / (1 - a_1 b_1); \text{ and}$$

$$\epsilon_3 = (\epsilon_1 + a_1 \epsilon_2) / (1 - a_1 b_1).$$

The estimated results for the reduced forms of the changes in annual hours models are shown in Table 4.3.2.1. Column 1 corresponding to Equation 4.31; Column 2 to Equation 4.32; Column 3 to Equation 4.33; Column 4 to Equation 4.34; and Column 3 to Equation 4.35.

The five predicted values of changes in annual hours are obtained when Equations 4.31 to 4.35 are estimated. These predicted values are entered into the structural form of the changes in hourly wages equations as an additional regressor and the significance is tested in the second stage.

The structural form of the changes in hourly wages equations including the predicted value of changes in annual hours for the second stage estimation is written in Equation 4.36.

$$\begin{aligned}
 (4.36) \quad \Delta \ln W = & b_0 + b_1 \Delta \ln H + b_2 \Delta \text{Residence} + b_3 \Delta \text{Getunion} + b_4 \Delta \text{Nounion} \\
 & + b_5 \Delta \text{Industry} + b_6 \Delta \text{Occupation} + b_7 \text{SMLBIG} + b_8 \text{BIGSML} \\
 & + b_9 E \Delta \ln H + \Delta v
 \end{aligned}$$

where $E \Delta \ln H$ is the predicted value of changes in annual hours obtained from the OLS estimation of the reduced form of the changes in annual hours models.

The estimated results are shown in Table 4.3.2.2. Column 1 used the predicted value of changes in annual hours from Equation 4.31; Column 2 from Equation 4.32; Column 3 from Equation 4.33; Column 4 from Equation 4.34; and Column 3 from Equation 4.35.

These test results strongly confirm the finding in the previous subsection --- there is no simultaneity between changes in annual hours and hourly wages, i.e., changes in hourly wages positively affect changes in annual hours but changes in annual hours are not significant in explaining changes in hourly wages.

Table 4.3.2.1

Estimated Reduced-Form Models of Changes in Log Annual Hours

Ind. Var.	1	2	3	4	5
$\Delta \ln \text{CPI}$	0.2549 (0.36)	0.0867 (0.13)	-0.0624 (-0.09)	0.0145 (0.02)	-0.0199 (-0.03)
$\Delta \text{Residence}$	-0.0719 (-1.24)	-0.0014 (-0.03)	-0.0109 (-0.21)	-0.0149 (-0.27)	-0.0209 (-0.39)
Getmarry	0.0368 (0.96)	0.0328 (0.89)	0.0229 (0.65)	0.0185 (-0.5)	0.0119 (0.34)
Getdivorce	-0.0306 (-0.61)	-0.0219 (-0.45)	-0.0041 (-0.09)	-0.0291 (-0.6)	-0.0113 (-0.24)
Getunion	0.0715*** (3.22)	0.0699*** (3.26)	0.0517** (2.53)	0.0685*** (3.21)	0.0514** (2.52)
Nounion	0.0044 (0.19)	0.009 (0.37)	0.0029 (0.24)	0.0064 (0.28)	0.0011 (0.05)
$\Delta \text{Industry}$	0.1732*** (6.02)	0.2053*** (7.32)	0.1547*** (5.84)	0.2059*** (7.37)	0.1515*** (5.7)
$\Delta \text{Occupation}$	0.1474*** (5.33)	0.1552*** (5.81)	0.1688*** (6.63)	0.1549*** (5.83)	0.1664*** (6.55)
SMLBIG	0.0653*** (3.31)	0.0654*** (3.43)	0.0594*** (3.27)	0.0639*** (3.37)	0.0585*** (3.23)
BIGSML	0.0169 (0.85)	0.0157 (0.82)	0.0227 (1.24)	0.0158 (0.83)	0.0221 (1.21)
D_1		0.3528*** (15.8)		0.3025*** (13.1)	
D_2		-0.472*** (-23.7)		-0.453*** (-22.3)	
D_4		0.0457* (1.93)		0.0191 (0.74)	
ΔU			-0.031*** (-47.1)		-0.03*** (-44.5)
K_1				0.196*** (10.3)	0.1402*** (7.89)
K_2				-0.078*** (-4.25)	-0.044** (-2.55)
K_4				0.0319 (1.45)	0.0355* (1.85)
Constant	-0.078** (-2.4)	-0.0621** (-1.96)	-0.051* (-1.7)	-0.0667** (-2.11)	-0.0621** (-2.07)
Adj. R^2	0.0259	0.092	0.1743	0.102	0.1792
N	12428				

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Table 4.3.2.2

Estimated Structural-Form Models of Changes in Log Hourly Wages:

Predicted Value of Changes in Log Annual Hours Added

Ind. Var.	1	2	3	4	5
$\Delta \ln H$	0.2832 (1.09)	-0.0018 (-0.16)	-0.005 (-0.64)	-0.001 (-0.05)	-0.0045 (-0.58)
$\Delta \ln H$	0.0116*** (4.12)	0.0118*** (4.03)	0.0124*** (4.05)	0.0117*** (3.98)	0.0124*** (4.02)
$\Delta \text{Residence}$	0.0384 (1.52)	0.0192 (1.06)	0.019 (1.05)	0.0193 (1.06)	0.019 (1.05)
$\Delta \text{Getunion}$	0.0285 (1.43)	0.049*** (6.96)	0.0491*** (7.01)	0.0488*** (6.95)	0.049*** (7.0)
$\Delta \text{Nounion}$	-0.088*** (-11.7)	-0.086*** (-11.7)	-0.086*** (-11.7)	-0.086*** (-11.7)	-0.086*** (-11.7)
$\Delta \text{Industry}$	-0.0539 (-1.17)	-0.0046 (-0.49)	-0.0041 (-0.45)	-0.0478 (-0.52)	-0.0042 (-0.46)
$\Delta \text{Occupation}$	-0.0203 (-0.52)	0.0217** (2.46)	0.0221** (2.53)	0.0216** (2.45)	0.0221** (2.52)
ΔSMLBIG	0.0167 (0.92)	0.0353*** (5.65)	0.0355*** (5.7)	0.0352*** (5.65)	0.0355*** (5.7)
ΔBIGSML	-0.035*** (-4.57)	-0.03*** (-4.8)	-0.03*** (-4.79)	-0.03*** (-4.8)	-0.03*** (-4.8)
Constant	0.0594*** (3.43)	0.0406*** (20.1)	0.0404*** (20.8)	0.0407*** (20.3)	0.0404*** (20.8)
Adj. R^2	0.0254	0.0253	0.0253	0.0253	0.0253
N	12428				

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

4.4 Summary and Conclusions

Using the Labour Market Activity Survey: 1988-1989 of Statistics Canada, this chapter empirically estimates three groups of nested simultaneous models of changes in annual hours and hourly wages. There are three ways in which this chapter adds to the literature. First, we theoretically allow the possibility of the interdependence of hours of work and wages suggested by many studies, and the empirical estimation of the simultaneous models directly tests whether this interdependence exists. In addition, a formal test of this interdependence is performed for the first time in the literature. The empirical results show there is no simultaneous determination of changes in log annual hours and hourly wages --- changes in log hourly wages positively affect changes in log annual hours but changes in log annual hours are not significant in explaining changes in log hourly wages.

Second, we theoretically distinguish between labour market constraints experienced in the last period, in the current period and in both periods. Those who experienced labour market constraints in the last period but not in the current period work significantly more hours than those who were never constrained --- i.e., they "make up for", in part, their past constraint, holding wage changes constant. Constraints experienced in the current period are highly negatively significant in explaining changes in log annual hours of labour supply. Those who are constrained in both periods want to increase labour supply to make up for past income losses, but cannot do so --- hence the effects of both-period

constraints on the changes in log annual hours of labour supply can be positively or negatively significant or insignificant depending upon which period's constraint dominates.

The real business cycle literature would predict these variables to be statistically insignificant --- we find their influence to be empirically large and statistically significant, which shows strong evidence that labour market constrained workers are off their intertemporal labour supply functions, rejecting the real business cycle view that variations in measured unemployment represent individuals adjusting their labour supply behavior in response to fluctuations in real wages and that unemployment time represents voluntary consumption of leisure.

The high statistical significance of changes in unemployment and underemployment variables suggests that the unemployment and underemployment doubly constrained models represent superior models of intertemporal substitution of labour supply.

Third, in the literature the hypothesis of no money illusion is usually directly imposed as nominal wages are converted into real wages, and the difference in log real wages is entered as a single independent variable. Instead of using real wages we specify the change in log nominal wages and in log consumer index as two separate independent variables, and explicitly test the no money illusion hypothesis. The empirical results provide strong evidence against this hypothesis.

Chapter Five

Summary and Conclusions

This volume consists of three independent but interrelated studies on intertemporal substitution of labour supply (Chapter Two: Intertemporal Substitution of Annual Hours; Chapter Three: Short-Run Intertemporal Substitution of Labour Supply; and Chapter Four: Simultaneous Models of Changes in Annual Hours and Hourly Wages).

Chapter Two develops and estimates three nested models of intertemporal substitution of annual hours (the unconstrained, unemployment-constrained, unemployment and underemployment doubly constrained) with the 1986-1987 and 1988-1989 waves of the Labour Market Activity Survey of Statistics Canada.

Chapter Three estimates two nested models of short-run intertemporal substitution of labour supply (the unconstrained, unemployment-constrained) by breaking down the two-year (1988-1989 waves of the Labour Market Activity Survey of Statistics Canada) data into eight successive quarters.

Chapter Four develops and estimates three nested simultaneous models of changes in annual hours and hourly wages with the 1988-1989 waves of the Labour Market Activity Survey of Statistics Canada, and performs a formal test (the Wu-Hausman Test) of the interdependence of changes in annual hours and hourly wages.

The volume contributes to the literature in a number of ways. First, it adds to the literature explicit consideration of the effects of quantity constraints in the labour market on labour supply behavior, which enables a direct and strong test of the quantity constrained models. Specifically, it distinguishes between quantity constraints in the labour market experienced in the past period, in the current period and in both periods. As the empirical results show this distinction is indeed important. Those people who experienced labour market constraints in the past period only work significantly more hours than those who were never constrained ---they "make up for", in part, the income losses due to past constraint, holding wage changes constant. Constraints experienced in the current period only are highly negatively significant in explaining the change in log hours of labour supply. Those who are constrained in both periods want to increase labour supply to make up for past income losses, but cannot do so --- hence the effects of both-period constraints on the changes in log hours of labour supply are as seen either positive or negative, depending upon which period's constraint dominates.

Second, it relaxes the assumption of wage-exogeneity commonly found in the literature and allows the possibility of the interdependence of hours of work and wages in the models of changes in annual hours and hourly wages, which directly overcomes and tests the problem of possible wage-endogeneity bias of labour supply estimates.

Third, in the literature the hypothesis of no money illusion is usually directly imposed as nominal wages are converted into real wages,

and the difference in log real wages is entered as a single independent variable in the hours equation. Instead of using real wages it specifies the change in log nominal wages and in log consumer price index as two separate independent variables, and explicitly tests the hypothesis of no money illusion.

In conclusion, the following observations can be made from the empirical results:

1. The unemployment and underemployment doubly constrained models are preferred to the unemployment constrained ones, and the unemployment constrained ones are preferred to the unconstrained one, i.e., quantity constraints in the labour market are, in practice, very important factors affecting the intertemporal substitution of labour supply.

2. Labour market constrained workers (either unemployed or underemployed) are off their intertemporal labour supply functions, rejecting the real business cycle (RBC) view that variations in measured unemployment represent individuals adjusting their labour supply behavior in response to fluctuations in real wages and that unemployment time represents voluntary consumption of leisure.

3. The hypothesis that workers make labour supply decisions without money illusion is rejected.

4. The wage elasticity of intertemporal substitution of annual hours is empirically small and statistically significant but highly variable over time and across regional labour markets in Canada. We can not, therefore, rely upon this estimate as a general explanation of fluctuations in unemployment across labour markets.

5. There is no simultaneous determination of changes in log annual hours and hourly wages --- changes in log hourly wages positively affect changes in log annual hours but changes in log annual hours are not significant in explaining changes in log hourly wages.

6. The single equation models assuming wage exogeneity correctly estimate the intertemporal substitution behavior of labour supply.

Appendices

Appendix 1 presents the provincial distribution of interviewees in 1986 and 1988 in the Labour Market Activity Survey (Table 1A1). For Chapter 2 Appendix 2A presents variable definitions (Table 2A1), descriptive statistics of variables (Tables 2A2(1) and 2A2(2)) for the group aged 25-54, and (Tables 2A3(1) and 2A3(2)) for the group aged 16-69 for 1986-1987 and 1988-1989, respectively, and Appendices 2B, 2C, 2D, 2E and 2F show the estimated difference log hours equations and descriptive statistics of variables for the five regional markets. For Chapter 3 Appendix 3A presents variable definitions (Table 3A1), descriptive statistics of variables (Tables 3A2) for the group aged 25-54 and (Table 3A3) for the group aged 16-69 for 1988-1989, and Appendices 3B, 3C, 3D, 3E and 3F show the estimated difference log hours equations and descriptive statistics of variables for the five regional markets. For Chapter 4 Appendix 4 shows variable definitions (Table 4A1), descriptive statistics of variables (Tables 4A2).

Appendix 1: Table 1A1

Provincial Distribution of Interviewees in LMAS: 1986

Province	Males	Females
Newfoundland	2172 (7.0%)	2146 (6.6%)
Prince Edward Island	1032 (3.3%)	1026 (3.2%)
Nova Scotia	2283 (7.4%)	2448 (7.5%)
New Brunswick	2419 (7.8%)	2640 (8.1%)
Quebec	4883 (15.8%)	5117 (15.7%)
Ontario	5977 (19.3%)	6354 (19.5)
Manitoba	2180 (7.1%)	2294 (7.1%)
Saskatchewan	2947 (9.5%)	3046 (9.4%)
Alberta	4125 (13.3%)	4284 (13.2%)
British Columbia	2898 (9.4%)	3161 (9.7%)
Total	30916 (100.0%)	32516 (100.0%)

1988

Province	Males	Females
Newfoundland	2026 (7.2%)	2096 (7.2%)
Prince Edward Island	842 (3.0%)	864 (3.0%)
Nova Scotia	2096 (7.5%)	2236 (7.6%)
New Brunswick	2319 (8.3%)	2443 (8.3%)
Quebec	4477 (16.0%)	4804 (16.4%)
Ontario	5160 (18.5%)	5437 (18.6%)
Manitoba	1944 (7.0%)	2044 (7.0%)
Saskatchewan	2501 (8.9%)	2687 (9.2%)
Alberta	3800 (13.6%)	3828 (13.1%)
British Columbia	2792 (10.0%)	2848 (9.7%)
Total	27957 (100.0%)	29287 (100.0%)

Appendix 2A: Table 2A1

Variable Definition

$\Delta \ln H =$	$\log(\text{hours in 1987/89}) - \log(\text{hours in 1986/88});$
$\Delta \ln W =$	$\log(\text{hourly wages in 1987/89}) - \log(\text{hourly wages in 1986/88});$
$D_1 =$	1 if unemployed in 1986/88 but not in 1987/89;
$D_2 =$	1 if unemployed in 1987/89 but not in 1986/88;
$D_3 =$	1 if not unemployed in both 1986/88 and 1987/89;
$D_4 =$	1 if unemployed in both 1986/88 and 1987/89;
$\Delta U =$	weeks unemployed in 1987/89 - weeks unemployed in 1986/88;
$K_1 =$	1 if underemployed in 1986/88 but not in 1987/89;
$K_2 =$	1 if underemployed in 1987/89 but not in 1986/88;
$K_3 =$	1 if not underemployed in both 1986/88 and 1987/89;
$K_4 =$	1 if underemployed in both 1986/88 and 1987/89;
$\Delta \ln \text{CPI} =$	$\log(\text{CPI in 1987/89}) - \log(\text{CPI in 1986/88});$
$\Delta \text{Residence} =$	1 if province in 1986/88 $\neq$ province in 1987/89;
$\text{Getmarry} =$	1 if single in 1986/88 and married in 1987/89;
$\text{Getdivorce} =$	1 if married in 1986/88 and single in 1987/89;
$\text{Getunion} =$	1 if not union member in 1986/88 but yes in 1987/89;
$\text{Nonunion} =$	1 if union member in 1986/88 but not in 1987/89;
$\Delta \text{Industry} =$	1 if industry in 1986/88 $\neq$ industry in 1987/89;
$\Delta \text{Occupation} =$	1 if occupation in 1986/88 $\neq$ occupation in 1987/89.

Appendix 2A: Table 2A2(1)

Variable Means and Standard Deviations: Canada, Aged 25-54, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00233	0.46799	0.03728	0.49735
$\Delta \ln W$	-0.06157	0.64	-0.00602	0.2709
D_1	0.046	0.20957	0.06057	0.23855
D_2	0.05757	0.23293	0.06804	0.25183
D_3	0.84937	0.3577	0.82875	0.37675
D_4	0.04703	0.21171	0.04264	0.20205
ΔU	-0.13761	6.6823	-0.07213	7.967
K_1	0.04147	0.19939	0.05439	0.2268
K_2	0.06793	0.25164	0.09544	0.29383
K_3	0.85642	0.35068	0.78811	0.40867
K_4	0.03417	0.18168	0.06206	0.24128
$\Delta \ln CPI$	0.03948	0.00901	0.03957	0.00901
$\Delta \text{Residence}$	0.01601	0.12551	0.01624	0.1264
Getmarry	0.01476	0.12061	0.01345	0.11519
Getdivorce	0.00755	0.08656	0.00767	0.08725
Getunion	0.05425	0.22651	0.05649	0.23087
Nonunion	0.08933	0.2852	0.07163	0.25788
$\Delta \text{Industry}$	0.09954	0.29939	0.09554	0.29397
$\Delta \text{Occupation}$	0.10219	0.30291	0.1047	0.30618
N	12056		10038	
ΔH	3.8724	638.34	27.674	670.17
ΔW	0.04896	6.0425	0.33493	4.6209

Appendix 2A: Table 2A2(2)

Variable Means and Standard Deviations: Canada, Aged 25-54, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.06344	0.51857	-0.00804	0.73508
$\Delta \ln W$	-0.09181	0.6104	-0.049	0.49766
D_1	0.04603	0.20956	0.05375	0.22553
D_2	0.06405	0.24486	0.06938	0.25411
D_3	0.84799	0.35904	0.83664	0.36971
D_4	0.04192	0.20042	0.04023	0.19651
ΔU	0.35901	6.8375	0.47307	7.5679
K_1	0.07787	0.26798	0.08701	0.28187
K_2	0.08599	0.28037	0.07508	0.26353
K_3	0.77292	0.41896	0.76146	0.42622
K_4	0.06321	0.24336	0.07645	0.26573
$\Delta \ln CPI$	0.04515	0.00717	0.04523	0.00735
$\Delta \text{Residence}$	0.00663	0.08115	0.00655	0.08065
Getmarry	0.01643	0.12714	0.01394	0.11724
Getdivorce	0.01269	0.11197	0.00993	0.09914
Getunion	0.05789	0.23355	0.06177	0.24076
Nonunion	0.07759	0.26754	0.06695	0.24995
$\Delta \text{Industry}$	0.1057	0.30746	0.10021	0.3003
$\Delta \text{Occupation}$	0.10719	0.30937	0.11362	0.31737
N	10710		9470	
ΔH	-76.408	678.41	-23.773	686.03
ΔW	-0.15019	4.6881	0.03455	3.5815

Appendix 2A: Table 2A3(1)

Variable Means and Standard Deviations: Canada, Aged 16-69, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.02836	0.59086	0.05407	0.76829
$\Delta \ln W$	-0.04428	0.62218	0.00239	0.51131
D_1	0.05845	0.2346	0.07211	0.25868
D_2	0.06741	0.25074	0.0748	0.26308
D_3	0.81746	0.3863	0.80661	0.39497
D_4	0.05668	0.23124	0.04648	0.21053
ΔU	-0.16981	7.1564	-0.11002	8.0782
K_1	0.04979	0.21753	0.06419	0.24511
K_2	0.08131	0.27331	0.09935	0.29914
K_3	0.82794	0.37744	0.77073	0.42038
K_4	0.04096	0.1982	0.06572	0.24781
$\Delta \ln CPI$	0.03962	0.00897	0.03967	0.00905
$\Delta \text{Residence}$	0.01719	0.12977	0.01881	0.13585
Getmarry	0.01749	0.1311	0.0183	0.13404
Getdivorce	0.00634	0.07937	0.00689	0.08278
Getunion	0.05845	0.2346	0.05846	0.23462
Nonunion	0.08545	0.27956	0.06783	0.25146
$\Delta \text{Industry}$	0.1258	0.33163	0.1183	0.32298
$\Delta \text{Occupation}$	0.12982	0.33612	0.12876	0.33494
N	16407		13770	
ΔH	23.152	685.02	37.43	688.85
ΔW	0.13621	5.805	0.3267	4.4173

Appendix 2A: Table 2A3(2)

Variable Means and Standard Deviations: Canada, Aged 16-69, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.03767	0.61263	0.00407	0.76764
$\Delta \ln W$	-0.0771	0.58845	-0.04615	0.49513
D_1	0.05519	0.22835	0.06262	0.24228
D_2	0.07164	0.25791	0.07437	0.26238
D_3	0.82576	0.37933	0.82213	0.38242
D_4	0.04714	0.21253	0.04089	0.19803
ΔU	0.38756	7.2134	0.40998	7.5348
K_1	0.08425	0.27777	0.09167	0.28857
K_2	0.09202	0.28907	0.08257	0.27525
K_3	0.75383	0.43079	0.74535	0.43568
K_4	0.06989	0.25498	0.0804	0.27193
$\Delta \ln CPI$	0.04526	0.0074	0.04529	0.00738
$\Delta \text{Residence}$	0.00805	0.08938	0.00821	0.09024
Getmarry	0.01933	0.13768	0.02294	0.14971
Getdivorce	0.01128	0.10559	0.01014	0.10019
Getunion	0.06149	0.24023	0.06592	0.24814
Nonunion	0.07494	0.2633	0.06543	0.2473
$\Delta \text{Industry}$	0.12445	0.3301	0.12249	0.32787
$\Delta \text{Occupation}$	0.12837	0.33451	0.1369	0.34376
N	14279		12425	
ΔH	-54.982	719.31	-13.877	694.4
ΔW	-0.06348	4.4876	0.04909	3.5773

Appendix 2B: Table 2B1M(1)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0059 (0.34)	0.0041 (0.26)	0.0041 (0.26)	0.0115 (0.7)	0.0089 (0.59)
D_1		0.4316*** (11.1)		0.3638*** (8.56)	
D_2		-0.319*** (-9.28)		-0.248*** (-6.86)	
D_4		0.0509 (1.47)		0.1261*** (3.13)	
ΔU			-0.031*** (-28.8)		-0.028*** (-25.8)
K_1				0.302*** (6.31)	0.2295*** (5.49)
K_2				-0.297*** (-8.19)	-0.188*** (-6.59)
K_4				0.1479*** (3.25)	0.1294*** (3.39)
Constant	-0.0064 (-0.68)	-0.0108 (-1.09)	-0.0101 (-1.24)	-0.0103 (-1.04)	-0.0083 (-0.94)
N	2938				
Adj. R^2	0.0003	0.0707	0.2201	0.116	0.2421
F	0.32	45.6	277.2	49.1	157.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B1M(2)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0522* (1.79)	0.0688** (2.52)	0.062** (2.45)	0.0786*** (2.89)	0.0732*** (2.9)
D_1		0.3246*** (6.88)		0.2594*** (5.27)	
D_2		-0.654*** (-17.9)		-0.637*** (-17.2)	
D_4		0.2201*** (5.0)		0.1364*** (2.69)	
ΔU			-0.034*** (-30.5)		-0.033*** (-28.9)
K_1				0.2399*** (5.51)	0.1612*** (4.11)
K_2				-0.081** (-2.06)	-0.07** (-1.96)
K_4				0.1163** (2.49)	0.1221*** (3.26)
Constant	-0.107*** (-9.1)	-0.074*** (-5.99)	-0.077*** (-7.52)	-0.085*** (-6.6)	-0.093*** (-7.96)
N	2731				
Adj. R^2	0.0008	0.137	0.2551	0.149	0.2628
F	46.9	108.4	352.8	73.9	183.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B1F(1)

Estimated Differenced Log Hours Equations:

Atlantic, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.0629* (-1.8)	-0.0628* (-1.85)	-0.0654** (-1.98)	-0.0562* (-1.69)	-0.0594* (-1.84)
D_1		0.5233*** (9.33)		0.4186*** (7.17)	
D_2		-0.369*** (-6.61)		-0.303*** (-5.21)	
D_4		0.0965 (1.62)		0.1182* (1.88)	
ΔU			-0.024*** (-17.0)		-0.022*** (-15.2)
K_1				0.682*** (10.4)	0.6619*** (10.6)
K_2				-0.167*** (3.21)	-0.123*** (-2.66)
K_4				0.0219 (0.37)	-0.0185 (-0.34)
Constant	0.0571*** (3.72)	0.0387** (2.29)	0.0427*** (2.93)	0.0184 (1.06)	0.0217 (1.34)
N	2391				
Adj. R^2	0.0009	0.0571	0.1082	0.1047	0.1518
F	8.6	32.7	102.6	37.8	74.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B1F(2)

Estimated Differenced Log Hours Equations:

Atlantic, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1797*** (3.66)	0.1701*** (3.64)	0.1742*** (3.86)	0.1678*** (3.59)	0.1718*** (3.79)
D_1		0.5203*** (8.31)		0.4636*** (7.09)	
D_2		-0.619*** (-12.7)		-0.616*** (-12.4)	
D_4		-0.129** (-2.18)		-0.142** (-2.25)	
ΔU			-0.029*** (-20.4)		-0.028*** (-19.6)
K_1				0.2253*** (4.08)	0.1572*** (3.0)
K_2				-0.0342 (-0.55)	-0.0048 (-0.08)
K_4				0.017 (0.33)	-0.0188 (-0.4)
Constant	-0.062*** (-3.99)	-0.0222 (-1.34)	-0.03** (-2.08)	-0.0364** (-2.08)	-0.0413** (-2.52)
N	2317				
Adj. R^2	0.0053	0.1022	0.1567	0.1079	0.1591
F	17.3	58.2	152.5	38.9	78.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B2M(1)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0195 (1.01)	0.0196 (1.05)	0.0177 (1.04)	0.0267 (1.47)	0.0235 (1.39)
$\Delta \text{Residence}$	-0.0473 (-0.67)	-0.029 (-0.43)	-0.0563 (-0.9)	-0.0232 (-0.35)	-0.0498 (-0.81)
Getmarry	0.0579 (0.81)	0.0325 (0.47)	0.0065 (0.1)	0.0373 (0.56)	0.1056 (0.17)
Getdivorce	-0.1222 (-0.94)	-0.0496 (-0.39)	0.0469 (0.41)	-0.0605 (-0.49)	0.0294 (0.26)
Getunion	0.0533 (1.27)	0.0216 (0.54)	-0.0168 (-0.45)	0.0089 (0.23)	-0.0235 (-0.64)
Nounion	0.0377 (1.05)	0.0342 (0.98)	0.0055 (0.17)	0.0441 (1.3)	0.0145 (0.46)
$\Delta \text{Industry}$	0.0907** (1.96)	0.0923** (2.04)	0.0713* (1.75)	0.1045** (2.37)	0.0879** (2.16)
$\Delta \text{Occupation}$	-0.0362 (-0.78)	-0.0323 (-0.72)	-0.0033 (-0.08)	-0.0476 (-1.08)	-0.028 (-0.46)
D_1		0.4204*** (10.7)		0.3576*** (8.39)	
D_2		-0.328*** (-9.43)		-0.253*** (-6.97)	
D_4		0.0371 (1.06)		0.1184*** (2.93)	
ΔU			-0.031*** (-28.7)		-0.028*** (-25.7)
K_1				0.2972*** (6.18)	0.2225*** (5.29)
K_2				-0.306*** (-8.4)	-0.2*** (-6.91)
K_4				0.1373*** (2.99)	0.1147*** (2.97)
Constant	-0.0162 (-1.57)	-0.0171 (-1.6)	-0.0147 (-1.61)	-0.016 (-1.52)	-0.0114 (-1.21)
N	2938				
Adj. R^2	0.0008	0.071	0.22	0.1169	0.2424
F	1.21	19.7	83.8	26.9	73.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B2M(2)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.129*** (3.98)	0.147*** (4.88)	0.1306*** (4.66)	0.1553*** (5.18)	0.1374*** (4.91)
$\Delta \text{Residence}$	-0.1078 (-0.75)	0.0684 (0.51)	-0.0535 (-0.43)	0.0685 (0.51)	-0.0465 (-0.38)
Getmarry	-0.007 (-0.07)	0.0156 (0.17)	0.0036 (0.04)	-0.0081 (-0.09)	-0.0093 (-0.11)
Getdivorce	0.128 (1.07)	0.0888 (0.8)	0.1694 (1.64)	0.0749 (0.68)	0.1561 (1.52)
Getunion	0.1213** (2.28)	0.0956* (1.93)	0.0673 (1.47)	0.0768 (1.56)	0.0562 (1.23)
Nounion	0.0614 (1.12)	0.0477 (0.94)	0.0988** (2.09)	0.04 (0.79)	0.0911* (1.93)
$\Delta \text{Industry}$	0.0539 (0.77)	0.0624 (0.96)	-0.0464 (-0.77)	0.0593 (0.92)	-0.0473 (-0.78)
$\Delta \text{Occupation}$	0.2307*** (3.33)	0.25*** (3.88)	0.2644*** (4.42)	0.2515*** (3.92)	0.2583*** (3.76)
D_1		0.3129*** (6.69)		0.2588*** (5.3)	
D_2		-0.677*** (-18.7)		-0.656*** (-17.7)	
D_4		0.1624*** (3.67)		0.0982* (1.94)	
ΔU			-0.034*** (-30.5)		-0.032*** (-28.9)
K_1				0.2232*** (5.14)	0.1473*** (3.76)
K_2				-0.099** (-2.53)	-0.087** (-2.44)
K_4				0.0856* (1.84)	0.0835** (2.21)
Constant	-0.136*** (-10.7)	-0.097*** (-7.35)	-0.101*** (-9.16)	-0.104*** (-7.79)	-0.109*** (-9.06)
N	2731				
Adj. R^2	0.0166	0.1542	0.2669	0.1653	0.2731
F	16.2	51.3	112.7	44.2	89.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B2F(1)

