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CHOICES FOR PART-TIME JOBS AND THE IMPACTS ON THE WAGE DIFFERENTIALS

A COMPARATIVE STUDY FOR GREAT BRITAIN AND THE NETHERLANDS

by

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Choices for part-time jobs and the impacts on the wage differentials

A comparative study for Great Britain and the Netherlands

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Abstract

This paper uses the European Household Panel (the ECHP) to analyze individuals' choices on part-time jobs and their impacts on the wage differentials. Our study is a comparative study between Great Britain and the Netherlands. In contrast to most of the previous researches on part-time employment, we make a distinction between short part-time and long part-time jobs. The results show that overall women were more likely to take part-time jobs in both countries, but the effect was much stronger in the Netherlands than it was in Great Britain. We find that there was no substantial wage gap between long part-time and full-time jobs in the Netherlands, working long part-time were more likely to be treated as full-time jobs, which may suggest the presence of " retention part-time jobs " described by Tilly (1996). On the other hand, the results show that part-time workers in Great Britain suffered relatively larger wage penalties, yet, working short part-time was not significantly different from working long part-time because they both received lower wage rates compared to full-time jobs.

Keywords: short part-time job, long part-time job and wage differential(gap)

JEL Classification: J22,J31

Choices for part-time jobs and the impacts on the wage differentials

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1. Introduction

During the past two decades the increase in part-time employment represented one of the most striking structural changes experienced by many EU member countries. Particularly, there has been a rapid expansion of part-time employment in the Dutch labour market, where part-time job as a percentage of the total employment remained the level of 28 per cent in the first half of the 1990s and reached 30 per cent by the late 1990s. The stronger growth in part-time employment also characterized the British labour market, the share of working part-time relative to the total jobs varied from 20 to 25 per cent in the 1990s(OECD, Labor Force Statistics, 2000). For both countries, part-time working's contribution to job creation has been become important as a whole. Between 1987 and 1997, in the Dutch labour market, part-time jobs accounted for 42 per cent of the total growth of employment, while in the British labour market, 53 per cent of the job creation was attributed to the growth of part-time working (OECD Economic Outlook, 1999).

In an optimistic view, part-time employment functions as an effective means to meet the needs of both employees and employers. It not only gives a chance to have a continuity of labor market attachment for those who want to combine their home responsibilities and earn additional income, but also provides firms with a certain flexibility of adjusting their workforce to copy with the fluctuation of market for their products.

As part-time jobs rise rapidly, there has been a growing concern about the quality of part-time jobs. The common criticism is that part-time workers earned lower wage rate than those of full-time workers (Dekker et al., 2000; Blank, 1990; Ermisch et al., 1992,1991), moreover, part-time workers were less well protected, in particular, they received low fringe benefits (Montgomery et al, 1993) and were expected to have a low incidence of firm-specific training compared to full-time workers. Tilly (1996) argued that majority of par-time workers had no little chance for promotion and career perspective.

Most of the previous empirical studies on part-time employment treated part-time job as an undifferentiated mass. Their major assumptions were: (1) overall, full-time workers have higher levels of human capital than do part-time workers, as a result, part-time workers earn less than full-time workers (2) female full-time and part-time workers may differ on a host of unobservable traits, women with part-time jobs are less productive than those whose orientation are toward full-time employment and toward labour market attachment more generally (3) part-time jobs are "bad jobs", which have been identified possessing all characteristics in secondary labour market.

However, in a study conducted by Tilly (1996), part-time workers are seen as a heterogeneous group instead of a homogenous one. According to Tilly, there are two types of part-time jobs: secondary part-time job and retention part-time job. Secondary part-time jobs are similar with jobs in secondary labour market, in which workers normally have low skills and compensation compared to their full-time counterparts. Those who do secondary part-time jobs have little prospect of advancement, hence, secondary part-time jobs are really " bad jobs". On the other hand, retention part-time jobs are found in primary labor markets and tend to be created for those who have skills, they are paid at the level comparable to or above those of full-timers.

Therefore, part-time job is not as simple as we thought it be, we need go further and explore the differences within the group of part-time workers. The aims of our study are: first, we make a comparative study between the Netherlands and Great Britain. We intend to identify what the major factors could affect an individual's decision on taking part-time jobs and what differences are likely to exist between two countries. Second, we break part-time jobs into two categories: short part-time job and long part-time job. By distinguishing between short part-time job and long part-time job, we shed light on the nature of voluntarily part-time jobs and their impacts on the wage gap.

Some of the previous studies have taken into account the differences between short part-time and long part-time jobs (see, e.g. Dekker, et al., 2000; Tam, 1997; Tijdens, 1997). In their studies, those who worked less than 12 hours per week were also classified as part-time jobs. In contrast to their classifications, we truncates those who worked less than 12 hours per week since these kinds of jobs are usually regarded as involuntarily part-time jobs or marginal jobs. With respect to the econometric specification, we allow for the sample selection and estimate the wage equations by two-step method. While two-regime endogenous switching regressions are widely used, for our study, since three categories are defined, i.e. short part-time job, long part-time job and full-time job, we estimate the ordered probit model instead of probit model, all standard errors for wage equations are corrected for accordingly.

The remainder of this paper is organized as follows: Part two provides an overview of the existing literature on explaining why there could be wage differential between full-time and part-time jobs. The recent empirical researches are reviewed in Part three. We introduce the data used for this study in Part four and outline the econometric specification in Part five. The estimation results are discussed in Part six. We summarize our findings and make conclusions in the last part.

For ease of reference when comparing two countries in the following parts we frequently use terms "the Dutch model (or the NL model) " and "the British model (or the UK model)". The former refers to the models and the estimations based on the data for the Netherlands, while the latter refers to the models and the results drawn from the data for Great Britain.

2. Theoretical background

Although the wage gap between full-time and part-time jobs has been the subject of enormous empirical investigations since the 1980s, a systematic theoretical framework is hardly found in any standard labour economics. Most of explanations heavily rely on the extensions of standard theories in labour economics, where the theory of endogenous wage setting, the compensation wage and the dual labour market theory are widely cited. We take up the theories listed above as follows.

2.1 The endogenity of wage setting

The neoclassical analysis of labor supply describes individual allocation of time between the market and non-market as the outcome of maximizing utility subject to a budget constraint. The relevant price for each individual is an hourly wage rate that is exogenously determined and does not vary with the number of hours supplied (see, e.g. Killingsworth 1983). Each employee chooses to work the number of hours for which the marginal rate of substation of leisure for consumption is equal to the wage rate, while each employer is a price-taker and pays employee according to the market wage rate and the productivity of the employee. Within this theoretical framework, full-time and part-time work are not distinguished from each other as distinct forms of wage work, instead, they are regarded as merely numbers of working hours, which can be incrementally increased or decreased by unit (Tam, 1997). The real wage rate shall be the same regardless he (she) is working part-time or full-time.

However, the exogeneity of wage setting (constant wage) is often criticized and questionable. For example, in a study on the determination of daily hours and wages, Barzel (1973) argued that a worker's productivity usually starts slowly at the beginning of a working day and gradually rises. Even at the last hour of a normal work day, a worker's productivity still exceeds the average daily productivity, as a result, the length of working hours could effectively affect a worker's marginal product (MP), the shorter hours individuals choose to work, the lower average hourly rate. The implication of the linkage between working hours and productivity is that part-time workers should be paid a lower rate rather than full-time workers' rate.

