Job satisfaction among US Ph.D. graduates: the effects of gender and employment sector

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First draft, January 2002

Abstract

In this paper we try to understand the determinants of job satisfaction. The population of Ph.D. graduates in the United States offered an interesting basis to test new factors that are likely to influence job satisfaction. Indeed, the Ph.D. group provides a useful homogeneity - same level of education - and an interesting heterogeneity - different career outcomes amongst them, academic vs. non academic positions. Empirically we use the Survey of Doctorate Recipients carried out by the National Science Foundation in 1997. We estimate various models on a sample of 30,000 Ph.D.s in science and engineering. Contrary to all the previous studies, and more accordingly to expectations, we find that females express themselves as less satisfied with their jobs than males, other things equal, at least for those who work in the academic sector. We show that the number of hours worked has a positive effect on the probability of being satisfied for males and a negative effect for females. The absolute earnings increase the probability of being satisfied. But when a measure of comparative pay is included in the models, the coefficient related to the absolute wage is not significant anymore. More generally, we find that job satisfaction is explained by different sets of variables respectively for males and females, and for academics and non-academics.

Keywords: job satisfaction, professional labor markets, Ph.D.

JEL classification: J28, J44.

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I would like to thank the participants to the 2001 ZEW conference in Berlin on unemployment, the participants to the 2001 IZA Summer School in Buch and my colleagues at IREDU and SPRU.

Introduction

A majority of economists are still reluctant to study job satisfaction. "They view personal judgments of satisfaction and other subjective opinions as a black box that should be opened only by psychologists and sociologists" (Lévy-Garboua and Montmarquette 1997 p.1). But, many studies have tried to understand the determinants of job satisfaction following the seminal papers of Hamermesh (1977), Freeman (1978) and Borjas (1979), and have considered job satisfaction as an economic variable.[2] Since then, economists have been increasingly interested in the assessment of subjective well-being. Recently, many studies have considered the general well-being of individuals[3] or more specifically the well-being at work, i.e. job satisfaction.[4]

Indeed, the satisfaction that workers derive from their jobs may be viewed as an indication to how they react to general economic conditions. It is a useful summary measure of numerous job characteristics. And, perhaps more interestingly, job satisfaction does also affect these general economic outcomes. In that sense, job satisfaction is an economic variable that is interesting to study. It can predict labour turnover, absenteeism, productivity or different events affecting the labour force.[5] Freeman (1978, p.8) noted that "subjective variables like job satisfaction [...] contains useful information for predicting and understanding behavior".

Specific groups have been studied such as lawyers, nurses or academics.[6] In this paper, we will focus our analysis on individuals with a doctorate in science and engineering who are employed in the USA. Three main elements have led us to consider the job satisfaction of this specific population as potentially interesting to study.

Many studies have shown that higher educated workers are less satisfied than lower educated workers.[7] The common interpretation of this fact is that job satisfaction depends on the gap between outcomes and aspirations, and that aspirations are increased by education. In considering a unique level of education, we eliminate this type of difficulty. The homogeneity of the group that results from the study of a unique level of education may reveal other mechanisms that are not visible when considering different levels of education.

Other studies have shown that females are more satisfied with their jobs than males.[8] The high investment in human capital necessary to obtain a Ph.D. may reverse this fact. It may also have important consequences on the variables that explained job satisfaction.

In the USA, Ph.D.s have traditionally two really different types of careers. About half of them are employed in the academic sector. But, the business and industrial sector recruit

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[2] However, and despite the "recent" interest of economists for job satisfaction, this notion remains an important domain of the psychological and organizational behavior researches. For a general survey of this literature, not really familiar for economists, see Spector (1997).

[3] Clark (1995, 2001), Ng (1996), Kenny (1999), Frey and Stutzer (1999), Blanchflower and Oswald (1997, 2000), Easterlin (2001).

[4] For example, among recent papers: Clark (1996, 1997, 1998), Brown and McIntosh (1998), Hamermesh (1999), Sloane and Williams (2000), Clark *et al.* (1998), Blanchflower and Oswald (1999), Sousa-Poza and Sousa-Poza (2000), Sloane and Ward (1999, 2001), Jürges (2001).

[5] Hamermesh (1977), Freeman (1978), Akerlof *et al.* (1988), Tsang *et al.* (1991), Clark and Oswald (1996), Lévy-Garboua *et al.* (1998), Clark *et al.* (1998), Clark (1999).

[6] See respectively: Laband and Lentz (1998), Shields and Ward (2000) and Sloane and Ward (1999, 2001).

[7] Clark and Oswald (1996) report that satisfaction levels are strongly declining in the level of education, other things equal. See, among others, Clark (1995, 1997), Sloane and Williams (1996).

[8] See below for more details on this topic.

nearly the other half of them, and a minority (around 10%) are employed in local government or federal administrations. In the United States, the private sector has been established as a major employment sector for Ph.D.s for decades now. Thus, Ph.D. graduates face two different labour market situations - academic vs. non academic positions. These two groups may have different behaviours in terms of job satisfaction.

Thus, the homogeneity - same level of education - and the diversity - career outcomes - of the Ph.D. group provide an interesting basis to analyse the determinants of job satisfaction.

The remaining of this paper is organized as follows.

In section I, we briefly review the job satisfaction at the theoretical level. We present the data used and we provide some basic facts about job satisfaction for Ph.D.s.

In section II, the empirical modelling of job satisfaction is developed.

In section III, we proceed to a systematic analysis of the results from the models.

Section I. Job satisfaction: some basic facts

Theoretical background

The first model that can explain job satisfaction is related to the standard lifetime utility microeconomic model.

We can define the utility of an individual from working as:

$$U = u(y, h)$$

where the utility increases with y, the income, and decreases with h, the number of hours worked. In that specification, the absolute level of wage enters directly in the utility function. Here, we give simply the static version of this model. However, the inter-temporal nature of utility could be taken into account (Lévy-Garboua and Montmarquette 1997).

However, other phenomena are likely to influence the individual utility. The subjective nature of income can be integrated in this simple model. Indeed, the level of utility may depend not only on the absolute level of income but also on a reference income to which individuals compare their earnings. This relative income captures the effect of "relative deprivation, envy, jealousy or inequity" (Clark 1995, p.2). In the case of job satisfaction, the annual salary is an important determinant of job satisfaction. But job satisfaction is also affected by relative earnings. Individuals compare their earnings with other group of individuals or have specific expectations concerning their earnings.[9] But as mentioned by Hamermesh (1999), it is not clear by which mechanism changes in earnings affect job satisfaction.

Thus we rewrite the utility function as:

$$U = v(y, y^*, h, X)$$

where y^* is the relative earnings of the individual and X a vector of individual and job characteristics. The utility is expected to decrease with y^*.

[9] The initial idea was proposed by Hamermesh (1977).

Presentation of the data

The Survey of Doctorate Recipients carried out by the National Science Foundation is designed to provide information about individuals with doctoral degrees in science and engineering fields less than 75 years old. The science and engineering fields include individuals with doctorate in "hard" sciences but also Ph.D.s in social sciences. The Survey we use here was carried out in April 1997 on about 35,000 individuals. It contains information about education, work activities and history, socio-economic background...

We have selected a sample of 29114 individuals from the 1997 SDR, 21358 males and 7756 females, who are employed full-time in April 1997, from a total sample of 35189 individuals.[10] Most individuals are employed in the academic sector (cf. table 1).

Table 1. Broad sectors of employment of Ph.D.s (in percentage)

	Male	Female	Total
Academic sector	46.9	59.5	50.2
Government	11.1	10.7	11.0
Industry	42.0	29.8	38.8

Source: SDR 1997
Note: our sample.

Job satisfaction is described as a categorical response that underline the feelings of individuals about their jobs. These feelings are represented by limited number of discrete choices. In the Survey of Doctorate Recipients, the overall job satisfaction is ranged in four categories. The exact question asked to the individuals is: "How would you rate your overall satisfaction with the job you held during the week of April 15, 1997 ?". Four answers are possible: very satisfied, somewhat satisfied, somewhat dissatisfied and very dissatisfied.

Table 2. Job satisfaction by gender and sector of employment (in percentage)

	All sectors			Academia		Government		Industry	
	Male	Fem	Total	Male	Fem	Male	Fem	Male	Fem
Very satisfied	52.1	48.2	51.0	55.2	46.9	47.0	45.8	49.9	51.7
Somewhat satisfied	37.7	38.8	38.1	35.5	39.5	40.5	39.0	39.7	37.5
Somewhat dissatisfied	7.8	9.3	8.1	7.2	9.8	9.5	10.7	7.8	7.9
Very dissatisfied	2.4	3.7	2.7	2.1	3.8	2.9	4.5	2.6	2.9

Source: SDR 1997.
Notes: our sample.