Estimated Differenced Log Hours Equations:

Atlantic, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.0452 (-1.27)	-0.0448 (-1.29)	-0.0452 (-1.34)	-0.0438 (-1.29)	-0.0446 (-1.35)
$\Delta \text{Residence}$	-0.232** (-2.03)	-0.225** (-2.03)	-0.2157** (-2.01)	-0.1892* (-1.75)	-0.1809* (-1.72)
Getmarry	-0.0722 (-0.52)	-0.0804 (-0.6)	-0.0639 (-0.49)	-0.0597 (-0.46)	-0.0494 (-0.39)
Getdivorce	0.089 (0.47)	0.1237 (0.67)	0.1109 (0.62)	0.0623 (0.34)	0.0499 (0.28)
Getunion	-0.0394 (-0.57)	-0.052 (-0.78)	-0.073 (-1.12)	-0.0193 (-0.29)	-0.0428 (-0.67)
Nounion	-0.006 (-0.09)	-0.0255 (-0.38)	-0.0216 (-0.33)	-0.0569 (-0.88)	-0.0533 (-0.84)
$\Delta \text{Industry}$	0.122 (1.4)	0.1243 (1.46)	0.1689** (2.05)	0.132 (1.59)	0.1789** (2.21)
$\Delta \text{Occupation}$	0.0581 (0.71)	0.0786 (0.99)	0.0427 (0.55)	0.0586 (0.75)	0.0275 (0.36)
D_1		0.518*** (9.22)		0.4187*** (7.17)	
D_2		-0.387*** (-6.86)		-0.317*** (-5.43)	
D_4		0.081 (1.35)		0.1083* (1.72)	
ΔU			-0.025*** (-17.1)		-0.022*** (10.3)
K_1				0.6701*** (10.2)	0.647*** (10.3)
K_2				-0.176*** (-3.37)	-0.137*** (-2.94)
K_4				0.0055 (0.09)	-0.0427 (-0.78)
Constant	0.0513*** (3.02)	0.0355** (1.97)	0.0368** (2.29)	0.0174 (0.96)	0.0202 (1.17)
N	2391				
Adj. R^2	0.003	0.0601	0.1118	0.1067	0.1546
F	3.2	14.9	32.6	21.0	35.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B2F(2)

Estimated Differenced Log Hours Equations:

Atlantic, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.2696*** (4.99)	0.2544*** (4.96)	0.2448*** (4.91)	0.2464*** (4.81)	0.2372*** (4.75)
$\Delta \text{Residence}$	0.1013 (0.48)	0.1812 (0.91)	0.09 (0.46)	0.2051 (1.03)	0.11 (0.57)
Getmarry	-0.036 (-0.28)	-0.0575 (-0.47)	-0.0546 (-0.46)	-0.0784 (-0.65)	-0.0697 (-0.59)
Getdivorce	-0.0049 (-0.03)	0.0524 (0.33)	0.0013 (0.009)	0.0667 (0.42)	0.013 (0.08)
Getunion	0.1246* (1.95)	0.111* (1.83)	0.0776 (1.31)	0.112* (1.84)	0.0836 (1.41)
Nounion	0.0331 (0.49)	0.0051 (0.08)	0.0202 (0.32)	0.0064 (0.1)	0.0215 (0.34)
$\Delta \text{Industry}$	0.4131*** (4.63)	0.4113*** (4.82)	0.3251*** (3.94)	0.3937*** (4.62)	0.3166*** (3.83)
$\Delta \text{Occupation}$	-0.1142 (-1.37)	-0.0925 (-1.17)	-0.09 (-1.16)	-0.094 (-1.19)	-0.0905 (-1.18)
D_1		0.4936*** (7.92)		0.4504*** (6.93)	
D_2		-0.625*** (-12.9)		-0.618*** (-12.5)	
D_4		-0.203*** (-3.4)		-0.202*** (-3.18)	
ΔU			-0.029*** (-20.0)		-0.028*** (-19.3)
K_1				0.1953*** (3.54)	0.1318** (2.5)
K_2				-0.0447 (-0.73)	-0.0214 (-0.37)
K_4				-0.0033 (-0.06)	-0.0465 (-0.99)
Constant	-0.091*** (-5.41)	-0.0447** (-2.56)	-0.052*** (-3.3)	-0.055 (-2.99)	-0.057*** (-3.31)
N	2317				
Adj. R^2	0.0196	0.1168	0.1643	0.1211	0.1662
F	8.4	28.4	49.0	23.8	38.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B.1(1)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0058 (0.31)	0.0098 (0.54)	0.0093 (0.53)	0.0161 (0.9)	0.0158 (0.92)
D_1		0.4824*** (12.8)		0.3597*** (8.83)	
D_2		-0.224*** (-6.47)		-0.181*** (-5.0)	
D_4		0.1557*** (4.62)		0.1646*** (4.19)	
ΔU			-0.029*** (-25.5)		-0.025*** (-22.2)
K_1				0.3954*** (8.44)	0.354*** (8.32)
K_2				-0.229*** (-6.43)	-0.124*** (-4.18)
K_4				0.2338*** (5.1)	0.2651*** (6.73)
Constant	0.0278*** (2.87)	0.0001 (0.01)	0.0209** (2.33)	-0.0039 (-0.36)	0.0032 (0.33)
N	3937				
Adj. R^2	0.0002	0.0567	0.1417	0.0954	0.169
F	4.14	49.9	220.5	53.9	135.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B3M(2)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0896*** (3.18)	0.1085*** (4.04)	0.092*** (3.65)	0.1174*** (4.39)	0.1038*** (4.12)
D_1		0.3744*** (8.45)		0.3026*** (6.57)	
D_2		-0.566*** (-16.1)		-0.559*** (-15.5)	
D_4		0.208*** (5.14)		0.1305*** (2.79)	
ΔU			-0.032*** (-30.2)		-0.031*** (-28.6)
K_1				0.2801*** (6.84)	0.2064*** (5.48)
K_2				-0.01 (-0.26)	0.0162 (0.47)
K_4				0.0984** (2.24)	0.1284*** (3.63)
Constant	-0.074*** (-6.54)	-0.053*** (-4.3)	-0.043*** (-4.23)	-0.073*** (-5.63)	-0.073*** (-6.21)
N	3623				
Adj. R^2	0.0025	0.1009	0.203	0.1122	0.2109
F	30.3	93.3	329.2	65.2	172.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B3F(1)

Estimated Differenced Log Hours Equations:

Atlantic, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.089*** (-2.73)	-0.08** (-2.49)	-0.087*** (-2.8)	-0.08** (-2.56)	-0.085*** (-2.79)
D_1		0.5741*** (11.7)		0.4347*** (8.41)	
D_2		-0.247*** (-5.04)		-0.22*** (-4.29)	
D_4		0.1241** (2.33)		0.1136** (2.02)	
ΔU			-0.026*** (-19.8)		-0.024*** (-17.5)
K_1				0.6353*** (11.1)	0.6178*** (11.4)
K_2				-0.11** (-2.33)	-0.0369 (-0.88)
K_4				0.0709 (1.36)	0.0321 (0.7)
Constant	0.0789*** (5.61)	0.0417*** (2.64)	0.0637*** (4.79)	0.0176 (1.08)	0.0268* (1.77)
N	3244				
Adj. R^2	0.002	0.0535	0.1092	0.0917	0.1438
F	19.7	44.2	145.1	46.2	97.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B3F(2)

Estimated Differenced Log Hours Equations:

Atlantic, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1787*** (4.16)	0.1796*** (4.37)	0.1627*** (4.05)	0.1933*** (4.7)	0.1769*** (4.4)
D_1		0.5225*** (9.8)		0.4512*** (8.12)	
D_2		-0.557*** (-12.4)		-0.555*** (-12.2)	
D_4		-0.0012 (-0.02)		-0.0093 (-0.16)	
ΔU			-0.028*** (-20.5)		-0.027*** (-19.6)
K_1				0.2856*** (5.72)	0.269*** (5.67)
K_2				-0.0314 (-0.58)	0.0058 (0.11)
K_4				0.0042 (0.09)	-0.0118 (-0.28)
Constant	-0.038*** (-2.7)	-0.0177 (-1.13)	-0.0133 (-0.99)	-0.035** (-2.13)	-0.0361** (-2.34)
N	2985				
Adj. R^2	0.0054	0.0894	0.1284	0.0991	0.1371
F	14.3	61.9	151.4	43.5	82.0

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B4M(1)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0309 (1.55)	0.0349* (1.79)	0.0323* (1.74)	0.0402** (2.11)	0.0364** (1.99)
$\Delta \text{Residence}$	0.0797 (1.18)	0.0947 (1.44)	0.0461 (0.74)	0.0941 (1.46)	0.0528 (0.85)
Getmarry	0.073 (1.07)	0.0564 (0.85)	0.0249 (0.39)	0.0791 (1.22)	0.044 (0.71)
Getdivorce	-0.0963 (-0.72)	-0.0763 (-0.59)	0.0088 (0.07)	-0.1124 (-0.88)	-0.0371 (-0.3)
Getunion	0.0691 (1.57)	0.0501 (1.17)	0.0275 (0.67)	0.0348 (0.83)	0.0149 (0.37)
Nounion	-0.0273 (-0.72)	-0.0302 (-0.82)	-0.049 (-1.39)	-0.0166 (-0.46)	-0.0352 (-1.02)
$\Delta \text{Industry}$	0.1907*** (4.12)	0.1713*** (3.75)	0.1616*** (3.76)	0.1718*** (3.83)	0.1545*** (3.6)
$\Delta \text{Occupation}$	0.0082 (0.18)	0.0255 (0.57)	0.0306 (0.72)	0.0099 (0.23)	0.0148 (0.35)
D_1		0.456*** (12.1)		0.3479*** (8.56)	
D_2		-0.265*** (-7.57)		-0.21*** (-5.77)	
D_4		0.1127*** (3.29)		0.1407*** (3.58)	
ΔU			-0.028*** (-25.4)		-0.025*** (-22.1)
K_1				0.3738*** (7.96)	0.328*** (7.66)
K_2				-0.251*** (-7.01)	-0.157*** (-5.2)
K_4				0.2034*** (4.42)	0.2242*** (5.61)
Constant	0.0019 (0.17)	-0.0157 (-1.37)	0.0005 (0.05)	-0.0173 (-1.52)	-0.0085 (-0.81)
N	3937				
Adj. R^2	0.0103	0.0656	0.1496	0.1032	0.1747
F	6.36	24.7	71.1	31.7	65.8

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B4M(2)

Estimated Differenced Log Hours Equations:

Atlantic, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1848*** (6.05)	0.2045*** (7.08)	0.1811*** (6.64)	0.2096*** (7.28)	0.1857*** (6.82)
$\Delta \text{Residence}$	-0.1252 (-0.99)	0.0292 (0.24)	-0.0826 (-0.73)	0.0196 (0.16)	-0.0844 (-0.75)
Getmarry	0.0068 (0.08)	0.0223 (0.28)	0.0301 (0.41)	0.0094 (0.12)	0.0175 (0.24)
Getdivorce	0.1061 (0.81)	0.0777 (0.63)	0.1334 (1.41)	0.0641 (0.52)	0.1215 (1.04)
Getunion	0.1135** (2.36)	0.1094** (2.4)	0.0717* (1.67)	0.0981** (2.16)	0.065 (1.51)
Nounion	0.1102** (2.13)	0.0972** (1.98)	0.1147** (2.48)	0.0895* (1.83)	0.1065** (2.3)
$\Delta \text{Industry}$	0.1439** (2.28)	0.1498** (2.49)	0.0546 (0.97)	0.143** (2.39)	0.0441 (0.78)
$\Delta \text{Occupation}$	0.218*** (3.52)	0.2472*** (4.22)	0.272*** (4.92)	0.2441*** (4.19)	0.2663*** (4.83)
D_1		0.3621*** (8.3)		0.308*** (6.79)	
D_2		-0.606*** (-17.4)		-0.589*** (-16.5)	
D_4		0.1334*** (3.3)		0.0857* (1.85)	
ΔU			-0.032*** (-30.3)		-0.031*** (-28.7)
K_1				0.2426*** (5.98)	0.175*** (4.67)
K_2				-0.0452 (-1.2)	-0.0202 (-0.59)
K_4				0.057 (1.31)	0.0781** (2.21)
Constant	-0.119*** (-9.61)	-0.091*** (-7.05)	-0.084*** (-7.53)	-0.103*** (-7.72)	-0.101*** (-8.23)
N	3623				
Adj. R^2	0.0283	0.1302	0.2248	0.1391	0.2297
F	18.4	50.9	112.4	43.8	89.0

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B4F(1)

Estimated Differenced log Hours Equations:

Atlantic, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.0647* (-1.95)	-0.057* (-1.76)	-0.0618** (-1.97)	-0.0617* (-1.94)	-0.0649** (-2.11)
$\Delta \text{Residence}$	-0.0948 (-1.01)	-0.0876 (-0.96)	-0.0745 (-0.84)	-0.0886 (-0.99)	-0.0817 (-0.94)
$\Delta \text{Getmarry}$	-0.159 (-1.5)	-0.1958* (-1.9)	-0.1796* (-1.8)	-0.1793* (-1.95)	-0.1846* (-1.88)
$\Delta \text{Getdivorce}$	0.0768 (0.39)	0.1129 (0.59)	0.0977 (0.53)	0.0688 (0.37)	0.0541 (0.3)
$\Delta \text{Getunion}$	-0.072 (-1.13)	-0.0722 (-1.17)	-0.0913 (-1.52)	-0.0512 (-0.84)	-0.0753 (-1.28)
$\Delta \text{Nounion}$	-0.1069* (-1.69)	-0.1348** (-2.19)	-0.124** (-2.08)	-0.1463** (-2.43)	-0.1366** (-2.33)
$\Delta \text{Industry}$	0.2983*** (4.11)	0.2693*** (3.81)	0.3218*** (4.71)	0.2668*** (3.84)	0.3127*** (4.63)
$\Delta \text{Occupation}$	0.0125 (0.18)	0.0503 (0.73)	-0.0027 (-0.04)	0.0384 (0.57)	-0.009 (-0.14)
D_1		0.5567*** (11.4)		0.4327*** (8.41)	
D_2		-0.293*** (-5.93)		-0.252*** (-4.91)	
D_4		0.089* (1.67)		0.0976* (1.74)	
ΔU			-0.027*** (-20.1)		-0.024*** (-17.9)
K_1				0.6145*** (10.8)	0.5921*** (11.0)
K_2				-0.135*** (-2.86)	-0.0711* (-1.68)
K_4				0.0313 (0.6)	-0.0176 (-0.36)
Constant	0.0621*** (3.97)	0.0337** (2.02)	0.0478*** (3.24)	0.0144 (0.85)	0.0224 (1.4)
N	3244				
Adj. R^2	0.014	0.0661	0.1229	0.1033	0.1561
F	9.6	22.9	50.0	28.2	50.0

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B4F(2)

Estimated Differenced log Hours Equations:

Atlantic, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.2492*** (5.31)	0.2552*** (5.69)	0.2302*** (5.23)	0.2597*** (5.81)	0.2351*** (5.36)
$\Delta \text{Residence}$	0.0305 (0.19)	0.087 (0.58)	0.0457 (0.31)	0.0982 (0.65)	0.0581 (0.39)
Getmarry	-0.0067 (-0.08)	-0.0094 (-0.11)	-0.0036 (-0.04)	-0.0112 (-0.13)	-0.0107 (-0.13)
Getdivorce	0.0287 (0.15)	0.1017 (0.73)	0.0498 (0.36)	0.112 (0.8)	0.0626 (0.45)
Getunion	0.1895*** (3.33)	0.1702*** (3.14)	0.1591*** (2.98)	0.1713*** (3.17)	0.1621*** (3.05)
Nounion	-0.0118 (-0.19)	-0.0204 (-0.34)	0.0042 (0.07)	-0.0215 (-0.36)	0.003 (0.05)
$\Delta \text{Industry}$	0.2626*** (3.49)	0.2843*** (3.93)	0.2329*** (3.31)	0.2628*** (3.64)	0.2147*** (3.04)
$\Delta \text{Occupation}$	0.0557 (0.79)	0.065 (0.96)	0.0508 (0.76)	0.0684 (1.01)	0.0547 (0.83)
D_1		0.5031*** (9.52)		0.4497*** (8.17)	
D_2		-0.578*** (-13.0)		-0.567*** (-12.5)	
D_4		-0.0806 (-1.49)		-0.0672 (-1.17)	
ΔU			-0.027*** (-20.3)		-0.026*** (-19.4)
K_1				0.2449*** (4.92)	0.2335*** (4.91)
K_2				-0.0652 (-1.2)	-0.0318 (-0.61)
K_4				-0.0259 (-0.55)	-0.0502 (-1.17)
Constant	-0.081*** (-5.11)	-0.053*** (-3.19)	-0.052*** (-3.48)	-0.063*** (-3.69)	-0.064*** (-3.91)
N	2985				
Adj. R^2	0.0215	0.1072	0.1407	0.115	0.148
F	9.5	31.8	51.1	27.6	41.8

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2B: Table 2B5(1)

Variable Means and Standard Deviations: Atlantic, Aged 25-54, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00096	0.52285	0.05513	0.76496
$\Delta \ln(W/CPI)$	-0.05249	0.53983	-0.01011	0.43461
D_1	0.06025	0.23798	0.08407	0.27754
D_2	0.07794	0.26813	0.07988	0.27117
D_3	0.77808	0.41561	0.76035	0.42696
D_4	0.08373	0.27703	0.0757	0.26457
ΔU	-0.13887	8.0745	-0.5596	10.355
K_1	0.04323	0.2034	0.06148	0.24026
K_2	0.09496	0.29321	0.11334	0.31708
K_3	0.81212	0.39069	0.74529	0.43579
K_4	0.04969	0.21735	0.07988	0.27117
$\Delta \text{Residence}$	0.01498	0.12148	0.01548	0.12346
Getmarry	0.01429	0.11873	0.01213	0.10948
Getdivorce	0.00477	0.06888	0.00586	0.07631
Getunion	0.05446	0.22696	0.05395	0.22597
Nonunion	0.08271	0.27549	0.0527	0.22348
$\Delta \text{Industry}$	0.09496	0.29321	0.0711	0.25705
$\Delta \text{Occupation}$	0.09462	0.29274	0.908156	0.27374
N	2938		2391	
ΔH	13.929	745.25	48.053	662.07
ΔW	0.26172	5.559	0.31542	3.8769

Appendix 2B: Table 2B5(2)

Variable Means and Standard Deviations: Atlantic, Aged 25-54, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.12735	0.63096	-0.02417	0.38783
$\Delta \ln(W/CPI)$	-0.07262	0.41418	-0.0551	0.3334
D_1	0.06481	0.24624	0.06344	0.24381
D_2	0.10655	0.3086	0.1079	0.31032
D_3	0.74844	0.43399	0.74407	0.43648
D_4	0.08019	0.27164	0.08459	0.27833
ΔU	0.89161	9.4585	1.1627	10.355
K_1	0.0758	0.26472	0.08589	0.28026
K_2	0.09337	0.29101	0.07208	0.25867
K_3	0.74039	0.4385	0.72767	0.44526
K_4	0.09044	0.28687	0.11437	0.31833
$\Delta \text{Residence}$	0.00732	0.08528	0.00777	0.08782
Getmarry	0.01172	0.10763	0.01381	0.11673
Getdivorce	0.01099	0.10425	0.00863	0.09253
Getunion	0.04901	0.21605	0.05913	0.23592
Nonunion	0.05932	0.23626	0.05524	0.2285
$\Delta \text{Industry}$	0.09301	0.29049	0.08848	0.28405
$\Delta \text{Occupation}$	0.09044	0.28687	0.09754	0.29676
N	2731		2317	
ΔH	-155.3	769.9	-90.275	707.07
ΔW	0.10697	3.7148	0.10858	2.2247

Appendix 2B: Table 2B6(1)

Variable Means and Standard Deviations: Atlantic, Aged 16-69, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.03419	0.62796	0.07911	0.81755
$\Delta \ln(W/CPI)$	-0.04283	0.5275	-0.00681	0.42643
D_1	0.07112	0.25706	0.09001	0.28624
D_2	0.08509	0.27905	0.0897	0.2858
D_3	0.7427	0.4372	0.73952	0.43896
D_4	0.10109	0.30149	0.08076	0.27252
ΔU	-0.23647	8.445	-0.50832	10.231
K_1	0.05004	0.21805	0.06905	0.25358
K_2	0.10719	0.30939	0.11745	0.322
K_3	0.78512	0.41079	0.72811	0.445
K_4	0.05766	0.23313	0.08539	0.2795
$\Delta \text{Residence}$	0.01727	0.1303	0.01942	0.13802
Getmarry	0.01854	0.13492	0.01788	0.13253
Getdivorce	0.00457	0.06747	0.00493	0.07007
Getunion	0.5232	0.22271	0.05148	0.22101
Nonunion	0.07849	0.26897	0.05179	0.22163
$\Delta \text{Industry}$	0.11684	0.32127	0.09556	0.29403
$\Delta \text{Occupation}$	0.11913	0.32398	0.1045	0.30596
N	3937		3244	
ΔH	3/.838	768.13	62.168	674.01
ΔW	0.26485	5.4434	0.28214	3.7409

Appendix 2B: Table 2B6(2)

Variable Means and Standard Deviations: Atlantic, Aged 16-69, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.09638	0.70179	-0.05675	0.81756
$\Delta \ln(W/CPI)$	-0.06793	0.41438	-0.05014	0.34353
D_1	0.07176	0.25813	0.07571	0.26458
D_2	0.10985	0.31275	0.10988	0.3128
D_3	0.72813	0.44499	0.72965	0.44422
D_4	0.09026	0.28659	0.08476	0.27857
ΔU	0.98979	9.9132	0.98526	10.137
K_1	0.0806	0.27225	0.09112	0.28783
K_2	0.10213	0.30285	0.07772	0.26778
K_3	0.07181	0.44968	0.71491	0.45153
K_4	0.09854	0.29808	0.11625	0.32058
$\Delta \text{Residence}$	0.00938	0.09643	0.01039	0.10139
Getmarry	0.01546	0.12338	0.02446	0.15448
Getdivorce	0.00856	0.09212	0.00905	0.09469
Getunion	0.05189	0.22184	0.06064	0.2387
Nonunion	0.05824	0.23423	0.05561	0.22921
$\Delta \text{Industry}$	0.1093	0.31206	0.1072	0.30942
$\Delta \text{Occupation}$	0.10903	0.31171	0.11658	0.32098
N	3623		2985	
ΔH	-123.76	783.75	-75.442	714.84
ΔW	0.15327	3.7993	0.14997	2.8754

Appendix 2C: Table 2C1M(1)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0716*** (3.56)	0.0701*** (3.63)	0.05*** (2.79)	0.0713*** (3.74)	0.053*** (2.98)
D_1		0.4187*** (8.8)		0.376*** (7.8)	
D_2		-0.38*** (-8.77)		-0.294*** (-6.22)	
D_4		0.2*** (3.98)		0.249*** (4.39)	
ΔU			-0.031*** (-23.0)		-0.03*** (-21.2)
K_1				0.2941*** (4.9)	0.2105*** (3.8)
K_2				-0.248*** (-5.02)	-0.103** (-2.56)
K_4				0.108* (1.68)	0.2166*** (3.9)
Constant	-0.0136 (-1.4)	-0.019* (-1.91)	-0.0139 (-1.61)	-0.0209** (-2.11)	-0.0193** (-2.14)
N	2034				
Adj. R^2	0.0057	0.0847	0.211	0.1096	0.2238
F	7.69	39.0	183.1	32.5	99.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C1M(2)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0751*** (2.71)	0.0814*** (3.08)	0.0606*** (3.3)	0.0708*** (2.71)	0.072*** (2.98)
D_1		0.2784*** (5.32)		0.2606*** (4.97)	
D_2		-0.625*** (-12.7)		-0.562*** (-11.3)	
D_4		0.0145 (0.23)		0.0872 (1.36)	
ΔU			-0.035*** (-23.2)		-0.034*** (-22.1)
K_1				0.2036*** (4.53)	0.1473*** (3.58)
K_2				-0.194*** (-5.09)	-0.183*** (-5.34)
K_4				-0.127** (-2.5)	-0.0956** (-2.14)
Constant		-0.0107 (-0.9)	-0.0226** (-2.2)	-0.0039 (-0.31)	-0.0103 (-0.91)
N	1844				
Adj. R^2	0.0034	0.0991	0.2285	0.1249	0.247
F	8.7	43.6	186.9	35.2	103.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C1F(1)

Estimated Differenced Log Hours Equations:

Quebec, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.0484 (-1.17)	-0.0498 (-1.25)	-0.0788** (-2.02)	-0.0547 (-1.39)	-0.0755** (-1.97)
D_1		0.6538*** (9.04)		0.5269*** (7.13)	
D_2		-0.453*** (-6.06)		-0.428*** (-5.41)	
D_4		0.1735** (1.96)		0.0897 (0.99)	
ΔU			-0.031*** (-13.9)		-0.028*** (-12.3)
K_1				0.4851*** (6.15)	0.4289*** (6.43)
K_2				-0.14** (-2.06)	-0.0364 (-0.57)
K_4				0.2706*** (3.19)	0.2824*** (3.51)
Constant	-0.0067 (-0.39)	-0.0263 (-1.46)	-0.0037 (-0.22)	-0.0425** (-2.3)	-0.0372** (-2.1)
N	1537				
Adj. R^2	0.0002	0.0762	0.1119	0.1059	0.1395
F	0.75	26.2	65.2	23.6	42.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C1F(2)

Estimated Differenced Log Hours Equations:

Quebec, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1093** (2.24)	0.0857* (1.82)	0.0951*** (2.09)	0.1058** (2.27)	0.109** (2.41)
D_1		0.5053*** (7.46)		0.4484*** (6.62)	
D_2		-0.487*** (-8.05)		-0.436*** (-6.98)	
D_4		0.0971 (1.1)		0.0731 (0.82)	
ΔU			-0.031*** (-15.3)		-0.029*** (-13.7)
K_1				0.318*** (5.45)	0.2985*** (5.29)
K_2				-0.18*** (-2.84)	-0.0895 (-1.46)
K_4				0.1062 (1.64)	0.0772 (1.25)
Constant	0.0343** (2.11)	0.0364** (2.15)	0.0487*** (3.21)	0.0189 (1.06)	0.0266 (1.58)
N	1527				
Adj. R^2	0.0026	0.0797	0.1344	0.1031	0.1505
F	4.2	27.9	80.9	23.3	46.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C2M(1)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0669*** (3.19)	0.0638*** (3.17)	0.0479** (2.57)	0.0657*** (3.31)	0.0498*** (2.69)
$\Delta \text{Residence}$	0.1584 (0.86)	0.0711 (0.4)	0.0344 (0.21)	0.0765 (0.44)	0.0362 (0.22)
Getmarry	0.0299 (0.42)	0.0047 (0.07)	0.0624 (0.99)	0.0101 (0.15)	0.0541 (0.87)
Getdivorce	-0.0271 (-0.25)	-0.0511 (-0.49)	-0.0836 (-0.86)	-0.0463 (-0.45)	-0.0751 (-0.78)
Getunion	0.0373 (0.98)	0.0387 (1.06)	0.0478 (1.41)	0.0261 (0.72)	0.0369 (1.1)
Nounion	-0.0088 (-0.26)	-0.0269 (-0.83)	-0.0122 (-0.4)	-0.0195 (-0.61)	-0.0086 (-0.29)
$\Delta \text{Industry}$	0.0552 (0.98)	0.0445 (0.81)	0.1101** (2.2)	0.0592 (1.08)	0.106** (2.09)
$\Delta \text{Occupation}$	-0.0751 (-1.37)	-0.0633 (-1.2)	-0.107** (-2.19)	-0.0816 (-1.56)	-0.116** (-2.38)
D_1		0.4199*** (8.78)		0.3761*** (7.76)	
D_2		-0.381*** (-8.69)		-0.294*** (-6.2)	
D_4		0.1989*** (3.84)		0.2474*** (4.3)	
ΔU			-0.032*** (-23.1)		-0.03*** (-21.3)
K_1				0.2937*** (4.87)	0.2072*** (3.72)
K_2				-0.249*** (-5.02)	-0.112*** (-2.71)
K_4				0.1073* (1.66)	0.2063*** (3.67)
Constant	-0.0145 (-1.32)	-0.0165 (-1.6)	-0.0167* (-1.71)	-0.0189* (-1.74)	-0.0198** (-1.99)
N	2034				
Adj. R^2	0.0041	0.0832	0.2118	0.1081	0.2243
F	2.1	16.5	55.9	17.6	46.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C2M(2)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.104*** (3.42)	0.1217*** (4.22)	0.1164*** (4.37)	0.1147*** (4.03)	0.1121*** (4.25)
$\Delta \text{Residence}$	-0.0545 (-0.26)	-0.0739 (-0.37)	-0.0707 (-0.39)	-0.082 (-0.42)	-0.0837 (-0.47)
Getmarry	0.0503 (0.73)	0.1044 (1.43)	0.0181 (0.27)	0.077 (1.06)	0.0073 (0.11)
Getdivorce	-0.0229 (-0.19)	-0.0222 (-0.2)	-0.0188 (-0.18)	-0.0289 (-0.24)	-0.0243 (-0.24)
Getunion	-0.0095 (-0.2)	-0.0221 (-0.5)	-0.0251 (-0.61)	-0.0173 (-0.4)	-0.0216 (-0.53)
Nounion	0.0753 (1.64)	0.0747* (1.71)	0.0906** (2.24)	0.0771* (1.79)	0.0925** (2.32)
$\Delta \text{Industry}$	0.0523 (0.8)	0.1541** (2.47)	0.0835 (1.45)	0.1668*** (2.71)	0.1053* (1.85)
$\Delta \text{Occupation}$	0.0182 (0.29)	-0.03 (-0.51)	-0.0023 (-0.04)	-0.0299 (-0.51)	-0.0064 (-0.12)
D_1		0.2766*** (5.29)		0.2607*** (4.98)	
D_2		-0.65*** (-13.2)		-0.586*** (-11.7)	
D_4		-0.0044 (-0.07)		0.072 (1.12)	
ΔU			-0.036*** (-23.3)		-0.034*** (-22.2)
K_1				0.199*** (4.4)	0.1471*** (3.54)
K_2				-0.2*** (-5.25)	-0.189*** (-5.5)
K_4				-0.138*** (-2.73)	-0.108** (-2.42)
Constant	-0.04*** (-3.13)	-0.0218* (-1.7)	-0.032*** (-2.81)	-0.0144 (-1.08)	-0.195 (-1.6)
N	1844				
Adj. R^2	0.0034	0.1042	0.2307	0.1307	0.2505
F	2.7	19.7	57.5	20.2	49.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C2F(1)