In other studies quasi-fixed labor cost is found to play an important role in explaining interdependence between wage and working hours. Quasi-fixed labor cost refers to those costs with the employment of labor, which do not vary with the amount of output (for example, hiring and training cost, and some employee benefits). The existence of quasi-fixed labor cost makes a firm's decision about its optimal combination for employment and hours no different from the one about the usage of any two factors of production (Ehrenberg and Smith, 2000). The firm must adjust both its employment level and working hours so that the costs of producing an added unit of output equal for each. If the hourly labor costs or the quasi-fixed costs of part-time workers fall relative to those full-time workers, part-time employment should expand relative to those of full-time workers. Once we admit to the existence of quasi-fixed labor cost, the assumption of independence between the wage and hours leads to absurd results, i.e. in order to minimize the cost per unit of labor input, the employer must set the average number of hours per worker equal to the total time in the period. A more reasonable assumption is that there should be a whole locus of possible wage-hour combinations, the wage-hours locus must slope upward in order for the cost-minimizing selection of a wage-hours combination (Rosen, 1976).

Overall, the theory of endogenity of wage setting emphasizes the effects of working hours on productivity and the roles of quasi-fixed labor cost on the mixing each type of labor. As Leeds (1990) points out, since the endogenity hypothesis holds for any job or skill level, there is no reason to expect part-time workers to differ significantly with regard to training or education variables. This implies that part-time job is paid less simply because they are less productive than full-time workers are. The lower productivity is not caused by less education level or on the job training, but by shorter working time horizons than full-time workers are.

2.2 Compensation wage and the theory of efficiency wage

Compensation theory predicts that job characteristics that workers consider undesirable will raise the pay to compensate for the unpleasant conditions, those that are desired should be purchased by employers in lower wages. Higher wage for full-time job is seen as the existence of a wage premium. Such wage premium lies in that a large proportion of women regard part-time as a "desired form "of mixing their home responsibilities and earning additional income. Employers who can offer these convenient working hours are in a good position to bargain and reduce the wage rate of part-time workers.

Spatial constraints for part-time workers could also cause compensation wage. Considering small number of working hours, women find it much convenient to combine their part-time jobs with their housework if the firm is easily accessible from their home. Therefore, their labor supplies are likely to be less elastic than the supply of full-time workers (Ermisch and Wright, 1991). If firms make use of their monopsony power in the local market, profit maximization entails paying lower wages to part-time workers.

Apart from the idea of compensation wage, the theory of efficiency wage is also utilized to explain the differences in wage between part-time and full-time jobs. The fundamental idea underlying the theory of efficiency wages is that firms may gain some benefit from paying their workers more than the marginal product they produced. High wage could be more recouped from the additional effort than it generates since it can prevent workers from shirking and turnover.

The implication of efficiency wage is that paying high wage for full-time employees can effectively render them more productive, this is because full-time employees take risk that they can not count on getting a new full-time job at the above market wages if they are fired. On the other hand, part-time workers, who face no threat of lower wages after being fired will be less productive. Hence, part-time workers are not inherently less productive than full-timers, just because of different set incentives.

2.3 The dual labor market theory

The theory of dual labour market claims that the overall labor market is divided into two segments: primary market and secondary market. Primary labour market offers jobs with high wages, good working conditions, employment stability and chances for advancement. On the contrary, secondary market has jobs, which, relative those in the primary sector, are decidedly less attractive. They tend to involve low wages, poor working conditions, and considerable variability. Hence, primary market is characterized by so-called "good job" while the secondary market is full of "bad job".

There are institutional barriers between the segments, mobility between two sectors is limited. The secondary market tends to be filled by groups whose attachment to paid employment is weaker, such as females, youths and part-timers; most of them constantly switch between low-paid jobs. The jobs in primary market tend to be the filled by prime-age cored workers and skilled contingent workers, their mobility are more likely to be intra-segment rather than inter-segment.

Tilly (1996) applied the theory of dual labor market to the study on part-time job market. In contrast to the most previous researches that classified all part-time jobs into "bad jobs", Tilly reexamined the nature of part-time job and made a distinction between " good part-time job and "bad part-time job ".

Tilly's dual conception on part-time job rests on the assumption that part-time work comprises of three broad categories: short part-time job, secondary part-time job and retention part-time job. He argued that short part-time job occurs when, instead of laying workers off during a business downturn, an employer temporarily reduces workers' hours until sales revive, this is what we call " involuntarily part-time jobs.

Compared to short part-time job, Tilly viewed secondary part-time employment and retention part-time job as the most important part-time jobs. Secondary part-time jobs are "bad part-time jobs" characterized by low skill requirements, low pay and fringe benefits and high turnover. Secondary part-time employment thus represents one form of "secondary labour market" in the dual labour market. On the other hand, retention part-time jobs are “good part-time jobs” created to retain valued employees whose life circumstances prevent them from working full-time. Retention part-time arrangements tend to be offered only to workers in relatively skilled jobs, most of workers in this group are so called “ core workers “. According to Tilly, unlike secondary part-time employment, retention part-time workers normally possess firm-specific training and remain internalized; firms can not easily replace them with several secondary part-time jobs.

3. Review of the recent empirical studies

Dekker et al. (2000) used SEP (the Dutch Social-Economic Panel) to analyze part-time work in the Netherlands. When estimating the multinomial model, they classified part-time work into short part-time and long part-time jobs. Those who worked less than or equal to 12 hours per week were regarded as short part-time jobs, while those who worked greater than 12 hours but less than 33 hours were defined as long part-time jobs. The threshold between part-time and full-time jobs is 33 working hours per week. The results show that in the Netherlands married men were more likely to work and especially to work full-time, women with children were significantly less likely to work long part-time or full-time. The findings also suggested that short part-time jobs were quite distinct in terms of the attached wages, but to what extent such distinction existed, it was unclear from their paper.

Tijdens (1997) classified working arrangement into four categories: full-time job is defined as working over 35 hours per week, long part-time jobs are those jobs working between 24-35 hours, medium-sized part-time jobs are 16-23 hours and short part-time jobs are those working less than 16 hours. The main conclusion drawn from the study is that no substantial wage gaps were found among the different groups in the Netherlands. Furthermore, Tijdens argued that the Dutch female part-time workforce consists of two groups. The first group is created as an employer strategy, a disproportionate amount of temporary work with lower wage characterizes this group. Another group working in part-time job is created due to family responsibilities; high skilled women are likely to be over represented in this group. While the former group has been decreasing over time, the latter group has been increasing.

By using the British data, Ermisch et al. (1992) constructed an order probit model and estimated wage equations for part-time and full-time jobs. The order probit model was estimated for the three-way decision of whether to work full-time, part-time and not at all. They found that the lower rate of return to human capital in part-time employment made a relatively small contribution to women's lower pay relative to men's in the British labor market.

Tam (1997) made an extensive study on part-time jobs in the UK. His classification between short-hour part-time and long-hour part-time was motivated by his argument that part-time workers who work fewer than 17 hours per week is the group who is minimally protected under the existing legal framework in the UK. Unfortunately, his analysis for the wage was based on combining all part-time workers instead of separating short hour part-time from long hour part-time; hence, the conclusion was very general.