Different studies have specifically considered the impact of race or gender on job satisfaction (Bartel 1981; Clark 1995, 1997; Groot and Brink 1998; Sloane and Williams 2000) and females are found to have higher job satisfaction than males. Contrary to these earlier studies, in the SDR survey, women are less satisfied than men with their jobs, except maybe for women working in the business/industry sectors. Ward and Sloane (1999) have showed for the UK academic profession that there were no significant differences between males and females regarding job satisfaction. But in all the other studies, women express

[10] The inclusion of part-time workers in the models has raised some difficulties (particularly with the variable umber of hours worked). In the original database, 6.7% of individuals work part-time.

themselves as more satisfied with their jobs than men. The authors have tried to explain this surprising job satisfaction[11] differential by the different nature of job and personal characteristics, by the different values or expectations among males and females or by sample selectivity problems. Here, these basic statistics seem to indicate that the gender differential in the job satisfaction has the opposite sign as usually.

The age has an impact on job satisfaction for both men and women An increasing satisfaction profile with age seems to appear with these basic data.

Table 3. Job satisfaction by date of birth and gender (in percentage)

	<1935	35-39	40-44	45-49	50-54	55-59	>1959
				Males			
Very satisfied	68.54	58.94	54.90	53.42	49.54	47.97	47.54
Somewhat satisfied	25.76	32.77	36.05	36.18	39.40	40.78	41.66
Somewhat dissatisfied	4.75	6.02	6.82	8.04	8.20	8.74	8.21
Very dissatisfied	0.95	2.28	2.22	2.36	2.87	2.52	2.59
				Females			
Very satisfied	56.72	58.82	50.25	49.64	48.46	48.05	44.51
Somewhat satisfied	32.34	30.81	39.10	37.47	39.26	38.82	40.90
Somewhat dissatisfied	7.96	7.00	8.15	9.16	8.78	8.87	10.82
Very dissatisfied	2.99	3.36	2.51	3.73	3.51	4.26	3.78

Source: SDR 1997.
Notes: our sample.

Section II. Empirical models for job satisfaction

To precise these basic evidences, it is necessary to estimate models to take into account the different factors that are likely to affect job satisfaction, and to assess their relative importance, other things equal.

Modelling the discrete but ordinal nature of job satisfaction

We will respectively denote the four job satisfaction outcomes ("very satisfied"..."very dissatisfied") by $y_i = 0$, $y_i = 1$, $y_i = 2$ and $y_i = 3$ for the individual i. The outcome is discrete but of ordinal nature. So, we would like to estimate the following model:

$$y_i^* = -\beta' x_i + u_i$$

where y_i^* is the independent unobserved variable, x_i the vector of dependent variables, u_i the vector of error terms and β the vector of parameters to estimate.

The observed satisfaction variable y_i is related to the latent variable y_i^* such as:

[11] Surprising if we consider that females have a disadvantage positions in the labour market in terms of earnings, promotion or job security.

$$y_i = 0 \text{ if } y_i^* \leq 0$$
$$y_i = 1 \text{ if } 0 < y_i^* \leq \mu_1$$
$$y_i = 2 \text{ if } \mu_1 < y_i^* \leq \mu_2$$
$$y_i = 3 \text{ if } \mu_2 < y_i^*$$

where μ_1 and μ_2 are two unknown threshold parameters to estimate.

As we suppose u_i normally and identically distributed across observations with mean 0 and variance 1, we have:

$$\Pr(y_i = 0) = \Pr(y_i^* \leq 0) = \Pr(-\beta' x_i + u_i \leq 0) = \Pr(u_i \leq \beta' x_i) = \Phi(\beta' x_i)$$

$$\Pr(y_i = 1) = \Pr(0 < y_i^* \leq \mu_1) = \Pr(y_i^* \leq \mu_1) - \Pr(y_i^* \leq 0) = \Phi(\mu_1 + \beta' x_i) - \Phi(\beta' x_i)$$

$$\Pr(y_i = 2) = \Phi(\mu_2 + \beta' x_i) - \Phi(\mu_1 + \beta' x_i)$$

$$\Pr(y_i = 3) = 1 - \Phi(\mu_2 + \beta' x_i)$$

where $\Phi(.)$ is the normal standard cdf.

We proceed to the ML estimation of the previous model. We included a sample selection term, with the estimation of a probit model in a first step, in the ordered probit but it has never been significant.

It is useful to calculate the marginal effects for the different probabilities. Indeed, only the sign of the changes in $\Pr(y_i = 0)$ and $\Pr(y_i = 3)$ are unambiguous[12].

The marginal effects evaluated at the sample means are for the continuous variables:

$$\frac{\partial \Pr(y = 0)}{\partial x} = \phi(\hat{\beta}' \bar{x})\hat{\beta}$$

$$\frac{\partial \Pr(y = 1)}{\partial x} = \left[\phi(\hat{\mu}_1 + \hat{\beta}' \bar{x}) - \phi(\hat{\beta}' \bar{x})\right]\hat{\beta}$$

$$\frac{\partial \Pr(y = 2)}{\partial x} = \left[\phi(\hat{\mu}_2 + \hat{\beta}' \bar{x}) - \phi(\hat{\mu}_1 + \hat{\beta}' \bar{x})\right]\hat{\beta}$$

$$\frac{\partial \Pr(y = 3)}{\partial x} = -\phi(\hat{\mu}_2 + \hat{\beta}' \bar{x})\hat{\beta}$$

where $\phi(.)$ is the normal standard pdf.

For a dummy variable *d*, the marginal effects are for the outcome *j*:

$$\Pr(y = j | \bar{x}, d = 1) - \Pr(y = j | \bar{x}, d = 0) \text{ for } j = 0,1,2,3$$

It is the difference between the two probabilities, when the dummy variable takes the value one and when it takes the value zero, as the other variables are at their sample means.

[12] in the general case. Greene (1999) underlines that it is useful to be cautious with this type of models.

As described in the theoretical section, four types of explanatory variables will be included:

- Hours worked: we use the average number of hours worked during a week declared by the individuals. Individuals with part-time position are not in the sample. However, when included in the sample, these individuals report a level of satisfaction clearly lower than individuals who work full-time.

- Social characteristics such as age, gender, race/ethnicity and family related variables.

- Job characteristics: we will include variables relative to the sector of employment, the number of employees in the work structure, the main work activity, the type of work arrangement (job security) and the region of employment. We have tried other combinations to describe the job held by individuals. We have tried to replace the couple sector of employer-main activity by a codification in 17 categories of the occupation and profession of individuals. But it seems that this description was less satisfactory that the first one. We also include various variables to control for geographical effects (region of employment) or scientific fields (field of Ph.D.).

- Earnings: the annual salary has been used. To take into account the relative earnings, we have computed a wage equation described in the next section.

In table 1 in the appendix, basic statistics are presented for the variables used in the empirical estimations.

Absolute vs. relative earnings

To take into account the wage expectations phenomenon, we compute a wage equation and we integrate the residuals in our ordered probit model. The main assumption of this regression is that individuals are likely to compare their earnings with a group of reference. This reference group is constituted by individuals with similar situations in the labour market to themselves. One has an opinion about his/her wage, his/her true "value", or has an idea to be well-paid or under-paid. This phenomenon takes into account the envy or the jealousy that are likely to play a role in the assessment of job satisfaction.

The fitted values from the regression represent what an individual can expect "on average" in terms of earnings with his/her diploma, basic social characteristics and type of job. Therefore, the residuals from the regression are a measure of comparative pay, difference between actual pay and expected pay. The explanatory variables in the wage equation are of three main types: socio-economic background, characteristics of the job and fields of doctorate.[13] We integrate the field of doctorate in this regression because workers are likely to pay more attention to observable characteristics than to less observable skills. And one essential characteristic of Ph.D. graduates is their field of doctorate.

The estimated equation is:

$$\ln w_i = z_i'\delta + v_i$$

where w_i is the observed annual wage, z_i the vector of independent variables, δ the vector of parameters to estimate and v_i the vector of error terms with $E(v_i)=0$, $V(v_i)=\sigma^2$ and $Cov(v_i,v_j)=0 \quad \forall i \neq j$

[13] We do not want to estimate a traditional wage equation. We would like to estimate the expected wage of individuals, or more exactly, what they can pretend to or expect to.

A sample selection problem may arise as well in this type of equation. To deal with it, we have computed a probit model and we have put the inverse Mill's ratio in the wage equation. The coefficient related to this variable has never been significant.

Once this equation is estimated, we put the residuals, difference between the observed and predicted values, $w_i - \hat{w}_i = w_i - \exp\left(z_i'\hat{\delta}\right)$, in the ordered probit as an explanatory variable (in the vector x_i). The coefficient related to this variable is expected to be positive: the higher the actual wage compared to the expected wage, the higher the job satisfaction.[14]

Section III. Main results

We present the empirical results for the different estimated models.

The job satisfaction for all sectors is first reviewed. Then, we examine the determinants of job satisfaction in the academic sector and in the business and industrial sector.

Job satisfaction: overall results

Some major determinants of job satisfaction appeared in the table 3 in the appendix which presents the estimated coefficients of six models: the models one to three are estimated without the comparison pay differentials and the models four to six include this variable. The table 4 presents the marginal effects for the model 6. Results from separate estimations for males and females are displayed in table 5.