Estimated Differenced Log Hours Equations:

Quebec, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.0362 (-0.85)	-0.0343 (-0.84)	-0.0623 (-1.55)	-0.0403 (-1.0)	-0.0633 (-1.6)
$\Delta \text{Residence}$	-0.2062 (-1.13)	-0.1959 (-1.11)	-0.1025 (-0.59)	-0.1458 (-0.84)	-0.0856 (-0.5)
Getmarry	0.2621* (1.73)	0.28* (1.92)	0.2347 (1.64)	0.2611* (1.81)	0.2222 (1.57)
Getdivorce	0.0757 (0.4)	0.0709 (0.39)	0.0565 (0.31)	0.0005 (0.003)	-0.0085 (-0.05)
Getunion	-0.0279 (-0.36)	0.0801 (0.11)	0.0046 (0.06)	0.0149 (0.2)	0.0114 (0.16)
Nounion	-0.0875 (-1.32)	-0.0975 (-1.53)	-0.0987 (-1.58)	-0.0645 (-1.03)	-0.0738 (-1.19)
$\Delta \text{Industry}$	0.0212 (0.2)	0.1094 (1.06)	0.0862 (0.86)	0.091 (0.89)	0.0615 (0.62)
$\Delta \text{Occupation}$	0.1686 (1.52)	0.1299 (1.22)	0.1612 (1.55)	0.1053 (1.0)	0.1234 (1.2)
D_1		0.6522*** (9.03)		0.5314*** (7.18)	
D_2		-0.485*** (-6.38)		-0.452*** (-5.65)	
D_4		0.1609* (1.82)		0.0873 (0.96)	
ΔU			-0.031*** (-14.1)		-0.029*** (-12.4)
K_1				0.4668*** (5.848)	0.4644*** (6.14)
K_2				-0.1444** (-2.12)	-0.045 (-0.7)
K_4				0.2385*** (2.8)	0.2508*** (3.08)
Constant	-0.0112 (-0.58)	-0.0334* (-1.72)	-0.013 (-0.72)	-0.048** (-2.45)	-0.0418** (-2.2)
N	1537				
Adj. R^2	0.0031	0.0817	0.1168	0.1084	0.1411
F	1.4	12.3	21.2	13.4	20.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C2F(2)

Estimated Differenced Log Hours Equations:

Quebec, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.133** (2.56)	0.1363*** (2.73)	0.1386*** (2.87)	0.1589*** (3.21)	0.1538*** (3.2)
$\Delta \text{Residence}$	-0.493** (-2.34)	-0.507** (-2.51)	-0.511*** (-2.6)	-0.475** (-2.38)	-0.483** (-2.48)
Getmarry	0.0388 (0.29)	-0.0578 (-0.46)	-0.0168 (-0.14)	-0.1419 (-1.12)	-0.0967 (-0.79)
Getdivorce	-0.0034 (-0.02)	-0.0182 (-0.12)	-0.029 (-0.2)	0.0177 (0.12)	-0.0081 (-0.06)
Getunion	0.0794 (1.19)	0.0387 (0.6)	0.0209 (0.34)	0.0319 (0.51)	0.0148 (0.24)
Nounion	-0.0144 (-0.2)	-0.0429 (-0.62)	-0.0135 (-0.2)	-0.0292 (-0.42)	-0.0056 (-0.08)
$\Delta \text{Industry}$	0.0841 (0.84)	0.1623* (1.69)	0.1513 (1.63)	0.1716* (1.8)	0.1496 (1.62)
$\Delta \text{Occupation}$	0.0146 (0.16)	0.0713 (0.82)	0.0246 (0.29)	0.0662 (0.77)	0.0294 (0.35)
D_1		0.4965*** (7.32)		0.4434*** (6.55)	
D_2		-0.536*** (-8.65)		-0.482*** (-7.58)	
D_4		0.084 (0.95)		0.0631 (0.71)	
ΔU			-0.031*** (-15.4)		-0.029*** (-13.9)
K_1				0.3173*** (5.41)	0.2958*** (5.2)
K_2				-0.192*** (-3.02)	-0.107* (-1.74)
K_4				0.1009 (1.56)	0.0675 (1.09)
Constant	0.0269 (1.51)	0.0312* (1.71)	0.0422** (2.54)	0.0147 (0.78)	0.0227 (1.27)
N	1527				
Adj. R^2	0.004	0.0861	0.1383	0.1099	0.1543
F	1.9	13.2	25.8	13.7	22.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C3M(1)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 15-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.058** (2.51)	0.0673*** (3.02)	0.0506** (2.35)	0.0776*** (3.55)	0.067*** (3.16)
D_1		0.5686*** (12.2)		0.4813*** (10.2)	
D_2		-0.261*** (-5.57)		-0.244*** (-4.89)	
D_4		0.306*** (5.98)		0.2493*** (4.39)	
ΔU			-0.03*** (-19.9)		-0.029*** (-18.8)
K_1				0.4403*** (8.09)	0.4207*** (8.14)
K_2				-0.13** (-2.57)	0.0537 (1.22)
K_4				0.2967*** (4.61)	0.4409*** (7.54)
Constant	0.0235** (2.08)	-0.009 (-0.76)	0.0236** (2.24)	-0.0225* (-1.89)	-0.0118 (-1.06)
N	2706				
Adj. R^2	0.002	0.0766	0.1295	0.1082	0.1653
F	5.1	46.5	136.3	42.4	90.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C3M(2)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1161*** (4.16)	0.1232*** (4.59)	0.1118*** (4.42)	0.1199*** (4.5)	0.1105*** (4.39)
D_1		0.4643*** (10.4)		0.4371*** (9.48)	
D_2		-0.401*** (-9.37)		-0.349*** (-7.93)	
D_4		0.0749 (1.31)		0.1175* (1.94)	
ΔU			-0.033*** (-23.1)		-0.032*** (-21.7)
K_1				0.1356*** (3.34)	0.1179*** (3.14)
K_2				-0.16*** (-4.32)	-0.101*** (-2.97)
K_4				-0.0635 (-1.33)	0.0194 (0.46)
Constant	-0.0023 (-0.21)	-0.0058 (-0.5)	0.0366 (0.36)	-0.0004 (-0.03)	0.0028 (0.24)
N	2421				
Adj. R^2	0.0067	0.0856	0.1859	0.0975	0.1918
F	9.1	46.3	185.2	33.7	96.7

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C3F(1)

Estimated Differenced Log Hours Equations:

Quebec, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0096 (0.24)	-0.0879 (-0.24)	-0.0307 (-0.84)	-0.0093 (-0.26)	-0.0265 (-0.74)
D_1		0.6997*** (11.6)		0.5904*** (9.62)	
D_2		-0.416*** (-6.45)		-0.393*** (-5.76)	
D_4		0.2244*** (2.82)		0.1489* (1.84)	
ΔU			-0.032*** (-16.3)		-0.029*** (-14.5)
K_1				0.4746*** (6.74)	0.4961*** (7.32)
K_2				-0.138** (-2.31)	-0.0111 (-0.19)
K_4				0.2739*** (3.58)	0.2728*** (3.73)
Constant	0.0277* (1.73)	-0.0047 (-0.28)	0.0299** (1.99)	-0.0211 (-1.22)	-0.0071 (-0.43)
N	2050				
Adj. R^2	0.0005	0.0852	0.1139	0.1123	0.1399
F	1.5	39.6	89.6	33.7	57.0

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C3F(2)

Estimated Differenced Log Hours Equations:

Quebec, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1517*** (3.35)	0.1323*** (3.08)	0.1372*** (3.25)	0.1421*** (3.34)	0.144*** (3.45)
D_1		0.6323*** (11.4)		0.5494*** (9.78)	
D_2		-0.502*** (-8.85)		-0.477*** (-8.11)	
D_4		0.1734** (2.33)		0.1386* (1.82)	
ΔU			-0.032*** (-17.2)		-0.03*** (-15.6)
K_1				0.3456*** (6.57)	0.3562*** (6.98)
K_2				-0.068 (-1.18)	-0.009 (-0.16)
K_4				0.0898 (1.57)	0.0761 (1.4)
Constant	0.0706*** (4.68)	0.0519*** (3.31)	0.0759*** (5.39)	0.0279* (1.68)	0.0418*** (2.66)
N	1967				
Adj. R^2	0.0052	0.1085	0.135	0.1283	0.1551
F	14.7	52.7	109.9	39.6	64.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C4M(1)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0621*** (2.63)	0.0662*** (2.91)	0.0567** (2.57)	0.0735*** (3.29)	0.0651*** (3.0)
$\Delta \text{Residence}$	0.4213** (2.51)	0.3142* (1.94)	0.361** (2.3)	0.3852** (2.41)	0.3983** (2.53)
$\Delta \text{Getmarry}$	0.079 (1.02)	0.0419 (0.56)	0.0739 (1.02)	0.0275 (0.37)	0.0461 (0.64)
$\Delta \text{Getdivorce}$	-0.0667 (-0.45)	-0.0776 (-0.55)	-0.1207 (-0.88)	-0.0596 (-0.43)	-0.0848 (-0.62)
$\Delta \text{Getunion}$	0.0218 (0.52)	0.026 (0.65)	0.0129 (0.33)	0.0193 (0.49)	0.0057 (0.15)
$\Delta \text{Nounion}$	-0.0763* (-1.93)	-0.092** (-2.42)	-0.778** (-2.11)	-0.084** (-2.25)	-0.0696* (-1.93)
$\Delta \text{Industry}$	0.1362** (2.23)	0.1105* (1.84)	0.1769*** (3.1)	0.1097* (1.85)	0.1314** (2.32)
$\Delta \text{Occupation}$	0.0181 (0.31)	0.0167 (0.29)	-0.0098 (-0.18)	-0.0254 (-0.45)	-0.0516 (-0.95)
D_1		0.5575*** (11.9)		0.477*** (10.1)	
D_2		-0.285*** (-6.01)		-0.253*** (-5.04)	
D_4		0.2655*** (5.03)		0.2315*** (4.02)	
ΔU			-0.0303*** (-20.1)		-0.029*** (-18.8)
K_1				0.4289*** (7.83)	0.4082*** (7.84)
K_2				-0.149*** (-2.93)	0.0252 (0.56)
K_4				0.2752*** (4.21)	0.4128*** (6.88)
Constant	0.0096 (0.74)	-0.0137 (-1.05)	0.0102 (0.84)	-0.0227* (-1.75)	-0.0127 (-1.03)
N	2706				
Adj. R^2	0.0094	0.0812	0.138	0.1114	0.1686
F	4.2	21.2	44.6	23.8	43.5

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C4M(2)

Estimated Differenced Log Hours Equations:

Quebec, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1643*** (5.58)	0.1731*** (6.13)	0.1683*** (6.33)	0.1727*** (6.16)	0.1682*** (6.35)
$\Delta \text{Residence}$	-0.142 (-0.82)	-0.1533 (-0.93)	-0.1596 (-1.03)	-0.1648 (-1.0)	-0.1669 (-1.08)
$\Delta \text{Getmarry}$	0.0102 (0.14)	0.0461 (0.68)	0.0107 (0.17)	0.037 (0.54)	0.0054 (0.08)
$\Delta \text{Getdivorce}$	-0.0639 (-0.58)	-0.0599 (-0.57)	-0.0686 (-0.69)	0.073 (0.7)	-0.0774 (-0.78)
$\Delta \text{Getunion}$	0.0309 (0.73)	0.0116 (0.28)	0.0686 (0.18)	0.0123 (0.3)	0.0673 (0.18)
$\Delta \text{Nounion}$	0.0476 (1.1)	0.0479 (1.16)	0.061 (1.56)	0.0477 (1.16)	0.0593 (1.52)
$\Delta \text{Industry}$	0.1353** (2.26)	0.1868*** (3.23)	0.1627*** (3.01)	0.2005*** (3.49)	0.1761*** (3.26)
$\Delta \text{Occupation}$	0.071 (1.19)	0.0316 (0.55)	0.0696 (1.29)	0.0335 (0.59)	0.0659 (1.23)
D_1		0.4404*** (9.85)		0.4203*** (9.16)	
D_2		-0.438*** (-10.2)		-0.379*** (-8.61)	
D_4		0.0379 (0.66)		0.0992* (1.65)	
ΔU			-0.033*** (-23.6)		-0.032*** (-22.1)
K_1				0.1172*** (2.89)	0.0957** (2.55)
K_2				-0.181*** (-4.91)	-0.128** (-3.75)
K_4				-0.107** (-2.23)	-0.035 (-0.82)
Constant	-0.027** (-2.18)	-0.0265** (-2.08)	-0.023** (-2.02)	-0.0177 (-1.33)	-0.0168 (-1.37)
N	2421				
Adj. R^2	0.018	0.0988	0.2017	0.1125	0.2082
F	5.9	23.1	62.1	21.5	49.9

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C4F(1)

Estimated Differenced log Hours Equations:

Quebec, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0292 (0.75)	0.0118 (0.31)	-0.006 (-0.16)	0.0096 (0.26)	-0.0062 (-0.17)
$\Delta \text{Residence}$	-0.1459 (-0.77)	-0.1247 (-0.69)	-0.0356 (-0.2)	-0.1056 (-0.59)	-0.0459 (-0.26)
Getmarry	0.3056*** (2.8)	0.253** (2.42)	0.2545** (2.48)	0.2565** (2.48)	0.2619*** (2.58)
Getdivorce	0.097 (0.54)	0.1048 (0.61)	0.0822 (0.49)	0.0537 (0.32)	0.0362 (0.22)
Getunion	-0.0822 (-0.01)	0.0096 (0.15)	0.0062 (0.1)	0.0575 (0.09)	0.0013 (0.02)
Nounion	-0.087 (-1.44)	-0.0691 (-1.19)	-0.0588 (-1.04)	-0.0481 (-0.84)	-0.048 (-0.85)
$\Delta \text{Industry}$	0.0808 (0.88)	0.1256 (1.44)	0.1158 (1.35)	0.1188 (1.38)	0.1041 (1.23)
$\Delta \text{Occupation}$	0.2455*** (2.65)	0.218** (2.45)	0.2511*** (2.88)	0.181** (2.06)	0.2009** (2.32)
D_1		0.67*** (11.2)		0.5709*** (9.32)	
D_2		-0.472*** (-7.23)		-0.44*** (-6.39)	
D_4		0.1638** (2.05)		0.1031 (1.27)	
ΔU			-0.032*** (-16.6)		-0.03*** (-14.7)
K_1				0.4461*** (6.32)	0.4561*** (6.71)
K_2				-0.141** (-2.35)	-0.0301 (-0.53)
K_4				0.2412*** (3.16)	0.2223 (3.04)
Constant	0.0027 (0.15)	-0.0246 (-1.37)	-0.0006 (-0.03)	-0.0375** (-2.06)	-0.0272 (-1.55)
N	2050				
Adj. R^2	0.0144	0.0995	0.1308	0.123	0.1515
F	4.6	20.1	32.1	20.3	29.3

Note: t - ratio given in parentheses; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C4F(2)

Estimated Differenced log Hours Equations:

Quebec, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1922*** (4.06)	0.1862*** (4.17)	0.1917*** (4.36)	0.198*** (4.47)	0.1985*** (4.55)
$\Delta \text{Residence}$	-0.301 (-1.48)	-0.3643* (-1.89)	-0.3212* (-1.69)	-0.3527* (-1.85)	-0.3128* (-1.67)
Getmarry	-0.0561 (-0.58)	-0.0773 (-0.85)	-0.0619 (-0.69)	-0.1134 (-1.26)	-0.1049 (-1.18)
Getdivorce	-0.0776 (-0.54)	-0.0836 (-0.61)	-0.0324 (-0.24)	-0.0831 (-0.61)	-0.0389 (-0.29)
Getunion	0.0911 (1.59)	0.0673 (1.25)	0.042 (0.79)	0.0653 (1.22)	0.0419 (0.8)
Nounion	-0.0033 (-0.51)	-0.0257 (-0.41)	-0.0029 (-0.05)	-0.0231 (-0.38)	-0.0019 (-0.03)
$\Delta \text{Industry}$	0.1535* (1.8)	0.1843** (2.28)	0.1933** (2.44)	0.1956** (2.46)	0.1951** (2.48)
$\Delta \text{Occupation}$	0.0425 (0.54)	0.093 (1.24)	0.0597 (0.81)	0.0862 (1.16)	0.0562 (0.77)
D_1		0.6236*** (11.3)		0.5413*** (9.68)	
D_2		-0.554*** (-9.63)		-0.523*** (-8.82)	
D_4		0.1374* (1.83)		0.1074 (1.41)	
ΔU			-0.032*** (-17.4)		-0.03*** (-15.8)
K_1				0.3464*** (6.61)	0.355*** (6.97)
K_2				-0.0842 (-1.47)	-0.0368 (-0.66)
K_4				0.0825 (1.45)	0.0592 (1.09)
Constant	0.0533*** (3.18)	0.0376** (2.22)	0.058*** (3.72)	0.0153 (0.87)	0.0283* (1.69)
N	1967				
Adj. R^2	0.0102	0.1188	0.143	0.139	0.1631
F	5.2	24.7	35.8	23.5	32.1

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2C: Table 2C5(1)

Variable Means and Standard Deviations: Quebec, Aged 25-54, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00786	0.47012	0.00499	0.66451
$\Delta \ln(W/CPI)$	-0.0328	0.4775	-0.01112	0.41599
D_1	0.04523	0.20786	0.05856	0.23487
D_2	0.05015	0.2183	0.06051	0.2385
D_3	0.85644	0.35073	0.83604	0.37036
D_4	0.04818	0.2142	0.04489	0.20714
ΔU	-0.12783	6.7906	0.15224	7.6517
K_1	0.0295	0.16924	0.04815	0.21414
K_2	0.05211	0.22231	0.08523	0.27932
K_3	0.88496	0.31915	0.81848	0.38558
K_4	0.03343	0.17981	0.04815	0.21414
$\Delta \text{Residence}$	0.00344	0.05858	0.00716	0.08432
Getmarry	0.01868	0.13543	0.01496	0.12145
Getdivorce	0.00934	0.09622	0.00911	0.09504
Getunion	0.07031	0.25572	0.05595	0.22991
Nonunion	0.09784	0.29717	0.07742	0.26735
$\Delta \text{Industry}$	0.0821	0.27459	0.06246	0.24207
$\Delta \text{Occupation}$	0.08161	0.27384	0.06051	0.2385
N	2034		1537	
ΔH	-10.786	510.52	-1.9616	581.73
ΔW	0.63619	5.1816	0.57685	4.1891

Appendix 2C: Table 2C5(2)

Variable Means and Standard Deviations: Quebec, Aged 25-54, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.01817	0.46402	0.02149	0.67078
$\Delta \ln(W/CPI)$	-0.08435	0.4426	-0.05588	0.34888
D_1	0.05206	0.22221	0.06352	0.24398
D_2	0.05206	0.22221	0.07007	0.25535
D_3	0.859	0.34811	0.82908	0.37657
D_4	0.03688	0.18851	0.03733	0.18963
ΔU	0.05803	6.5964	0.46496	7.639
K_1	0.06779	0.25145	0.07859	0.26918
K_2	0.09165	0.28861	0.07138	0.25755
K_3	0.77983	0.41448	0.77931	0.41485
K_4	0.06074	0.23891	0.07073	0.25645
$\Delta \text{Residence}$	0.00217	0.04654	0.00393	0.06258
Getmarry	0.02115	0.14392	0.01441	0.1192
Getdivorce	0.00922	0.0956	0.01179	0.10797
Getunion	0.07267	0.25966	0.06156	0.24043
Nonunion	0.0808	0.27261	0.05043	0.21889
$\Delta \text{Industry}$	0.0846	0.27836	0.06745	0.25089
$\Delta \text{Occupation}$	0.09111	0.28784	0.07466	0.26292
N	1844		1527	
ΔH	-10.307	600.66	3.3792	623.66
ΔW	-0.01896	4.1767	0.10202	3.0475

Appendix 2C: Table 2C6(1)

Variable Means and Standard Deviations: Quebec, Aged 16-69, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.03079	0.59949	0.0299	0.72524
$\Delta \ln(W/CPI)$	-0.02197	0.4833	-0.00099	0.4132
D_1	0.06245	0.24202	0.07122	0.25725
D_2	0.06098	0.23933	0.06537	0.24723
D_3	0.82077	0.38362	0.81512	0.38829
D_4	0.0558	0.22985	0.04829	0.21444
ΔU	-0.17184	7.4181	0.02488	8.0005
K_1	0.04435	0.2059	0.05073	0.2195
K_2	0.06356	0.24402	0.09073	0.2873
K_3	0.85514	0.35203	0.80634	0.39526
K_4	0.03696	0.18869	0.0522	0.22247
$\Delta \text{Residence}$	0.0048	0.06916	0.00585	0.0763
Getmarry	0.02106	0.14363	0.02342	0.15125
Getdivorce	0.00702	0.08352	0.0078	0.088
Getunion	0.08093	0.27278	0.06342	0.24377
Nonunion	0.09645	0.29527	0.07854	0.26908
$\Delta \text{Industry}$	0.10606	0.30797	0.08049	0.27211
$\Delta \text{Occupation}$	0.10791	0.31032	0.08	0.27136
N	2706		2050	
ΔH	16.429	578.72	15.963	602.56
ΔW	0.63519	5.3682	0.56081	4.094

Appendix 2C: Table 2C6(2)

Variable Means and Standard Deviations: Quebec, Aged 16-69, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00003	0.54282	0.05459	0.70016
$\Delta \ln(W/CPI)$	-0.07519	0.42722	-0.054	0.34636
D_1	0.06155	0.24038	0.07677	0.26629
D_2	0.06237	0.24188	0.06914	0.25376
D_3	0.83271	0.37331	0.8124	0.39049
D_4	0.04337	0.20373	0.04169	0.19993
ΔU	0.09542	7.1522	0.18251	7.8273
K_1	0.08096	0.27283	0.0849	0.2788
K_2	0.09665	0.29555	0.07778	0.2679
K_3	0.75423	0.43063	0.76157	0.42623
K_4	0.06815	0.25206	0.07575	0.26466
$\Delta \text{Residence}$	0.00289	0.05371	0.00407	0.06366
Getmarry	0.02272	0.14903	0.02965	0.16196
Getdivorce	0.01033	0.10111	0.01271	0.11205
Getunion	0.07931	0.27027	0.06812	0.25202
Nonunion	0.08013	0.27155	0.05491	0.22785
$\Delta \text{Industry}$	0.11029	0.31331	0.08744	0.28255
$\Delta \text{Occupation}$	0.11235	0.31586	0.09609	0.29478
N	2421		1967	
ΔH	3.5229	669.5	29.737	640.86
ΔW	0.04102	3.902	0.10638	2.9238

Appendix D: Table 2D1M(1)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0689*** (4.66)	0.0602*** (4.23)	0.0578*** (4.36)	0.0562*** (4.01)	0.0551*** (4.18)
D_1		0.5025*** (10.8)		0.4198*** (8.01)	
D_2		-0.364*** (-9.28)		-0.234*** (-5.51)	
D_4		0.1269** (2.4)		0.2128*** (3.71)	
ΔU			-0.037*** (-25.2)		-0.034*** (-21.4)
K_1				0.2518*** (4.46)	0.1375*** (2.76)
K_2				-0.318*** (-7.87)	-0.188*** (-5.46)
K_4				0.0125 (0.17)	-0.0258 (-0.4)
Constant	0.0077 (0.93)	0.0047 (0.56)	0.0057 (0.77)	0.0089 (1.08)	0.012 (1.55)
N	2560				
Adj. R^2	0.008	0.0841	0.2057	0.1145	0.216
F	10.9	47.8	221.5	42.2	118.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D1M(2)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1323*** (5.49)	0.1328*** (5.67)	0.1292*** (5.47)	0.1351*** (5.75)	0.1292*** (5.49)
D_1		0.508*** (7.62)		0.5041*** (7.16)	
D_2		-0.496*** (-8.59)		-0.518*** (-8.74)	
D_4		0.1374 (1.42)		0.1035 (1.03)	
ΔU			-0.024*** (-9.59)		-0.026*** (-10.2)
K_1				-0.0338 (-0.69)	0.2108*** (4.45)
K_2				0.0639 (1.31)	0.0292 (0.6)
K_4				0.0737 (1.17)	-0.0424 (-0.71)
Constant	-0.092*** (-7.01)	-0.051*** (-3.82)	-0.086*** (-6.72)	-0.055*** (-3.84)	-0.07*** (-4.92)
N	2104				
Adj. R^2	0.0137	0.0698	0.0545	0.0701	0.0625
F	50.0	47.2	65.4	30.0	36.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D1F(1)

Estimated Differenced Log Hours Equations:

Ontario, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0099 (0.33)	0.0076 (0.26)	0.0174 (0.61)	0.0141 (0.5)	0.0228 (0.81)
D_1		0.6692*** (11.0)		0.5294*** (8.54)	
D_2		-0.512*** (-8.54)		-0.421*** (-6.77)	
D_4		0.2865*** (3.44)		0.2054** (2.36)	
ΔU			-0.033*** (-14.3)		-0.027*** (-11.4)
K_1				0.5177*** (8.2)	0.5383*** (8.74)
K_2				-0.286*** (-5.17)	-0.264*** (-5.08)
K_4				0.2804*** (3.62)	0.3231*** (4.4)
Constant	0.0555*** (3.95)	0.0409*** (2.85)	0.0562*** (4.19)	0.031** (2.14)	0.0378*** (2.67)
N	2104				
Adj. R^2	0.0004	0.0916	0.0876	0.1379	0.1366
F	7.8	46.6	73.7	45.2	59.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D1F(2)

Estimated Differenced Log Hours Equations:

Ontario, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.0418 (-1.23)	-0.0283 (-0.86)	-0.0324 (-1.0)	-0.0255 (-0.78)	-0.0266 (-0.82)
D_1		0.4621*** (7.13)		0.3733*** (5.56)	
D_2		-0.59*** (-9.13)		-0.571*** (-8.75)	
D_4		0.3933*** (3.92)		0.3776*** (3.65)	
ΔU			-0.034*** (-13.8)		-0.032*** (-12.6)
K_1				0.2439*** (4.65)	0.2481*** (4.91)
K_2				-0.115* (-1.89)	-0.0588 (-0.99)
K_4				0.0629 (0.86)	0.1019 (1.45)
Constant	-0.0244 (-1.62)	-0.025 (-1.62)	-0.017 (-1.19)	-0.0378** (-2.32)	-0.0396** (-2.5)
N	1893				
Adj. R^2	0.0003	0.076	0.0911	0.0877	0.1025
F	1.79	32.4	64.6	23.9	37.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D2M(1)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0656*** (4.07)	0.0635*** (4.1)	0.0595*** (4.13)	0.0631*** (4.14)	0.061*** (4.26)
$\Delta \text{Residence}$	0.058 (0.68)	0.0275 (0.33)	0.0845 (0.01)	0.0264 (0.32)	0.0185 (0.02)
$\Delta \text{Getmarry}$	0.0647 (1.0)	0.0395 (0.63)	0.0276 (0.48)	0.0406 (0.66)	0.0252 (0.44)
$\Delta \text{Getdivorce}$	-0.0232 (-0.24)	-0.0125 (-0.14)	-0.0239 (-0.28)	-0.0201 (-0.22)	-0.0305 (-0.36)
$\Delta \text{Getunion}$	0.03 (0.79)	0.031 (0.85)	0.0191 (0.56)	0.0418 (1.17)	0.026 (0.77)
$\Delta \text{Nounion}$	0.0427 (1.31)	0.0678** (2.18)	0.08*** (2.76)	0.0648** (2.12)	0.0782*** (2.71)
$\Delta \text{Industry}$	-0.0669 (-1.64)	-0.0411 (-1.03)	-0.0791** (-2.17)	-0.0208 (-0.53)	-0.0596 (-1.63)
$\Delta \text{Occupation}$	0.0283 (0.69)	0.0274 (0.69)	0.0451 (1.21)	0.0309 (0.79)	0.0506 (1.37)
D_1		0.504*** (10.8)		0.4191*** (7.97)	
D_2		-0.367*** (-9.14)		-0.241*** (-5.61)	
D_4		0.1293** (2.44)		0.2149*** (3.74)	
ΔU			-0.038*** (-25.4)		-0.035*** (-21.5)
K_1				0.2423*** (4.46)	0.1366*** (2.74)
K_2				-0.321*** (-7.9)	-0.186*** (-5.33)
K_4				0.0056 (0.08)	-0.0353 (-0.55)
Constant	0.005 (0.54)	-0.0013 (-0.14)	0.0018 (0.21)	0.0012 (0.14)	0.0059 (0.7)
N	2560				
Adj. R^2	0.0077	0.0841	0.2072	0.1146	0.2172
F	3.1	20.5	67.8	23.0	55.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D2M(2)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 25-54, 1986-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1743*** (6.37)	0.1807*** (6.77)	0.1689*** (6.29)	0.1812*** (6.78)	0.1716*** (6.42)
$\Delta \text{Residence}$	-1.437*** (-4.61)	-1.155*** (-3.79)	-1.358*** (-4.45)	-1.14*** (-3.76)	-1.354*** (-4.45)
Getmarry	-0.286*** (-2.95)	-0.279*** (-2.95)	-0.278*** (-2.93)	-0.278*** (-2.94)	-0.268*** (-2.83)
Getdivorce	-0.0646 (-0.58)	0.0193 (0.18)	0.0195 (0.18)	0.0208 (0.19)	0.0339 (0.31)
Getunion	0.0739 (1.36)	0.0736 (1.39)	0.0668 (1.24)	0.0718 (1.35)	0.056 (1.05)
Nounion	0.1159** (2.23)	0.1048** (2.07)	0.1179** (2.32)	0.1042** (2.05)	0.1309** (2.57)
$\Delta \text{Industry}$	0.0477 (0.78)	0.1061* (1.75)	0.0113 (0.19)	0.1056* (1.74)	0.0178 (0.29)
$\Delta \text{Occupation}$	0.0625 (1.03)	0.0348 (0.59)	0.0854 (1.43)	0.0304 (0.51)	0.0785 (1.32)
D_1		0.5133*** (7.75)		0.5055*** (7.22)	
D_2		-0.487*** (-8.38)		-0.502*** (-8.42)	
D_4		0.0833 (0.85)		0.0621 (0.61)	
ΔU			-0.024*** (-9.43)		-0.025*** (-9.98)
K_1				-0.0348 (-0.71)	0.2103*** (4.47)
K_2				0.0474 (0.97)	0.0158 (0.33)
K_4				0.0465 (0.74)	-0.07 (-1.17)
Constant	-0.105*** (-7.3)	-0.067*** (-4.62)	-0.099*** (-7.05)	-0.068*** (-4.49)	-0.081*** (-5.34)
N	2104				
Adj. R^2	0.0315	0.0854	0.0705	0.085	0.0785
F	16.4	23.6	24.3	19.0	20.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D2F(1)