In a comparative study between Great Britain and other OECD countries, Bardasi et al. (2000) constructed a multinomial logit model and estimated the wage equations based on the data of Luxembourg Income Studies. Three categories, i.e. part-time jobs, full-time jobs and non-employment are defined in the multinomial logit model. Their results revealed that that in the UK, the hourly wage gap between part-time and full-time jobs was about 15 per cent, the differences in observable characteristics between part-time and full-time workers explained almost the entire unadjusted wage gap.

4.The data

4.1 The ECHP data

The data used in this study come from the ECHP-UDB released in December 2001 by Eurostat. The ECHP-UDB is short for "the users' database of European Community Household Panel"(hereinafter called "the ECHP"). As a standardized yearly based-survey, it aims at forming a coordinated system of household surveys across EU member states, providing comparable information on diverse economic and social indicators concerning living conditions of private households and persons. The first full-scale survey begun in 1994, the latest wave was conducted in 2001, there are currently 14 member countries involved in the survey.

While each member country carries its own labor force survey, some countries usually combine their data collection for the ECHP with the existing national panels. Most surveys for the ECHP are based on two-stage random sampling: sample areas are selected in the first stage, followed by the selection of a small number of addresses or households within each selected area. Note, however, in part of the Netherlands and Great Britain, direct sampling method was used, for example, in city like Amsterdam. The sample size for each country is determined on the basis of various theoretical and practical considerations and the available budget.

In the ECHP-UDB released in December 2001, five waves for the years 1994-98 are available. The data sets used for our study are drawn from the panels of Great Britain and the Netherlands for the year 1998. As both countries have been on scale in part-time job market, the numbers who reported that they were working part-time in the surveys are relatively larger than the ones obtained from other countries. Moreover, each category (i.e. short part-time, long part-time and full-time job, see the discussion in the following sub-section) considerably varies within the categories of every chosen discrete independent variable, so that the relative models can be estimated without predicting perfectly.

The data contains 4962 households and 8826 persons in the year 1998 for the Netherlands, while there are 4996 households and 8868 persons in the year 1998 for Great Britain. Since we excluded those respondents aged over 65 or below 15 and categorized part-time jobs into short part-time and long part-time jobs, the number of observations is decreased when estimating models, especially estimating wage equations. Moreover, the treatment for missing values by econometric software (STATA) we used could also lead to a substantial decrease in the number of observations. Note that the number of observations used in estimation is always listed along with the report for the results.

4.2 Classification of part-time working

Given the emphasis on examining differences among short part-time and long part-time jobs, it is essential that the classification of part-time jobs under our study combine this requirement. Two steps are needed to achieve this goal. At first, based on weekly working hours reported by respondents, we define full-time jobs as those working 30 hours or more, those less than 30-hours are seen as part-time jobs. Second, we divide part-time jobs into two categories: short part-time job and long part-time job. Short part-time job is defined as those working at least 12 but not more than 21 hours per week, a job are a long part-time job if the weekly working hour is between 22 and 29.

As mentioned in Part one, Dekker (2000), Tam (1997) and Tijden (1997) also divided part-time jobs into short part-time and long part-time jobs. Table 4.1 compares our classification with theirs.

Table4.1
Comparisons with other authors' classifications

	Short part-time	Long part-time	Full-time
In our study	12-21 hours	22-29 hours	>=30 hours
In Dekker 's paper (1999)	<= 12 hours	13-32 hours	>=33 hours
In Tam 's paper (1997)	<=16 hours	17-29 hours	>=30 hours
In Tijdens 's paper (1997)*	<=15 hours	24-35 hours	>= 36 hours

Note: according to Tijdens' classification, persons who work between 16 and 23 hours are classified as medium-sized part-time jobs; see Tijdens (1997), p178.

The classification under our study is different from others in two major aspects: first, adopting 30-hours to differentiate between part-time and full-time job; second, truncating those who reported that they worked less than 12 hours per week. The treatment for those who reported their working less than 12 hours per week merits attention. Working less than 12 hours are usually called "involuntarily part-time job", the central bureau for statistics in the Netherlands explicitly defines these people as unemployed persons, which are not considered in our study. Further, considering the possible inaccurate reporting of working hours in the survey and the fact that marginal jobs are relatively fewer in the data, dropping them from the group of part-timers in the data does not cause any meaningful selection bias.

5. Econometric specification

5.1 The ordered probit model and the ordered inverse Mills' ratios

Assume that there are three observed choices: the respondent works either short part-time, or long part-time, or full-time. Accordingly, let y takes on the value, 1,2,3 to denote these three outcomes. The choices observed are assumed to be ordinal and mutually exclusive.

An ordered probit model can be derived in the form of the propensity index function model, which is analytically convenient than the methods motivated by the utility function. Conventionally, the latent variable can be denoted by $y*$, the asterisk implies its nature of latent variable.

$$y_j^* = \gamma Z_j' + u_j$$

The propensity index function shows that individuals have their own preference, depending on certain measurable factors Z, and the unobservable factors u_j. The error term in the function u_j is assumed to have standard normal distribution with unity variance. The setting of unity variance is for identification due to the unobservable nature of the lateen variable $y*$.

Although y_i^* is a latent variable and unobservable, we do observe:

$y=1$ if	$y^* < \mu$	the individual works short-part-time
$y=2$ if	$\mu \le y^* < \mu_1$	the individual works long-part-time
$y=3$ if	$\mu_1 \le y^*$	the individual works full time

μ and μ_1 are two thresholds that the individuals have to cross over to make y observable, therefore, there are two truncated points reflecting three intervals of each individual's propensity: $(-\infty, \mu)$, $[\mu, \mu_1)$ and $[\mu_1, +\infty)$. Long (1999) explained that while the assumption of unity variance can identify variance in the index function, the mean of the latent variable is still unidentified, therefore, parameterization of model is necessary. Following Green (2000)'s specification, we set the first cut-point be zero, as a result, we leave only one threshold to estimate and remain the intercept in the model. If a person's propensity index is less than zero, he (she) is observed to take short part-time, otherwise, he (she) will be observed to work long part-time job or full-time job.

Estimation of ordered probit model functions twofold: first, examine the major factors that could affect individuals' choices of part-time jobs; second, use the predicted probabilities of observing different choices to compute the inverse Mills' ratios, which is denoted by $\Lambda(i)$.

Allowing three choices in an ordered probit model implies that the distribution is doubly truncated and not one point (from above or below), as is necessary to apply the standard Heckman selection model, the ordered inverse Mills' ratios can be computed as follows:

the inverse Mills ratio for short part-time job:

$\lambda(1) = -\phi(Z'\gamma)/[1-\Phi(Z'\gamma)]$

the inverse Mills ratio for long part-time job:

$\lambda(2) \ = [\phi(-Z'\gamma)-\phi(\mu_1 - Z'\gamma)]/[\Phi(\mu_1 - Z'\gamma)-\Phi(-Z'\gamma)]$

the inverse Mills ratio for full-time job:

$\lambda(3) = \phi(\mu_1 - Z'\gamma)/[1-\Phi(\mu_1 - Z'\gamma)]$

The computed inverse Mills' ratios are plugged into the wage equations to correct for selectivity-bias. Since the coefficient matrix γ is used to compute the inverse Mills' ratio for every observation, its impact will be accounted for when computing covariance matrix for the wage equations, as explained in the following section.