Before examining the effects of the different variables on the probability of being satisfied with job, we have to note that the models presented in the appendix predict relatively well the job satisfaction. We have computed the predicted probabilities for the model 6 table 3. The results are as follows (take the previous expressions and evaluate them at the sample means with the vector of estimated parameters):

$$\Pr(y=0) = \Phi\left(\hat{\beta}'\bar{x}\right) = 0.515$$

$$\Pr(y=1) = \Phi\left(\hat{\mu}_1 + \hat{\beta}'\bar{x}\right) - \Phi\left(\hat{\beta}'\bar{x}\right) = 0.418$$

$$\Pr(y=2) = \Phi\left(\hat{\mu}_2 + \hat{\beta}'\bar{x}\right) - \Phi\left(\hat{\mu}_1 + \hat{\beta}'\bar{x}\right) = 0.054$$

$$\Pr(y=3) = 1 - \Phi\left(\hat{\mu}_2 + \hat{\beta}'\bar{x}\right) = 0.013$$

They are quite close to the observed frequencies in the sample that are respectively 0.521, 0.377, 0.078 and 0.024.

Number of hours worked and earnings

The coefficient of the variable 'number of hours worked' is positive, contrary to the theoretical predictions. One possible interpretation is that at this level of education, and for the corresponding type of job, more hours worked are associated with more job satisfaction.

[14] If the residual is positive, the individual is "relatively" well-paid. He/she may have such a subjective perception of the situation. Therefore, his/her job satisfaction may increase.

But males and females are really different in that respect. In the table 5, we see than the coefficient of the hours worked is negative for women and strongly positive for men.

The absolute annual salary has a positive effect on satisfaction as predicted by the theoretical model. However, when the residual from the wage regression is added in the model, the absolute earnings is not significant anymore. The coefficient related to the comparative earnings is positive as expected: the higher the earnings (comparatively to the "reference" group), the higher the probability of being satisfied. Thus, the comparison pay may have a strong influence on job satisfaction. Males and females have different behaviour in that respect (cf. model 2, table 5). When the two variables are included in the model of job satisfaction, the coefficient of the annual salary is positive and significant for females and not significant for males. The coefficient related to the measure of the comparative pay is positive and significant for males and not significant for females. Thus job satisfaction is sensible to the absolute earnings for females and to the relative earnings for males.

But, we have to be cautious with the interpretation of the coefficient of the comparative pay in the ordered probit model. Indeed, this coefficient is quite sensitive to the specification of the wage equation. The estimates of the wage equation are shown in the table 2 in the appendix. The traditional determinants of the earnings of individuals are also found here (age, gender, employment sector...). More specific elements to Ph.D.s have also an effect on the earnings (fields of doctorate).

A dummy variable had also been tested in the ordered probit model to account for the relative nature of earnings. This dummy is 1 for "well-paid" individuals (individuals with a positive residual) and 0 otherwise. The coefficient of this variable was always positive and highly significant as expected. This specification of the relative pay is less sensitive to the wage equation specification but is also less precise because only one dummy attempts to capture all the information. When this variable was included in the ordered probit models, the coefficient of the annual salary remained positive and significant.

Socio-economic variables

These estimates confirm that females express themselves as less satisfied with their jobs than males. The coefficient related to this variable is negative and significantly different from zero in all the models except the model 1. The marginal effects for the model 6 that are displayed in table 4 show that being a female decreases the probability of being very satisfied by 3.2%. The pecuniary elements - and essentially the wage gap between males and females - are not sufficient to explain this less well-being at work for females. Indeed, the impact of this gender variable is reinforced by the inclusion in the model of the residuals from the wage equation. So, once taken into account the pay differential between males and females, women are even more dissatisfied with their jobs than without taking into account the pay gap.

Non-US citizens have a lower job satisfaction. This is also true, to a lesser extent, for Asians and under-represented minorities who have a lower job satisfaction than Whites.

There is a strong effect from age. In the models one to six, the date of doctorate award is used as a proxy from age. In the database, few individuals have earned a doctorate in a second part of their career. But for those one, the date of award can be an indicator of the beginning of a new career. In other models that we estimated, the age profile was nearly the same as with the date of award profile, but with a more pronounced U shape for the former. Having recently awarded doctorate decreases the probability of being "happy" at work comparatively to the individuals at the end of their career. But the individuals at mid-career are the far less happy at work. This age profile is confirmed by the main studies that have been conducted since then. [15] The separated estimations for males and females - results are

[15] See for example Clark *et al.* (1995, 1998)

presented in table 5 - show that the U-shaped age-profile in satisfaction is more clearly visible for females than for males. Females are less satisfied in the middle of their careers. Males are less satisfied with their jobs during nearly all their career, comparatively to the end of their career where their satisfaction is at the highest level.

We have included variables related to the family status of individuals in the models. The variable 'number of children' has a significant positive effect on the job satisfaction, even if it is not one of the main determinants.[16] This variable does not have an effect for males but it is strongly significant for females. This is relatively surprising that such a variable not directly related to job satisfaction has an effect on it. However, the job satisfaction reported by individuals may also reflect other elements of a broader satisfaction, as life satisfaction elements.[17]

Sector of employment, work activity and job security

All the variables that are related to the "traditional" work activity of Ph.D. graduates increase the satisfaction of individuals. This is the case for the main business for employer. The academic sector (education) has a strong positive effect on job satisfaction. But this is only the case for males (cf. table 5). For females, this coefficient is not significantly different from zero. Females are less satisfied when working in the public administration or government sector. The individuals who work in the transportations services sector express themselves are less satisfied, but at a low level of significance.

If the main activity of individuals is research (applied or basic) or teaching, it increases their probabilities of being satisfied at work. But, once again, these variables are only positive and significant for males. To the contrary, the coefficients related to the variables 'employer relations' or 'production' are significantly negative.

The establishment size is also an important variable to consider as Idson (1990) has shown. The smaller the work structure, the greater the satisfaction. An establishment size of less than 10 employees increases the marginal probability of being very satisfied by 11.7% for the model 6. This effect is common to males and females.

Working on a short-term basis has a strong negative effect on job satisfaction. It decreases the probability of being very satisfied with job by nearly 9%.[18] This is not surprising as the job security is an important element of the well-being at work. Working from home more than 50% of time work, or to a lesser extent, being self-employed increase the job satisfaction.

We have for instance[19] few variables related to the work history of individuals. Indeed, the past conditions in the labour market may have an influence on the job satisfaction that individuals express today. If the individual has been laid off on the two last years (between April 1995 and April 1997), his/her satisfaction is clearly decreased by about 10%.

Dummies for the region of employment are included in the explanatory variables. Only the coefficients related to the 'Middle Atlantic' and 'South Atlantic' regions are significant (and negative).

Finally, to account for potential impact of the scientific disciplines of doctorate, dummies for the field of doctorate have been included. Specific effect of the field of doctorate

[16] The marginal probability of being very satisfied reported in the table 4 is 0.75% by 'additional child'.

[17] See the literature on the more general well-being or happiness. Among others, Blanchflower and Oswald (1997, 2000).

[18] Working through a temporary agency has the same effect but it is far less significant. Few individuals are in this type of work arrangement at the level of Ph.D..

[19] Future development of this paper will try to integrate more dynamic elements in the explanation of job satisfaction.

may arise especially for the younger people if there was an over-production of Ph.D.s. or main evolutions affecting the scientific labour market.[20] Ph.D.s in chemistry express themselves as less satisfied with their jobs but with a low significant level. To the contrary, the psychology field may have a positive effect.

Job satisfaction by broad sector of employment

Separate estimations have been implemented by broad sector of employment. Here, we make some comments on the estimated coefficients for individuals employed in the academic sector (table 6) and for those employed in the industrial sector (table 7).

Academics

The results for the individuals employed in the academic sector are presented in the table 6. Three models have been estimated: one for males, one for females and another one for the whole sub-sample. In these models, a new codification of jobs is used, closer from the academic standards than the previous one.[21] This codification is mainly based on the fields of activity and on the status of individuals. The reference is constituted by postsecondary teachers in computer sciences and mathematics.

Females express themselves as significantly less satisfied with their jobs in the academic sector. That confirms the impression we had with the basic statistics presented in the first section. Members of the under-represented minorities are far less satisfied with their jobs. This is also the case for the non-US citizens.

Great differences can be observed in the sign and significance of variables by gender. The year of doctorate award has no significant effect for females, as if their (dis)satisfaction remains constant during all their careers. The number of hours worked decreases the probability of being satisfied for females but is not significant for males.

The annual salary is likely to influence the job satisfaction. The residual from the wage equation is positive, with a high level of significant for males and a slightly lower level for females. Even in the academic profession, pecuniary advantages have an effect, to a certain extent, on the probability of being satisfied with job (Sloane and Ward 1999).[22]

One major common effect among males and females is the job security. If they are employed on a temporary position, the probability of being satisfied is largely decreased.

There are some effects of the academic field and status of individuals. Male academics in social sciences have a higher probability of being satisfied. Female academics in biological sciences have a lower probability of expressing themselves as satisfied with their jobs.

Business/industry

The estimated coefficients for three models are displayed in table 7.

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[20] In another paper (Moguérou 2001), we developed a comparison between France and the United States in the production of Ph.D.s in science and engineering. We show the specific patterns but also the common trends in the scientific labour market in the two countries. Specifically, an over-production of Ph.D.s was clearly visible in France at the beginning of the 1990s, and to a lesser extent, in the USA, in some scientific fields. This over-production had important consequences on labour market prospects for Ph.D. graduates but also on their satisfaction towards their Ph.D. programme and towards their field of study, but also on their job satisfaction.