Estimated Differenced Log Hours Equations:

Ontario, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0288 (0.91)	0.0267 (0.88)	0.0364 (1.21)	0.0278 (0.94)	0.0348 (1.18)
$\Delta \text{Residence}$	-0.026 (-0.18)	-0.1488 (-1.1)	-0.093 (-0.69)	-0.0988 (-0.75)	-0.053 (-0.4)
Getmarry	-0.1808 (-1.45)	-0.1734 (-1.46)	0.171 (-1.43)	-0.1661 (-1.43)	-0.1638 (-1.41)
Getdivorce	0.2529 (1.28)	0.2344 (1.24)	0.2 (1.06)	0.1882 (1.02)	0.158 (0.86)
Getunion	0.1933*** (3.54)	0.1545*** (2.96)	0.1708*** (3.27)	0.1355*** (2.66)	0.1488*** (2.92)
Nounion	0.025 (0.43)	0.0345 (0.62)	0.0198 (0.36)	0.0131 (0.24)	-0.0009 (-0.02)
$\Delta \text{Industry}$	0.1109 (1.6)	0.0901 (1.34)	0.1105* (1.67)	0.0772 (1.18)	0.0871 (1.33)
$\Delta \text{Occupation}$	0.0682 (1.06)	0.0613 (0.99)	0.062 (1.0)	0.0569 (0.95)	0.0567 (0.94)
D_1		0.6469*** (10.5)		0.5165*** (8.29)	
D_2		-0.527*** (-8.76)		-0.429*** (-6.89)	
D_4		0.228*** (2.69)		0.168* (1.91)	
ΔU			-0.033*** (-14.2)		-0.026*** (-11.3)
K_1				0.4955*** (7.84)	0.5086*** (8.23)
K_2				-0.294*** (-5.31)	-0.281*** (-5.36)
K_4				0.2572*** (3.3)	0.289*** (3.89)
Constant	0.0233 (1.48)	0.0183 (1.17)	0.0274* (1.83)	0.0134 (0.87)	0.0182 (1.19)
N	2104				
Adj. R^2	0.0111	0.0992	0.0971	0.143	0.1425
F	5.3	21.7	25.2	25.5	29.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D2F(2)

Estimated Differenced Log Hours Equations:

Ontario, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	-0.0356 (-0.96)	-0.0105 (-0.29)	-0.0211 (-0.59)	-0.0083 (-0.23)	-0.0174 (-0.49)
$\Delta \text{Residence}$	-0.889*** (-3.4)	-0.542** (-2.13)	-0.2923 (-1.15)	-0.4721* (-1.85)	-0.274 (-1.08)
Getmarry	0.0397 (0.36)	0.0169 (0.16)	0.0396 (0.37)	-0.0241 (-0.23)	-0.0041 (-0.04)
Getdivorce	-0.192 (-0.89)	-0.248 (-1.19)	-0.2585 (-1.26)	-0.2406 (-1.17)	-0.2448 (-1.2)
Getunion	0.3078*** (5.09)	0.2583*** (4.42)	0.2907*** (5.03)	0.2569*** (4.41)	0.2845*** (4.94)
Nounion	-0.0112 (-0.18)	-0.0184 (-0.31)	-0.0293 (-0.5)	-0.0105 (-0.18)	-0.0223 (-0.38)
$\Delta \text{Industry}$	-0.0506 (-0.7)	0.0338 (0.48)	-0.0116 (-0.17)	0.0277 (0.4)	-0.0185 (-0.27)
$\Delta \text{Occupation}$	0.1197* (1.69)	0.0849 (1.24)	0.1116* (1.65)	0.0823 (1.21)	0.1044 (1.55)
D_1		0.4388*** (6.8)		0.3558*** (5.33)	
D_2		-0.583*** (-8.89)		-0.565*** (-8.57)	
D_4		0.3615*** (3.61)		0.3548*** (3.44)	
ΔU			-0.034*** (-13.4)		-0.032*** (-12.4)
K_1				0.2365*** (4.51)	0.2375*** (4.7)
K_2				-0.1068* (-1.76)	-0.0558 (-0.94)
K_4				0.0343 (0.47)	0.0695 (0.99)
Constant	-0.048*** (-2.92)	-0.048*** (-2.9)	-0.043*** (-2.73)	-0.059*** (-3.43)	-0.0614*** (-3.66)
N	1893				
Adj. R^2	0.0198	0.0887	0.105	0.0993	0.1149
F	5.37	16.5	23.3	15.0	20.0

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D3M(1)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0915*** (5.48)	0.0815*** (5.09)	0.0815*** (5.26)	0.0824*** (5.18)	0.0814*** (5.27)
D_1		0.6212*** (15.2)		0.5656*** (12.8)	
D_2		-0.273*** (-7.17)		-0.2*** (-4.9)	
D_4		0.2921*** (5.37)		0.2912*** (4.99)	
ΔU			-0.036*** (-23.9)		-0.033*** (-20.7)
K_1				0.1375*** (2.63)	0.1523*** (3.16)
K_2				-0.208*** (-5.47)	-0.08** (-2.35)
K_4				0.2161*** (3.22)	0.211*** (3.4)
Constant	0.0279*** (3.12)	0.006 (0.65)	0.0239*** (2.89)	0.0097	0.0206** (2.35)
N	3575				
Adj. R^2	0.0081	0.0894	0.1446	0.102	0.15
F	18.2	72.4	204.5	52.5	107.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D3M(2)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1556*** (6.39)	0.1591*** (6.63)	0.1537*** (6.43)	0.1615*** (6.74)	0.1547*** (6.49)
D_1		0.1814*** (3.19)		0.1925*** (3.26)	
D_2		-0.42*** (-8.14)		-0.459*** (-8.69)	
D_4		0.2724*** (3.25)		0.1915** (2.2)	
ΔU			-0.024*** (-10.5)		-0.026*** (-11.0)
K_1				-0.021 (-0.45)	0.1277*** (2.83)
K_2				0.0967** (2.11)	0.0915** (2.03)
K_4				0.189*** (3.2)	0.1435*** (2.58)
Constant	-0.066*** (-5.38)	-0.039*** (-3.03)	-0.059*** (-4.89)	-0.049 (-3.57)	-0.062*** (-4.66)
N	2870				
Adj. R^2	0.0137	0.0418	0.0501	0.0456	0.0557
F	42.0	34.7	66.0	23.6	36.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D3F(1)

Estimated Differenced Log Hours Equations:

Ontario, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0216 (0.78)	0.0191 (0.72)	0.028 (1.05)	0.0188 (0.72)	0.0269 (1.03)
D_1		0.6987*** (13.7)		0.6105*** (11.6)	
D_2		-0.34*** (-6.77)		-0.265*** (-5.09)	
D_4		0.3621*** (4.95)		0.3275*** (4.24)	
ΔU			-0.033*** (-16.1)		-0.028*** (-13.9)
K_1				0.3706*** (6.85)	0.44*** (8.41)
K_2				-0.267*** (-5.46)	-0.173*** (-3.73)
K_4				0.1588** (2.27)	0.2871*** (4.33)
Constant	0.0664*** (5.18)	0.0344** (2.57)	0.0698*** (5.68)	0.0293** (2.15)	0.047*** (3.55)
N	2892				
Adj. R^2	0.0001	0.0841	0.0822	0.1114	0.1133
F	13.6	59.7	96.6	49.9	67.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D3F(2)

Estimated Differenced Log Hours Equations:

Ontario, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0422 (1.32)	0.0445 (1.44)	0.0417 (1.37)	0.0475 (1.55)	0.0459 (1.52)
D_1		0.4921*** (8.69)		0.3917*** (6.75)	
D_2		-0.506*** (-9.33)		-0.481*** (-8.71)	
D_4		0.2937*** (3.08)		0.2381** (2.44)	
ΔU			-0.035*** (-16.0)		-0.032*** (-14.2)
K_1				0.2828*** (5.94)	0.2675*** (5.8)
K_2				-0.139*** (-2.59)	-0.113** (-2.18)
K_4				0.2195*** (3.34)	0.2098*** (3.33)
Constant	-0.0324 (-0.23)	-0.0053 (-0.37)	0.0057 (0.43)	-0.0249* (-1.65)	-0.0201 (-1.38)
N	2528				
Adj. R^2	0.0003	0.0671	0.0921	0.0857	0.1084
F	0.97	37.2	86.2	30.5	52.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D4M(1)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1133*** (6.5)	0.1042*** (6.23)	0.1036*** (6.4)	0.1069*** (6.43)	0.1042*** (6.44)
$\Delta \text{Residence}$	0.029 (0.31)	0.0367 (0.41)	0.0125 (0.14)	0.0424 (0.47)	0.0221 (0.25)
Getmarry	0.0177 (0.26)	0.0138 (0.21)	0.0002 (0.003)	0.0157 (0.24)	0.0011 (0.02)
Getdivorce	-0.0578 (-0.51)	-0.0315 (-0.29)	-0.0531 (-0.5)	-0.0392 (-0.36)	-0.0537 (-0.51)
Getunion	0.0201 (0.52)	0.0238 (0.64)	0.0366 (1.02)	0.0277 (0.75)	0.0384 (1.07)
Nounion	0.0135 (0.39)	0.0357 (1.09)	0.0453 (1.42)	0.0341 (1.04)	0.0445 (1.41)
$\Delta \text{Industry}$	0.0903** (2.18)	0.1026** (2.57)	0.075* (1.95)	0.1022*** (2.58)	0.0741* (1.92)
$\Delta \text{Occupation}$	0.052 (1.27)	0.0374 (0.94)	0.0536 (1.41)	0.0492 (1.26)	0.0582 (1.53)
D_1		0.603*** (14.8)		0.5543*** (12.5)	
D_2		-0.315*** (-8.13)		-0.233*** (-5.69)	
D_4		0.2655*** (4.87)		0.2816*** (4.84)	
ΔU			-0.036*** (-23.9)		-0.033*** (-20.7)
K_1				0.1227** (2.35)	0.1348*** (2.79)
K_2				-0.235*** (-6.16)	-0.116*** (-3.33)
K_4				0.1757*** (2.62)	0.1675*** (2.68)
Constant	0.0089 (0.88)	-0.011 (-1.1)	0.0037 (0.4)	-0.007 (-0.7)	0.0035 (0.36)
N	3575				
Adj. R^2	0.0133	0.0949	0.1499	0.1084	0.1553
F	7.0	32.7	64.7	30.4	52.0

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D4M(2)

Estimated Differenced Log Hours Equations:

Ontario, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.2052*** (7.78)	0.2142*** (8.22)	0.2042*** (7.88)	0.2128*** (8.17)	0.2025*** (7.82)
$\Delta \text{Residence}$	-0.434** (-2.02)	-0.2456 (-1.16)	-0.341 (-1.61)	-0.228 (-1.07)	-0.3346 (-1.59)
Getmarry	-0.273*** (-3.33)	-0.211*** (-2.62)	-0.221*** (-2.74)	-0.218*** (-2.7)	-0.223*** (-2.78)
Getdivorce	-0.0666 (-0.57)	-0.0098 (-0.09)	0.0091 (0.08)	-0.0195 (-0.17)	0.0044 (0.04)
Getunion	0.1036** (2.09)	0.1131** (2.31)	0.0993** (2.03)	0.1149** (2.35)	0.0967** (1.98)
Nounion	0.0587 (1.19)	0.0468 (0.97)	0.0556 (1.15)	0.0387 (0.8)	0.0531 (1.1)
$\Delta \text{Industry}$	0.0828 (1.46)	0.1239** (2.2)	0.0646 (1.16)	0.1211** (2.15)	0.0578 (1.04)
$\Delta \text{Occupation}$	0.1934*** (3.57)	0.1883*** (3.53)	0.2165*** (4.07)	0.1808*** (3.38)	0.2118*** (3.98)
D_1		0.1934*** (3.45)		0.2017*** (3.45)	
D_2		-0.455*** (-8.75)		-0.479*** (-9.03)	
D_4		0.186** (2.22)		0.1214 (1.4)	
ΔU			-0.024*** (-10.5)		-0.025*** (-10.8)
K_1				-0.023 (-0.5)	0.1311*** (2.94)
K_2				0.0431 (0.93)	0.0362 (0.8)
K_4				0.1617*** (2.76)	0.1036* (1.86)
Constant	-0.098*** (-7.26)	-0.073*** (-5.27)	-0.094*** (-7.05)	-0.078*** (-5.33)	-0.089*** (-6.26)
N	2870				
Adj. R^2	0.0369	0.0663	0.0722	0.0682	0.0756
F	18.0	21.7	27.8	18.0	22.5

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D4F(1)

Estimated Differenced log Hours Equations:

Ontario, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0355 (1.23)	0.0302 (1.09)	0.0442 (1.61)	0.0289 (1.06)	0.0391 (1.45)
$\Delta \text{Residence}$	0.0866 (0.69)	0.0304 (0.25)	0.0743 (0.62)	0.0392 (0.33)	0.0792 (0.67)
Getmarry	-0.1319 (-1.4)	-0.1183 (-1.31)	-0.101 (-1.12)	-0.1176 (-1.32)	-0.1065 (-1.2)
Getdivorce	0.0621 (0.34)	0.0607 (0.35)	0.0171 (0.1)	0.0345 (0.2)	-0.0049 (-0.03)
Getunion	0.1871*** (3.77)	0.1579*** (3.31)	0.1642*** (3.45)	0.1542*** (3.42)	0.1589*** (3.39)
Nounion	0.0184 (0.33)	0.0132 (0.25)	0.0086 (0.16)	-0.0165 (-0.003)	-0.0074 (-0.14)
$\Delta \text{Industry}$	0.102* (1.77)	0.0849 (1.52)	0.1197** (2.17)	0.0856 (1.55)	0.1053* (1.93)
$\Delta \text{Occupation}$	0.0996* (1.84)	0.0794 (1.53)	0.0964* (1.86)	0.0828 (1.62)	0.0093* (1.81)
D_1		0.665*** (12.9)		0.5839*** (11.1)	
D_2		-0.368*** (-7.28)		-0.286*** (-5.47)	
D_4		0.306** (4.11)		0.2869*** (3.69)	
ΔU			-0.033*** (-16.2)		-0.028*** (-13.9)
K_1				0.3513*** (6.5)	0.4056*** (7.74)
K_2				-0.291*** (-5.93)	-0.215*** (-4.59)
K_4				0.133* (1.89)	0.2397*** (3.59)
Constant	0.0254* (1.73)	0.0068 (0.46)	0.029** (2.07)	0.0046 (0.32)	0.0169 (1.17)
N	2892				
Adj. R^2	0.013	0.0921	0.0952	0.1193	0.124
F	8.1	27.8	34.3	29.1	34.7

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D4F(2)

Estimated Differenced log Hours Equations:

Ontario, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0655** (1.96)	0.076** (2.36)	0.0618* (1.94)	0.0764** (2.39)	0.0637** (2.02)
$\Delta \text{Residence}$	0.2548 (1.5)	0.3652** (2.21)	0.4493*** (2.78)	0.4065** (2.48)	0.461*** (2.87)
Getmarry	-0.0556 (-0.62)	-0.0031 (-0.04)	0.019 (0.22)	-0.012 (-0.14)	0.009 (0.11)
Getdivorce	-0.0989 (-0.62)	-0.2372 (-1.53)	-0.394** (-2.56)	-0.2446 (-1.58)	-0.387** (-2.53)
Getunion	0.2826*** (5.09)	0.2447*** (4.57)	0.2675*** (5.08)	0.2285*** (4.3)	0.2496*** (4.75)
Nounion	-0.0135 (-0.24)	-0.0272 (-0.5)	-0.0355 (-0.66)	-0.0278 (-0.52)	-0.0337 (-0.63)
$\Delta \text{Industry}$	-0.0142 (-0.23)	0.0613 (1.01)	0.008 (0.13)	0.0585 (0.98)	0.0073 (0.12)
$\Delta \text{Occupation}$	0.204*** (3.33)	0.1883*** (3.18)	0.1971*** (3.38)	0.1787*** (3.04)	0.1858*** (3.21)
D_1		0.4492*** (7.97)		0.3613*** (6.25)	
D_2		-0.579*** (-10.5)		-0.544*** (-9.74)	
D_4		0.2491*** (2.63)		0.2205** (2.28)	
ΔU			-0.036*** (-16.5)		-0.033*** (-14.8)
K_1				0.2563*** (5.41)	0.2325*** (5.06)
K_2				-0.167*** (-3.14)	-0.147*** (-2.85)
K_4				0.1671** (2.55)	0.1557** (2.47)
Constant	-0.047*** (-3.05)	-0.047*** (-3.0)	-0.039*** (-2.64)	-0.059*** (-3.67)	-0.054*** (-3.46)
N	2528				
Adj. R^2	0.0202	0.0902	0.1158	0.1063	0.129
F	6.7	21.8	34.0	21.0	29.7

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix D: Table 2D5(1)

Variable Means and Standard Deviations: Ontario, Aged 25-54, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.0006	0.40082	0.06086	0.63763
$\Delta \ln(W/CPI)$	-0.08798	0.55773	-0.03606	0.47147
D_1	0.03203	0.17612	0.04895	0.21582
D_2	0.04453	0.20631	0.05181	0.22169
D_3	0.89727	0.30367	0.8712	0.33506
D_4	0.02617	0.15968	0.02804	0.16513
ΔU	-0.72656	4.9688	0.02804	5.9126
K_1	0.02695	0.16198	0.05133	0.22072
K_2	0.04727	0.21225	0.07414	0.26207
K_3	0.90938	0.28713	0.8327	0.37333
K_4	0.01641	0.12706	0.04183	0.20024
$\Delta \text{Residence}$	0.00859	0.09232	0.00903	0.09462
Getmarry	0.01445	0.11937	0.01283	0.11258
Getdivorce	0.00781	0.08806	0.00428	0.06528
Getunion	0.04688	0.211421	0.06844	0.25256
Nonunion	0.07656	0.26595	0.06939	0.25418
$\Delta \text{Industry}$	0.09531	0.2937	0.10599	0.3079
$\Delta \text{Occupation}$	0.09844	0.29796	0.12405	0.32972
N	2560		2104	
ΔH	-2.8277	534.84	45.967	654.56
ΔW	0.03743	5.6796	0.47041	4.6418

Appendix D: Table 205(2)

Variable Means and Standard Deviations: Ontario, Aged 25-54, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.08193	0.45198	-0.01061	0.64813
$\Delta \ln(W/CPI)$	-0.08283	0.6132	-0.07295	0.4384
D_1	0.02852	0.16648	0.03751	0.19005
D_2	0.05133	0.22072	0.05599	0.22997
D_3	0.90494	0.29336	0.88801	0.31544
D_4	0.01521	0.12241	0.01849	0.13475
ΔU	0.36644	5.0142	0.31062	5.3197
K_1	0.07082	0.25658	0.07501	0.26348
K_2	0.07889	0.26964	0.06392	0.24467
K_3	0.80703	0.39472	0.81088	0.39171
K_4	0.04325	0.20347	0.05019	0.21838
$\Delta \text{Residence}$	0.00143	0.03774	0.00317	0.05623
Getmarry	0.01473	0.12051	0.01585	0.12492
Getdivorce	0.01236	0.1105	0.00739	0.0857
Getunion	0.05056	0.23105	0.06445	0.24561
Nonunion	0.08127	0.27332	0.06867	0.25297
$\Delta \text{Industry}$	0.10076	0.30108	0.10882	0.3115
$\Delta \text{Occupation}$	0.09696	0.29597	0.11833	0.32308
N	2104		1893	
ΔH	-104.6	593.43	-25.753	674.34
ΔW	-0.01346	4.6594	0.23296	4.2339

Appendix D: Table 2D6(1)

Variable Means and Standard Deviations: Ontario, Aged 16-69, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.0179	0.53178	0.06889	0.69311
$\Delta \ln(W/CPI)$	-0.06901	0.53908	-0.02475	0.47025
D_1	0.04587	0.20924	0.06017	0.23784
D_2	0.05427	0.22657	0.06432	0.24536
D_3	0.87105	0.33519	0.84371	0.3632
D_4	0.02881	0.1673	0.03181	0.17553
ΔU	-0.1158	5.4401	0.09924	6.3503
K_1	0.03525	0.18442	0.06293	0.24288
K_2	0.06126	0.23984	0.08091	0.27275
K_3	0.88056	0.32435	0.81328	0.38976
K_4	0.02294	0.14972	0.04288	0.20261
$\Delta \text{Residence}$	0.00839	0.09123	0.01003	0.09965
Getmarry	0.01566	0.12419	0.01798	0.1329
Getdivorce	0.00615	0.07822	0.00449	0.06691
Getunion	0.05371	0.22547	0.07192	0.2584
Nonunion	0.07888	0.26959	0.0612	0.23974
$\Delta \text{Industry}$	0.12196	0.32728	0.13243	0.33902
$\Delta \text{Occupation}$	0.12615	0.33207	0.15318	0.36022
N	3575		2892	
ΔH	11.777	602.73	51.707	670.15
ΔW	0.16739	5.3306	0.46509	4.4513

Appendix D: Table 2D6(2)

Variable Means and Standard Deviations: Ontario, Aged 16-69, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.05285	0.56065	-0.00509	0.69265
$\Delta \ln(W/CPI)$	-0.09112	0.49022	-0.06729	0.42888
D_1	0.03868	0.19286	0.0443	0.20581
D_2	0.05819	0.23414	0.06408	0.24495
D_3	0.88258	0.32198	0.87342	0.33257
D_4	0.02056	0.14192	0.01819	0.13369
ΔU	0.39686	5.1333	0.36788	5.5594
K_1	0.07317	0.26046	0.08109	0.27303
K_2	0.08258	0.27529	0.07239	0.25918
K_3	0.79652	0.40266	0.79549	0.40342
K_4	0.04774	0.21324	0.05103	0.2201
$\Delta \text{Residence}$	0.00244	0.04993	0.00514	0.07154
Getmarry	0.01882	0.1359	0.02294	0.14975
Getdivorce	0.00976	0.0983	0.00831	0.09078
Getunion	0.06028	0.23804	0.06646	0.24913
Nonunion	0.07526	0.26386	0.0621	0.24139
$\Delta \text{Industry}$	0.11742	0.32198	0.13805	0.34502
$\Delta \text{Occupation}$	0.123	0.32849	0.14873	0.3559
N	2870		2528	
ΔH	-81.184	634.39	-17.167	674.0
ΔW	0.14623	4.3453	0.25428	4.0504

Appendix 2E: Table 2E1M(1)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0363*** (2.78)	0.0365*** (2.98)	0.0245** (2.17)	0.0381*** (3.15)	0.0262** (2.34)
D_1		0.5017*** (12.5)		0.4089*** (9.18)	
D_2		-0.593*** (-15.3)		-0.459*** (-10.5)	
D_4		0.2722*** (6.31)		0.2987*** (6.13)	
ΔU			-0.038*** (-33.7)		-0.035*** (-29.3)
K_1				0.2265*** (4.99)	0.1324*** (3.4)
K_2				-0.271*** (-7.44)	-0.176*** (-5.99)
K_4				0.1454*** (2.84)	0.0849** (1.98)
Constant	-0.0026 (-0.31)	-0.0067 (-0.79)	-0.0119 (-1.62)	-0.0041 (-0.48)	-0.0068 (-0.86)
N	3353				
Adj. R^2	0.002	0.1199	0.2549	0.1463	0.2654
F	4.2	92.3	383.2	72.8	202.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E1M(2)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0975*** (6.97)	0.0967*** (7.1)	0.0986*** (7.47)	0.1024*** (7.53)	0.1046*** (7.94)
D_1		0.5177*** (11.2)		0.4567*** (9.59)	
D_2		-0.265*** (-6.22)		-0.229*** (-5.22)	
D_4		0.0634 (1.27)		0.0132 (0.24)	
ΔU			-0.032*** (-19.3)		-0.03*** (-17.5)
K_1				0.1757*** (5.57)	0.1653*** (5.55)
K_2				-0.16*** (-4.92)	-0.098*** (-3.15)
K_4				0.0678 (1.63)	0.0878** (2.42)
Constant	-0.0029 (-0.31)	-0.0127 (-1.32)	-0.0023	-0.0161 (-1.57)	-0.0136 (-1.38)
N	2994				
Adj. R^2	0.0156	0.0681	0.1243	0.0874	0.1375
F	26.5	45.5	143.9	37.3	81.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E1F(1)

Estimated Differenced Log Hours Equations:

Prairie, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0301 (1.37)	0.0306 (1.44)	0.0304 (1.46)	0.0361* (1.72)	0.0351* (1.7)
D_1		0.5213*** (9.65)		0.453*** (8.2)	
D_2		-0.481*** (-10.3)		-0.378*** (-7.68)	
D_4		0.0607 (0.82)		0.0716 (0.94)	
ΔU			-0.032*** (-18.8)		-0.028*** (-15.9)
K_1				0.2791*** (4.78)	0.2552*** (4.53)
K_2				-0.299*** (-6.83)	-0.242*** (-5.91)
K_4				0.157*** (3.04)	0.1519*** (3.14)
Constant	0.0093 (0.76)	0.0148 (1.16)	0.0173 (1.49)	0.0168 (1.27)	0.0184 (1.44)
N	3039				
Adj. R^2	0.0003	0.0654	0.1042	0.0914	0.123
F	1.11	43.4	118.6	39.1	71.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E1F(2)

Estimated Differenced Log Hours Equations:

Prairie, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1037*** (3.73)	0.1099*** (4.03)	0.1144*** (4.26)	0.1181*** (4.39)	0.1225*** (4.62)
D_1		0.4479*** (6.6)		0.3512*** (5.19)	
D_2		-0.487*** (-7.35)		-0.479*** (-7.24)	
D_4		0.2768*** (2.77)		0.1633 (1.63)	
ΔU			-0.035*** (-14.6)		-0.031*** (-13.1)
K_1				0.4052*** (8.25)	0.3698*** (7.75)
K_2				-0.21*** (-3.92)	-0.163*** (-3.11)
K_4				0.2066*** (3.47)	0.2074*** (3.6)
Constant	0.042*** (2.9)	0.04*** (2.67)	0.0495*** (3.54)	0.0139 (0.87)	0.0163 (1.06)
N	2869				
Adj. R^2	0.0045	0.0404	0.073	0.072	0.0985
F	9.28	25.9	77.6	29.3	53.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E2M(1)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.051*** (3.41)	0.0532*** (3.78)	0.0258** (1.99)	0.0516*** (3.71)	0.0284** (2.19)
$\Delta \text{Residence}$	-0.142** (-2.87)	-0.0942** (-2.01)	-0.0479 (-1.11)	-0.0703 (-1.52)	-0.0332 (-0.77)
Getmarry	0.1285* (1.95)	0.1155* (1.87)	0.1123** (1.97)	0.1147* (1.88)	0.1126** (1.99)
Getdivorce	-0.2098** (-2.02)	-0.2382** (-2.44)	-0.194** (-2.16)	-0.257*** (-2.66)	-0.2067** (-2.31)
Getunion	0.0674* (1.76)	0.0571 (1.59)	0.0453 (1.37)	0.0631* (1.79)	0.0499 (1.52)
Nounion	0.0339 (1.1)	0.0372 (1.28)	0.0579** (2.16)	0.0279 (0.97)	0.0516* (1.94)
$\Delta \text{Industry}$	0.1494*** (3.42)	0.1641*** (3.97)	0.0765** (2.02)	0.1349*** (3.29)	0.0731* (1.93)
$\Delta \text{Occupation}$	-0.0993** (-2.33)	-0.106*** (-2.65)	-0.107*** (-2.9)	-0.0835** (-2.14)	-0.094** (-2.56)
D_1		0.4926*** (12.3)		0.4028*** (9.03)	
D_2		-0.607*** (-15.5)		-0.472*** (-10.8)	
D_4		0.2489*** (5.72)		0.2864*** (5.87)	
ΔU			-0.038*** (-33.5)		-0.035*** (-29.2)
K_1				0.2251*** (4.94)	0.1335*** (3.41)
K_2				-0.268*** (-7.34)	-0.174*** (-5.86)
K_4				0.1215** (2.36)	0.0697 (1.61)
Constant	-0.0096 (-1.01)	-0.0133 (-1.45)	-0.015* (-1.84)	-0.0103 (-1.12)	-0.0106 (-1.26)
N	3353				
Adj. R^2	0.0094	0.1269	0.2585	0.1517	0.2685
F	4.5	41.6	117.9	40.9	95.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E2M(2)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1183*** (6.99)	0.121*** (7.3)	0.1196*** (7.48)	0.126*** (7.67)	0.1231*** (7.75)
$\Delta \text{Residence}$	-0.041 (-0.49)	-0.0173 (-0.21)	-0.0197 (-0.25)	-0.0277 (-0.34)	-0.0287 (-0.36)
Getmarry	0.1605*** (2.91)	0.1125** (2.08)	0.1056** (2.02)	0.0922* (1.73)	0.0882* (1.7)
Getdivorce	0.0862 (1.1)	0.0927 (1.21)	0.1066 (1.43)	0.0785 (1.03)	0.092 (1.25)
Getunion	0.1195*** (2.92)	0.0959** (2.4)	0.0948** (2.45)	0.1038*** (2.63)	0.0999*** (2.6)
Nounion	0.018 (0.51)	0.0251 (0.73)	0.0285 (0.85)	0.0084 (0.24)	0.0132 (0.4)
$\Delta \text{Industry}$	0.1805*** (4.2)	0.1508*** (3.58)	0.1265*** (3.11)	0.1558*** (3.73)	0.1255*** (3.09)
$\Delta \text{Occupation}$	-0.099** (-2.35)	-0.0639 (-1.54)	-0.0543 (-1.36)	-0.056 (-1.37)	-0.0483 (-1.22)
D_1		0.4828*** (10.4)		0.427*** (8.93)	
D_2		-0.286*** (-6.67)		-0.244*** (-5.56)	
D_4		0.0405 (0.81)		-0.0008 (-0.01)	
ΔU			-0.031*** (-18.9)		-0.029*** (-17.1)
K_1				0.1683*** (5.34)	0.1559*** (5.22)
K_2				-0.173*** (-5.3)	-0.114*** (-3.63)
K_4				0.0537 (1.29)	0.0678* (1.86)
Constant	-0.023** (-2.25)	-0.029*** (-2.77)	-0.0202** (-2.07)	-0.03*** (-2.79)	-0.027*** (-2.6)
N	2994				
Adj. R^2	0.0262	0.0749	0.1299	0.0944	0.1426
F	10.4	21.5	46.1	22.1	39.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E2F(1)