5.2 Wage equations and correction for selectivity-bias

Following Main et al. (1993)'s notation, we write the original wage equations as follows:

$$W_1 = \beta_1 X_1' + \varepsilon_1$$
$$W_2 = \beta_2 X_2' + \varepsilon_2$$
$$W_3 = \beta_3 X_3' + \varepsilon_3$$

the subscripts i=1,2,3 designate short part-time job, long part-time job and full-time job respectively. For simplicity, the subscript for individual j is suppressed. X_i is a matrix consisting of an intercept and explanatory variables; β_i is a coefficient matrix including a constant , ε_i is an error term.

Substituting the relative inverse Mills' ratios into the original wage equations, we have:

$$W_1 = \beta_1 X_1' + \rho_1\sigma_1\lambda(1) + \nu_1$$
$$W_2 = \beta_2 X_2' + \rho_2\sigma_2\lambda(2) + \nu_2$$
$$W_3 = \beta_3 X_3' + \rho_3\sigma_3\lambda(3) + \nu_3$$

the error term ν_i is assumed to be homogenous; ρ_i is the coefficient for the correlation between the error term in the ordered probit model and the error term in the wage equations; σ_i is the standard error for the *ith* wage equation.

Least squared regression of W_i on exogenous variables X_i and $\lambda(i)$ would produce consistent estimates. The consistent estimate of the error variance for the ith wage equation is calculated as follows:

$$\hat{\sigma}_i^2 = \frac{1}{n} e_i' e_i + \hat{\bar{\delta}}_i b_i^2$$

where:

$$b_i = \sigma_i \rho_i$$

$$\bar{\delta}_i = \frac{1}{n} \sum_{i=1}^{3} \hat{\delta}_{ij}$$

$$\hat{\delta}_{ij} = \hat{\lambda}(i)_j (\hat{\lambda}(i)_j + Z'_{ij} \hat{\gamma})$$

The squared correlation coefficients between the error term in the ordered probit model and the ith wage equation is given by:

$$\rho_i^2 = \frac{b_i^2}{\sigma_i^2}$$

The corrected-standard errors for the wage regressions are calculated according to:

$$Var(\beta, b) = \sigma^2 (X_*^{'} X_*)^{-1} [X_*^{'} (1 - \rho^2 \delta_i) X_* + Q][X_*^{'} X_*]^{-1}$$

Note that X_* is a matrix including λ, $Q = \rho^2 (X_*^{'} Z) VAr - Cov(\hat{\gamma})(Z^{'} X_*)$. The term Q is designed to account for the fact that the same estimate of γ is used to compute $\hat{\lambda}(i)$. For the detailed description, see Green (2000) and Main et al. (1993).

5.3 The decomposition of wage differentials

The Decomposition of wage differentials is based on the method developed by Oaxaca (1973), the extension here is that the self-selection is included in the augments.

$$\log \overline{w}_F - \log \overline{w}_S = \beta_F (\overline{X}_F - \overline{X}_S) + \overline{X}_S (\beta_F - \beta_S) + (\rho_F \sigma_F \overline{\lambda}_F - \rho_S \sigma_S \overline{\lambda}_S)$$

$$\log \overline{w}_F - \log \overline{w}_L = \beta_F (\overline{X}_F - \overline{X}_L) + \overline{X}_L (\beta_F - \beta_L) + (\rho_F \sigma_F \overline{\lambda}_F - \rho_L \sigma_L \overline{\lambda}_L)$$

$$\log \overline{w}_L - \log \overline{w}_S = \beta_L (\overline{X}_L - \overline{X}_S) + \overline{X}_S (\beta_L - \beta_S) + (\rho_L \sigma_L \overline{\lambda}_L - \rho_S \sigma_S \overline{\lambda}_S)$$

The subscripts F, L, S denote full-time job, long part-time job and short part-time job receptively, β is the coefficients for explanatory variables in the wage equations and $\overline{X}$ is the average values for each explanatory variable. The left hand side for each decomposing equation shows the differentials of the average log hourly wage. The right hand side consists of three parts that contribute to the wage gap: the first term is the contribution due to the differences in the average characteristic between part-time and full-time employees; the second term represents the contribution arising from the different wage offers for part-time and full-time jobs. The final part is taken as a selection-bias contribution, in which $\overline{\lambda}$ is the average inverse Mills' ratio, the product of ρ and σ is the estimated coefficient for the inverse Mills' ratios in wage equation.

6. The results

Two major components build up this part: we first introduce the variables included in the ordered probit model and the wage equations, a more detailed explanation for these variables are given in the Appendix A. We then present the empirical results and make a comparative analysis between the Netherlands and Britain.

6.1 Variables

6.1.1 The key variables in the ordered probit model

The dependent variable in the ordered probit model is a categorical variable representing three outcomes, taking on the value 1 if one works short part-time; 2 if one works long part-time; and 3 if one works full-time. The numbers are assumed to be ordinal in both working time and utility, short-part-time job is less than long part-time job, long part-time is less than full-time job.

We expect a greater influence of social and demographic characteristics on individual choices of working part-time. Though, part-time jobs are strongly associated with women, the share of male part-timers has risen recently. Yet, excluding male workers from the sample will lead to a decrease in the number of observations when estimating the models. Hence, a dummy variable for gender is defined in the model to test what differences are likely to exist between men and women.

Decision of individual labor supply is enhanced by jointly considering household and the number of dependent children in the family. The dummies for martial status and children in the model allow us to further understand how individual's decision is constrained within the family framework. In addition, the interaction items among the variables for gender, martial status and the number of children are constructed in the model.

As a proxy for the income effect imposed by family other members, we define a categorical variable describing the number of actively working persons in a family. By dosing so, we expect that larger number of active working persons, higher income a family possesses, and more likely one takes part-time job.

The segregated nature of the labour market by occupation and industry adds a further impact on the patterns of working time. Many clerical jobs and the jobs in service sectors are more likely to be taken by women and part-timers, whereas other occupations are more likely to work full-time. We make use of the information provided by the respondents in the ECHP and define a categorical variable to capture the effect of occupation. In addition, the dummies reporting one's job level are also concluded in the model.

The ordered probit model under our study can be viewed as a 'choice model" in the sense that all these factors are set for the employees (supply side). In order to analyze the roles of the firms (demand side), we need more firm-oriented variables from the ECHP. Unfortunately, the ECHP is a household survey instead of employee-employer match data; we are not able to consider the effects of firm demand on part-time jobs in the choice model.

6.1.2 The key variables in the wage equations

The dependent variable is the natural logarithm of the hourly wage expressed in its own national currency (Dutch guilder and British pound), it is defined by the reported current monthly earnings divided by the number of actual hours worked in that respective period.

The variable for age is used as a proxy for one's potential working experience; the dummy for tenure is a measure of firm-specific experiences. To control for the possible wage gaps among different industries and the effects due to the size of firm, we include dummies for industry and the size of firms. In addition, as explained in Part 5, we use the computed inverse Mills' ratios to correct for selectivity-bias in the wage equations.