[21] Some other variables were not significant anymore and have been excluded from the models (number of employees...)

[22] But, it is true that we have few elements to take into account the non-pecuniary advantages of the academic profession.

The coefficient related to the variable female is not significant for the sub-sample of individuals working in the business or industry sector. Females who work in this sector are not less satisfied than men contrary to the females employed in the two other broad sectors (government and academia).

We find a positive and strong effect on job satisfaction of the number of hours worked for males. Thus, males who work in the business or industrial sector are mainly responsible for the positive sign of this variable in the whole sample (table 3). The effect of the number of hours worked is not significantly different from zero for females in the business/industry.

The size of the establishment is an important determinant of job satisfaction for Ph.D.s who work in the industrial/business sector, as are the main activities declared by individuals. The job insecurity is also a key element to explain the job dissatisfaction.

The pay comparison term has a positive effect on the satisfaction for males only. It is not significant for females.

An interpretation of the different coefficients related to females who are employed in the private sector is maybe that females who make the choice to work in this sector are "highly" motivated and really decided to have such a career. Indeed, few females, relative to males, undertake a career in the private sector, even nowadays.

Conclusion

Some major conclusions can be drawn from this study on job satisfaction for Ph.D. graduates in the USA. We have estimated various econometric models that attempt to catch-up the factors that are likely to influence job satisfaction.

We showed that job satisfaction is explained by different sets of variables for males and females and that variables neither have the same effects on job satisfaction according to the employment sector.

The social characteristics have still an effect on job satisfaction at this high level of qualification. Contrary to all the previous studies, and more accordingly to expectations, females express themselves as less satisfied with their jobs than males, other things equal. But this is only true for those who work in the academic sector. The variable gender is not significant for the females who work in the industrial or business sector. The race/ethnicity and the citizenship status are also likely to influence the job satisfaction, as well as family related variables. A U-shaped age profile for job satisfaction is found for males and, to a lesser extent, for females.

The job security is a major determinant of job satisfaction in all sectors of employment and identically for males and females.

A striking fact is that the number of hours worked has a positive effect on the probability of being satisfied for males - and this effect is especially strong for males who are employed in the business or industrial sector - and a negative effect for females.

Finally, the coefficient related to the variable earnings is positive in all the estimated models, for males and females, and for academics and non-academics. But, when a variable to account for the pay comparison phenomenon is included in the models - derived from the estimation of a wage equation -, generally the absolute level of pay is not significant anymore. This variable of comparative earnings has, as expected, a positive effect on the probability of being satisfied: the higher the earnings (comparatively to a reference group), the higher the probability of being happy at work.

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Table 1. Descriptive statistics

Variable	Mean
Female	0.266
Number of children	0.931
Race/ethnicity: Asian	0.156
Race/ethnicity: minorities	0.103
Non US citizen	0.091
Number of hours worked pw	48.96
Laid off on the two last years	0.037
Annual salary	66969
Comparative pay: residual	4658
Employer main business	
Agriculture, Forestry	0.014
Biotechnology	0.028
Construction or Mining	0.005
Education	0.438
Finance, insurance	0.009
Health Services	0.097
Information technology	0.046
All other services	0.029
Manufacturing	0.077
Public administration, gov.	0.035
Research	0.170
Transportation Services	0.012
Wholesale or retail trade	0.005
Number of employees	
Under 10 employees	0.064
10-24 employees	0.023
25-99 employees	0.038
100-499 employees	0.094
500-999 employees	0.044
1000-4999 employees	0.113
Main activity	
Accounting, finance	0.010
Applied research	0.207
Basic research	0.162
Computer	0.049
Development	0.057
Design	0.023
Employee relations, recruit.	0.009
Management	0.112
Production	0.004
Services	0.090
Marketing, purchasing	0.016
Quality or prod. manag.	0.009
Teaching	0.212
Alternative work arrangements	
Employer contracted out	0.036
Some other alternative work	0.014
Working from home	0.029
Working short-term basis	0.016
Self-employed	0.043
Job sharing	0.002
Working through temp agenc	0.003
Region of employment	
New England	0.078
Middle Atlantic	0.159
East North Central	0.137
West North Central	0.064
South Atlantic	0.186
East South Central	0.044
West South Central	0.081
Mountain	0.067
Pacific	0.184
Field of doctorate	
Biological sciences	0.268
Other Life and Related Sc.	0.091
Chemistry, except Biochemis	0.086
Physics and astronomy	0.066
Other physical sciences	0.032
Economics	0.030
Psychology	0.106
Sociology	0.038
Other Social Sciences	0.039
Chemical Engineering	0.025
Civil Engineering	0.016
Electrical, Electronics	0.044
Mechanical Engineering	0.023
Other Engineering	0.070
Date of Ph.D. award	
1995-96	0.140
1990-94	0.200
1985-89	0.175
1980-84	0.135
1975-79	0.124
1970-74	0.121
1965-69	0.066
1960-64	0.025
prior to 1960	0.014

Source: SDR 1997.

Notes. means of selected variables in our sample.

Table 2. Estimation of the wage equation

Variable	Coeff.
Constant	11.366***
	(0.025)
Female	-0.134***
	(0.006)
Race/ethnicity:	-0.032***
Asian	(0.008)
Race/ethnicity:	-0.046***
under-rep.minorities	(0.008)
Non-US citizen	-0.089***
	(0.010)
Date of birth	
1960-...	-0.420***
	(0.013)
1955-59	-0.203***
	(0.013)
1950-54	-0.086***
	(0.013)
1945-49	-0.013
	(0.013)
1940-44	0.003
	(0.013)
1935-39	0.032**
	(0.015)
Region of employment	
Middle Atlantic	-0.025**
	(0.010)
East North Central	-0.043***
	(0.010)
West North Central	-0.072***
	(0.012)
South Atlantic	-0.051***
	(0.011)
East South Central	-0.117***
	(0.016)
West South Central	-0.099***
	(0.012)
Mountain	-0.116***
	(0.013)
Pacific	-0.019*
	(0.010)
Number of employees	
Under 10	-0.181***
employees	(0.012)
10-24 employees	-0.072***
	(0.017)
25-99 employees	-0.041***
	(0.013)
100-499 employees	-0.051***
	(0.009)
500-999 employees	0.004
	(0.012)
1000-4999	0.016**
employees	(0.008)
Main business for employer	
Agriculture,	-0.109***
Forestry, or Fishing	(0.026)
Biotechnology	0.148***
	(0.020)
Construction or	0.020
Mining	(0.039)
Education	-0.140***
	(0.015)
Finance, insurance	0.157***
of real estate serv.	(0.029)
Health Services	0.012
	(0.017)
Information	0.108***
technology	(0.018)
All other services	0.031
(e.g.. social...)	(0.020)
Manufacturing	0.069***
	(0.016)
Public	-0.088***
administration, gov.	(0.019)
Research	-0.022
	(0.015)
Transportation	0.051**
Services, utilities...	(0.026)
Wholesale or retail	-0.255***
trade	(0.038)
Main activity	
Accounting, finance	0.070**
	(0.028)
Applied research	0.080***
	(0.014)
Basic research	-0.047***
	(0.015)
Computer	0.014
	(0.018)
Development	0.132***
	(0.017)
Design	0.028
	(0.021)
Employee relations,	0.183***
recruiting	(0.029)
Management	0.228***
	(0.015)
Production	-0.342***
	(0.039)
Services	0.115***
	(0.016)
Marketing,	0.044*
purchasing	(0.024)
Quality or	0.054*
productivity manag.	(0.029)
Teaching	-0.083***
	(0.015)
Field of Ph.D.	
Ph.D. in biological	-0.132***
sciences	(0.011)
Other Life &	-0.148***
Related Sciences	(0.013)
Chemistry, except	-0.070***
Biochemistry	(0.013)
Physics and	-0.035**
astronomy	(0.014)
Other physical	-0.120***
sciences	(0.017)
Economics	0.048***
	(0.018)
Psychology	-0.167***
	(0.013)
Sociology	-0.209***
	(0.016)
Other Social	-0.150***
Sciences	(0.016)
Chemical	0.071***
Engineering	(0.019)
Civil Engineering	0.020
	(0.022)
Electrical,	0.141***
Electronics eng.	(0.016)
Mechanical	0.030
Engineering	(0.019)
Other Engineering	0.032**
	(0.014)
R2	0.297
Number of observations	29114

Source: SDR 1997.

Notes: ML estimation of the wage equation. Coefficients with s.e. in parentheses. *Significant at the 10% level, **Significant at the 5% level, ***Significant at the 1% level.