Estimated Differenced Log Hours Equations:

Prairie, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0324 (1.39)	0.0412* (1.83)	0.0352 (1.6)	0.0466** (2.1)	0.0409* (1.87)
$\Delta \text{Residence}$	-0.0721 (-0.95)	-0.0102 (-0.14)	0.0622 (0.87)	-0.0852 (-0.12)	0.0589 (0.83)
$\Delta \text{Getmarry}$	0.0128 (0.13)	0.0357 (0.37)	0.0472 (0.09)	0.03 (0.31)	0.0418 (0.44)
$\Delta \text{Getdivorce}$	0.1109 (0.9)	0.1263 (1.06)	0.2188* (1.88)	0.1114 (0.95)	0.1956* (1.7)
$\Delta \text{Getunion}$	0.1119** (2.03)	0.1203** (2.25)	0.0936* (1.79)	0.1249** (2.37)	0.1002* (1.94)
$\Delta \text{Nounion}$	-0.0597 (-1.31)	-0.0243 (-0.55)	-0.0656 (-1.52)	-0.0384 (-0.88)	-0.0726* (-1.7)
$\Delta \text{Industry}$	0.0519 (0.93)	0.0488 (0.9)	0.0425 (0.8)	0.0696 (1.29)	0.0614 (1.16)
$\Delta \text{Occupation}$	0.0324 (0.58)	0.0699 (1.29)	0.0586 (1.11)	0.0602 (1.13)	0.054 (1.04)
D_1		0.5093*** (9.38)		0.4427*** (7.99)	
D_2		-0.506*** (-10.6)		-0.397*** (-7.95)	
D_4		0.0369 (0.5)		0.0554 (0.73)	
ΔU			-0.033*** (-18.9)		-0.028*** (-15.9)
K_1				0.271*** (4.64)	0.2427*** (4.29)
K_2				-0.315*** (-7.17)	-0.263*** (-6.32)
K_4				0.141*** (2.71)	0.1351*** (2.76)
Constant	-0.0176 (-0.13)	-0.0029 (-0.2)	0.0553 (0.04)	0.001 (0.07)	0.0039 (0.28)
N	3039				
Adj. R^2	0.0021	0.0687	0.1075	0.0954	0.127
F	1.66	19.6	37.5	22.3	34.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E2F(2)

Estimated Differenced Log Hours Equations:

Prairie, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1237*** (3.85)	0.1346*** (4.27)	0.1359*** (4.38)	0.1335*** (4.3)	0.1338*** (4.37)
$\Delta \text{Residence}$	-0.2297 (-1.62)	-0.1333 (-0.95)	-0.1249 (-0.91)	-0.1971 (-1.43)	-0.1991 (-1.47)
Getmarry	-0.341*** (-2.63)	-0.277** (-2.17)	-0.2386* (-1.9)	-0.2536** (-2.02)	-0.2245* (-1.82)
Getdivorce	-0.1261 (-0.89)	-0.1194 (-0.86)	-0.1311 (-0.96)	-0.0899 (-0.66)	-0.0994 (-0.74)
Getunion	-0.0275 (-0.49)	-0.016 (-0.29)	-0.0294 (-0.54)	0.0563 (0.1)	-0.078 (-0.14)
Nounion	-0.0799 (-1.46)	-0.0956* (-1.78)	-0.082 (-1.55)	-0.1069** (-2.02)	-0.0932* (-1.79)
$\Delta \text{Industry}$	0.0534 (0.81)	0.0774 (1.19)	0.0575 (0.91)	0.0687 (1.08)	0.0452 (0.72)
$\Delta \text{Occupation}$	0.0832 (1.32)	0.0938 (1.51)	0.0878 (1.44)	0.0823 (1.35)	0.0754 (1.25)
D_1		0.4488*** (6.62)		0.3541*** (5.24)	
D_2		-0.497*** (-7.39)		-0.481*** (-7.18)	
D_4		0.2588*** (2.58)		0.16 (1.59)	
ΔU			-0.034*** (-14.4)		-0.031*** (-12.9)
K_1				0.4044*** (8.22)	0.3703*** (7.73)
K_2				-0.218*** (-4.07)	-0.171*** (-3.24)
K_4				0.1826*** (3.04)	0.1888*** (3.24)
Constant	0.0428*** (2.65)	0.0365** (2.22)	0.0473*** (3.04)	0.013 (0.76)	0.0177 (1.06)
N	2869				
Adj. R^2	0.0087	0.0446	0.0757	0.0758	0.1008
F	4.19	12.5	24.9	16.9	26.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E· Table 2E3M(1)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0423*** (2.94)	0.0522*** (3.77)	0.0372*** (2.82)	0.0516*** (3.79)	0.0392*** (3.01)
D_1		0.6182*** (16.0)		0.4602*** (11.1)	
D_2		-0.293*** (-8.12)		-0.212*** (-5.29)	
D_4		0.2395*** (5.71)		0.202*** (4.32)	
ΔU			-0.034*** (-29.6)		-0.03*** (-24.8)
K_1				0.3919*** (9.28)	0.0332*** (8.61)
K_2				-0.205*** (-5.82)	-0.07** (-2.36)
K_4				0.2332*** (4.78)	0.2411*** (5.71)
Constant	0.0407*** (4.54)	0.0166* (1.77)	0.0345*** (4.19)	0.0105 (1.11)	0.0157* (1.76)
N	4633				
Adj. R^2	0.0016	0.0748	0.1608	0.1053	0.1792
F	12.9	79.4	303.2	71.4	172.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E3M(2)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1121*** (7.22)	0.1107*** (7.27)	0.1156*** (7.76)	0.1154*** (7.59)	0.1211*** (8.14)
D_1		0.5423*** (11.9)		0.4895*** (10.4)	
D_2		-0.16*** (-3.98)		-0.118*** (-2.84)	
D_4		0.0175 (0.32)		-0.0108 (-0.19)	
ΔU			-0.031*** (-18.4)		-0.029*** (-16.7)
K_1				0.1653*** (4.9)	0.1681*** (5.23)
K_2				-0.189*** (-5.5)	-0.112*** (-3.38)
K_4				0.0349 (0.84)	0.0867** (2.22)
Constant	0.0263*** (2.64)	0.0101 (0.96)	0.0303*** (3.16)	0.0104 (0.93)	0.0191* (1.76)
N	3986				
Adj. R^2	0.0127	0.0512	0.0897	0.0654	0.0996
F	26.5	44.0	131.8	35.8	74.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E3F(1)

Estimated Differenced Log Hours Equations:

Prairie, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0244 (1.15)	0.0307 (1.49)	0.0266 (1.32)	0.0334 (1.64)	0.0312 (1.56)
D_1		0.6267*** (13.7)		0.5459*** (11.6)	
D_2		-0.384*** (-9.08)		-0.303*** (-6.77)	
D_4		0.2473 (3.77)		0.2524*** (3.72)	
ΔU			-0.035*** (-22.9)		-0.032*** (-19.9)
K_1				0.3417*** (6.91)	0.3363*** (7.07)
K_2				-0.239*** (-5.99)	-0.125*** (-3.34)
K_4				0.1485*** (3.14)	0.1713*** (3.88)
Constant	0.0317*** (2.76)	0.014 (1.16)	0.0369*** (3.4)	0.0081 (0.64)	0.0194 (1.6)
N	4296				
Adj. R^2	0.0001	0.0656	0.1083	0.0873	0.1233
F	4.18	62.6	177.2	53.2	102.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E3F(2)

Estimated Differenced Log Hours Equations:

Prairie, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1324*** (5.26)	0.1332*** (5.39)	0.1421*** (5.84)	0.1496*** (6.11)	0.1578*** (6.53)
D_1		0.5023*** (9.09)		0.4244*** (7.68)	
D_2		-0.396*** (-7.55)		-0.404*** (-7.63)	
D_4		0.1875** (2.18)		0.0361 (0.99)	
ΔU			-0.035*** (-16.4)		-0.032*** (-15.2)
K_1				0.3757*** (8.86)	0.3493*** (8.42)
K_2				-0.068 (-1.53)	-0.0234 (-0.54)
K_4				0.2211*** (4.43)	0.2302*** (4.78)
Constant	0.0454*** (3.59)	0.0386*** (2.91)	0.0557*** (4.56)	0.0033 (0.23)	0.0114 (0.82)
N	3813				
Adj. R^2	0.0069	0.0445	0.072	0.0679	0.0926
F	17.1	37.6	101.7	10136.5	66.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E4M(1)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0906*** (5.77)	0.1*** (6.59)	0.0821*** (5.69)	0.0956*** (6.38)	0.0794*** (5.53)
$\Delta \text{Residence}$	-0.139*** (-2.74)	-0.0856* (-1.74)	-0.0457 (-0.98)	-0.064 (-1.32)	-0.0347 (-0.75)
Getmarry	0.1242* (1.94)	0.0952 (1.55)	0.0675 (1.15)	0.09 (1.48)	0.0665 (1.14)
Getdivorce	-0.0256** (-2.23)	-0.0248** (-2.24)	-0.242** (-2.29)	-0.273** (-2.5)	-0.262** (-2.5)
Getunion	-0.0007 (-0.02)	-0.0058 (-0.15)	-0.0226 (-0.65)	-0.0102 (-0.28)	-0.0253 (-0.73)
Nounion	-0.0253 (-0.75)	-0.0217 (-0.66)	-0.021 (-0.68)	-0.0307 (-0.96)	-0.0293 (-0.96)
$\Delta \text{Industry}$	0.23*** (5.33)	0.2333*** (5.62)	0.2006*** (5.13)	0.2185*** (5.33)	0.1857*** (4.74)
$\Delta \text{Occupation}$	0.0403 (0.96)	0.0308 (0.76)	0.0438 (1.13)	0.0292 (0.73)	0.0386 (1.01)
D_1		0.5897*** (15.4)		0.4527*** (11.0)	
D_2		-0.344*** (-9.42)		-0.243*** (-6.05)	
D_4		0.1747*** (4.16)		0.1744*** (3.75)	
ΔU			-0.334*** (-29.5)		-0.03*** (-24.6)
K_1				0.3592*** (8.52)	0.3016*** (7.82)
K_2				-0.233*** (-6.62)	-0.112*** (-3.72)
K_4				0.168*** (3.43)	0.1716*** (4.02)
Constant	0.0122 (1.21)	-0.0053 (-0.52)	0.0081 (0.87)	-0.0063 (-0.62)	-0.00002 (-0.002)
N	4633				
Adj. R^2	0.0228	0.0939	0.177	0.1217	0.1922
F	14.8	42.5	102.6	45.0	87.3

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E4M(2)

Estimated Differenced Log Hours Equations:

Prairie, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1268*** (7.14)	0.1298*** (7.39)	0.1352*** (7.92)	0.1338*** (7.68)	0.1377*** (8.09)
Δ Residence	0.1073 (1.25)	0.1015 (1.2)	0.1389* (1.69)	0.0812 (0.97)	0.119 (1.45)
Getmarry	0.0964* (1.71)	0.0678 (1.22)	0.0472 (0.87)	0.042 (0.76)	0.0256 (0.47)
Getdivorce	-0.0083 (-0.1)	-0.0153 (-0.18)	0.0002 (0.002)	-0.0273 (-0.28)	-0.0099 (-0.12)
Getunion	0.1919*** (4.61)	0.162*** (3.96)	0.1558*** (3.89)	0.1768*** (4.35)	0.1664*** (4.17)
Nounion	0.0161 (0.44)	0.0197 (0.54)	0.0209 (0.59)	0.0084 (0.23)	0.008 (0.23)
Δ Industry	0.1309*** (2.9)	0.1171*** (2.63)	0.0595** (2.21)	0.1354*** (3.05)	0.1065** (2.45)
Δ Occupation	-0.058 (-1.31)	-0.0322 (-0.75)	-0.0072 (-0.17)	-0.0409 (-0.95)	-0.0283 (-0.4)
D_1		0.5141*** (11.3)		0.4654*** (9.93)	
D_2		-0.189*** (-4.61)		-0.14*** (-3.33)	
D_4		-0.0007 (-0.01)		-0.0202 (-0.35)	
ΔU			-0.031*** (-18.2)		-0.028*** (-16.4)
K_1				0.1574*** (4.65)	0.157*** (4.87)
K_2				-0.21*** (-6.09)	-0.138*** (-4.12)
K_4				0.0179 (0.43)	0.0632* (1.65)
Constant	0.0006 (0.05)	-0.011 (-0.95)	0.0052 (0.49)	-0.0079 (-0.67)	0.000007 (0.0006)
N	3986				
Adj. R^2	0.0207	0.0572	0.0957	0.0724	0.1057
F	10.3	21.1	43.2	21.7	37.2

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E4F(1)

Estimated Differenced log Hours Equations:

Prairie, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0378* (1.7)	0.0494** (2.29)	0.0436** (2.07)	0.0518** (2.43)	0.0469** (2.25)
$\Delta \text{Residence}$	-0.066 (-0.99)	-0.0187 (-0.29)	0.0683 (1.08)	-0.0184 (-0.29)	0.0581 (0.93)
$\Delta \text{Getmarry}$	-0.027 (-0.3)	-0.0126 (-0.15)	0.0063 (0.07)	-0.0237 (-0.03)	0.0174 (0.21)
$\Delta \text{Getdivorce}$	0.0342 (0.27)	0.0507 (0.42)	0.181 (1.53)	0.0278 (0.23)	0.1529 (1.31)
$\Delta \text{Getunion}$	0.1113** (2.2)	0.1184** (2.42)	0.0884* (1.85)	0.1221** (2.53)	0.0928** (1.96)
$\Delta \text{Nounion}$	-0.117*** (-2.66)	-0.0857** (-2.01)	-0.114*** (-2.73)	-0.103** (-2.44)	-0.124*** (-3.0)
$\Delta \text{Industry}$	0.0975* (1.92)	0.0855* (1.74)	0.0911* (1.9)	0.1118** (2.29)	0.1057** (2.21)
$\Delta \text{Occupation}$	0.1083** (2.17)	0.1409*** (2.9)	0.1308*** (2.78)	0.1307*** (2.73)	0.1249*** (2.67)
D_1		0.6031*** (13.2)		0.5288*** (11.3)	
D_2		-0.437*** (-10.1)		-0.341*** (-7.54)	
D_4		0.1829*** (2.77)		0.2055*** (3.03)	
ΔU			-0.035*** (-23.2)		-0.032*** (-20.0)
K_1				0.3263*** (6.63)	0.3157*** (6.66)
K_2				-0.281*** (-7.0)	-0.179*** (-4.73)
K_4				0.1151** (2.43)	0.1264*** (2.84)
Constant	0.0051 (0.39)	-0.0129 (-0.98)	0.0032 (0.26)	-0.0152 (-1.12)	-0.0055 (-0.42)
N	4296				
Adj. R^2	0.0097	0.0764	0.1198	0.0996	0.1351
F	6.37	31.2	60.2	33.1	53.1

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E4F(2)

Estimated Differenced log Hours Equations:

Prairie, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1695*** (5.94)	0.1756*** (6.27)	0.1793*** (6.49)	0.1856*** (6.7)	0.1866*** (6.83)
$\Delta \text{Residence}$	-0.337*** (-2.89)	-0.259** (-2.26)	-0.2673** (-2.37)	-0.2845** (-2.51)	-0.3*** (-2.69)
Getmarry	-0.2146** (-2.36)	-0.1403 (-1.57)	-0.1346 (-1.53)	-0.1324 (-1.49)	-0.1304 (-1.49)
Getdivorce	-0.1385 (-1.07)	-0.1252 (-0.98)	-0.1359 (-1.08)	-0.1019 (-0.81)	-0.1129 (-0.91)
Getunion	0.0566 (1.2)	0.0471 (1.02)	0.0502 (1.1)	0.0529 (1.16)	0.0556 (1.23)
Nounion	-0.0614 (-1.27)	-0.0717 (-1.52)	-0.0603 (-1.29)	-0.0721 (-1.54)	-0.0614 (-1.33)
$\Delta \text{Industry}$	0.0963* (1.72)	0.1169** (2.11)	0.0991 (1.82)	0.104* (1.89)	0.0805 (1.49)
$\Delta \text{Occupation}$	0.0953* (1.77)	0.104** (1.97)	0.0939* (1.81)	0.0982* (1.88)	0.0857* (1.66)
D_1		0.4928*** (8.95)		0.4193*** (7.61)	
D_2		-0.414*** (-7.82)		-0.412*** (-7.74)	
D_4		0.1677* (1.95)		0.0846 (0.98)	
ΔU			-0.034*** (-16.2)		-0.032*** (-15.0)
K_1				0.3696*** (8.74)	0.3452*** (8.33)
K_2				-0.0873** (-1.97)	-0.0414 (-0.95)
K_4				0.1865*** (3.71)	0.2021*** (4.15)
Constant	0.0301** (2.11)	0.0206 (1.41)	0.0383*** (2.76)	-0.0096 (-0.63)	0.0005 (0.04)
N	3813				
Adj. R^2	0.0156	0.0532	0.0791	0.0755	0.0985
F	8.36	19.3	34.3	22.2	33.5

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2E: Table 2E5(1)

Variable Means and Standard Deviations: Prairie, Aged 25-54, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00649	0.46067	0.00882	0.7018
$\Delta \ln(W/CPI)$	-0.13676	0.67376	-0.07728	0.55666
D_1	0.04086	0.19799	0.04936	0.21665
D_2	0.04832	0.21446	0.07042	0.25589
D_3	0.87534	0.33039	0.85554	0.35161
D_4	0.03549	0.18504	0.02468	0.15517
ΔU	-0.14196	6.4235	0.19579	7.0622
K_1	0.03996	0.1959	0.04837	0.21458
K_2	0.07005	0.25533	0.09938	0.29921
K_3	0.86102	0.34598	0.79237	0.40568
K_4	0.02893	0.16763	0.05989	0.23732
$\Delta \text{Residence}$	0.03012	0.17095	0.02534	0.15717
Getmarry	0.01461	0.12002	0.01218	0.10968
Getdivorce	0.00567	0.07507	0.00888	0.09385
Getunion	0.05309	0.22424	0.05627	0.23048
Nonunion	0.09484	0.29304	0.08687	0.28169
$\Delta \text{Industry}$	0.12019	0.32523	0.1257	0.33156
$\Delta \text{Occupation}$	0.12377	0.32937	0.12833	0.33451
N	3353		3039	
ΔH	0.71575	655.01	2.8115	702.97
ΔW	-0.35352	7.1828	0.11759	5.5173

Appendix 2E: Table 2E5(2)

Variable Means and Standard Deviations: Prairie, Aged 25-54, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.02845	0.49746	0.03782	0.7684
$\Delta \ln(W/CPI)$	-0.17803	0.65264	-0.11336	0.51313
D_1	0.03741	0.18979	0.04531	0.20802
D_2	0.04542	0.20827	0.04845	0.21475
D_3	0.88477	0.31935	0.88428	0.31994
D_4	0.0324	0.17708	0.02196	0.14657
ΔU	0.07148	4.3249	0.15824	6.0065
K_1	0.08717	0.28214	0.0955	0.29396
K_2	0.08183	0.27415	0.07877	0.26943
K_3	0.77121	0.42012	0.75776	0.42852
K_4	0.05979	0.23713	0.06797	0.25173
$\Delta \text{Residence}$	0.01303	0.1134	0.00941	0.09657
Getmarry	0.01703	0.12942	0.0115	0.10665
Getdivorce	0.0147	0.12035	0.00976	0.09832
Getunion	0.05711	0.2321	0.06483	0.24627
Nonunion	0.09085	0.28744	0.08714	0.28209
$\Delta \text{Industry}$	0.1336	0.34028	0.12374	0.32934
$\Delta \text{Occupation}$	0.13928	0.34629	0.14256	0.34968
N	2994		2869	
ΔH	-32.462	706.44	16.418	702.88
ΔW	-0.57588	5.5188	-0.20018	4.1009

Appendix 2E: Table 2E6(1)

Variable Means and Standard Deviations: Prairie, Aged 16-69, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.029	0.58176	0.02894	0.7687
$\Delta \ln(W/CPI)$	-0.11409	0.64752	-0.06527	0.53959
D_1	0.05223	0.22252	0.06425	0.24522
D_2	0.06108	0.23951	0.07309	0.26032
D_3	0.84136	0.36538	0.83473	0.37147
D_4	0.04533	0.20804	0.02793	0.1648
ΔU	-0.12799	6.9257	0.08659	7.1957
K_1	0.04921	0.21633	0.06122	0.23976
K_2	0.08547	0.27962	0.10033	0.30047
K_3	0.82927	0.37631	0.77374	0.41846
K_4	0.03605	0.18642	0.06471	0.24604
$\Delta \text{Residence}$	0.03065	0.17239	0.02817	0.16547
Getmarry	0.01792	0.13266	0.01467	0.12022
Getdivorce	0.0054	0.07327	0.00815	0.0899
Getunion	0.05698	0.23183	0.05679	0.23148
Nonunion	0.08483	0.27865	0.07961	0.27072
$\Delta \text{Industry}$	0.14893	0.35606	0.14502	0.35216
$\Delta \text{Occupation}$	0.15109	0.35818	0.15037	0.35748
N	4633		4296	
ΔH	21.241	700.48	13.615	719.34
ΔW	-0.18505	6.663	0.1398	5.1666

Appendix 2E: Table 2E6(2)

Variable Means and Standard Deviations: Prairie, Aged 16-69, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.1463	0.71845	0.03707	0.78241
$\Delta \ln(W/CPI)$	-0.16249	0.63132	-0.1088	0.50103
D_1	0.04742	0.21255	0.05193	0.22191
D_2	0.0567	0.23129	0.0577	0.2332
D_3	0.86252	0.3444	0.86703	0.33958
D_4	0.03337	0.17961	0.02334	0.151
ΔU	0.09378	5.6475	0.23394	5.9672
K_1	0.09207	0.28916	0.0973	0.2964
K_2	0.08831	0.28378	0.09048	0.28691
K_3	0.75289	0.43139	0.738	0.43978
K_4	0.06673	0.24959	0.07422	0.26216
$\Delta \text{Residence}$	0.01405	0.11771	0.01102	0.10439
Getmarry	0.02057	0.14196	0.01783	0.13236
Getdivorce	0.0138	0.11667	0.00944	0.09672
Getunion	0.06147	0.24021	0.0716	0.25785
Nonunion	0.08931	0.28523	0.0834	0.27652
$\Delta \text{Industry}$	0.15228	0.35934	0.14267	0.34978
$\Delta \text{Occupation}$	0.1578	0.3646	0.16365	0.37001
N	3986		3813	
ΔH	-12.222	755.76	13.618	713.88
ΔW	-0.48199	5.2486	-0.19168	3.9705

Appendix 2F: Table 2F1M(1)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1089*** (5.26)	0.1194*** (6.14)	0.1229*** (7.01)	0.1257*** (6.64)	0.129*** (7.66)
D_1		0.5266*** (9.3)		0.3351*** (5.79)	
D_2		-0.414*** (-7.68)		-0.211*** (-3.47)	
D_4		0.2337*** (2.84)		0.2341*** (2.72)	
ΔU			-0.041*** (-21.4)		-0.033*** (-17.0)
K_1				0.4039*** (8.33)	0.3681*** (8.63)
K_2				-0.449*** (-7.02)	-0.246*** (-4.76)
K_4				0.2432*** (3.43)	0.2239*** (3.83)
Constant	0.0188 (1.36)	0.0102 (0.73)	0.0133 (1.14)	-0.0063 (-0.47)	-0.0079 (-0.65)
N	1171				
Adj. R^2	0.0223	0.1401	0.2977	0.2329	0.3554
F	14.0	39.0	166.2	45.3	108.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F1M(2)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1131*** (4.36)	0.1171*** (4.74)	0.1108*** (4.63)	0.1341*** (5.51)	0.1222*** (5.14)
D_1		0.3696*** (5.69)		0.1717** (2.45)	
D_2		-0.432*** (-7.76)		-0.416*** (-7.47)	
D_4		-0.255*** (-3.31)		-0.324*** (-3.8)	
ΔU			-0.026*** (-13.5)		-0.023*** (-11.3)
K_1				0.3357*** (6.79)	0.2495*** (5.45)
K_2				-0.067 (-1.35)	-0.0633 (-1.35)
K_4				0.1762** (2.34)	-0.0341 (-0.52)
Constant	-0.0139 (-0.98)	0.0039 (0.28)	-0.0084 (-0.65)	-0.0157 (-1.06)	-0.0232 (-1.64)
N	1037				
Adj. R^2	0.0171	0.1075	0.164	0.1492	0.1879
F	11.4	26.6	69.9	24.1	41.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F1F(1)

Estimated Differenced Log Hours Equations:

BC, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0233 (0.51)	0.0374 (0.87)	0.0507 (1.19)	0.0362 (0.85)	0.0514 (1.23)
D_1		0.7675*** (8.46)		0.6641*** (7.0)	
D_2		-0.465*** (-5.12)		-0.413*** (-4.25)	
D_4		0.4785*** (4.67)		0.4895*** (4.53)	
ΔU			-0.035*** (-12.5)		-0.032*** (-11.2)
K_1				0.4317*** (4.53)	0.4597*** (5.05)
K_2				-0.141* (-1.78)	-0.066 (-0.91)
K_4				-0.0002 (-0.003)	0.0935 (1.11)
Constant	0.0839*** (3.6)	0.0415* (1.72)	0.0653*** (3.01)	0.0325 (1.28)	0.0392 (1.6)
N	967				
Adj. R^2	0.0008	0.1113	0.1379	0.1322	0.1594
F	6.54	27.9	57.2	21.1	33.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F1F(2)

Estimated Differenced Log Hours Equations:

BC, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0962* (1.72)	0.1118** (2.07)	0.1233** (2.29)	0.1252** (2.33)	0.1335** (2.5)
D_1		0.4272*** (4.3)		0.3414*** (3.28)	
D_2		-0.581*** (-5.74)		-0.659*** (-6.49)	
D_4		0.3636** (2.33)		0.1928 (1.18)	
ΔU			-0.032*** (-8.32)		-0.033*** (-8.42)
K_1				0.1388* (1.71)	0.0749 (0.95)
K_2				-0.342*** (-4.15)	-0.358*** (-3.24)
K_4				0.3393*** (2.76)	0.3639*** (3.24)
Constant	-0.024 (-0.92)	-0.0236 (-0.86)	-0.0266 (-1.06)	-0.077*** (-2.58)	-0.091 (-3.17)
N	864				
Adj. R^2	0.0023	0.0654	0.0755	0.0871	0.1015
F	2.19	13.2	24.7	11.4	17.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F2M(1)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0982*** (4.31)	0.1148*** (5.34)	0.1248*** (6.42)	0.1192*** (5.86)	0.127*** (6.81)
$\Delta \text{Residence}$	0.1741 (1.51)	0.1793* (1.65)	0.1249 (1.27)	0.1499 (1.46)	0.1094 (1.16)
Getmarry	0.3531*** (2.61)	0.276** (2.16)	0.2228* (1.92)	0.2685** (2.22)	0.2138* (1.93)
Getdivorce	0.0835 (0.7)	0.0118 (0.1)	-0.1675 (-1.63)	-0.0618 (-0.64)	-0.215** (-2.18)
Getunion	-0.0966* (-1.69)	-0.0786 (-1.46)	-0.0182 (-0.37)	-0.0406 (-0.8)	0.0052 (0.11)
Nounion	0.017 (0.34)	0.0116 (0.25)	0.0596 (0.14)	0.0143 (0.32)	0.003 (0.07)
$\Delta \text{Industry}$	-0.0846 (-1.09)	-0.0837 (-1.13)	-0.064 (-0.96)	-0.0992 (-1.41)	-0.0899 (-1.4)
$\Delta \text{Occupation}$	-0.048 (-0.68)	0.0097 (0.14)	0.0612 (1.0)	0.0188 (0.29)	0.0671 (1.15)
D_1		0.516*** (9.08)		0.327*** (5.63)	
D_2		-0.397*** (-7.2)		-0.2*** (-3.27)	
D_4		0.2618*** (3.14)		0.257*** (2.97)	
ΔU			-0.04*** (-21.1)		-0.034*** (-16.9)
K_1				0.4097*** (8.41)	0.3762*** (8.78)
K_2				-0.437*** (-6.78)	-0.24*** (-4.57)
K_4				0.2474*** (3.45)	0.2297*** (3.85)
Constant	0.0256* (1.67)	0.0122 (0.81)	0.0115 (0.88)	-0.006 (-0.41)	-0.0102 (-0.77)
N	1171				
Adj. R^2	0.0314	0.1433	0.2988	0.2354	0.3578
F	5.1	17.3	50.8	25.0	51.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F2M(2)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.124*** (3.94)	0.1359*** (4.52)	0.128*** (4.41)	0.1564*** (5.29)	0.1417*** (4.92)
Δ Residence	-0.3138 (-1.07)	-0.0919 (-0.33)	-0.1607 (-0.59)	-0.0815 (-0.3)	-0.1265 (-0.47)
Getmarry	-0.0435 (-0.52)	-0.0367 (-0.46)	-0.0067 (-0.09)	-0.0201 (-0.26)	0.0047 (0.06)
Getdivorce	-0.1334 (-1.33)	-0.1115 (-1.16)	-0.1179 (-1.27)	-0.0919 (-0.98)	-0.1105 (-1.21)
Getunion	0.1056* (1.75)	0.1033* (1.79)	0.1197** (2.15)	0.1011* (1.79)	0.1096** (1.99)
Nounion	0.0172 (0.25)	0.0072 (0.11)	0.0546 (0.85)	0.0265 (0.41)	0.0598 (0.94)
Δ Industry	-0.0466 (-0.81)	0.0118 (0.21)	-0.0323 (-0.61)	0.0178 (0.32)	-0.046 (-0.87)
Δ Occupation	0.0883 (1.51)	0.0746 (1.33)	0.0685 (1.27)	0.0694 (1.26)	0.088* (1.65)
D_1		0.3624*** (5.51)		0.1668** (2.35)	
D_2		-0.437*** (-7.67)		-0.42*** (-7.38)	
D_4		-0.261*** (-3.34)		-0.327*** (-3.78)	
ΔU			-0.026*** (-13.5)		-0.023*** (-11.3)
K_1				0.3323*** (6.72)	0.2483*** (5.42)
K_2				-0.0761 (-1.53)	-0.0694 (-1.45)
K_4				0.1667** (2.19)	-0.0427 (-0.65)
Constant	-0.0192 (-1.25)	-0.0049 (-0.32)	-0.017 (-1.19)	-0.0248 (-1.59)	-0.032** (-2.09)
N	1037				
Adj. R^2	0.0186	0.1086	0.1658	0.1501	0.1901
F	3.5	11.8	21.9	13.4	20.0