6.2 The results of estimated ordered probit model

6.2.1 The choices for part-time jobs by gender and age

Table 6.1 summarizes the results of the estimated ordered probit model for the Netherlands and Great Britain, the signs of the coefficients reveal the direction of effects associated with the average individual demographic characteristics and the job related

Table 6.1
The estimates of ordered probit model

	NL Model	UK Model
Constant	1.289**	1.395**
	(0.032)	(0.027)
Gender (female=1)	-0.571**	-0.290**
	(0.105)	(0.109)
Age	0.073**	0.054**
	(0.023)	(0.018)
Age squared (/10)	-0.013**	-0.009**
	(0.003)	(0.002)
Education (high level as ref. Group)		
Middle level	-0.368	-0.003
	(0.320)	(0.103)
Basic level	-0.206	-0.105
	(0.220)	(0.073)
Marriage (married=1)	0.552**	0.360**
	(0.134)	(0.146)
Gender x married	-0.969**	-0.795**
	(0.147)	(0.155)
Children (=1 if at least one child)	-0.197	0.135
	(0.133)	(0.173)
Gender x children	-0.837**	-1.053**
	(0.149)	(0.183)
Health problem (health=1)	-0.087	0.704**
	(0.242)	(0.353)
Income effect (>3 as a ref. Group)		
Active working family members: 0-1	0.442**	-0.004
	(0.165)	(0.125)
Active working family members: 2-3	0.200	0.086
	(0.155)	(0.113)
Unemployment (=1 if previously unemployed)	-0.199**	-0.086
	(0.071)	(0.140)
Occupation (operatives as a ref. group)		
Professional workers	-0.010	-0.649**
	(0.160)	(0.203)
Technician	-0.167	-0.656**
	(0.154)	(0.198)
Clerical workers	-0.154	-0.894**
	(0.159)	(0.186)
Service workers	-0.510**	-1.356**
	(0.162)	(0.186)
Craftsmen	0.086	-0.066
	(0.189)	(0.267)
Elementary occupation	-0.449**	-1.292**
	(0.180)	(0.197)
Job level (basic level as a ref. group)		
Supervisory	0.554**	0.640**
	(0.187)	(0.134)
Intermediate	0.280**	0.562**
	(0.098)	(0.090)
No. of observations:	2638	3346
Log likelihood	-1436.38	-1416.55
Pseudo R2	0.274	0.243

Standard errors in parenthesis, ** significant at 5 %.

attributes (occupation and job level). The tests for joint significances are listed in table B2. We present the effects of a change in an explanatory variable on the probability (marginal effect) in table B3.

It can be seen from table 6.1 that the coefficient for gender was significant in both models, indicating that the women were more likely to take part-time jobs compared to men. At the mean level, being a woman, the probability of working full-time decreased while the probability for working short part-time and long part-time increased. By comparing the probabilities for the variable of gender in table B3, we find that the Dutch women had higher propensity to work part-time than the British women, the increase in probability of a woman working part-time in the Netherlands was 0.151 (0.073+0.078), two times higher than a woman's in Britain.

As demonstrated in table 6.1, a married person was more likely to work part-time in both models, which is consistent with the findings for the effect of martial status by Dekker (2000) and Bardasi et al. (2000). In order to test for the difference between the married women and men in taking part-time jobs, we interact the variables of gender and the martial status. The coefficients for such interaction are found to be significant, implying that compared to the married men, the married women had higher likelihood of working part-time. Again, it is important to note that the increase in probabilities of working part-time for the married women in the NL model was greater than their counterpart's in the UK model, as illustrated in table B3.

We also find a significant interaction for the variables of gender and children in table 6.1, suggesting that the effect of children on women was stronger than men's. Therefore, the presence of children put more constrains on women's labor supplies than men's, the adjustment for working time was mainly undertaken by women's choice in part-time job. Compared to the UK model, the NL model demonstrates that the effects of children for the Dutch women were larger in both working short and long part-time (see table B3).

Based on the estimated ordered probit model, a simulation is made to examine the combined impacts of gender, martial status and age on part-time choices. Suppose that there are hypothetical persons aged 35 and 45 years respectively, they are married and have at least one child under the age of 12. In addition, they have middle level education and enjoy good health, other factors are set to be on the average.

Table6.2
Simulation: the probabilities of choosing part-time and full-time jobs

		Short PT	Long PT	Full-time job
NL model	Men (age=35)	0.0751	0.1294	0.7955
	Men (age=45)	0.0150	0.0446	0.9404
	Women (age=35)	0.1928	0.2067	0.6004
	Women (age=45)	0.0548	0.1070	0.8382
UK model	Men (age=35)	0.0145	0.0255	0.9600
	Men (age=45)	0.0033	0.0079	0.9889
	Women (age=35)	0.0360	0.0501	0.9138
	Women (age=45)	0.0075	0.0154	0.9770

Under these conditions, we compute the predicted probabilities and present them in table 6.2. As anticipated, in every age group women's probabilities of working part-time jobs are larger than men's. For the NL model, among the women aged 35, the likelihood of their taking short part-time job is 0.1928, one and a half time larger than men's, yet, such differential in the prime-age group is enlarged more than two times. On the other hand, the ratios in probabilities of working long part-time between women and men for two age groups are 1.59 and 2.40 respectively. Therefore, the simulation for the NL model demonstrates that the gap in probabilities between women and men are increased from the age group of 35 to the group of 45. However, the same pattern can not be found in the UK model, where the ratios do not substantially vary with the age.

This result may be explained by the assumption that in the Netherlands the composition of male part-timers is not fixed, most of them may use working part-time as a "bridge" and eventually work full-time. On the other hand, in Britain the population of working part-time is inelastic due to the limitation of social and demographic characteristics, the age effect seems relatively smaller compared to the one for the Netherlands.

Table 6.3
Comparison between the U.S. and some European countries

	Full-time job	Part-time job
Canada	0.596	0.142
The United States	0.585	0.171
Germany	0.515	0.233
Italy	0.502	0.129
The Netherlands*	0.600	0.230
Great Britain*	0.914	0.086

Note: for the countries without asterisks, the figures are from Bardasi et al (2000).

Table 6.3 makes a comparison in the predicted probabilities between the United States and some major European countries including the Netherlands and Great Britain. For the countries without asterisks, the figures are copies from Bardasi et al. (2000)'s paper; the last two rows come from our own simulation in table 6.2. Note that the figures from Bardasi et al.'s prediction refer to those married women aged 35,with the medium education level and one child of ages 12-17.

The higher proportion of part-time in Germany seems to be associated with higher unemployment in its own labor market; working par-time may not be individual voluntary choice. In contrast, the recent studies suggest that the high incidence of part-time jobs and flexible work in the Netherlands correspond to personal preferences (see, e.g. Pot et al., 2001). Britain has a relatively higher ratio of working part-time in its overall labor market, the lowest part-time rate for the British women in table 6.3 may indicate that a large proportion of part-timers may be concentrated in other age group.

6.2.2 The choices for part-time jobs and education

The signs of education shown in table 6.1 were negative, indicating that relative to those with high-level education, people with medium and basic levels of education were more likely to work part-time jobs. However, the results of single and joint tests are found to be insignificant in the model. Since the job level and the occupation were positively associated with one's education level, entering them in the model might cause multicollinearity and make the variable for education insignificant, we reestimate the model without the variables for job level and occupation. The re-estimation shows that in the NL model, the education (medium and basic levels) was significant only at 10% level, whereas in the UK model, the basic education level was significantly associated with working part-time jobs at 5% level, but the coefficient for the middle education level was insignificant.

Once we accept the assumption that the education level has no impact on taking part-time jobs, the choice of part-time undertaken by women are quite likely motivated by combing their participation in labor market and traditional roles in family production.