Table 3. Job satisfaction, all sectors of employment: ordered probit estimates

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-0.193**	-0.220**	-0.189*	0.233**	0.367***	0.397***
	(0.092)	(0.097)	(0.100)	(0.112)	(0.127)	(0.131)
Female	-0.027	-0.035**	-0.033*	-0.074***	-0.082***	-0.080***
	(0.016)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)
Number of children	0.017***	0.018***	0.017***	0.018***	0.019***	0.019***
	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)
Race/ethnicity: Asian	-0.072***	-0.065***	-0.063***	-0.072***	-0.077***	-0.075***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Race/ethnicity: under-represented minorities	-0.069***	-0.068***	-0.064***	-0.081***	-0.082***	-0.078***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Non US citizen	-0.056**	-0.053**	-0.053*	-0.089***	-0.102***	-0.101***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.028)	(0.028)
Granted Ph.D. in 1995-96	-0.496***	-0.495***	-0.497***	-0.596***	-0.635***	-0.636***
	(0.072)	(0.073)	(0.073)	(0.074)	(0.075)	(0.075)
1990-94	-0.524***	-0.523***	-0.526***	-0.615***	-0.650***	-0.652***
	(0.071)	(0.072)	(0.072)	(0.073)	(0.074)	(0.074)
1985-89	-0.559***	-0.555***	-0.557***	-0.613***	-0.638***	-0.639***
	(0.071)	(0.071)	(0.072)	(0.072)	(0.072)	(0.072)
1980-84	-0.585***	-0.586***	-0.588***	-0.620***	-0.632***	-0.633***
	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)
1975-79	-0.555***	-0.556***	-0.559***	-0.566***	-0.570***	-0.573***
	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)
1970-74	-0.532***	-0.530***	-0.531***	-0.529***	-0.528***	-0.529***
	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)
1965-69	-0.404***	-0.404***	-0.407***	-0.400***	-0.398***	-0.401***
	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)
1960-64	-0.260***	-0.260***	-0.263***	-0.257***	-0.256***	-0.259***
	(0.083)	(0.083)	(0.083)	(0.083)	(0.083)	(0.083)
Number of hours worked per week	0.0016**	0.0019**	0.0018**	0.0014*	0.0016**	0.002*
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.001)
Laid off on the two last years	-0.262***	-0.263***	-0.262***	-0.261***	-0.258***	-0.257***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Annual salary	6.60-6***	6.66-6***	6.57-6***	1.14-6	-4.70-7	-3.19-7
	(3.02-7)	(3.07-7)	(3.08-7)	(8.57-7)	(1.06-6)	(1.06-6)
Comparative pay: residual from the wage equation				5.80-6***	7.32-6***	7.23-6***
				(8.73-7)	(1.04-6)	(1.04-6)
Main business for employer						
Agriculture, Forestry, or Fishing	0.087	0.087	0.081	0.029	0.037	0.031
	(0.069)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)
Biotechnology	-0.004	-0.004	-0.014	0.025	0.057	0.045
	(0.055)	(0.056)	(0.056)	(0.056)	(0.057)	(0.057)
Construction or Mining	0.013	0.020	0.006	0.022	0.026	0.014
	(0.106)	(0.107)	(0.107)	(0.106)	(0.107)	(0.107)
Education	0.216***	0.206***	0.204***	0.162***	0.146***	0.145***
	(0.041)	(0.041)	(0.041)	(0.042)	(0.042)	(0.042)
Finance, insurance of real estate services	0.020	0.009	0.019	0.080	0.083	0.090
	(0.081)	(0.081)	(0.081)	(0.081)	(0.082)	(0.082)
Health Services	0.048	0.029	0.029	0.032	0.032	0.032
	(0.045)	(0.045)	(0.046)	(0.045)	(0.045)	(0.046)
Information technology	-0.016	-0.019	-0.018	0.039	0.037	0.036
	(0.049)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)
All other services (e.g.. social, legal, business)	0.059	0.049	0.046	0.062	0.061	0.058
	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
Manufacturing	-0.035	-0.026	-0.029	0.003	0.015	0.012
	(0.044)	(0.044)	(0.045)	(0.045)	(0.045)	(0.045)
Public administration, government	0.014	0.006	0.014	-0.016	-0.027	-0.019
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)

Table 3 (continued)

Research	0.042	0.040	0.040	0.028	0.029	0.028
	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)
Transportation Services,	-0.129*	-0.132*	-0.122*	-0.089	-0.096	-0.088
utilities, or communications	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)
Wholesale or retail trade	-0.086	-0.085	-0.087	-0.183*	-0.197*	-0.199*
	(0.103)	(0.103)	(0.103)	(0.104)	(0.104)	(0.104)
Number of employees						
Under 10 employees	0.384***	0.377***	0.376***	0.323***	0.301***	0.299***
	(0.044)	(0.044)	(0.044)	(0.045)	(0.045)	(0.045)
10-24 employees	0.130***	0.130***	0.130***	0.107**	0.101**	0.101**
	(0.047)	(0.047)	(0.047)	(0.048)	(0.048)	(0.048)
25-99 employees	0.108***	0.105***	0.103***	0.092**	0.087**	0.085**
	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)
100-499 employees	0.075***	0.072***	0.075***	0.056**	0.050**	0.052**
	(0.024)	(0.024)	(0.025)	(0.025)	(0.025)	(0.025)
500-999 employees	0.057*	0.056*	0.059*	0.057*	0.058*	0.060*
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
1000-4999 employees	-0.009	-0.009	-0.006	-0.002	-0.001	0.001
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Main activity						
Accounting, finance	-0.016	-0.015	-0.016	0.007	0.009	0.008
	(0.076)	(0.076)	(0.076)	(0.076)	(0.076)	(0.076)
Applied research	0.134***	0.138***	0.137***	0.163***	0.168***	0.168***
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
Basic research	0.181***	0.184***	0.183***	0.156***	0.157***	0.156***
	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)
Computer	-0.052	-0.048	-0.052	-0.042	-0.048	-0.053
	(0.047)	(0.048)	(0.048)	(0.047)	(0.048)	(0.048)
Development	0.060	0.066	0.065	0.116**	0.123***	0.122***
	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)
Design	-0.012	-0.004	-0.007	0.016	0.006	0.003
	(0.056)	(0.057)	(0.057)	(0.056)	(0.057)	(0.057)
Employee relations, recruiting	-0.132*	-0.141*	-0.147*	-0.061	-0.051	-0.056
	(0.079)	(0.079)	(0.079)	(0.080)	(0.080)	(0.080)
Management	0.110***	0.109***	0.107***	0.207***	0.230***	0.227***
	(0.041)	(0.041)	(0.041)	(0.043)	(0.044)	(0.044)
Production	-0.289***	-0.284***	-0.291***	-0.397***	-0.423***	-0.429***
	(0.103)	(0.103)	(0.103)	(0.105)	(0.105)	(0.105)
Services	0.044	0.021	0.018	0.078*	0.073	0.070
	(0.044)	(0.045)	(0.045)	(0.044)	(0.045)	(0.045)
Marketing, purchasing	-0.103	-0.099	-0.101	-0.084	-0.077	-0.079
	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)
Quality or productivity	-0.110	-0.107	-0.109	-0.093	-0.087	-0.089
management	(0.078)	(0.078)	(0.078)	(0.078)	(0.078)	(0.078)
Teaching	0.122***	0.125***	0.124***	0.105***	0.095**	0.095**
	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)
Alternative work arrangements						
Employer contracted out to	-0.018	-0.018	-0.020	-0.016	-0.016	-0.017
another organization	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
Working from home 50% or	0.131***	0.131***	0.129***	0.135***	0.135***	0.133***
more of work time	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
Working on a short-term basis,	-0.230***	-0.227***	-0.225***	-0.228***	-0.222***	-0.221***
seasonal, as-needed	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)	(0.056)
Self-employed	0.120**	0.117**	0.119**	0.121**	0.117**	0.120**
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)
Job sharing	-0.044	-0.047	-0.050	-0.047	-0.041	-0.044
	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)
Working through a temp or	-0.243*	-0.238*	-0.233*	-0.248*	-0.245*	-0.240*
employment agency	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)
Some other alternative work	-0.023	-0.026	-0.022	-0.018	-0.019	-0.016
arrangements	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)

Table 3 (continued)