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F2F(1)

Estimated Differenced Log Hours Equations:

BC, Females, Aged 25-54, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0236 (0.49)	0.0439 (0.96)	0.0458 (1.02)	0.0319 (0.87)	0.0424 (0.96)
$\Delta \text{Residence}$	-0.2887* (-1.7)	-0.122 (-0.76)	-0.1201 (-0.76)	-0.1528 (-0.96)	-0.1452 (-0.93)
Getmarry	0.0705 (0.4)	0.0836 (0.5)	0.0202 (0.12)	0.0655 (0.39)	0.0116 (0.07)
Getdivorce	0.1267 (0.59)	0.0532 (0.25)	0.0925 (0.46)	0.0579 (0.29)	0.0875 (0.44)
Getunion	0.1947* (1.69)	0.2111* (1.94)	0.2322** (2.17)	0.2273** (2.11)	0.2389** (2.26)
Nounion	-0.0869 (-0.89)	-0.0717 (-0.78)	-0.1021 (-1.13)	-0.0699 (-0.77)	-0.0979 (-1.09)
$\Delta \text{Industry}$	0.2599** (2.27)	0.2599** (2.4)	0.2642** (2.49)	0.2258** (2.09)	0.2231** (2.11)
$\Delta \text{Occupation}$	-0.0804 (-0.78)	-0.066 (-0.67)	-0.1281 (-1.33)	-0.0588 (-0.61)	-0.1203 (-1.26)
D_1		0.7463*** (8.19)		0.6527*** (6.86)	
D_2		-0.503*** (-5.38)		-0.44*** (-4.41)	
D_4		0.4545*** (4.41)		0.4793*** (4.42)	
ΔU			-0.035*** (-12.5)		-0.032*** (-11.2)
K_1				0.4192*** (4.39)	0.4482*** (4.91)
K_2				-0.143* (-1.8)	-0.072 (-0.99)
K_4				-0.0277 (-0.3)	0.0337 (0.83)
Constant	0.0706*** (2.7)	0.0274 (1.05)	0.0543** (2.23)	0.0214 (0.79)	0.0337 (1.29)
N	967				
Adj. R^2	0.0059	0.1168	0.1437	0.1369	0.1638
F	2.96	12.8	18.6	12.	16.7

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F2F(2)

Estimated Differenced Log Hours Equations:

BC, Females, Aged 25-54, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1255** (2.02)	0.1332** (2.2)	0.1357** (2.26)	0.1441** (2.39)	0.1381** (2.32)
$\Delta \text{Residence}$	-0.2482 (-0.61)	-0.2099 (-0.53)	-0.2205 (-0.56)	-0.1245 (-0.32)	-0.1313 (-0.34)
$\Delta \text{Getmarry}$	-0.1417 (-0.62)	0.022 (0.1)	-0.0399 (-0.18)	0.0147 (0.07)	-0.0485 (-0.22)
$\Delta \text{Getdivorce}$	0.0399 (0.2)	0.1409 (0.74)	0.1915 (1.0)	0.0899 (0.47)	0.1469 (0.78)
$\Delta \text{Getunion}$	0.1327 (1.14)	0.0838 (0.74)	0.0665 (0.59)	0.0624 (0.56)	0.0486 (0.44)
$\Delta \text{Nounion}$	-0.0133 (-0.11)	0.0493 (0.42)	0.0221 (0.19)	0.0434 (0.38)	0.0247 (0.22)
$\Delta \text{Industry}$	-0.0569 (-0.44)	-0.0927 (-0.73)	-0.0997 (-0.79)	-0.1199 (-0.96)	-0.138 (-1.11)
$\Delta \text{Occupation}$	0.2027* (1.87)	0.181* (1.72)	0.1621 (1.55)	0.1915* (1.83)	0.1613 (1.56)
D_1		0.4127*** (4.12)		0.3329*** (3.18)	
D_2		-0.586*** (-5.71)		-0.663*** (-6.44)	
D_4		0.3569** (2.27)		0.1963 (1.19)	
ΔU			-0.031*** (-8.12)		-0.032*** (-8.26)
K_1				0.1362* (1.65)	0.0764 (0.95)
K_2				-0.345*** (-4.16)	-0.357*** (-4.36)
K_4				0.3212*** (2.6)	0.3522*** (3.1)
Constant	-0.0463 (-1.6)	-0.0439 (-1.47)	-0.0437 (-1.56)	-0.094*** (-2.97)	-0.104*** (-3.38)
N	864				
Adj. R^2	0.0025	0.0633	0.0729	0.0844	0.0981
F	1.28	5.89	7.84	6.34	8.26

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F3M(1)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1225*** (5.16)	0.1312*** (5.76)	0.1359*** (6.26)	0.1378*** (6.2)	0.1411*** (6.62)
D_1		0.5222*** (8.82)		0.3541*** (5.69)	
D_2		-0.381*** (-6.5)		-0.251*** (-3.75)	
D_4		0.3114*** (3.84)		0.2299*** (2.67)	
ΔU			-0.036*** (-17.6)		-0.03*** (-13.8)
K_1				0.3654*** (6.52)	0.3197*** (6.14)
K_2				-0.291*** (-4.36)	-0.165*** (-2.92)
K_4				0.2953*** (3.89)	0.2749*** (4.09)
Constant	0.0397** (2.55)	0.0203 (1.24)	0.0293** (2.06)	0.0033 (0.2)	0.0045 (0.29)
N	1556				
Adj. R^2	0.0162	0.0978	0.1796	0.1418	0.2084
F	15.3	25.4	115.8	33.6	69.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F3M(2)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1615*** (5.16)	0.1645*** (5.35)	0.1515*** (5.03)	0.1753*** (5.76)	0.1606*** (5.35)
D_1		0.3532*** (4.92)		0.2249*** (2.99)	
D_2		-0.333*** (-5.43)		-0.302*** (-4.87)	
D_4		-0.1296 (-1.53)		-0.149* (-1.65)	
ΔU			-0.024*** (-10.6)		-0.021*** (-8.87)
K_1				0.3456*** (6.24)	0.2853*** (5.46)
K_2				-0.098* (-1.68)	-0.072 (-1.29)
K_4				-0.071 (-0.99)	-0.1308** (-1.97)
Constant	0.0046 (0.29)	0.0147 (0.87)	0.0099 (0.65)	-0.001 (-0.06)	-0.0045 (-0.26)
N	1379				
Adj. R^2	0.0182	0.0569	0.0917	0.0876	0.1146
F	13.5	17.5	47.2	17.5	30.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F3F(1)

Estimated Differenced Log Hours Equations:

BC, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0104 (0.23)	0.0153 (0.35)	0.0272 (0.63)	0.0211 (0.49)	0.0346 (0.81)
D_1		0.8095*** (10.1)		0.6296*** (7.36)	
D_2		-0.411*** (-4.72)		-0.373*** (-3.99)	
D_4		0.3333*** (7.49)		0.2828*** (2.78)	
ΔU			-0.234*** (-12.5)		-0.029*** (-10.4)
K_1				0.5101*** (5.85)	0.57*** (6.95)
K_2				-0.1062 (-1.37)	-0.0301 (-0.43)
K_4				0.098 (1.11)	0.1586* (1.95)
Constant	0.0827*** (3.66)	0.0282 (1.18)	0.0615*** (2.87)	0.0823 (0.33)	0.0132 (0.54)
N	1288				
Adj. R^2	0.0007	0.0973	0.1067	0.1223	0.1387
F	6.72	31.5	56.9	25.2	37.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F3F(2)

Estimated Differenced Log Hours Equations:

BC, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Not Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0764 (1.52)	0.0746 (1.53)	0.0867* (1.79)	0.0863* (1.77)	0.0973** (2.01)
D_1		0.5517*** (6.4)		0.4775*** (5.31)	
D_2		-0.452*** (-5.05)		-0.512*** (-5.63)	
D_4		0.4783*** (3.32)		0.3835** (2.53)	
ΔU			-0.033*** (-9.91)		-0.033*** (-9.59)
K_1				0.1899** (2.51)	0.1427* (1.95)
K_2				-0.201** (-2.49)	-0.241*** (-3.03)
K_4				0.2002* (1.9)	0.2512** (2.56)
Constant	-0.0124 (-0.51)	-0.0359 (-1.39)	-0.0213 (-0.91)	-0.076*** (-2.71)	-0.075*** (-2.79)
N	1132				
Adj. R^2	0.0011	0.0672	0.0803	0.0753	0.0913
F	1.44	17.2	33.8	12.5	19.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F4M(i)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1341*** (5.27)	0.1415*** (5.8)	0.1482*** (6.39)	0.1431*** (5.99)	0.1477*** (6.45)
$\Delta \text{Residence}$	0.1148 (0.95)	0.1372 (1.18)	0.1113 (1.01)	0.1146 (1.01)	0.1003 (0.92)
Getmarry	0.4431*** (3.16)	0.3548*** (2.63)	0.3528*** (2.76)	0.3285** (2.49)	0.3244** (2.57)
Getdivorce	0.0681 (0.45)	0.0106 (0.07)	-0.1369 (-0.98)	-0.0717 (-0.5)	-0.1858 (-1.35)
Getunion	-0.189*** (-2.93)	-0.179*** (-2.89)	-0.15** (-2.55)	-0.1288** (-2.12)	-0.1166** (-2.0)
Nounion	-0.123** (-2.23)	-0.1234** (-2.33)	-0.1238** (-2.46)	-0.128** (-2.46)	-0.125*** (-2.6)
$\Delta \text{Industry}$	0.0517 (0.63)	0.0348 (0.44)	0.0557 (0.74)	0.059 (0.75)	0.06 (0.79)
$\Delta \text{Occupation}$	0.091 (1.17)	0.1132 (1.51)	0.1237* (1.74)	0.0793 (1.08)	0.0966 (1.38)
D_1		0.4979*** (8.4)		0.3379*** (5.44)	
D_2		-0.414*** (-6.95)		-0.287*** (-4.26)	
D_4		0.2505*** (2.99)		0.1718** (1.96)	
ΔU			-0.036*** (-17.7)		-0.03*** (-14.0)
K_1				0.3597*** (6.41)	0.3046*** (5.84)
K_2				-0.278*** (-4.1)	-0.181*** (-3.12)
K_4				0.2839*** (3.71)	0.2383*** (3.48)
Constant	0.0392** (2.22)	0.0256 (1.44)	0.0253 (1.57)	0.0083 (0.47)	0.0064 (0.38)
N	1556				
Adj. R^2	0.0293	0.1087	0.1921	0.1496	0.218
F	6.6	17.1	38.4	19.5	34.7

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F4M(2)

Estimated Differenced Log Hours Equations:

BC, Males, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1884*** (5.31)	0.2033*** (5.88)	0.1936*** (5.69)	0.219*** (6.41)	0.2064*** (6.14)
$\Delta \text{Residence}$	-0.1708 (-0.76)	-0.0437 (-0.2)	-0.1093 (-0.51)	-0.1583 (-0.73)	-0.1966 (-0.93)
Getmarry	-0.0349 (-0.35)	-0.0748 (-0.77)	-0.0268 (-0.28)	-0.0448 (-0.47)	-0.0109 (-0.12)
Getdivorce	-0.0895 (-0.74)	-0.0717 (-0.61)	-0.1054 (-0.91)	-0.0978 (-0.84)	-0.1262 (-1.11)
Getunion	0.12* (1.77)	0.1337** (2.02)	0.1428** (2.2)	0.1163* (1.79)	0.1226* (1.91)
Nounion	-0.0311 (-0.4)	-0.0084 (-0.12)	0.0458 (0.61)	0.0177 (0.24)	0.0602 (0.82)
$\Delta \text{Industry}$	-0.188*** (-2.94)	-0.168*** (-2.64)	-0.19*** (-3.11)	-0.183*** (-2.93)	-0.206*** (-3.39)
$\Delta \text{Occupation}$	0.4134*** (6.84)	0.4348*** (7.36)	0.4206*** (7.27)	0.4575*** (7.85)	0.4483*** (7.83)
D_1		0.3653*** (5.15)		0.2509*** (3.39)	
D_2		-0.372*** (-6.06)		-0.326*** (-5.3)	
D_4		-0.147* (-1.72)		-0.1258 (-1.4)	
ΔU			-0.025*** (-11.1)		-0.021*** (-9.29)
K_1				0.3334*** (6.13)	0.2832*** (5.49)
K_2				-0.145** (-2.52)	-0.1145** (-2.06)
K_4				-0.1318* (-1.86)	-0.181*** (-2.78)
Constant	-0.027 (-1.55)	-0.0202 (-1.14)	-0.0264 (-1.57)	-0.0316* (-1.72)	-0.0353** (-1.98)
N	1379				
Adj. R^2	0.052	0.0969	0.1299	0.1308	0.1569
F	9.3	13.3	21.5	14.8	20.7

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F4F(1)

Estimated Differenced log Hours Equations:

BC, Females, Aged 16-69, 1986-1987

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.0269 (0.56)	0.0366 (0.8)	0.0416 (0.92)	0.0408 (0.91)	0.046 (1.03)
$\Delta \text{Residence}$	-0.1814 (-1.25)	-0.0395 (-0.28)	-0.0403 (-0.29)	-0.0366 (-0.27)	-0.0378 (-0.28)
Getmarry	0.042 (0.27)	0.08 (0.55)	0.0206 (0.14)	0.0769 (0.53)	0.0279 (0.2)
Getdivorce	0.2798 (1.23)	0.2119 (0.98)	0.2289 (1.07)	0.198 (0.93)	0.1957 (1.64)
Getunion	0.1271 (1.22)	0.1384 (1.4)	0.1488 (1.51)	0.1497 (1.53)	0.1585 (0.93)
Nounion	-0.0842 (-0.92)	-0.0613 (-0.7)	-0.0874 (-1.01)	-0.0577 (-0.67)	-0.0748 (-0.88)
$\Delta \text{Industry}$	0.2561** (2.44)	0.2507** (2.51)	0.2535** (2.56)	0.2239** (2.27)	0.2142** (2.19)
$\Delta \text{Occupation}$	0.0677 (0.69)	0.09 (0.96)	0.0479 (0.52)	0.1066 (1.15)	0.06 (0.66)
D_1		0.7704*** (9.62)		0.6062*** (7.12)	
D_2		-0.51*** (-5.7)		-0.455*** (-4.78)	
D_4		0.2742*** (2.86)		0.2496** (2.46)	
ΔU			-0.034*** (-12.4)		-0.029*** (-10.3)
K_1				0.4911*** (5.67)	0.5434*** (6.64)
K_2				-0.1297* (-1.68)	-0.0757 (-1.06)
K_4				0.0417 (0.47)	0.0969 (1.18)
Constant	0.046* (1.8)	-0.0039 (-0.16)	0.0242 (1.0)	-0.0194 (-0.73)	-0.0112 (-0.43)
N	1288				
Adj. R^2	0.0128	0.111	0.1188	0.1351	0.148
F	4.25	15.6	19.8	15.4	19.3

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F4F(2)

Estimated Differenced log Hours Equations:

BC, Females, Aged 16-69, 1988-1989

Changes in Personal Characteristics Considered

Indep. Var.	1	2	3	4	5
$\Delta \ln(W/CPI)$	0.1375** (2.55)	0.1324** (2.54)	0.1349*** (2.61)	0.1401*** (2.69)	0.1388*** (2.69)
$\Delta \text{Residence}$	-0.3984 (-1.14)	-0.3434 (-1.01)	-0.4219 (-1.26)	-0.3208 (-0.9)	-0.395 (-1.18)
Getmarry	-0.0376 (-0.24)	0.0397 (0.26)	0.0466 (0.31)	0.0106 (0.07)	0.0127 (0.08)
Getdivorce	-0.0495 (-0.27)	0.0325 (0.18)	0.0805 (0.46)	0.0027 (0.02)	0.0597 (0.34)
Getunion	-0.0769 (-0.71)	-0.0869 (-0.83)	-0.1163 (-1.12)	-0.1131 (-1.08)	-0.136 (-1.31)
Nounion	-0.0467 (-0.43)	-0.022 (-0.21)	-0.0733 (-0.7)	-0.0409 (-0.38)	-0.0846 (-0.8)
$\Delta \text{Industry}$	0.0334 (0.3)	0.0289 (0.27)	0.0377 (0.36)	-0.0285 (-0.003)	0.0046 (0.04)
$\Delta \text{Occupation}$	0.2602*** (2.58)	0.2349** (2.41)	0.2018** (2.08)	0.2458** (2.52)	0.2044** (2.11)
D_1		0.5315*** (6.16)		0.4612*** (5.12)	
D_2		-0.471*** (5.24)		-0.527*** (-5.78)	
D_4		0.433*** (2.99)		0.348** (2.29)	
ΔU			-0.033*** (-9.7)		-0.032*** (-9.41)
K_1				0.1889** (2.47)	0.1435* (1.94)
K_2				-0.199** (-2.48)	-0.234*** (-2.94)
K_4				0.1784* (1.69)	0.2275** (2.3)
Constant	-0.0393 (-1.45)	-0.059** (-2.12)	-0.0418 (-1.61)	-0.093*** (-3.17)	-0.088 (-3.08)
N	1132				
Adj. R^2	0.0094	0.0732	0.0853	0.0805	0.0949
F	2.14	8.41	11.5	7.58	10.1

Note: t - ratio given in parenthesis; or two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 2F: Table 2F5(1)

Variable Means and Standard Deviations: BC, Aged 25-54, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.01197	0.47609	0.08255	0.75856
$\Delta \ln(W/CPI)$	-0.12467	0.66386	-0.01392	0.47648
D_1	0.05722	0.23235	0.06618	0.24873
D_2	0.0743	0.26236	0.07859	0.26924
D_3	0.83689	0.36962	0.80972	0.39272
D_4	0.0316	0.175	0.0455	0.20851
ΔU	-0.28096	6.6374	-0.28335	8.1984
K_1	0.09394	0.29187	0.07239	0.25926
K_2	0.06661	0.24945	0.10134	0.30194
K_3	0.78907	0.40814	0.73526	0.44142
K_4	0.05038	0.21883	0.091	0.28776
$\Delta \text{Residence}$	0.01623	0.1264	0.01965	0.13886
Getmarry	0.01025	0.10075	0.01965	0.13886
Getdivorce	0.01623	0.1264	0.01344	0.11522
Getunion	0.04526	0.20796	0.03826	0.19193
Nonunion	0.10333	0.30452	0.06618	0.24873
$\Delta \text{Industry}$	0.09138	0.28826	0.091	0.28776
$\Delta \text{Occupation}$	0.10333	0.30452	0.11582	0.32018
N	1171		967	
ΔH	27.783	703.69	62.721	742.12
ΔW	-0.32717	5.6824	0.38687	3.7207

Appendix 2F: Table 2F5(2)

Variable Means and Standard Deviations: 6C, Aged 25-54, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.03911	0.44585	-0.01181	0.7686
$\Delta \ln(W/CPI)$	-0.12239	0.57307	-0.08125	0.47469
D_1	0.04629	0.21021	0.07407	0.26204
D_2	0.05304	0.22422	0.06366	0.24428
D_3	0.86885	0.33772	0.82755	0.37799
D_4	0.03182	0.17561	0.03472	0.18318
ΔU	0.30665	6.0004	0.03935	7.3269
K_1	0.08872	0.28447	0.103	0.30415
K_2	0.08293	0.27591	0.10185	0.30263
K_3	0.78206	0.41304	0.72454	0.44701
K_4	0.04629	0.21021	0.0706	0.25631
$\Delta \text{Residence}$	0.00482	0.0693	0.00579	0.07589
Getmarry	0.02218	0.14734	0.01736	0.13069
Getdivorce	0.01832	0.13418	0.0162	0.12633
Getunion	0.05979	0.23721	0.05324	0.22464
Nonunion	0.07425	0.26231	0.05671	0.23143
$\Delta \text{Industry}$	0.10608	0.30808	0.09259	0.29003
$\Delta \text{Occupation}$	0.108	0.31054	0.11921	0.32423
N	1037		864	
ΔH	-55.868	604.32	-22.539	676.16
ΔW	-0.10912	5.192	0.06149	3.9443

Appendix 2F: Table 2F6(1)

Variable Means and Standard Deviations: BC, Aged 16-69, 1986-1987

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.03151	0.63371	0.08003	0.85818
$\Delta \ln(W/CPI)$	-0.1001	0.65788	-0.00691	0.47029
D_1	0.06684	0.24982	0.08152	0.27374
D_2	0.08291	0.27583	0.08152	0.27374
D_3	0.80656	0.39513	0.78494	0.41103
D_4	0.0437	0.2045	0.05202	0.22215
ΔU	-0.24614	7.291	-0.4472	8.2653
K_1	0.09383	0.29169	0.08618	0.28074
K_2	0.08033	0.2719	0.10559	0.30743
K_3	0.76414	0.42467	0.71584	0.45119
K_4	0.0617	0.24068	0.09239	0.28969
$\Delta \text{Residence}$	0.01864	0.13528	0.02639	0.16038
Getmarry	0.01157	0.10697	0.02407	0.15332
Getdivorce	0.01285	0.11268	0.01165	0.10733
Getunion	0.05012	0.21828	0.04348	0.20401
Nonunion	0.1009	0.30129	0.06677	0.24972
$\Delta \text{Industry}$	0.12275	0.32826	0.11491	0.31903
$\Delta \text{Occupation}$	0.1401	0.34721	0.14053	0.34767
N	1556		1288	
ΔH	29.504	759.77	56.659	783.09
ΔW	-0.1721	5.6541	0.37898	3.6003

Appendix 2F: Table 2F6(2)

Variable Means and Standard Deviations: BC, Aged 16-69, 1988-1989

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.02095	0.60002	-0.08524	0.54799
$\Delta \ln(W/CPI)$	-0.10484	0.54492	-0.08386	0.47933
D_1	0.05729	0.23248	0.08039	0.27201
D_2	0.05874	0.23522	0.06891	0.2534
D_3	0.84554	0.36152	0.81714	0.38672
D_4	0.03843	0.19231	0.03357	0.1802
ΔU	0.15011	6.518	-0.02474	7.4648
K_1	0.10007	0.30021	0.10954	0.31245
K_2	0.08775	0.28303	0.09982	0.2999
K_3	0.75925	0.4277	0.71025	0.45385
K_4	0.05294	0.22399	0.08039	0.27201
$\Delta \text{Residence}$	0.00798	0.08899	0.00707	0.08381
Getmarry	0.02103	0.14354	0.02915	0.16831
Getdivorce	0.01595	0.12534	0.01502	0.12168
Getunion	0.05801	0.23385	0.05565	0.22935
Nonunion	0.06744	0.25087	0.05634	0.23106
$\Delta \text{Industry}$	0.12328	0.32888	0.12102	0.3263
$\Delta \text{Occupation}$	0.13343	0.34016	0.14488	0.35213
N	1379		1132	
ΔH	-46.066	666.68	-12.59	697.26
ΔW	-0.04311	4.9259	0.0364	3.7131

Appendix 3A: Table 3A1

Variable Definition

$\Delta \ln H$ =	Log(hours in Quarter t) - Log(hours in Quarter t-1), t = 8, 7, ..., 2;
$\Delta \ln W$ =	Log(hourly wages in Quarter t) - Log(hourly wages in Quarter t-1), t = 8, 7, ..., 2;
D_1 =	1 if the individual is unemployed in Quarter t-1 but not in Quarter t, t = 8, 7, ..., 2;
D_2 =	1 if the individual is unemployed in Quarter t but not in Quarter t-1, t = 8, 7, ..., 2;
D_3 =	1 if the individual is not unemployed in both Quarter t-1 and Quarter t, t = 8, 7, ..., 2;
D_4 =	1 if the individual is unemployed in both Quarter t-1 and Quarter t, t = 8, 7, ..., 2;
ΔU =	weeks of unemployment in Quarter t - weeks of unemployment in Quarter t-1, t = 8, 7, ... 2;
$\Delta \ln CPI$ =	Log(CPI in Quarter t) - Log(CPI in Quarter t-1), t = 8, 7, ..., 2;
Getpen =	1 if the individual is covered by a job-related pension plan in Quarter t but not in Quarter t-1, t = 8, 7, ..., 2;
Getnopen =	1 if the individual is covered by a job-related pension plan in Quarter t-1 but not in Quarter t, t = 8, 7, ..., 2;
Getunion =	1 if the individual is a union member in Quarter t but not in Quarter t-1, t = 8, 7, ..., 2;

Nonunion= 1 if the individual is a union member in Quarter $t-1$ but not
in Quarter t , $t = 8, 7, \dots, 2$;

Δ Industry = 1 if industry in Quarter $t \neq$ industry in Quarter $t-1$,
 $t = 8, 7, \dots, 2$;

Δ Occupation = 1 if occupation in Quarter $t \neq$ occupation in Quarter $t-1$,
 $t = 8, 7, \dots, 2$;

Tran12 = 1 if transion between Quarters 1 and 2;

Tran23 = 1 if transion between Quarters 2 and 3;

Tran34 = 1 if transion between Quarters 3 and 4;

Tran45 = 1 if transion between Quarter 4 in 1988 and Quater 1 in 1989

Appendix 3A: Table 3A2

Variable Means and Standard Deviations: Canada, Aged 25-44

	Males		Females	
Variable	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.001543	0.26797	0.001133	0.33454
$\Delta \ln W$	0.007488	0.097472	0.008363	0.094035
$\Delta \ln CPI$	0.011512	0.005399	0.011491	0.005437
D_1	0.014015	0.11755	0.012797	0.1124
D_2	0.014459	0.11938	0.012204	0.1098
D_3	0.96464	0.18469	0.96966	0.17152
D_4	0.006885	0.082693	0.005338	0.072869
ΔU	-0.002166	1.0511	-0.002139	1.0581
Getpen	0.017486	0.13107	0.017075	0.12955
Getnopen	0.01281	0.11245	0.012222	0.10988
Getunion	0.011806	0.10801	0.012204	0.1098
Nounion	0.010041	0.099702	0.010029	0.09965
$\Delta \text{Industry}$	0.020599	0.14204	0.018423	0.13448
$\Delta \text{Occupation}$	0.020398	0.14136	0.021641	0.14551
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	-0.72232	98.876	0.065767	89.848
ΔW	0.11095	1.4221	0.093506	1.1645
N	69713		55636	

Appendix 3A: Table 3A3

Variable Means and Standard Deviations: Canada, Aged 16-69

	Males		Females	
Variable	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.000878	0.30855	0.00387	0.35227
$\Delta \ln W$	0.008679	0.11222	0.009584	0.10517
$\Delta \ln CPI$	0.011525	0.005419	0.011509	0.005462
D_1	0.016851	0.12871	0.015016	0.12162
D_2	0.017196	0.13	0.014308	0.11876
D_3	0.95757	0.20157	0.96412	0.18599
D_4	0.008381	0.091164	0.006557	0.080708
ΔU	-0.002237	1.1393	-0.003237	1.0929
Getpen	0.018198	0.13367	0.018461	0.13461
Getnopen	0.01349	0.11536	0.012738	0.11214
Getunion	0.01349	0.11536	0.013961	0.11733
Nounion	0.011108	0.10481	0.010974	0.10418
$\Delta \text{Industry}$	0.028549	0.16654	0.027782	0.16435
$\Delta \text{Occupation}$	0.029039	0.16792	0.031075	0.17352
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	0.04156	105.46	0.86159	95.065
ΔW	0.11392	1.418	0.09706	1.163
N	89845		71988	

Appendix 3B: Table 3B1M

Estimated Differenced Log Hours Equations: Atlantic, Males, Aged 25-54

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0872*** (-3.27)	-0.0913*** (-3.83)	-0.0885*** (-4.32)
$\Delta \ln CPI$	2.5036*** (6.08)	1.6564*** (4.49)	1.1654*** (3.68)
D_1		0.6445*** (41.9)	
D_2		-0.6666*** (-44.8)	
D_3		0.0522** (2.19)	
ΔU			-0.15*** (-102.7)
Constant	-0.0316*** (-6.03)	-0.021*** (-4.46)	-0.0163*** (-4.05)
N	15253		
Adj. R ²	0.0031	0.2035	0.4107
F	17.1	650.9	2659.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3B: Table 3B.1

Estimated Differenced Log Hours Equations: Atlantic, Females, Aged 25-54
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1485*** (-4.08)	-0.1685*** (-4.95)	-0.1822*** (-5.8)
$\Delta \ln CPI$	0.6649 (1.18)	0.8465 (1.61)	1.025** (2.11)
D_t		0.8001*** (30.1)	
D_{t-1}		-0.6973*** (-27.1)	
D_{t-2}		-0.1451*** (-3.64)	
ΔU			-0.1621*** (-63.0)
Constant	-0.0093 (-1.29)	-0.0111 (-1.64)	-0.123** (-1.97)
N	11494		
Adj. R ²	0.0014	0.1282	0.258
F	6.42	282.6	1000.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;
 ** - significant at 5%; and
 * - significant at 10%.