6.2.3 The choices for part-time jobs and the income effect

The signs of income effect shown in table 6.1 are positive in the NL model, implying that people with less family income were more likely to work longer hours. However, the significant effect is only found among those having at most one family member actively involved in working. With 2-3 family members actively working, the effect becomes insignificant. In the case of the UK model, all coefficients for the effect of income and the joint test are shown insignificant.

6.2.4 The choice for part-time jobs and the characteristics related to work

A careful examination on table 6.1 and table B3 shows that job level had a significant effect on individual choice in working part-time. The higher job level, the less likely one worked part-time. For example, in the Dutch model, being in a supervisory position decreased the probability of working short part-time and long part-time by 0.07 and 0.08 respectively, being in an intermediate position would decrease the probability by 0.03 and 0.04 respectively. Compared the last two rows in table B3, we see that there was a significant variation in the changes of probability for a person from the supervisory position to the intermediate position in the NL model, while for the UK model, the marginal effects remain almost the same.

By and large, the signs of coefficients for the occupation variable are in line with our expectation. The joint test for occupation show a significant result for both models. Note that in the models, our reference group of comparison is operatives who were supposed to be male-dominated occupation and usually work in the organized consecutive production, hence, we assume that they are less likely to work part-time. In the UK model, compared to the operatives, all other occupations were more likely to work part-time, the coefficients were significant with the exception of craftsmen's. Among the different occupation, the NL model shows that, service and elementary occupations, which are female dominated, were significantly associated with working part-time. The sign of craftsman was positive, implying that they were more likely to work full-time.

Similar pattern can be found in both models that service workers and elementary occupations had higher probabilities of working short part-time jobs. Note, however, in the NL model, the likelihood remained almost the same when comparing the probabilities between short part-time and long part-time jobs undertaken by the service and elementary occupations. By contrast, the probabilities of working long part-time jobs by service workers and elementary occupations in the UK model were decreased compared to the ones of working short part-time jobs, suggesting that those occupations were more likely to take short part-time jobs rather than long part-time jobs.

6.3 The results of estimating wage equations and decomposing wage differentials

6.3.1 The analysis of wage equations

The regression results are reported in tables B4 and B5 in the appendix, all standard errors have been adjusted according to the formula shown in the econometric specification. Coefficients related to selection bias λ, ρ, and the standard errors of the wage equations are reported in the lower panel in the table.

As the proxy variables, the age and the quadratic in age are used to capture the effect of one's potential working experience. Our results are in line with the basic assumption of human capital theory and the wage function is concave in the effect of age. It can be seen from the tables that the effect of age for full-time job was stronger in both models. For example, in the UK model, holding other variable constant, the change in age by one year would increase the wage by 8 percent for full-time jobs, but the wage rose only by 5.4 per cent and 3.7 per cent for long part-time and full-time jobs.

Table B4 displays that the wage level for part-timers in the NL model was significantly associated with their educational attainments, workers with high education received higher wage. Furthermore, the effect of education on wage for part-timers was much stronger than that for full-time jobs, although the coefficients for full-time jobs were shown insignificant.

A significant effect of education on full-time job is found in the UK model, workers with basic education level earned 24 per cent less than those with higher education in the group of full-time jobs. Given each level of education table B5 shows that there was a large difference in wage between short part-time and long part-time jobs. For example, suppose a person with basic education works long part-time, his (her) wage will be 21 per cent lower than that received by high educated part-timers, however, if this person works short part-time job, his (her) wage would be substantially decreased and be paid 32.41 per cent less than the level for higher educated part-timers in the same group.

The variables of industry and the sizes of firms are designed to capture the possible compensation wage across industries and firms. Most coefficients were insignificant. As to the effect of firm size, a similar pattern can be found in both models, i.e. working in large- sized firms were paid higher than working in small and medium-sized firms. Note that there was evidence shown in the tables that the effect of firm size was stronger in the group of part-time jobs. For example, in the UK model, working short and long time in the small-sized firms was paid 24.72 and 30.76 per cent less than the level of wage working in large-sized firms. By contrast, the wage for those working full-time in small-sized firm was only 19.77 per cent lower than the wage in large-sized firms.

Based on tables B4 and B5, we see that the hypothesis of no selection bias is rejected in the Dutch model. For the UK model, we are able to accept the hypothesis of no selection bias only for full-time job, but the hypothesis is rejected for part-time jobs. Our findings for the UK model are in agreement line with Ermisch et al. (1992)'s analysis on the British part-time workers.

The implication of rejecting hypothesis of no selection bias is that the standard errors for the estimates of the parameters in the wage equation are biased upwards, the adjustment of standard errors has to be corrected for. The lower panels in both tables also present the coefficient ρ, which is a measure of the correlation between the error term in the choice model and the one in the wage equation. The negative ρ suggests that, for given measured characteristics, part-time or full-time employees who were observed in the wage equations received lower wage offers than those excluded. On the other hand, a positive ρ implies that, among those with similar observed characteristics, those (part-timer or full-timer) who were excluded from the wage equations had lower wage offers than those included.

6.3.2 The decomposition of wage differentials

The unadjusted wage differentials listed in table 6.4 are computed by taking anti-log of the difference between the average wages rate for short (long) part-time job and full-time job and subtracting 1 from it.

The figures in the second row of table 6.4 indicate that the wage gap between short part-time and full-time jobs was about 11 per cent in the Dutch model, working short part-time received 7.25 per cent lower wage than working long part-time job. Two things deserve our attention when examining the long part-time job in the Dutch model. First, the wage gap between full-time and long part-time jobs was only about 3 per cent;

second, the differential in wage between long part-time job and full-time jobs was significantly smaller than the one between full-time and short part-time jobs.

Table 6.4
The unadjusted wage differentials (%)

	NL model	UK model
Full-time vs. short part-time jobs	10.52	31.52
Long-time vs. short part-time jobs	7.25	1.61
Full-time vs. long part-time jobs	3.05	29.43

The most interesting finding is the contrast between two models. A direct comparison explicitly suggests that in general there was quite a large wage differential between full-time and part-time jobs in the UK model. For example, short part-time workers and long part-time workers earned 31 per cent and 29 per cent less than those working full-time job respectively, much larger gaps than their counterparts in the NL model. The magnitude of the effects of part-time jobs on the wage was quite striking, yet, it is important to note that the wage gap between short part-time and long part-time jobs in the UK model existed but quite small compared to their gaps with full-time jobs.

The results of decomposing the wage gaps are reported in table 6.5 The wage differentials are decomposed into three components: the first part is due to the differences in the average productivity-enhancing characteristics (endowments); the second part is attributable to the differences in the average sample selection; the third part is what we call “ return differences “ revealed by differences in estimated coefficients. Three pairs are made when decomposing the wage differentials: full-time and short part-time jobs, long part-time and short part-time jobs, and full-time and long part-time jobs.

To the extent the characteristics affected the wage gap, it can be seen from table 6.5 that the differences helped reduced the wage gap between short (long) part-time and the full-time jobs in the NL model. One possible explanation for this is that the older people were over represent in the sample of part-timers for the NL model (recall that we use age as a proxy for ones’ potential working experience).