Region of employment						
Middle Atlantic			-0.075**			-0.077**
			(0.030)			(0.030)
East North Central			0.003			-0.005
			(0.031)			(0.031)
West North Central			-0.006			-0.015
			(0.037)			(0.037)
South Atlantic			-0.055*			-0.060**
			(0.030)			(0.030)
East South Central			-0.053			-0.066
			(0.041)			(0.041)
West South Central			-0.031			-0.043
			(0.034)			(0.035)
Mountain			0.051			0.040
			(0.036)			(0.036)
Pacific			-0.014			-0.015
			(0.029)			(0.029)
Field of Ph.D.						
Ph.D. in biological sciences		0.013	0.013		-0.040	-0.040
		(0.032)	(0.032)		(0.032)	(0.032)
Other Life & Related Sciences		0.002	0.000		-0.059	-0.060
		(0.036)	(0.036)		(0.037)	(0.037)
Chemistry, except		-0.024	-0.024		-0.064*	-0.063*
Biochemistry		(0.037)	(0.037)		(0.037)	(0.037)
Physics and astronomy		0.006	0.001		-0.011	-0.016
		(0.038)	(0.038)		(0.038)	(0.038)
Other physical sciences		0.051	0.040		0.005	-0.006
		(0.047)	(0.047)		(0.048)	(0.048)
Economics		0.029	0.030		0.054	0.055
		(0.048)	(0.048)		(0.049)	(0.049)
Psychology		0.092**	0.090**		0.022	0.022
		(0.037)	(0.037)		(0.038)	(0.039)
Sociology		-0.004	-0.005		-0.072	-0.073
		(0.044)	(0.045)		(0.046)	(0.046)
Other Social Sciences		0.051	0.049		0.004	0.003
		(0.044)	(0.044)		(0.045)	(0.045)
Chemical Engineering		-0.019	-0.018		0.002	0.004
		(0.052)	(0.052)		(0.052)	(0.052)
Civil Engineering		-0.041	-0.050		-0.026	-0.035
		(0.060)	(0.060)		(0.060)	(0.060)
Electrical, Electronics and		0.009	0.002		0.071	0.063
Communications Enginee		(0.043)	(0.043)		(0.044)	(0.044)
Mechanical Engineering		-0.014	-0.022		-0.001	-0.008
		(0.053)	(0.053)		(0.053)	(0.053)
Other Engineering		-0.010	-0.016		0.007	0.001
		(0.038)	(0.038)		(0.038)	(0.038)
μ_1	1.057***	1.031***	1.062***	1.485***	1.618***	1.649***
	(0.092)	(0.097)	(0.100)	(0.112)	(0.128)	(0.131)
μ_2	1.764***	1.738***	1.770***	2.193***	2.327***	2.358***
	(0.093)	(0.097)	(0.101)	(0.113)	(0.128)	(0.131)
-2 log L	57419.407	57401.885	57376.466	57375.4	57352	57328.06
Number of observations	29114	29114	29114	29114	29114	29114

Source: SDR 1997.

Notes: ML estimation of the ordered probit models. Coefficients with standard errors in parentheses. See the paper for details. The reference for the main business for employer is constituted by the category "other sectors". For the work activity, it is the "other main activity" category. For the region, New England is the reference. And for the field of doctorate, computer sciences as reference. * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level.

Table 4. Marginal effects for the model 6 table 3

		$\frac{\partial \Pr(y=0)}{\partial x}$	$\frac{\partial \Pr(y=1)}{\partial x}$	$\frac{\partial \Pr(y=2)}{\partial x}$	$\frac{\partial \Pr(y=3)}{\partial x}$
Female	***	-0.0317	0.0237	0.0061	0.0019
Number of children	***	0.0075	-0.0056	-0.0014	-0.0004
Race/ethnicity: Asian	***	-0.0300	0.0223	0.0058	0.0018
Race/ethnicity: under-rep. minorit.	***	-0.0310	0.0231	0.0061	0.0019
Non US citizen	***	-0.0401	0.0296	0.0079	0.0026
Granted Ph.D. in 1995-96	***	-0.2449	0.1546	0.0641	0.0262
1990-94	***	-0.2521	0.1638	0.0632	0.0251
1985-89	***	-0.2469	0.1589	0.0629	0.0252
1980-84	***	-0.2436	0.1535	0.0639	0.0261
1975-79	***	-0.2217	0.1422	0.0568	0.0227
1970-74	***	-0.2058	0.1340	0.0516	0.0202
1965-69	***	-0.1571	0.1052	0.0378	0.0141
1960-64	***	-0.1027	0.0717	0.0229	0.0080
Hours worked	*	6.09E-04	-4.60E-04	-1.14E-04	-3.50E-05
Laid off on the last two years	***	-0.1019	0.0714	0.0226	0.0079
Annual salary		-1.27E-07	9.60E-08	2.37E-08	7.34E-09
Residual from wage equation	***	2.88E-06	-2.18E-06	-5.38E-07	-1.67E-07
Employer main business					
Agriculture, Forestry, or Fishing		0.0125	-0.0095	-0.0023	-0.0007
Biotechnology		0.0179	-0.0137	-0.0032	-0.0010
Construction or Mining		0.0054	-0.0041	-0.0010	-0.0003
Education	***	0.0577	-0.0438	-0.0106	-0.0033
Finance, insurance		0.0358	-0.0277	-0.0063	-0.0019
Health Services		0.0127	-0.0096	-0.0023	-0.0007
Information technology		0.0144	-0.0110	-0.0026	-0.0008
All other services		0.0230	-0.0176	-0.0041	-0.0012
Manufacturing		0.0046	-0.0035	-0.0008	-0.0003
Public administration, government		-0.0076	0.0057	0.0014	0.0004
Research		0.0113	-0.0086	-0.0021	-0.0006
Transportation Services		-0.0352	0.0260	0.0070	0.0023
Wholesale or retail trade	*	-0.0789	0.0561	0.0170	0.0058
Number of employees					
Under 10 employees	***	0.1173	-0.0939	-0.0183	-0.0051
10-24 employees	**	0.0399	-0.0309	-0.0070	-0.0021
25-99 employees	**	0.0338	-0.0260	-0.0060	-0.0018
100-499 employees	**	0.0208	-0.0159	-0.0038	-0.0011
500-999 employees	*	0.0237	-0.0182	-0.0043	-0.0013
1000-4999 employees		0.0004	-0.0003	-0.0001	0.0000
Main activity					
Accounting, finance		0.0031	-0.0024	-0.0006	-0.0002
Applied research	***	0.0666	-0.0515	-0.0116	-0.0035
Basic research	***	0.0621	-0.0481	-0.0108	-0.0032
Computer		-0.0210	0.0156	0.0040	0.0013
Development	***	0.0483	-0.0375	-0.0084	-0.0025
Design		0.0013	-0.0010	-0.0002	-0.0001
Employee relations, recruiting		-0.0225	0.0168	0.0044	0.0014
Management	***	0.0898	-0.0707	-0.0148	-0.0043
Production	***	-0.1670	0.1082	0.0424	0.0165
Services		0.0280	-0.0215	-0.0050	-0.0015
Marketing, purchasing		-0.0316	0.0234	0.0062	0.0020

Table 4 (continued)

Quality or productivity management		-0.0353	0.0260	0.0070	0.0023
Teaching	**	0.0377	-0.0289	-0.0068	-0.0020
Alternative work arrangements					
Employer contracted out another organ.		-0.0068	0.0052	0.0013	0.0004
Working at home	***	0.0527	-0.0410	-0.0090	-0.0026
Temporary	***	-0.0877	0.0620	0.0191	0.0066
Self employed	**	0.0476	-0.0370	-0.0082	-0.0024
Job sharing		-0.0176	0.0131	0.0034	0.0011
Working through a temp or empl. ag.	*	-0.0952	0.0667	0.0211	0.0074
Some other alternative work arrang.		-0.0062	0.0047	0.0012	0.0004
Region of employment					
Middle Atlantic	**	-0.0306	0.0228	0.0059	0.0019
East North Central		-0.0019	0.0014	0.0003	0.0001
West North Central		-0.0061	0.0046	0.0012	0.0004
South Atlantic	**	-0.0240	0.0179	0.0046	0.0015
East South Central		-0.0262	0.0195	0.0051	0.0016
West South Central		-0.0173	0.0129	0.0033	0.0010
Mountain		0.0159	-0.0121	-0.0029	-0.0009
Pacific		-0.0060	0.0045	0.0011	0.0003
Fields of Ph.D.					
Biological sciences		-0.0158	0.0119	0.0030	0.0009
Other Life & Related Sciences		-0.0240	0.0179	0.0046	0.0015
Chemistry, except Biochemistry	*	-0.0251	0.0187	0.0049	0.0015
Physics and astronomy		-0.0065	0.0049	0.0012	0.0004
Other physical sciences		-0.0023	0.0017	0.0004	0.0001
Economics		0.0218	-0.0167	-0.0039	-0.0012
Psychology		0.0087	-0.0066	-0.0016	-0.0005
Sociology		-0.0289	0.0215	0.0057	0.0018
Other Social Sciences		0.0012	-0.0009	-0.0002	-0.0001
Chemical Engineering		0.0015	-0.0011	-0.0003	-0.0001
Civil Engineering		-0.0138	0.0103	0.0026	0.0008
Electrical, Electronics and Comm. eng.		0.0252	-0.0193	-0.0045	-0.0014
Mechanical Engineering		-0.0032	0.0024	0.0006	0.0002
Other Engineering		0.0005	-0.0004	-0.0001	0.0000

Source: SDR 1997.

Notes: marginal effects for the model 6 table 3. See the text for details. * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level.