Appendix 3B: Table 3B2M

Estimated Differenced Log Hours Equations: Atlantic, Males, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0284 (-1.04)	-0.035 (-1.43)	-0.0447** (-2.12)
$\Delta \ln CPI$	-0.2178 (-0.44)	-0.0895 (-0.2)	-0.3678 (-0.97)
D_1		0.6451*** (41.7)	
D_2		-0.6576*** (-44.1)	
D_3		0.0525** (2.18)	
ΔU			-0.1492*** (-102.4)
Getpen	-0.0629*** (-3.17)	-0.0648*** (-3.65)	-0.0487*** (-3.19)
Getnopen	-0.0025 (-0.11)	-0.0117 (-0.6)	-0.0073 (-0.44)
Getunion	-0.0896*** (-3.85)	-0.0882*** (-4.23)	-0.0723*** (-4.03)
Nounion	0.0353 (1.33)	0.0385 (1.61)	0.046** (2.24)
$\Delta \text{Industry}$	0.0343 (1.33)	-0.0039 (-0.17)	0.0132 (0.67)
$\Delta \text{Occupation}$	-0.0194 (-0.76)	-0.0017 (-0.07)	0.0073 (0.37)
Tran23	-0.0277*** (-4.59)	-0.0175*** (-3.24)	-0.013*** (-2.81)
Tran34	-0.0611*** (-8.73)	-0.0364*** (-5.8)	-0.0324*** (-6.01)
Tran45	-0.0759*** (-9.22)	-0.0572*** (-7.76)	-0.0477*** (-7.51)
Constant	0.0368*** (4.33)	0.0238*** (3.12)	0.0216*** (3.29)
N	15253		
Adj. R^2	0.0132	0.2101	0.4152
F	18.1	271.5	834.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3B: Table 3B2F

Estimated Differenced Log Hours Equations: Atlantic, Females, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.2442*** (-6.43)	-0.256*** (-7.21)	-0.26*** (-7.94)
$\Delta \ln CPI$	1.7625*** (2.61)	1.8557*** (2.94)	1.6866*** (2.89)
D_1		0.7816*** (29.4)	
D_2		-0.7039*** (-27.5)	
D_3		-0.1814*** (-4.52)	
ΔU			-0.1609*** (-62.8)
Getpen	0.0266 (0.96)	0.0233 (0.89)	0.0277 (1.16)
Getnopen	-0.1366*** (-4.38)	-0.1573*** (-5.39)	-0.1376*** (-5.11)
Getunion	0.0143 (0.47)	0.0132 (0.46)	0.0376 (1.42)
Nounion	-0.1228*** (-3.76)	-0.1137*** (-3.71)	-0.0774*** (-2.74)
$\Delta \text{Industry}$	0.2667*** (7.13)	0.2434*** (6.91)	0.1831*** (5.67)
$\Delta \text{Occupation}$	-0.0419 (-1.27)	-0.0414 (-1.33)	0.0007 (0.03)
Tran23	-0.0359*** (-4.36)	-0.0309*** (-4.01)	-0.0232*** (-3.27)
Tran34	0.0112 (1.17)	0.0118 (1.31)	0.0065 (0.78)
Tran45	0.0252** (2.23)	0.0245** (2.32)	0.014 (1.44)
Constant	-0.0186 (-1.59)	-0.0199* (-1.82)	-0.0176* (-1.75)
N	11494		
Adj. R^2	0.0131	0.1383	0.2651
F	13.7	123.9	319.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3B: Table 3B3M

Estimated Differenced Log Hours Equations: Atlantic, Males, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0016 (-0.07)	-0.0107 (-0.53)	-0.052*** (-2.9)
$\Delta \ln CPI$	2.5971*** (7.32)	2.3592*** (6.45)	1.82*** (5.62)
D_1		0.6433*** (44.7)	
D_2		-0.6453*** (-45.9)	
D_3		0.0814*** (3.94)	
ΔU			-0.1452*** (-103.1)
Constant	-0.0336*** (-6.49)	-0.0267*** (-5.67)	-0.0205*** (-4.94)
N	19089		
Adj. R^2	0.0027	0.1827	0.3591
F	17.9	711.8	2675.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

Appendix 3B: Table 3B3F

Estimated Differenced Log Hours Equations: Atlantic, Females, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1212*** (-4.1)	-0.1221*** (-4.38)	-0.1631*** (-6.33)
$\Delta \ln CPI$	1.0127* (1.92)	1.2869*** (2.59)	1.4913*** (3.25)
D_1		0.7122*** (32.1)	
D_2		-0.5616*** (-25.7)	
D_3		-0.2649*** (8.25)	
ΔU			-0.1548*** (-67.5)
Constant	-0.0105 (-1.56)	-0.0138** (-2.15)	-0.0154*** (-2.61)
N	14469		
Adj. R^2	0.0013	0.1112	0.2407
F	6.99	302.5	1147.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3B: Table 3B4M

Estimated Differenced Log Hours Equations: Atlantic, Males, Aged 16-69

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0257 (1.11)	0.194 (0.93)	-0.0209 (-1.13)
$\Delta \ln CPI$	-0.2387 (-0.49)	0.0381 (0.09)	-0.1364 (-0.36)
D_1		0.6382*** (43.9)	
D_2		-0.6396*** (-45.3)	
D_3		0.0769*** (3.62)	
ΔU			-0.1447*** (-102.9)
Getpen	-0.0111 (-0.58)	-0.0145 (-0.84)	-0.0276* (-1.82)
Getnopen	-0.0333 (-1.64)	-0.0396** (-2.15)	-0.0229 (-1.41)
Getunion	-0.0461** (-2.17)	-0.0345* (-1.79)	-0.0834*** (-4.89)
Nounion	0.0354 (1.38)	0.0408* (1.76)	0.0752*** (3.66)
Δ Industry	0.0412* (1.72)	0.0113 (0.52)	0.0419** (2.18)
Δ Occupation	-0.0024 (-0.1)	0.0006 (0.02)	0.0033 (0.18)
Tran23	-0.0288*** (-4.79)	-0.0205*** (-3.75)	-0.0141*** (-2.93)
Tran34	-0.0785*** (-11.3)	-0.0549*** (-8.74)	-0.0462*** (-8.29)
Tran45	-0.0799*** (-9.83)	-0.0659*** (-8.95)	-0.0503*** (-7.7)
Constant	0.0449*** (5.41)	0.0313*** (4.14)	0.0262*** (3.94)
N	19089		
Adj. R^2	0.0119	0.1881	0.3644
F	20.1	295.8	842.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3B: Table 3B4F

Estimated Differenced Log Hours Equations: Atlantic, Females, Aged 16-69

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.2106*** (-6.82)	-0.2162*** (-7.43)	-0.2434*** (-9.04)
$\Delta \ln CPI$	0.8942 (1.43)	1.0292* (1.74)	0.9439* (1.73)
D_t		0.7013*** (31.6)	
D_t		-0.5755*** (-26.4)	
D_t		-0.3095*** (-9.49)	
ΔU			-0.1545*** (-67.7)
Getpen	0.0133 (0.55)	0.0179 (0.78)	0.0018 (0.08)
Getnopen	-0.1381*** (-4.77)	-0.1658*** (-6.07)	-0.1499*** (-5.94)
Getunion	0.0871*** (3.22)	0.0936*** (3.67)	0.1169*** (4.96)
Nounion	-0.2129*** (-6.81)	-0.2039*** (6.93)	-0.1768*** (-6.49)
Δ Industry	0.0992*** (3.41)	0.1375*** (4.96)	0.0735*** (2.9)
Δ Occupation	0.0312 (1.13)	0.0297 (0.79)	0.0428* (1.78)
Tran23	-0.0341*** (-4.37)	-0.0267*** (-3.63)	-0.0224*** (-3.29)
Tran34	-0.0157* (-1.73)	-0.151* (-1.77)	-0.0208** (-2.65)
Tran45	0.0078 (0.73)	0.0029 (0.29)	-0.0013 (-0.14)
Constant	0.0037 (0.34)	0.0006 (0.06)	0.003 (0.32)
N	14469		
Adj. R ²	0.0105	0.1218	0.2487
F	13.75	134.6	369.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3B: Table 3B5

Variable Means and Standard Deviations: Atlantic, Aged 25-44

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00348	0.2861	-0.00314	0.3424
$\Delta \ln W$	0.00693	0.088648	0.008169	0.08778
$\Delta \ln CPI$	0.01142	0.005722	0.01145	0.0057
D_1	0.01928	0.13749	0.01375	0.11644
D_2	0.01993	0.13977	0.01462	0.12
D_3	0.95306	0.21152	0.96563	0.1822
D_4	0.007736	0.08762	0.006	0.0773
ΔU	-0.0059	1.1931	0.004785	1.1044
Getpen	0.015276	0.12265	0.01479	0.12072
Getnopen	0.011735	0.1077	0.01009	0.09996
Getunion	0.010031	0.09965	0.01166	0.10735
Nounion	0.008457	0.09158	0.00827	0.0905
$\Delta \text{Industry}$	0.018029	0.13306	0.01383	0.1168
$\Delta \text{Occupation}$	0.018226	0.13377	0.01757	0.1314
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	-1.8115	109.19	-1.3118	93.719
ΔW	0.092988	1.131	0.08535	0.87999
N	15253		11494	

Appendix 3B: Table 3B6

Variable Means and Standard Deviations: Atlantic, Aged 16-69

	Males		Females	
Variable	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00061	0.31756	-0.00052	0.36166
$\Delta \ln W$	0.008109	0.09733	0.009435	0.09892
$\Delta \ln CPI$	0.011458	0.00581	0.01149	0.005838
D_1	0.021216	0.14411	0.01673	0.12825
D_2	0.022212	0.14738	0.01721	0.13005
D_3	0.94719	0.22365	0.95867	0.19906
D_4	0.009377	0.09638	0.007395	0.08568
ΔU	-0.00341	1.2734	0.002073	1.1642
Getpen	0.01593	0.12519	0.01666	0.12798
Getnopen	0.01263	0.11165	0.01064	0.10262
Getunion	0.01126	0.10553	0.01341	0.11502
Nounion	0.00869	0.09285	0.00857	0.09218
$\Delta \text{Industry}$	0.02347	0.15139	0.02295	0.14974
$\Delta \text{Occupation}$	0.02431	0.15401	0.02626	0.15992
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	-0.65278	113.31	-0.64462	100.04
ΔW	0.09918	1.1	0.08975	0.92799
N	19089		14469	

Appendix 3C: Table 3C1M

Estimated Differenced Log Hours Equations: Quebec, Males, Aged 25-54
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0752*** (2.75)	0.0923*** (3.73)	0.0981*** (4.59)
$\Delta \ln CPI$	1.6511** (2.38)	1.1651* (1.86)	0.6886 (1.27)
D_1		0.7305*** (37.1)	
D_2		-0.7169*** (-36.8)	
D_3		0.0106 (0.38)	
ΔU			-0.1639*** (-88.6)
Constant	-0.0212** (-2.55)	-0.0158** (-2.1)	-0.0103 (-1.59)
N	12243		
Adj. R ²	0.0009	0.1854	0.3911
F	4.64	465.3	1966.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3C: Table 3C1F

Estimated Differenced Log Hours Equations: Quebec, Females, Aged 25-54

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.011 (-0.24)	0.0419 (1.0)	0.0533 (1.38)
$\Delta \ln CPI$	1.4299 (1.55)	1.402* (1.65)	0.9727 (1.23)
D_1		0.8418*** (30.5)	
D_2		-0.7237*** (-25.7)	
D_3		-0.0796** (-2.0)	
ΔU			-0.1466*** (-58.2)
Constant	-0.0169 (-1.52)	-0.0184* (-1.79)	-0.0122 (-1.29)
N	8995		
Adj. R^2	0.0001	0.1524	0.2736
F	0.83	270.4	847.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3C: Table 3C2M

Estimated Differenced Log Hours Equations: Quebec, Males, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.1007*** (3.59)	0.1152*** (4.54)	0.1092*** (4.98)
$\Delta \ln CPI$	0.3571 (0.41)	1.0156 (1.29)	0.6072 (0.89)
D_1		0.7385*** (37.5)	
D_2		-0.7099*** (-36.2)	
D_3		0.0361 (1.27)	
ΔU			-0.164*** (-88.5)
Getpen	-0.0789*** (-3.9)	-0.0942*** (-5.15)	-0.089*** (-5.63)
Getnopen	-0.0238 (-0.97)	-0.0143 (-0.65)	-0.0186 (-0.97)
Getunion	-0.0289 (-1.18)	-0.0472** (-2.13)	-0.0592*** (-3.09)
Nounion	-0.0261 (-1.01)	-0.0184 (-0.79)	-0.0289 (-1.43)
$\Delta \text{Industry}$	-0.1283*** (-4.55)	-0.0871*** (-3.38)	-0.0445** (-2.02)
$\Delta \text{Occupation}$	0.0448 (1.57)	0.0415 (1.61)	0.0398* (1.79)
Tran23	-0.0173** (-2.15)	-0.004 (-0.55)	-0.0049 (-0.79)
Tran34	-0.0164** (-2.03)	0.0073 (0.99)	0.0065 (1.02)
Tran45	-0.0102 (-1.02)	-0.002 (-0.22)	0.0095 (1.24)
Constant	0.0084 (0.61)	-0.0117 (-0.93)	-0.0082 (-0.76)
N	12243		
Adj. R^2	0.0056	0.1893	0.3939
F	6.67	191.6	612.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3C: Table 3C2F

Estimated Differenced Log Hours Equations: Quebec, Females, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0333 (-0.71)	0.0205 (0.47)	0.0019 (0.05)
$\Delta \ln CPI$	-0.2081 (-0.18)	0.7831 (0.73)	0.6145 (0.62)
D_t		0.8368*** (30.2)	
D_{t-1}		-0.7248*** (-25.5)	
D_{t-2}		-0.0837** (-2.1)	
ΔU			-0.1472*** (-58.2)
Getpen	0.0939*** (2.92)	0.0802*** (2.7)	0.0584** (2.13)
Getnopen	-0.0099 (-0.29)	0.0056 (0.18)	-0.0168 (-0.58)
Getunion	0.0216 (0.64)	0.0115 (0.38)	0.0278 (0.96)
Nounion	-0.0201 (-0.52)	-0.0008 (-0.02)	-0.0143 (-0.44)
Δ Industry	0.0289 (0.67)	0.0219 (0.55)	0.0776** (2.12)
Δ Occupation	-0.0409 (-1.04)	-0.0039 (-0.11)	0.037 (1.11)
Tran23	-0.0368*** (-3.39)	-0.0178* (-1.78)	-0.0095 (-1.02)
Tran34	-0.0155 (-1.42)	-0.0035 (-0.35)	-0.0045 (-0.48)
Tran45	-0.0176 (-1.31)	-0.0077 (-0.62)	-0.0024 (-0.21)
Constant	0.0184 (0.99)	-0.0054 (-0.32)	-0.0059 (-0.38)
N	8995		
Adj. R ²	0.0019	0.1529	0.2753
F	2.3	109.2	263.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3C: Table 3C3M

Estimated Differenced Log Hours Equations: Quebec, Males, Aged 16-69

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.3462*** (-16.7)	-0.3537*** (-18.5)	-0.3521*** (-20.3)
$\Delta \ln CPI$	2.8227*** (4.0)	2.151*** (3.31)	1.8077*** (3.07)
D_1		0.6745*** (36.8)	
D_2		-0.6672*** (-37.3)	
D_3		0.0159 (0.59)	
ΔU			-0.1556*** (-82.4)
Constant	-0.0292*** (-3.45)	-0.0212*** (-2.7)	-0.0167** (-2.36)
N	15568		
Adj. R ²	0.0184	0.168	0.3167
F	98.2	524.8	1804.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3C: Table 3C3F

Estimated Differenced Log Hours Equations: Quebec, Females, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0077 (0.22)	0.0019 (0.06)	0.0204 (0.68)
$\Delta \ln CPI$	1.0216 (1.22)	0.8845 (1.14)	0.4679 (0.66)
D_t		0.8143*** (35.7)	
D_t		-0.5915*** (-25.2)	
D_t		-0.1483*** (-4.45)	
ΔU			-0.1441*** (-65.1)
Constant	-0.0086 (-0.85)	-0.0099 (-1.06)	-0.0028 (-0.32)
N	11361		
Adj. R^2	0.0	0.147	0.2719
F	0.85	327.4	1061.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

Appendix 3C: Table 3C4M

Estimated Differenced Log Hours Equations: Quebec, Males, Aged 16-69

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.355*** (-16.8)	-0.3604*** (-18.4)	-0.3704*** (-20.9)
$\Delta \ln CPI$	-0.0698 (-0.08)	0.3989 (0.49)	0.1539 (0.21)
D_1		0.6639*** (36.0)	
D_2		-0.6744*** (-37.4)	
D_3		-0.0108 (-0.39)	
ΔU			-0.1561*** (-82.7)
Getpen	-0.0681*** (-3.41)	-0.0701*** (-3.81)	-0.0556*** (-3.34)
Getnopen	-0.021 (-0.85)	-0.0047 (-0.21)	-0.0208 (-1.01)
Getunion	0.0668*** (2.98)	0.0321 (1.55)	0.0121 (0.64)
Nounion	-0.0213 (-0.82)	-0.0259 (-1.08)	-0.0458** (-2.11)
Δ Industry	0.0637** (2.51)	0.0856*** (3.53)	0.0123*** (5.77)
Δ Occupation	-0.0065 (-0.25)	-0.0135 (-0.56)	-0.0041 (-0.19)
Tran23	-0.0267*** (-3.26)	-0.0129* (-1.71)	-0.0132* (-1.93)
Tran34	-0.0484*** (-5.88)	-0.027*** (-3.56)	-0.0276*** (-4.02)
Tran45	-0.0356*** (-3.52)	-0.0256*** (-2.75)	-0.0134 (-1.59)
Constant	0.0296** (2.08)	0.0137 (1.05)	0.0141 (1.19)
N	15568		
Adj. R ²	0.0222	0.1705	0.3207
F	30.3	214.2	566.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3C: Table 3C4F

Estimated Differenced Log Hours Equations: Quebec, Females, Aged 16-69

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0163 (-0.45)	-0.0144 (-0.43)	-0.0168 (-0.54)
$\Delta \ln CPI$	-0.3884 (-0.37)	0.3259 (0.33)	0.2406 (0.27)
D_t		0.8083*** (35.1)	
D_t		-0.5954*** (-25.1)	
D_t		-0.1625*** (-4.82)	
ΔU			-0.1445*** (-65.2)
Getpen	0.025 (0.93)	0.0134 (0.54)	-0.0101 (-0.44)
Getnopen	0.0181 (0.59)	0.0354 (1.27)	0.0156 (0.61)
Getunion	0.0104 (0.37)	0.0097 (0.37)	0.218 (0.91)
Nounion	-0.0096 (-0.29)	0.0079 (0.26)	-0.0014 (-0.05)
$\Delta \text{Industry}$	0.0915*** (2.77)	0.0933*** (3.04)	0.1216*** (4.32)
$\Delta \text{Occupation}$	-0.0461 (-1.47)	-0.0633** (-2.18)	-0.0241 (-0.9)
Tran23	-0.0328*** (-3.36)	-0.0162* (-1.8)	-0.0073 (-0.88)
Tran34	-0.0172* (-1.76)	-0.0079 (-0.87)	-0.0086 (-1.03)
Tran45	-0.0022 (-0.19)	0.0041 (0.37)	0.0111 (1.08)
Constant	0.0208 (1.24)	0.0018 (0.12)	0.0008 (0.06)
N	11361		
Adj. R^2	0.0017	0.148	0.2739
F	2.59	132.5	330.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3C: Table 3C5

Variable Means and Standard Deviations: Quebec, Aged 25-44

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00039	0.2812	0.00071	0.34662
$\Delta \ln W$	0.00712	0.09352	0.00665	0.07559
$\Delta \ln CPI$	0.01143	0.00362	0.01141	0.00371
D_1	0.01413	0.11803	0.01434	0.1189
D_2	0.01454	0.1197	0.01365	0.11567
D_3	0.9639	0.18655	0.96543	0.18271
D_4	0.00743	0.0859	0.00667	0.0814
ΔU	-0.00359	1.0956	-0.00411	1.2084
Getpen	0.01911	0.13693	0.01379	0.11661
Getnopen	0.01144	0.10635	0.01023	0.10062
Getunion	0.01413	0.11803	0.01223	0.10991
Nounion	0.01103	0.10443	0.00823	0.09033
$\Delta \text{Industry}$	0.01903	0.13664	0.01445	0.11935
$\Delta \text{Occupation}$	0.01821	0.13373	0.01356	0.12379
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	0.16622	91.156	0.04503	85.768
ΔW	0.09844	1.2992	0.0665	0.88823
N	12243		8995	

Appendix 3C: Table 3C6

Variable Means and Standard Deviations: Quebec, Aged 16-69

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.00068	0.31536	0.00501	0.35284
$\Delta \ln W$	0.00817	0.11238	0.08527	0.08627
$\Delta \ln CPI$	0.01143	0.00364	0.01142	0.00368
D_1	0.01696	0.12912	0.01664	0.12791
D_2	0.01766	0.13173	0.01496	0.12141
D_3	0.9569	0.20309	0.96039	0.19505
D_4	0.00848	0.09169	0.00801	0.08914
ΔU	-0.0009	1.1669	-0.00986	1.237
Getpen	0.01966	0.13882	0.01558	0.12385
Getnopen	0.01195	0.10865	0.01092	0.10391
Getunion	0.01664	0.12791	0.01417	0.1182
Nounion	0.01131	0.10573	0.00924	0.0957
$\Delta \text{Industry}$	0.02743	0.16333	0.02095	0.14322
$\Delta \text{Occupation}$	0.02589	0.1588	0.02201	0.14671
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	0.27023	98.059	1.291	88.59
ΔW	0.10128	1.3098	0.07657	0.95261
N	15568		11361	

Appendix 3D: Table 3D1M

Estimated Differenced Log Hours Equations: Ontario, Males, Aged 25-54
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1518*** (-7.56)	-0.1523*** (-8.31)	-0.1527*** (-8.83)
$\Delta \ln CPI$	3.6898*** (8.43)	2.7559*** (6.89)	2.3042*** (6.1)
D_1		0.7753*** (42.3)	
D_2		-0.6149*** (-33.2)	
D_3		-0.1401*** (3.91)	
ΔU			-0.1529*** (-71.5)
Constant	-0.0496*** (-8.27)	-0.0392*** (-7.13)	-0.0333*** (-6.44)
N	14672		
Adj. R^2	0.0088	0.174	0.2647
F	45.4	516.4	1322.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3D: Table 3D1F

Estimated Differenced Log Hours Equations: Ontario, Females, Aged 25-54
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0338 (1.11)	-0.0326 (-1.13)	0.0019 (0.07)
$\Delta \ln CPI$	0.1527 (0.24)	-0.5267 (-0.86)	-0.7016 (-1.21)
D_t		0.6929*** (25.7)	
D_t		-0.7252*** (-26.8)	
D_t		0.18*** (3.89)	
ΔU			-0.1498*** (-53.1)
Constant	-0.0031 (-0.35)	0.0061 (0.73)	0.0085 (1.07)
N	11907		
Adj. R ²	0.0001	0.1054	0.1911
F	0.45	234.6	704.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3D: Table 3D2M

Estimated Differenced Log Hours Equations: Ontario, Males, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1437*** (-6.92)	-0.1503*** (-7.93)	-0.1583*** (-8.89)
$\Delta \ln CPI$	11.182*** (8.06)	11.202*** (8.83)	13.3*** (11.2)
D_1		0.7735*** (42.3)	
D_2		-0.6228*** (-33.4)	
D_3		-0.1307*** (-3.57)	
ΔU			-0.1542*** (-72.5)
Getpen	-0.0955*** (-6.09)	-0.1093*** (-7.63)	-0.1187*** (-8.81)
Getnopen	-0.0268 (-1.44)	-0.0207 (-1.22)	-0.0242 (-1.52)
Getunion	0.1402*** (7.04)	0.1379*** (7.59)	0.1509*** (8.84)
Nounion	0.0563** (2.56)	0.0473** (2.35)	0.0298 (1.58)
Δ Industry	0.0008 (0.04)	0.0045 (0.25)	0.0166 (0.99)
Δ Occupation	-0.0281 (-1.44)	0.0029 (0.16)	0.004 (0.24)
Tran23	0.0984*** (6.6)	0.1062*** (7.79)	0.1319*** (10.3)
Tran34	0.0789*** (5.29)	0.092*** (6.75)	0.1226*** (9.56)
Tran45	0.0655*** (4.13)	0.0774*** (5.35)	0.1089*** (7.99)
Constant	-0.2052*** (-7.32)	-0.215*** (-8.39)	-0.2625*** (-10.9)
N	14672		
Adj. R^2	0.0179	0.1836	0.2769
F	23.4	221.2	433.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3D: Table 3D2F

Estimated Differenced Log Hours Equations: Ontario, Females, Aged 25-54
Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0306 (0.98)	-0.0343 (-1.16)	0.0015 (0.05)
$\Delta \ln CPI$	4.7411 (0.68)	4.3209 (0.66)	4.4097 (0.7)
D,		0.6892*** (25.5)	
D,		-0.7284*** (-26.9)	
D,		0.1957*** (4.19)	
ΔU			-0.1499*** (-53.1)
Getpen	-0.0279 (-1.29)	-0.0329 (-1.6)	-0.0155 (-0.79)
Getnopen	-0.1112*** (-4.45)	-0.1086*** (-4.59)	-0.1181*** (-5.25)
Getunion	0.0593** (2.07)	0.0902*** (3.32)	0.0872*** (3.38)
Nounion	-0.0662** (-2.22)	-0.0695** (-2.46)	-0.0812*** (-3.02)
$\Delta \text{Industry}$	0.0877*** (3.07)	0.0783*** (2.89)	0.0812*** (3.16)
$\Delta \text{Occupation}$	-0.07*** (-2.6)	-0.0781*** (-3.06)	-0.0825*** (-3.4)
Tran23	0.0268 (0.38)	0.0319 (0.48)	0.0421 (0.67)
Tran34	0.0675 (0.96)	0.0675 (1.02)	0.0643 (1.02)
Tran45	0.0558 (0.79)	0.0575 (0.86)	0.0567 (0.89)
Constant	-0.0949 (-0.68)	-0.0906 (-0.68)	-0.0935 (-0.75)
N	11907		
Adj. R ²	0.0048	0.1103	0.1956
F	5.7	99.3	223.6

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

Appendix 3D: Table 3D3M

Estimated Differenced Log Hours Equations: Ontario, Males, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0732*** (-3.89)	-0.0534*** (-3.15)	-0.0413** (-2.56)
$\Delta \ln CPI$	4.1965*** (9.93)	3.1783*** (8.19)	2.4643*** (6.78)
D_1		0.7588*** (47.4)	
D_2		-0.6022*** (-37.0)	
D_3		-0.149*** (-5.11)	
ΔU			-0.1536*** (-83.3)
Constant	-0.0546*** (-9.43)	-0.0436*** (-8.18)	-0.0334*** (-6.82)
N	19481		
Adj. R^2	0.0058	0.1641	0.2669
F	38.8	638.4	1773.7

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3D: Table 3D3F

Estimated Differenced Log Hours Equations: Ontario, Females, Aged 16-69
Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0302 (1.16)	0.0061 (0.24)	0.0182 (0.76)
$\Delta \ln CPI$	0.086 (0.15)	-0.448 (-0.81)	-0.6392 (-1.19)
D_t		0.6822*** (27.8)	
D_{t-1}		-0.6731*** (-28.2)	
D_{t-2}		0.1423*** (3.81)	
ΔU			-0.1407*** (-53.9)
Constant	-0.0002 (-0.03)	0.0066 (0.86)	0.0103 (1.4)
N	15743		
Adj. R^2	0.0	0.0919	0.1558
F	0.5	266.4	726.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3D: Table 3D4M

Estimated Differenced Log Hours Equations: Ontario, Males, Aged 16-69
Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0825*** (-4.23)	-0.0635*** (-3.55)	-0.0547*** (-3.27)
$\Delta \ln CPI$	8.3283*** (6.19)	8.2125*** (6.65)	9.815*** (8.5)
D_1		0.7567*** (47.1)	
D_2		-0.6072*** (-37.0)	
D_3		-0.1561*** (-5.23)	
ΔU			-0.1541*** (-83.7)
Getpen	-0.0519*** (-3.44)	-0.0631*** (-4.56)	-0.0693*** (-5.35)
Getnopen	-0.0678*** (-3.88)	-0.0433*** (-2.7)	-0.041*** (-2.74)
Getunion	0.0887*** (4.73)	0.0964*** (5.6)	0.0989*** (6.15)
Nounion	0.0017 (0.09)	0.0586 (0.32)	-0.0111 (-0.65)
$\Delta \text{Industry}$	-0.0145*** (-0.82)	0.0153 (0.93)	0.012 (0.79)
$\Delta \text{Occupation}$	0.0317* (1.81)	0.0037 (0.23)	0.0193 (1.29)
Tran23	0.0625*** (4.32)	0.0732*** (5.52)	0.0954*** (7.67)
Tran34	0.0341** (2.36)	0.0448*** (3.37)	0.0742*** (5.97)
Tran45	0.0427*** (2.78)	0.0496*** (3.52)	0.0763*** (5.78)
Constant	-0.1409*** (-5.18)	-0.1487*** (-5.96)	-0.1876*** (-8.04)
N	19481		
Adj. R^2	0.01	0.1686	0.2721
F	17.3	264.3	561.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3D: Table 3D4F