Moreover, as we argued before, in the Netherlands, those working part-time jobs might not be necessarily lower educated, people with high education were quite actively involved in the part-time job market, especially work long part-time jobs. Thus, the differences in education level for those contained in our sample reduced the wage differentials. Similar explanation can be applied to the effect of narrowing wage gap between long part-time and full-time jobs in the UK model, although such effect was minor compare to the one in the NL model.

Table 6.5
The decomposition of wage gap

	NL Model			UK Model		
	Full time vs. Short PT	Long PT vs. Short PT	Full time vs. Long PT	Full time vs. Short PT	Long time vs. Short PT	Full time vs. Long PT
Wage gap	0.100	0.067	0.032	0.274	0.016	0.258
Due to:						
Characteristics	-0.042	0.050	-0.088	0.039	0.036	-0.001
Selection	-0.119	-0.195	0.008	-0.253	-0.199	-0.063
Return	0.328	0.215	0.113	0.488	0.169	0.322

Both models in table 6.5 show the positive effect of " return", indicating part-time jobs are discriminated against full-time jobs. But a comparison between two models displays the following patterns: (1) for the pair of full-time and short part-time jobs, the effect of return in the UK model was stronger than the one in the NL model, the differences accounts for 0.488 in the wage gap for the UK model as compared to 0.328 for the NL model. (2) the differences in return contributed to the wage gap between full-time and long part-time jobs in the NL model was much less than it is in the UK model.(3) the differences in return in the NL model contributed more to the wage gap between long part-time and short part-time jobs than it did in the counterpart for the UK model.

Such observation indicates that in Britain for those working short and long part-time, they both suffered larger wage penalties, long part-timers were more likely to be treated as short part-timers in terms of their wage rate. In contrast, those working long part-time in the Netherlands were more likely treated as those working full-time. On the other hand, in both countries, working short part-time jobs were paid lower, but the effect was stronger in Great Britain, as shown in table 6.5.

7. Summary

In this paper, we have made a comparative study on part-time jobs for the Netherlands and Great Britain. The data sets from the European Household Panel (ECHP) are used.

We classify part-time job into short part-time and long part-time jobs and tend to explore their impacts on the wage differentials.

In most comparisons between two countries, we find that employees in the Netherlands had higher likelihood of taking part-time jobs than their counterparts in Great Britain. As expected, marriage increased the probabilities of working part-time, but the effect imposed on women was stronger than it did on men. The same conclusion can be applied to the effect caused by the presence of children. Our simulation shows that given a certain of constrains, the proportion of working part-time by the Dutch women is relatively higher than the level in the comparable group in Great Britain.

The relationship between the choices of part-time jobs and the job related characteristics are captured by the distribution of occupations and job levels. The result shows that working in service sector increased the likelihood of taking part-time jobs, being supervisory position or intermediate job level, their likelihood of working full-time significantly rose. These conclusions hold for the Dutch model and the British model.

Surprisingly, although a large proportion of women were working part-time in the Netherlands, the wage differentials between part-timers and full-time employees are relatively smaller than the ones in Britain. More importantly, we find that the pattern of the wage gap in the Netherlands was quite distinct from the one in Great Britain. The fact that there was only 3 per cent of the unadjusted wage gap between long part-time and full-time jobs in the Dutch model might single the presence of the 'retention part-time job " characterized by Tilly (1996). Yet, in the Dutch model, the average characteristics for those taking long part-time job is higher than those of full-time employees, as a result, the difference in the average characteristics made a contribution of reducing the wage gap.

Compared to the Netherlands, working part-time in Britain suffered much wage penalty. Our finding is in line with Tam (1997)'s arguments about the British part-time workers. The analysis for the UK model suggests that in Great Britain there was no obvious distinction between long part-time and short part-time jobs in terms of their wage. The wage penalty for long part-time job was almost same as the one received by the short part-time job.

Our study is based on the selected wave from ECHP; we only observe individual choice on part-time job at one point in time. In order to capture the dynamic change of individual choice and its effect on the wage, we need to make a panel study. Moreover, the quality of part-time jobs actually covers many aspects such as the benefit and training opportunities received by part-timers and their career prospects, etc., which really call for a rich data set containing more information on part-timers. All these will be left for our further study in the future.

Appendix A

The definition of variables in the ordered probit and the wage equations

(1) The variable for part-time jobs: a dependent variable with three categories in the ordered probit model. The variable is coded 1 if weekly working time is between 12 and 21 hours (short part-time job), 2 if weekly working time is between 22 and 29 hours (long part-time job), 3 if weekly working time is greater than 29 hours (Full-time job).

(2) Hourly wage: a dependent variable in the wage equations. Hourly wage is calculated according to the reported current gross wage divided by the number of actual working hours in that respective period. We follow the convention and take the logarithm of hourly wage.

(3) Gender: gender=1 for male, zero otherwise.

(4) Age: a continuous variable in years.

(5) Age squared: squared age divided by 10.

(6) Education: a categorical variable describing individuals' education level. Education =1 if it is a high education level, education =2 if it is a middle education level, education =3 if it is a basic education level. Accordingly, three dummy variables are created, the dummy for the basic education level is chosen as a reference group.

(7) Marriage: marriage=1 for married person, zero otherwise.

(8) Children: a dummy variable indicating the number of children under the age of 12 in a household .It is coded 1 if there is at least one child, 0 if no child.

(9) Health: a dummy variable reporting the respondent's healthy condition. Heatlth=1 if one is healthy, zero otherwise.

(10) Income effect: The income effect is proxyed by the variable indicating the active-working members in a household. It is coded 1 if there is at most one person actively working, 2 if there are two or three actively working persons, 3 if there are four or five persons actively working. Three dummies are created, the third group is chosen as a reference group.

(11) Unemployment: a dummy variable, 1 if one was previously unemployed, zero otherwise.

(12) Tenure: a categorical variable used for the estimation of wage equation. Tenure=1if it is less than five years; tenure=2 if it is between 5 and 10 years, tenure=3 if it is greater

than 10 years. Three dummies are created, the third group is chosen for a comparison group.

(13) Occupation:

Occupation=1 if one is a professional worker

Occupation=2 if one is a technician

Occupation=3 if one is a clerical worker

Occupation=4 if one is a service worker

Occupation=5 if one is a craftsmen

Occupation=6 if one is an operative

Occupation=7 if one's job is elementary

Seven dummies are created, the group of operatives is chosen as a reference category.

(14) Job level:

Job level=1: supervisory

Job level =2: intermediate

Job level=3: basic

Three dummies are constructed, the third group is chosen as a reference group.

(15) Firm size:

Firm size=1 if there are less than 11 employees, small-sized firm

Firm size=2 if the number of employees is between 11 and 100,medium-szie firm

Firm size=3 if the number of employees is over 100, large-sized firm

Three dummies are created, large sized-firms are defined as a reference group.

(16) Industry:

Industry=1: agriculture

Industry=2: manufacturing

Industry=3: service

Three dummies are created, the dummy for agriculture is chosen as a reference group.

(17) Private: a dummy variable, indicating that the firm where the respondent worked is a private or public sector. Public sector is chosen as a reference group.