Table 5. Job satisfaction by gender, all sectors

	(1) Females	(2) Males	(3) Females	(4) Males
Constant	0.015	-0.333***	0.199	0.151
	(0.293)	(0.101)	(0.316)	(0.126)
Number of children	0.038***	0.012	0.038***	0.013*
	(0.014)	(0.007)	(0.014)	(0.007)
Race/ethnicity: Asian	-0.101**	-0.057**	-0.105**	-0.054**
	(0.041)	(0.025)	(0.041)	(0.025)
Race/ethnicity: under-rep. minorities	-0.148***	-0.026	-0.154***	-0.039
	(0.038)	(0.028)	(0.038)	(0.028)
Non US citizen	-0.082	-0.049	-0.097*	-0.086***
	(0.051)	(0.032)	(0.052)	(0.032)
Granted Ph.D. in 1995-96	-0.394	-0.512***	-0.433	-0.633***
	(0.269)	(0.076)	(0.270)	(0.079)
1990-94	-0.383	-0.570***	-0.418	-0.680***
	(0.268)	(0.075)	(0.269)	(0.077)
1985-89	-0.442	-0.589***	-0.462*	-0.653***
	(0.268)	(0.075)	(0.269)	(0.075)
1980-84	-0.530**	-0.593***	-0.540**	-0.634***
	(0.269)	(0.075)	(0.269)	(0.076)
1975-79	-0.544**	-0.553***	-0.548**	-0.565***
	(0.270)	(0.075)	(0.270)	(0.075)
1970-74	-0.375	-0.561***	-0.373	-0.558***
	(0.271)	(0.075)	(0.271)	(0.075)
1965-69	-0.216	-0.433***	-0.214	-0.428***
	(0.280)	(0.077)	(0.280)	(0.077)
1960-64	-0.331	-0.262***	-0.329	-0.258***
	(0.303)	(0.086)	(0.303)	(0.087)
Laid off on the last two years	-0.257***	-0.267***	-0.257***	-0.266***
	(0.064)	(0.042)	(0.064)	(0.042)
Number of hours worked	-0.0026*	0.0040***	-0.0027**	0.0037***
	(0.0014)	(0.0009)	(0.0014)	(0.0009)
Annual salary	7.73E-6***	6.38E-6***	4.84E-6**	2.47E-7
	(6.66E-7)	(3.41E-7)	(1.94E-6)	(1.01E-6)
Residual from wage equation			3.03E-6	6.49E-6***
			(1.94E-6)	(1.00E-6)
Agriculture, Forestry, or Fishing	-0.112	0.126*	-0.134	0.056
	(0.178)	(0.075)	(0.179)	(0.076)
Biotechnology	-0.074	0.003	-0.059	0.037
	(0.117)	(0.063)	(0.118)	(0.063)
Construction or Mining	0.014	0.051	0.029	0.057
	(0.413)	(0.110)	(0.413)	(0.110)
Education	0.074	0.250***	0.054	0.184***
	(0.087)	(0.046)	(0.088)	(0.048)
Finance, insurance	-0.085	0.048	-0.057	0.119
	(0.175)	(0.091)	(0.176)	(0.092)
Health Services	-0.028	0.041	-0.027	0.015
	(0.091)	(0.052)	(0.091)	(0.052)
Information technology	-0.019	-0.013	0.007	0.048
	(0.118)	(0.054)	(0.119)	(0.055)
All other services (e.g.. social, legal...)	0.040	0.042	0.041	0.047
	(0.112)	(0.063)	(0.112)	(0.063)
Manufacturing	-0.176	-0.005	-0.162	0.036
	(0.108)	(0.049)	(0.109)	(0.049)
Public administration, government	-0.225**	0.092	-0.234**	0.054
	(0.104)	(0.060)	(0.104)	(0.060)
Research	-0.028	0.054	-0.033	0.037
	(0.089)	(0.046)	(0.089)	(0.046)
Transportation Services	-0.186	-0.117	-0.166	-0.073

	(0.166)	(0.077)	(0.167)	(0.077)
Wholesale or retail trade	-0.290	-0.046	-0.331	-0.160
	(0.241)	(0.114)	(0.243)	(0.116)
Under 10 employees	0.458***	0.360***	0.434***	0.284***
	(0.091)	(0.050)	(0.092)	(0.051)
10-24 employees	-0.077	0.206***	-0.088	0.178***
	(0.091)	(0.056)	(0.092)	(0.056)
25-99 employees	0.189**	0.079*	0.183**	0.059
	(0.076)	(0.042)	(0.076)	(0.042)
100-499 employees	0.086*	0.067**	0.079*	0.043
	(0.045)	(0.029)	(0.046)	(0.029)
500-999 employees	0.066	0.050	0.067	0.050
	(0.061)	(0.040)	(0.061)	(0.040)
1000-4999 employees	-0.041	0.003	-0.037	0.010
	(0.042)	(0.026)	(0.043)	(0.026)
Accounting, finance	0.041	-0.019	0.050	0.011
	(0.148)	(0.089)	(0.148)	(0.089)
Applied research	0.072	0.167***	0.082	0.203***
	(0.069)	(0.046)	(0.069)	(0.046)
Basic research	0.109	0.216***	0.095	0.189***
	(0.071)	(0.048)	(0.072)	(0.049)
Computer	-0.202**	0.004	-0.197*	0.017
	(0.101)	(0.055)	(0.101)	(0.055)
Development	-0.005	0.096*	0.016	0.164***
	(0.094)	(0.053)	(0.095)	(0.054)
Design	-0.179	0.039	-0.165	0.072
	(0.135)	(0.063)	(0.135)	(0.064)
Employee relations, recruiting	-0.237*	-0.060	-0.206	0.025
	(0.131)	(0.100)	(0.132)	(0.101)
Management	0.050	0.138***	0.093	0.252***
	(0.076)	(0.048)	(0.080)	(0.052)
Production	-0.230	-0.269**	-0.274	-0.391***
	(0.313)	(0.111)	(0.315)	(0.112)
Services	-0.020	0.070	-0.006	0.110**
	(0.076)	(0.054)	(0.077)	(0.055)
Marketing, purchasing	0.202	-0.146**	0.210	-0.125*
	(0.149)	(0.073)	(0.149)	(0.073)
Quality or productivity management	-0.001	-0.138	0.008	-0.118
	(0.151)	(0.091)	(0.151)	(0.091)
Teaching	0.036	0.172***	0.027	0.151***
	(0.071)	(0.049)	(0.071)	(0.049)
Employer contracted out another organ.	-0.028	-0.010	-0.029	-0.007
	(0.081)	(0.044)	(0.081)	(0.044)
Working from home more than 50% of time work	0.070	0.165***	0.072	0.170***
	(0.079)	(0.055)	(0.079)	(0.055)
Temporary	-0.148	-0.268***	-0.147	-0.266***
	(0.101)	(0.068)	(0.101)	(0.068)
Self employed	0.191*	0.085	0.190*	0.087
	(0.104)	(0.058)	(0.104)	(0.058)
Job sharing	-0.018	-0.079	-0.018	-0.084
	(0.302)	(0.165)	(0.302)	(0.165)
Working through a temporary or employment agency	-0.685***	-0.021	-0.687***	-0.022
	(0.225)	(0.159)	(0.225)	(0.159)
Some other alternative work arrangements	0.030	-0.058	0.035	-0.054
	(0.103)	(0.071)	(0.103)	(0.071)
μ_1	1.228***	0.937***	1.413***	1.422***
	(0.293)	(0.101)	(0.316)	(0.126)
μ_2	1.914***	1.658***	2.099***	2.144***
	(0.294)	(0.102)	(0.317)	(0.127)
-2 log L	16020.92	41256.93	16025	41215
N	7756	21358	7756	21358

Source: SDR 1997. ML estimates of ordered probit models.

Table 6. Job satisfaction for academics

	(1) Total	(2) Females	(3) Males
Constant	0.381***	0.210	0.319**
	(0.137)	(0.402)	(0.154)
Female	-0.120***		
	(0.024)		
Number of children	0.027***	0.045**	0.019
	(0.010)	(0.019)	(0.012)
Asian	-0.047	-0.007	-0.062
	(0.034)	(0.057)	(0.042)
Under-represented minorities	-0.113***	-0.159***	-0.083**
	(0.030)	(0.048)	(0.039)
Non-US citizen	-0.102**	-0.090	-0.104**
	(0.040)	(0.068)	(0.049)
Earned Ph.D. in 1995-96	-0.483***	-0.220	-0.527***
	(0.099)	(0.362)	(0.107)
1990-94	-0.483***	-0.204	-0.543***
	(0.096)	(0.360)	(0.103)
1985-89	-0.533***	-0.273	-0.575***
	(0.095)	(0.360)	(0.101)
1980-84	-0.534***	-0.311	-0.550***
	(0.095)	(0.360)	(0.101)
1975-79	-0.416***	-0.291	-0.400***
	(0.095)	(0.361)	(0.100)
1970-74	-0.389***	-0.115	-0.423***
	(0.094)	(0.362)	(0.099)
1965-69	-0.291***	0.087	-0.331***
	(0.097)	(0.373)	(0.101)
1960-64	-0.234**	-0.007	-0.250**
	(0.107)	(0.398)	(0.112)
Number of hours worked per week	-0.0005	-0.0043**	0.0019
	(0.0011)	(0.0018)	(0.0013)
Annual salary	2.79E-6**	3.93E-6	2.04E-6
	(1.26E-6)	(2.46E-6)	(1.50E-6)
Residual from wage equation	5.97E-6***	4.26E-6*	6.96E-6***
	(1.26E-6)	(2.41E-6)	(1.51E-6)
Alternative work arrangements			
Employer contracted out another organ.	0.074	0.080	0.085
	(0.080)	(0.141)	(0.098)
Working from home more than 50% of time work	-0.006	0.046	-0.064
	(0.073)	(0.112)	(0.098)
Temporary position	-0.431***	-0.376***	-0.475***
	(0.078)	(0.130)	(0.098)
Job sharing	0.300	-0.122	0.504
	(0.282)	(0.465)	(0.367)
Working through a temporary or employment agency	0.422	-0.640	1.240**
	(0.344)	(0.546)	(0.560)
Some other alternative work arrangements	0.042	0.100	-0.011
	(0.083)	(0.144)	(0.102)
Job description			
Computer scientist and mathematician	0.076	-0.102	0.141
	(0.100)	(0.198)	(0.116)
Biological scientist	-0.085*	-0.143*	-0.073
	(0.044)	(0.086)	(0.052)
Post-secondary teacher in life sciences	0.041	0.070	0.023
	(0.045)	(0.093)	(0.052)
Other life and related scientist	-0.002	-0.033	-0.003
	(0.076)	(0.142)	(0.091)