Estimated Differenced Log Hours Equations: Ontario, Females, Aged 16-69
Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.0187 (0.7)	-0.0075 (-0.29)	-0.003 (-0.12)
$\Delta \ln CPI$	-0.313 (-0.12)	-0.3687 (-0.15)	-0.5206 (-0.22)
D_t		0.6817*** (27.7)	
D_{t-1}		-0.6735*** (-28.1)	
D_{t-2}		0.1436*** (3.8)	
ΔU			-0.1412*** (-54.1)
Getpen	0.0165 (0.83)	0.0159 (0.84)	0.0266 (1.45)
Getnopen	-0.1042*** (-4.52)	-0.1036*** (-4.72)	-0.1206*** (-5.7)
Getunion	0.0564** (2.26)	0.0746*** (3.14)	0.0598*** (2.61)
Nounion	-0.0285 (-1.11)	-0.0251 (-1.02)	-0.0448* (-1.9)
Δ Industry	0.0244 (1.03)	0.0102 (0.45)	0.0468** (2.15)
Δ Occupation	-0.0223 (-0.99)	-0.0122 (-0.57)	-0.0137 (-0.66)
Tran23	-0.0166 (-0.63)	-0.009 (-0.36)	-0.0042 (-0.17)
Tran34	0.0089 (0.34)	0.0114 (0.45)	0.0076 (0.32)
Tran45	0.0037 (0.14)	0.008 (0.31)	0.0095 (0.38)
Constant	0.0075 (0.15)	0.0046 (0.09)	0.0066 (0.14)
N		15743	
Adj. R ²	0.0022	0.0941	0.1585
F	3.9	109.9	229.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

Appendix 3D: Table 3D5

Variable Means and Standard Deviations: Ontario, Aged 25-44

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00249	0.21985	-0.00032	0.31472
$\Delta \ln W$	0.00921	0.09358	0.01057	0.09987
$\Delta \ln CPI$	0.01284	0.0047	0.01285	0.00455
D_1	0.01009	0.09993	0.01008	0.09989
D_2	0.01118	0.10514	0.01083	0.10353
D_3	0.97553	0.1545	0.97514	0.1557
D_4	0.0032	0.05651	0.00395	0.06271
ΔU	0.00048	0.8291	0.00479	0.90683
Getpen	0.01915	0.13706	0.01982	0.13939
Getnopen	0.01418	0.11822	0.01377	0.11655
Getunion	0.01193	0.10856	0.01243	0.1108
Nounion	0.00961	0.09756	0.01075	0.10313
$\Delta \text{Industry}$	0.02161	0.1454	0.02259	0.1486
$\Delta \text{Occupation}$	0.02017	0.1406	0.02578	0.15849
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	-0.96422	80.341	-0.05006	83.375
ΔW	0.14792	1.6214	0.12673	1.6002
N	14672		11907	

Appendix 3D: Table 3D6

Variable Means and Standard Deviations: Ontario, Aged 16-69

	Males		Females	
Variable	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.0006	0.26392	0.00152	0.33688
$\Delta \ln W$	0.01059	0.1031	0.01193	0.10833
$\Delta \ln CPI$	0.01284	0.00471	0.01285	0.00459
D_1	0.01283	0.11256	0.01182	0.10806
D_2	0.0135	0.11541	0.01245	0.11089
D_3	0.96951	0.17194	0.97103	0.16771
D_4	0.00416	0.06435	0.0047	0.0684
ΔU	-0.00051	0.93763	0.00559	0.93525
Getpen	0.0191	0.13686	0.01976	0.13916
Getnopen	0.01442	0.11923	0.01404	0.11765
Getunion	0.01309	0.11366	0.0141	0.11791
Nounion	0.01083	0.10351	0.0115	0.10661
$\Delta \text{Industry}$	0.02941	0.16897	0.03443	0.18233
$\Delta \text{Occupation}$	0.02911	0.16811	0.03887	0.1933
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	-0.3891	88.786	0.42038	89.685
ΔW	0.14645	1.5288	0.12561	1.5148
N	19481		15743	

Appendix 3E: Table 3E1M

Estimated Differenced Log Hours Equations: Prairie, Males, Aged 25-54

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0123 (-0.7)	-0.0605*** (-3.77)	-0.0496*** (-3.45)
$\Delta \ln CPI$	0.6167** (2.33)	0.421* (1.75)	0.1871 (0.87)
D_1		0.7355*** (46.3)	
D_2		-0.6792*** (-44.4)	
D_3		0.077*** (3.56)	
ΔU			-0.1585*** (-100.4)
Constant	-0.0081** (-2.41)	-0.0062** (-2.0)	-0.003 (-1.07)
N	20083		
Adj. R ²	0.0002	0.1726	0.3343
F	2.23	698.9	2521.9

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3E: Table 3E1F

Estimated Differenced Log Hours Equations: Prairie, Females, Aged 25-54
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0803*** (-3.18)	-0.0646*** (-2.75)	-0.619** (-2.76)
$\Delta \ln CPI$	-0.4311 (-1.25)	-0.4057 (-1.26)	-0.0599 (-0.19)
D_t		0.7055*** (34.9)	
D_{t-1}		-0.8245*** (-37.6)	
D_{t-2}		0.3476*** (9.69)	
ΔU			-0.1504*** (-69.0)
Constant	0.0092** (2.07)	0.0073* (1.76)	0.0038 (0.96)
N	17913		
Adj. R ²	0.0005	0.1338	0.2104
F	4.79	462.6	1194.8

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;
 ** - significant at 5%; and
 * - significant at 10%.

Appendix 3E: Table 3E2M

Estimated Differenced Log Hours Equations: Prairie, Males, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0102 (-0.57)	-0.0505*** (-3.09)	-0.0414*** (-2.82)
$\Delta \ln CPI$	0.2034 (0.69)	0.3594 (1.34)	0.2138 (0.89)
D_1		0.7321*** (45.6)	
D_2		-0.681*** (-44.2)	
D_3		0.0715*** (3.23)	
ΔU			-0.1584*** (-100.2)
Getpen	0.0223 (1.51)	0.009 (0.67)	0.0181 (1.51)
Getnopen	-0.0426*** (-2.61)	-0.0275* (-1.85)	-0.0254* (-1.9)
Getunion	0.0152 (0.8)	-0.011 (-0.63)	-0.0201 (-1.29)
Nounion	-0.0095 (-0.51)	0.0189 (1.11)	0.0192 (1.26)
$\Delta \text{Industry}$	0.0533*** (2.89)	0.0311* (1.81)	0.0262* (1.74)
$\Delta \text{Occupation}$	-0.0222 (-1.24)	-0.0247 (-1.51)	-0.0043 (-0.29)
Tran23	-0.0159*** (-3.23)	-0.0098** (-2.18)	-0.0055 (-1.38)
Tran34	-0.0179*** (-3.32)	-0.0037 (-0.76)	0.0001 (0.02)
Tran45	-0.0347*** (-5.37)	-0.0268*** (-4.55)	-0.0182*** (-3.45)
Constant	0.0104* (1.92)	0.0022 (0.44)	0.0004 (0.94)
N	20083		
Adj. R^2	0.0026	0.1737	0.335
F	5.32	283.4	779.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3E: Table 3E2F

Estimated Differenced Log Hours Equations: Prairie, Females, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1155*** (-4.47)	-0.0916*** (-3.81)	-0.089*** (-3.87)
$\Delta \ln CPI$	-0.0707 (-0.18)	-0.2404 (-0.67)	-0.0351 (-0.1)
D_t		0.6851*** (33.8)	
D_t		-0.8406*** (-38.1)	
D_t		0.3054*** (8.44)	
ΔU			-0.1496*** (-68.6)
Getpen	0.0033 (0.18)	-0.0191 (-1.09)	-0.0173 (-1.04)
Getnopen	-0.0916*** (-4.25)	-0.0245 (-1.22)	-0.0479** (-2.5)
Getunion	0.0114 (0.48)	0.0118 (0.54)	0.0229 (1.1)
Nounion	-0.0693*** (-2.9)	-0.0676*** (-3.04)	-0.0571*** (-2.69)
$\Delta \text{Industry}$	0.094*** (3.71)	0.1091*** (4.62)	0.1044*** (4.64)
$\Delta \text{Occupation}$	-0.0818*** (3.6)	0.0613*** (4.62)	0.0622*** (3.08)
Tran23	-0.0385*** (-5.98)	-0.0266*** (-4.44)	-0.0172*** (-3.01)
Tran34	0.0018 (0.25)	-0.0017 (-0.26)	-0.0044 (-0.7)
Tran45	-0.002 (-0.23)	-0.0051 (-0.66)	-0.0014 (-0.18)
Constant	0.0141** (2.01)	0.0126* (1.91)	0.0076 (1.22)
N	17913		
Adj. R ²	0.0088	0.1391	0.2153
F	14.5	194.6	379.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3E: Table 3E3M

Estimated Differenced Log Hours Equations: Prairie, Males, Aged 16-69

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.03* (-1.91)	-0.0467*** (-3.19)	-0.0445*** (-3.31)
$\Delta \ln CPI$	0.9236*** (3.29)	0.7502*** (2.87)	0.4336* (1.81)
D_1		0.6823*** (46.3)	
D_2		-0.6542*** (-45.1)	
D_3		0.1296 (6.41)	
ΔU			-0.153*** (-98.1)
Constant	-0.0074** (-2.07)	-0.0065* (-1.95)	-0.0021 (-0.67)
N	26299		
Adj. R^2	0.0005	0.1407	0.2682
F	5.3	718.9	2411.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3E: Table 3E3F

Estimated Differenced Log Hours Equations: Prairie, Females, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0003 (-0.02)	-0.0254 (-1.32)	-0.028 (-1.52)
$\Delta \ln CPI$	-0.0901 (-0.27)	-0.0476 (-0.15)	0.1766 (0.6)
D_t		0.6839*** (38.9)	
D_t		-0.7348*** (-39.8)	
D_t		0.3489*** (11.5)	
ΔU			-0.1499*** (-76.1)
Constant	0.0075* (1.77)	0.0052 (1.3)	0.0037 (0.97)
N	23667		
Adj. R ²	0.0001	0.1215	0.1965
F	2.69	548.1	1450.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3E: Table 3E4M

Estimated Differenced Log Hours Equations: Prairie, Males, Aged 16-69

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0355** (-2.21)	-0.0451*** (-3.03)	-0.0442*** (-3.21)
$\Delta \ln CPI$	-0.1215 (-0.39)	0.0678 (0.23)	-0.1405 (-0.52)
D_1		0.6747*** (45.3)	
D_2		-0.6553*** (-44.9)	
D_3		0.1216*** (5.89)	
ΔU			-0.1525*** (-97.8)
Getpen	0.0068 (0.46)	-0.0022 (-0.16)	-0.0021 (-0.16)
Getnopen	-0.0871*** (-5.32)	-0.0602*** (-3.96)	-0.0584*** (-4.16)
Getunion	0.0759*** (4.17)	0.0662*** (3.92)	0.0576*** (3.69)
Nounion	0.0417** (2.37)	0.0622*** (3.82)	0.0613*** (4.08)
Δ Industry	0.044** (2.57)	0.0172 (1.06)	0.0258* (1.75)
Δ Occupation	-0.0108 (-0.66)	-0.0117 (-0.77)	-0.0104 (-0.74)
Tran23	-0.0223*** (4.34)	-0.0171*** (-3.58)	-0.0143*** (-3.25)
Tran34	-0.0434*** (-7.67)	-0.0291*** (-5.52)	-0.0249*** (-5.13)
Tran45	-0.0301*** (-4.46)	-0.0281*** (-4.48)	-0.0199*** (-3.43)
Constant	0.0256*** (4.47)	0.0173*** (3.25)	0.0171*** (3.48)
N	26299		
Adj. R ²	0.0049	0.1431	0.2702
F	11.9	293.7	750.0

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3E: Table 3E4F

Estimated Differenced Log Hours Equations: Prairie, Females, Aged 16-69
Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0292 (-1.38)	-0.0415** (-2.09)	-0.0454** (-2.4)
$\Delta \ln CPI$	-0.0087 (-0.02)	-0.1569 (-0.05)	-0.0663 (-0.2)
D_t		0.6638*** (37.7)	
D_t		-0.7576*** (-40.7)	
D_t		0.3055*** (9.98)	
ΔU			-0.1497*** (-76.0)
Getpen	0.0332** (1.98)	0.0226 (1.44)	0.0225 (1.49)
Getnopen	-0.061*** (-3.14)	-0.0353* (-1.94)	-0.051*** (-2.93)
Getunion	-0.0018 (-0.08)	-0.0137 (-0.71)	-0.0123 (-0.67)
Nounion	-0.0332 (-1.62)	-0.0101 (-0.53)	-0.0128 (-0.7)
$\Delta \text{Industry}$	0.0878*** (4.31)	0.1161*** (6.04)	0.1106*** (6.05)
$\Delta \text{Occupation}$	0.0491*** (2.6)	0.0215 (1.21)	0.0279* (1.65)
Tran23	-0.0373*** (-6.14)	-0.0268*** (-4.7)	-0.0184*** (-3.36)
Tran34	-0.0104 (-1.55)	-0.0132** (-2.09)	-0.0163*** (-2.71)
Tran45	-0.0067 (-0.85)	-0.0133* (-1.79)	-0.0092 (-1.29)
Constant	0.0174*** (2.59)	0.0164*** (2.6)	0.0136** (2.25)
N	23667		
Adj. R ²	0.0061	0.1265	0.2013
F	13.7	230.0	460.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;
 *** - significant at 1%;
 ** - significant at 5%; and
 * - significant at 10%.

Appendix 3E: Table 3E5

Variable Means and Standard Deviations: Prairie, Aged 25-44

	Males		Females	
Variable	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	-0.00127	0.25864	0.00432	0.3327
$\Delta \ln W$	0.00637	0.10434	0.00765	0.09829
$\Delta \ln CPI$	0.0107	0.00676	0.01067	0.00668
D_1	0.01125	0.10549	0.01206	0.10915
D_2	0.01121	0.10933	0.01066	0.10271
D_3	0.97017	0.17011	0.97298	0.16214
D_4	0.00647	0.0802	0.0043	0.06542
ΔU	0.00129	96467	-0.00625	1.0104
Getpen	0.01653	0.12751	0.01999	0.13995
Getnopen	0.0129	0.11283	0.01273	0.1121
Getunion	0.01061	0.10244	0.0129	0.11283
Nounion	0.01066	0.10268	0.01178	0.10789
$\Delta \text{Industry}$	0.01997	0.13989	0.02088	0.14298
$\Delta \text{Occupation}$	0.02106	0.1436	0.02462	0.15497
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	-0.60255	102.48	0.91783	91.932
ΔW	0.09699	1.4385	0.08436	1.1283
N	20083		17913	

Appendix 3E: Table 3E6

Variable Means and Standard Deviations: Prairie, Aged 16-69

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.00175	0.30941	0.00723	0.35355
$\Delta \ln W$	0.00747	0.12252	0.00867	0.11123
$\Delta \ln CPI$	0.01069	0.0067	0.0107	0.00663
D_1	0.01483	0.12087	0.01437	0.119
D_2	0.01559	0.12388	0.01318	0.1141
D_3	0.96129	0.1929	0.96675	0.1793
D_4	0.00829	0.09067	0.0057	0.07531
ΔU	0.00042	1.0689	-0.00621	1.0525
Getpen	0.01787	0.12252	0.02176	0.1459
Getnopen	0.01434	0.13249	0.01356	0.11567
Getunion	0.01281	0.11887	0.01466	0.1202
Nounion	0.01289	0.11247	0.01348	0.11532
$\Delta \text{Industry}$	0.03023	0.17122	0.02979	0.17
$\Delta \text{Occupation}$	0.03251	0.17736	0.03368	0.1804
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	0.43416	111.17	1.7886	96.562
ΔW	0.09951	1.4529	0.0871	1.146
N	26299		23667	

Appendix 3F: Table 3F1M

Estimated Differenced Log Hours Equations: BC, Males, Aged 25-54

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1278*** (-3.77)	-0.1451*** (-4.78)	-0.1545*** (-5.69)
$\Delta \ln CPI$	-0.448 (-0.46)	-0.254 (-0.29)	-0.7902 (-1.01)
D_1		0.7778*** (31.8)	
D_2		-0.7176*** (-28.5)	
D_3		-0.1046*** (-3.21)	
ΔU			-0.1571*** (-65.0)
Constant	0.0103 (0.88)	0.0075 (0.71)	0.015 (1.59)
N	7462		
Adj. R^2	0.0017	0.201	0.3624
F	5.3	313.9	1061.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;
 ** - significant at 5%; and
 * - significant at 10%.

Appendix 3F: Table 3F1F

Estimated Differenced Log Hours Equations: BC, Females, Aged 25-54

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.1745*** (4.35)	0.2063*** (5.48)	0.1882*** (5.24)
$\Delta \ln CPI$	-4.977*** (-3.8)	-3.4716*** (-2.84)	-2.9015** (-2.47)
D_t		0.6437*** (17.8)	
D_t		-0.8066*** (-21.1)	
D_t		0.2484*** (4.5)	
ΔU			-0.1365*** (-36.4)
Constant	0.0583*** (3.71)	0.0403*** (2.74)	0.0341** (2.43)
N	5327		
Adj. R ²	0.0063	0.1345	0.204
F	12.0	138.9	342.2

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3F: Table 3F2M

Estimated Differenced Log Hours Equations: BC, Males, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.1177*** (-3.32)	-0.1271*** (-4.0)	-0.1436*** (-5.08)
$\Delta \ln CPI$	-0.2963 (-0.23)	0.2651 (0.23)	0.5457 (0.53)
D_1		0.7609*** (30.5)	
D_2		-0.7284*** (-28.7)	
D_3		-0.121*** (-3.65)	
ΔU			-0.1569*** (-65.0)
Getpen	0.0858*** (3.27)	0.0485** (2.06)	0.0738*** (3.52)
Getnopen	0.0055 (0.17)	0.0219 (0.31)	0.0122 (0.47)
Getunion	0.0131 (0.41)	-0.0346 (-1.21)	0.0114 (0.45)
Nounion	-0.0131 (-0.32)	0.0122 (0.31)	0.0029 (0.09)
Δ Industry	0.1321*** (4.31)	0.0806*** (2.9)	0.0918*** (3.75)
Δ Occupation	-0.0582* (-1.83)	-0.0137 (-0.48)	-0.0263 (-1.04)
Tran23	-0.0018 (-0.16)	-0.0046 (-0.46)	-0.0148* (-1.66)
Tran34	0.0029 (0.32)	0.0057 (0.7)	0.0071 (0.98)
Tran45	-0.0141 (-1.19)	-0.0065 (-0.61)	-0.0155 (-1.64)
Constant	0.0062 (0.43)	-0.0001 (-0.01)	0.0004 (0.04)
N	7462		
Adj. R ²	0.0059	0.2024	0.3657
F	4.75	127.3	332.1

Note: t-ratio is given in parentheses; a two-tailed test is applied;

- *** - significant at 1%;
- ** - significant at 5%; and
- * - significant at 10%.

Appendix 3F: Table 3F2F

Estimated Differenced Log Hours Equations: BC, Females, Aged 25-54

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.1368*** (3.28)	0.1739*** (4.45)	0.1586*** (4.26)
$\Delta \ln CPI$	-2.8862* (-1.7)	-1.7963 (-1.13)	-2.0619 (-1.36)
D,		0.6601*** (18.1)	
D,		-0.7904*** (-20.7)	
D,		0.3059*** (5.34)	
ΔU			-0.1374*** (-36.5)
Getpen	-0.0458 (-1.0)	-0.0182 (-0.43)	-0.0201 (-0.49)
Getnopen	0.1297*** (3.57)	0.1361*** (4.01)	0.1267*** (3.89)
Getunion	0.1798*** (3.83)	0.1579*** (3.61)	0.1691*** (4.03)
Nounion	0.0389 (0.81)	0.0299 (0.67)	0.0354 (0.83)
$\Delta \text{Industry}$	-0.1689*** (-3.68)	-0.2379*** (-5.46)	-0.2408*** (-5.86)
$\Delta \text{Occupation}$	0.1235*** (2.93)	0.1013** (2.57)	0.0817** (2.17)
Tran23	-0.0414*** (-2.8)	-0.0313** (-2.27)	-0.0183 (-1.38)
Tran34	-0.344*** (-2.84)	-0.021* (-1.86)	-0.0158 (-1.46)
Tran45	-0.0255 (-1.61)	-0.304** (-2.06)	-0.025* (-1.76)
Constant	0.0564*** (2.95)	0.0381** (2.14)	0.0368** (2.15)
N	5327		
Adj. R ²	0.0147	0.1429	0.2124
F	7.59	60.2	111.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3F: Table 3F3M

Estimated Differenced Log Hours Equations: BC, Males, Aged 16-69

Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.0699** (-2.44)	-0.0912*** (-3.49)	-0.0892*** (-3.75)
$\Delta \ln CPI$	-1.4067 (-1.4)	-1.39 (-1.52)	-1.9199** (-2.3)
D_1		0.7373*** (31.8)	
D_2		-0.7325*** (-29.7)	
D_3		-0.053* (-1.76)	
ΔU			-0.1559*** (-64.6)
Constant	0.025** (2.08)	0.0238** (2.17)	0.03*** (3.01)
N	9408		
Adj. R^2	0.0006	0.1711	0.308
F	4.43	325.5	1049.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3F: Table 3F3F

Estimated Differenced Log Hours Equations: BC, Females, Aged 16-69
 Changes in Job-Related Characteristics Not Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.1654*** (4.75)	0.2029*** (6.15)	0.1816*** (5.76)
$\Delta \ln CPI$	-3.8098*** (-3.22)	-2.2397** (-2.0)	-1.6879 (-1.59)
D_1		0.609*** (19.6)	
D_2		-0.7162*** (-21.3)	
D_3		0.0773* (1.75)	
ΔU			-0.1379*** (-38.8)
Constant	0.0491*** (3.46)	0.0301** (2.24)	0.0236* (1.83)
N	6748		
Adj. R ²	0.0048	0.1165	0.186
F	12.6	149.7	387.3

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3F: Table 3F4M

Estimated Differenced Log Hours Equations: BC, Males, Aged 16-69

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	-0.094*** (-3.16)	-0.1171*** (-4.31)	-0.1176*** (-4.75)
$\Delta \ln CPI$	-1.741 (-1.34)	-1.7953 (-1.52)	-1.5065 (-1.4)
D_1		0.7161*** (30.4)	
D_2		-0.747*** (-30.1)	
D_3		-0.0733** (-2.39)	
ΔU			-0.1558*** (-64.7)
Getpen	0.0317 (1.21)	0.0117 (0.49)	0.0398* (1.83)
Getnopen	-0.0902*** (-2.65)	-0.0693** (-2.23)	-0.0586** (-2.07)
Getunion	0.1008*** (3.22)	0.00963*** (3.37)	0.01251*** (4.8)
Nounion	0.0701* (1.9)	0.0481 (1.43)	0.0341 (1.11)
Δ Industry	0.1242*** (4.1)	0.0574** (2.06)	0.00736*** (2.92)
Δ Occupation	-0.059* (-1.93)	0.0045 (0.16)	-0.0196 (-0.77)
Tran23	-0.0035 (-0.31)	-0.025 (-0.24)	-0.0094 (-0.99)
Tran34	-0.0155* (-1.65)	-0.0142* (-1.66)	-0.0069 (-0.88)
Tran45	-0.0056 (-0.46)	-0.0039*** (-0.35)	-0.0097 (-0.96)
Constant	0.031** (2.13)	0.0314** (2.35)	0.0273** (2.25)
N	9408		
Adj. R ²	0.6055	0.1737	0.3119
F	5.73	133.2	329.5

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3F: Table 3F4F

Estimated Differenced Log Hours Equations: BC, Females, Aged 16-69

Changes in Job-Related Characteristics Considered

Indep. Var.	1	2	3
$\Delta \ln W$	0.1277*** (3.54)	0.168*** (4.93)	0.1445*** (4.42)
$\Delta \ln CPI$	-1.1549 (-0.75)	-0.291 (-0.2)	-0.1432 (-0.1)
D_t		0.6238*** (19.9)	
D_t		-0.699*** (-20.9)	
D_t		0.0953** (2.07)	
ΔU			-0.1375*** (-38.7)
Getpen	0.075* (1.91)	0.0933** (2.52)	0.0921*** (2.6)
Getnopen	0.0735** (2.09)	0.0811** (2.45)	0.065** (2.04)
Getunion	0.1364*** (3.35)	0.1376*** (3.59)	0.01561*** (4.24)
Nounion	-0.039 (-0.87)	-0.0571 (-1.35)	-0.0491 (-1.22)
Δ Industry	-0.1717*** (4.56)	-0.2165*** (-5.98)	-0.1964*** (-5.77)
Δ Occupation	0.2053*** (5.51)	0.1877*** (5.34)	0.1542*** (4.57)
Tran23	-0.054*** (-4.03)	-0.0414*** (-3.28)	-0.0338*** (-2.79)
Tran34	-0.0452*** (-4.11)	-0.036*** (-3.47)	-0.0316*** (-3.17)
Tran45	-0.0211 (-1.48)	-0.0237* (-1.76)	-0.0187 (-1.44)
Constant	0.0461*** (2.67)	0.0303* (1.86)	0.0254 (1.63)
N	6748		
Adj. R^2	0.0155	0.1261	0.1943
F	10.1	66.1	126.4

Note: t-ratio is given in parentheses; a two-tailed test is applied;

*** - significant at 1%;

** - significant at 5%; and

* - significant at 10%.

Appendix 3F: Table 3F5

Variable Means and Standard Deviations: BC, Aged 25-44

Variable	Males		Females	
	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.00165	0.31423	0.00358	0.3456
$\Delta \ln W$	0.00887	0.10872	0.00913	0.10623
$\Delta \ln CPI$	0.01143	0.00351	0.01143	0.00352
D_1	0.01823	0.13378	0.01671	0.12818
D_2	0.01595	0.12528	0.01295	0.11308
D_3	0.95323	0.21116	0.96208	0.19102
D_4	0.0126	0.11154	0.00826	0.09052
ΔU	-0.0067	1.2598	-0.01539	1.1507
Getpen	0.01863	0.13522	0.01164	0.10726
Getnopen	0.01434	0.11889	0.01502	0.12164
Getunion	0.01461	0.11998	0.01051	0.102
Nounion	0.01086	0.10363	0.00939	0.09644
$\Delta \text{Industry}$	0.02814	0.16539	0.01746	0.13098
$\Delta \text{Occupation}$	0.02707	0.1623	0.0214	0.14473
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	0.19954	111.27	0.46687	94.764
ΔW	0.13306	1.6641	0.11321	1.0732
N	7462		5327	

Appendix 3F: Table 3F6

Variable Means and Standard Deviations: BC, Aged 16-69

	Males		Females	
Variable	Means	Std. Dev.	Means	Std. Dev.
$\Delta \ln H$	0.00484	0.35796	0.00506	0.36142
$\Delta \ln W$	0.0101	0.1271	0.01075	0.11832
$\Delta \ln CPI$	0.01144	0.00361	0.01143	0.00353
D_1	0.02179	0.146	0.0183	0.13432
D_2	0.01839	0.13436	0.01526	0.12261
D_3	0.94462	0.22873	0.95673	0.20348
D_4	0.0152	0.12235	0.00963	0.09768
ΔU	-0.01397	1.3561	-0.01363	1.1546
Getpen	0.01945	0.13811	0.0126	0.11153
Getnopen	0.0135	0.11541	0.01438	0.11904
Getunion	0.01552	0.12361	0.012	0.10891
Nounion	0.01127	0.10555	0.009	0.09465
$\Delta \text{Industry}$	0.03423	0.18182	0.02712	0.16244
$\Delta \text{Occupation}$	0.03401	0.18127	0.02934	0.16878
Tran12	0.28571	0.45176	0.28571	0.45176
Tran23	0.28571	0.45176	0.28571	0.45176
Tran34	0.28571	0.45176	0.28571	0.45176
Tran45	0.14286	0.34993	0.14286	0.34933
ΔH	0.86628	115.72	0.11464	101.32
ΔW	0.13763	1.7786	0.11558	1.0891
N	9408		6748	

Appendix 4A: Table 4A1

Variable Definition

$\Delta \ln H =$	$\log(\text{hours in 1989}) - \log(\text{hours in 1988});$
$\Delta \ln W =$	$\log(\text{hourly wages in 1989}) - \log(\text{hourly wages in 1988});$
$D_1 =$	1 if unemployed in 1988 but not in 1989;
$D_2 =$	1 if unemployed in 1989 but not in 1988;
$D_3 =$	1 if not unemployed in both 1988 and 1989;
$D_4 =$	1 if unemployed in both 1988 and 1989;
$\Delta U =$	weeks unemployed in 1989 - weeks unemployed in 1988;
$K_1 =$	1 if underemployed in 1988 but not in 1989;
$K_2 =$	1 if underemployed in 1989 but not in 1988;
$K_3 =$	1 if not underemployed in both 1988 and 1989;
$K_4 =$	1 if underemployed in both 1988 and 1989;
$\Delta \ln \text{CPI} =$	$\log(\text{CPI in 1989}) - \log(\text{CPI in 1988});$
$\Delta \text{Residence} =$	1 if province in 1988 $\neq$ province in 1989;
$\text{Getmarry} =$	1 if single in 1988 and married in 1989;
$\text{Getdivorce} =$	1 if married in 1988 and single in 1989;
$\text{Getunion} =$	1 if not union member in 1988 but yes in 1989;
$\text{Nonunion} =$	1 if union member in 1988 but not in 1989;
$\Delta \text{Industry} =$	1 if industry in 1988 $\neq$ industry in 1989;
$\Delta \text{Occupation} =$	1 if occupation in 1988 $\neq$ occupation in 1989.

Appendix 4A: Table 4A2
Variable Means and Standard Deviations

Variable	Means	Std. Dev.
$\Delta \ln H$	-0.02625	0.58839
$\Delta \ln W$	0.04084	0.18498
D_1	0.05455	0.22712
D_2	0.07218	0.25879
D_3	0.82395	0.38088
D_4	0.04932	0.21655
ΔU	0.40803	7.3443
K_1	0.08288	0.27571
K_2	0.09133	0.28808
K_3	0.75547	0.42982
K_4	0.07033	0.2557
$\Delta \ln CPI$	0.0453	0.00743
$\Delta \text{Residence}$	0.00829	0.09066
Getmarry	0.01899	0.13649
Getdivorce	0.01094	0.10404
Getunion	0.06059	0.23858
Nonunion	0.05439	0.2268
$\Delta \text{Industry}$	0.08859	0.28416
$\Delta \text{Occupation}$	0.09446	0.29249
N	12428	
ΔH	-40.988	558.67
ΔW	0.57145	2.4173

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