Appendix B

Table B1
The means and standard deviations of the variables in the ordered probit model

	NL		UK	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Gender	0.473	0.499	0.521	0.500
Age	36.340	9.299	36.147	11.535
Age squared (/10)	140.701	70.957	143.961	88.713
Middle education level	0.013	0.115	0.088	0.283
Primary education level	0.959	0.198	0.252	0.434
Marriage (married=1)	0.596	0.491	0.530	0.499
Gender X marriage	0.263	0.440	0.277	0.447
Children	0.367	0.482	0.292	0.454
Children x gender	0.146	0.354	0.144	0.352
Health	0.986	0.118	0.995	0.071
Active members:0-1	0.292	0.455	0.253	0.435
Active members: 2-3	0.675	0.468	0.673	0.469
Unemployment	0.221	0.415	0.056	0.230
Professional workers	0.205	0.404	0.162	0.369
Technician	0.271	0.444	0.159	0.366
Clerical workers	0.167	0.373	0.227	0.419
Service workers	0.120	0.325	0.172	0.378
Craftsmen	0.109	0.311	0.113	0.317
Elementary occupations	0.056	0.231	0.078	0.268
Job level: supervisory	0.060	0.238	0.107	0.309
Job level: intermediate	0.131	0.338	0.188	0.390

Table B2
The LR test for joint significances in the ordered probit model

	NL Model	UK Model
LR test for joint significance of education	1.40	2.26
LR test for joint significance of income effect	12.91**	1.78
LR test for joint significance of occupation	34.36**	151.32**
LR test for joint significance of job level	16.85**	58.64**

** Significant at 5 % level.
Note: the income effect refers to the number of actively working members in a family.

Table B3
The marginal effects based on the estimated ordered probit model

	NL model			UK model		
	Short PT	Long PT	Full-time	Short PT	Long PT	Full-time
Gender	0.073	0.078	-0.151	0.022	0.022	-0.040
Age	-0.009	-0.010	0.019	-0.004	-0.004	0.008
Age squared (/10)	0.002	0.002	-0.004	0.001	0.001	-0.002
Middle education level	0.045	0.051	-0.096	0.0002	0.0002	-0.0004
Primary education level	0.025	0.028	-0.054	0.008	0.008	-0.016
Marriage (married=1)	-0.075	-0.076	0.151	-0.027	-0.027	0.054
Gender x married	0.170	0.129	-0.299	0.059	0.060	-0.120
Children	0.025	0.028	-0.053	-0.010	-0.01	0.020
Gender x children	0.158	0.112	-0.271	0.153	0.097	-0.249
Health problem	0.010	0.012	-0.022	-0.053	-0.053	0.106
Active member: at most one	-0.048	-0.058	0.106	0.0003	0.0003	-0.006
Active member: 2-3	-0.026	-0.028	0.054	-0.06	-0.007	0.013
Unemployment	0.025	0.028	-0.052	0.006	0.007	-0.013
Professional workers	0.001	0.001	-0.003	0.048	0.049	-0.097
Technician	0.021	0.023	-0.044	0.049	0.050	-0.099
Clerical workers	0.019	0.021	-0.040	0.067	0.068	-0.134
Service workers	0.063	0.070	-0.133	0.101	0.103	-0.204
Craftsmen	-0.011	-0.012	0.022	0.005	0.005	-0.010
Elementary occupation	0.055	0.062	-0.118	0.096	0.098	-0.194
Job level: supervisory	-0.068	-0.077	0.145	-0.048	-0.048	0.096
Job level: intermediate	-0.035	-0.039	0.073	-0.042	-0.043	0.085

Note: due to rounding, the sum of marginal effect for some variables may not be equal to zero.

Table B4
The estimation of wage equation for the NL model

Explanatory variable	Short PT coefficient	Long PT Coefficient	Full-time Coefficient
Constant	1.494	2.037	1.097
	(0.450)	(0.406)	(0.153)
Age	0.091**	0.094**	0.109**
	(0.015)	(0.014)	(0.006)
Age squared (/10)	-0.010**	-0.011**	-0.012**
	(0.002)	(0.002)	(0.001)
Education (ref.group: high)			
Middle level	-0.560**	-0.844**	-0.012
	(0.261)	(0.248)	(0.082)
Basic level	-0.430**	-0.564**	-0.007
	(0.206)	(0.174)	(0.044)
Tenure (ref.group: <=5 years)			
6-10 years	0.238**	0.143**	0.038**
	(0.050)	(0.048)	(0.019)
More than 10 years	0.196**	0.135**	0.043
	(0.058)	(0.055)	(0.022)
Unemployment (unemployed=1)	-0.070*	-0.059	-0.092**
	(0.047)	(0.048)	(0.019)
Firm size (ref.group: large)			
Small	-0.110**	-0.204**	-0.113**
	(0.050)	(0.050)	(0.022)
Medium	-0.131	-0.078	-0.077**
	(0.071)	(0.066)	(0.023)
Industry (ref.group: agriculture)			
Manufacturing	0.062	0.072	0.122
	(0.240)	(0.261)	(0.096)
Service	0.061	0.093	0.183**
	(0.233)	(0.249)	(0.050)
Private (ref.group: public)	-0.147**	-0.111**	-0.093**
	(0.047)	(0.044)	(0.020)
Lambuda	-0.146**	-0.131**	-0.143**
	(0.052)	(0.029)	(0.017)
σ	0.394	0.339	0.370
ρ	0.370	0.386	0.386
No. of observations	371	293	1914
Adjusted R-squared	0.268	0.335	0.376

The corrected standard errors in parenthesis, ** significant at 5%, * significant at 10 %.
Note: short PT: short part-time job; long PT: long part-time job.

Table B5
The estimation of wage equation for the UK model

Explanatory variable	Short PT Coefficient	Long PT Coefficient	Full -time Coefficient
Constant	0.411	0.799	0.620
	(0.471)	(0.357)	(0.134)
Age	0.037**	0.050**	0.080**
	(0.011)	(0.013)	(0.004)
Age squared (/10)	-0.004**	-0.005**	-0.009**
	(0.001)	(0.002)	(0.001)
Education (ref.group: high)			
Middle level	-0.090	-0.124*	-0.086**
	(0.074)	(0.077)	(0.027)
Basic level	-0.281**	-0.197**	-0.212**
	(0.051)	(0.056)	(0.018)
Tenure (ref.group: <=5 years)			
6-10 years	0.112*	0.122*	0.045**
	(0.068)	(0.071)	(0.022)
More than 10 years	0.138*	0.046	0.029
	(0.088)	(0.104)	(0.032)
Unemployment (unemployed=1)	0.056	-0.149	-0.030
	(0.108)	(0.114)	(0.031)
Firm size (ref.group: large)			
Small	-0.221**	-0.268**	-0.180
	(0.058)	(0.059)	(0.017)
Medium	-0.118*	-0.066	-0.105**
	(0.063)	(0.068)	(0.018)
Industry (ref.group: agriculture)			
Manufacturing	0.233	0.054	0.056
	(0.404)	(0.225)	(0.105)
Service	0.263	0.139	0.058
	(0.395)	(0.212)	(0.104)
Private (ref.group: public)	-0.269**	-0.114**	-0.109*
	(0.052)	(0.055)	(0.018)
Lambuda	-0.131*	-0.158**	-0.253
	(0.075)	(0.040)	(0.015)
σ	0.392	0.348	0.441
ρ	0.333	0.453	0.574
No. of observations	324	219	2738
Adjusted R-squared	0.284	0.296	0.355

The corrected standard errors in parenthesis, ** significant at 5 %, * significant at 10 %.
Note: short PT: short part-time job; long PT: long part-time job.

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