Table 6 (continued)

Chemist	0.045	-0.128	0.087
	(0.094)	(0.183)	(0.109)
Physics and astronomy scientist	-0.118	-0.342	-0.077
	(0.082)	(0.252)	(0.088)
Post-secondary teacher in physical sciences	0.186***	0.015	0.228***
	(0.049)	(0.107)	(0.056)
Other physical and related scientist	-0.034	-0.208	0.018
	(0.091)	(0.189)	(0.104)
Economist	0.017	-0.161	0.077
	(0.153)	(0.313)	(0.176)
Psychologist	0.062	-0.042	0.108
	(0.067)	(0.105)	(0.099)
Post-secondary teacher social and related sciences	0.110**	0.031	0.143***
	(0.045)	(0.087)	(0.053)
Other social scientist	0.126	0.029	0.188
	(0.104)	(0.149)	(0.155)
Other engineer	-0.042	-0.487*	0.038
	(0.098)	(0.276)	(0.106)
Chemical engineer	-0.042	0.888	-0.122
	(0.201)	(0.672)	(0.213)
Civil engineer	-0.236	-0.433	-0.192
	(0.214)	(1.086)	(0.220)
Electrical and electronics engineer	0.139	0.196	0.160
	(0.134)	(0.362)	(0.145)
Mechanical engineer	-0.036	3.781	-0.013
	(0.165)	(41.277)	(0.168)
Post-secondary teachers in engineering	0.036	-0.168	0.083
	(0.053)	(0.128)	(0.058)
Managers	0.079	0.052	0.082
	(0.055)	(0.108)	(0.064)
Other management or related occupations	-0.313	-0.674**	0.031
	(0.212)	(0.299)	(0.309)
Teachers, except S&E fields	-0.029	-0.098	-0.013
	(0.049)	(0.087)	(0.065)
μ_1	1.608***	1.417***	1.561***
	(0.137)	(0.403)	(0.155)
μ_2	2.319***	2.106***	2.292***
	(0.138)	(0.404)	(0.157)
-2 ln L	27398.70	9291.96	10048.5
N	14078	4410	9668

Source: SDR 1997

Notes: ML estimation of ordered probit models. the reference for the field of doctorate is "postsecondary teachers in computer sciences and mathematics". * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level.

Table 7. Job satisfaction for Ph.D.s employed in business/industry

	(1) Total	(2) Females	(3) Males
Constant	0.144	0.296	0.116
	(0.177)	(0.672)	(0.190)
Female	0.042		
	(0.031)		
Number of children	0.008	0.014	0.009
	(0.010)	(0.027)	(0.011)
Asian	-0.094***	-0.231***	-0.060*
	(0.031)	(0.072)	(0.035)
Under-represented minorities	-0.066	-0.126	-0.054
	(0.042)	(0.085)	(0.049)
Non-US citizen	-0.057	-0.076	-0.053
	(0.041)	(0.090)	(0.047)
Granted Ph.D. in 1995-96	-0.603***	-0.460	-0.642***
	(0.130)	(0.616)	(0.135)
1990-94	-0.705***	-0.493	-0.774***
	(0.128)	(0.615)	(0.132)
1985-89	-0.669***	-0.466	-0.734***
	(0.126)	(0.614)	(0.130)
1980-84	-0.703***	-0.613	-0.736***
	(0.127)	(0.614)	(0.131)
1975-79	-0.690***	-0.708	-0.698***
	(0.126)	(0.615)	(0.130)
1970-74	-0.673***	-0.484	-0.707***
	(0.126)	(0.618)	(0.129)
1965-69	-0.519***	-0.385	-0.538***
	(0.131)	(0.635)	(0.134)
1960-64	-0.184	-0.101	-0.205
	(0.154)	(0.720)	(0.158)
Number of hours worked per week	0.0038***	-0.0018	0.0060***
	(0.0014)	(0.0029)	(0.0016)
Laid off on the 2 last years	-0.299***	-0.289***	-0.309***
	(0.048)	(0.110)	(0.054)
Annual salary	2.33E-6*	4.49E-6	1.49E-6
	(1.26E-6)	(3.29E-6)	(1.39E-6)
Residual from wage equation	3.74E-6***	3.09E-6	4.34E-6***
	(1.25E-6)	(3.23E-6)	(1.38E-6)
	Sector of employment		
Agriculture, Forestry, or Fishing	0.017	-0.479**	0.078
	(0.084)	(0.225)	(0.091)
Biotechnology	0.038	0.065	0.035
	(0.060)	(0.131)	(0.067)
Construction or Mining	0.064	0.088	0.087
	(0.110)	(0.419)	(0.115)
Finance, insurance	0.034	-0.059	0.063
	(0.084)	(0.185)	(0.095)
Health Services	0.115**	0.036	0.123*
	(0.055)	(0.113)	(0.064)
Information technology	0.016	0.019	0.023
	(0.054)	(0.132)	(0.059)
All other services	0.096	0.076	0.090
	(0.060)	(0.127)	(0.068)
Manufacturing	-0.002	-0.140	0.019
	(0.048)	(0.119)	(0.052)
Research	0.032	0.015	0.029
	(0.047)	(0.109)	(0.053)
Transportation Services	-0.134*	-0.197	-0.113
	(0.075)	(0.185)	(0.083)
Wholesale or retail trade	-0.155	-0.416	-0.124

	(0.107)	(0.261)	(0.119)
	Number of employees		
Under 10 employees	0.330***	0.487***	0.274***
	(0.052)	(0.117)	(0.058)
10-24 employees	0.138**	-0.083	0.186***
	(0.054)	(0.119)	(0.061)
25-99 employees	0.029	0.003	0.020
	(0.043)	(0.099)	(0.048)
100-499 employees	0.020	-0.038	0.019
	(0.037)	(0.082)	(0.041)
500-999 employees	-0.055	-0.174	-0.024
	(0.052)	(0.113)	(0.058)
1000-4999 employees	-0.031	-0.153**	-0.008
	(0.033)	(0.078)	(0.037)
	Main work activity		
Accounting, finance	0.033	0.078	0.031
	(0.108)	(0.225)	(0.124)
Applied research	0.115**	0.065	0.129*
	(0.057)	(0.113)	(0.067)
Basic research	0.188**	0.245*	0.173*
	(0.077)	(0.148)	(0.090)
Computer	-0.044	-0.120	-0.024
	(0.064)	(0.138)	(0.074)
Development	0.077	0.002	0.102
	(0.062)	(0.128)	(0.072)
Design	-0.034	-0.221	-0.001
	(0.070)	(0.162)	(0.080)
Employee relations, recruiting	-0.044	-0.119	0.023
	(0.124)	(0.230)	(0.148)
Management	0.166***	0.209	0.161**
	(0.064)	(0.130)	(0.074)
Production	-0.418***	-0.348	-0.421***
	(0.123)	(0.369)	(0.133)
Services	-0.034	-0.019	-0.040
	(0.065)	(0.122)	(0.078)
Marketing, purchasing	-0.129*	0.219	-0.187**
	(0.078)	(0.183)	(0.088)
Quality or productivity management	-0.224**	-0.084	-0.266**
	(0.096)	(0.199)	(0.111)
Teaching	0.291*	0.429	0.193
	(0.166)	(0.329)	(0.195)
	Alternative work arrangements		
Employer contracted out another organ.	-0.054	-0.150	-0.025
	(0.048)	(0.111)	(0.054)
Working from home more than 50% of time work	0.220***	0.132	0.260***
	(0.060)	(0.126)	(0.069)
Temporary	0.003	0.222	-0.060
	(0.089)	(0.188)	(0.102)
Self employed	0.098*	0.077	0.082
	(0.053)	(0.112)	(0.060)
Job sharing	-0.168	-0.021	-0.241
	(0.187)	(0.458)	(0.207)
Working through a temporary or employment agency	-0.455***	-0.676**	-0.316*
	(0.155)	(0.274)	(0.190)
Some other alternative work arrangements	-0.219**	-0.187	-0.248**
	(0.101)	(0.174)	(0.124)
μ_1	1.451***	1.574**	1.437***
	(0.178)	(0.673)	(0.191)
μ_2	2.155***	2.260***	2.149***
	(0.179)	(0.674)	(0.192)
-2 ln L	21968.25	4441.53	17455.45
Number of observations	11300	2316	8984

Source: SDR 1997. ML estimation of ordered probit models.