



Job satisfaction, age and tenure: A generalized dynamic random effects model



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HIGHLIGHTS

- Uses a generalized dynamic random effects ordered probit to estimate the relationship.
- Marginal effects are allowed to vary by job satisfaction level.
- Results do not support the U-shape relationship between job satisfaction and age.
- Results on tenure vary by job satisfaction level and gender.

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This paper is dedicated to Kevin T. Reilly

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ABSTRACT

This paper examines the effects of age and tenure on job satisfaction. We estimate a generalized dynamic random effects ordered probit model using the British Household Panel Survey. Contrary to previous literature, we find that age has no significant impact on job satisfaction for females, and a limited impact for males who report higher levels of job satisfaction. We also find that tenure shares a non-monotonic relationship with job satisfaction for females. For males, the same result is found only at higher levels of job satisfaction. Our results suggest that age and tenure effects on job satisfaction vary with gender.

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1. Introduction

This paper investigates the effects of age and tenure on job satisfaction using data from the United Kingdom, namely the British Household Panel Survey (BHPS). We employ an innovative empirical methodology: a generalized dynamic random effects ordered probit (GDREOP) model. Conti and Pudney (2011) argue for the use of a dynamic structure in the estimation of job satisfaction models. Pfarr et al. (2010), Boes and Winkelmann (2006) and Chongvilaivan and Powdthavee (2014) suggest that

estimation of random effects ordered probit models should go beyond the standard random effect model and allow for independent variable coefficients to vary across categories of job satisfaction. We add to the existing literature by using a GDREOP model to estimate the marginal effects of tenure and age on job satisfaction.

The paper extends the framework of Conti and Pudney (2011) by allowing for generalized random effects where the marginal effects can vary by category and do not rely on constant relative effects. While our framework is similar to Chongvilaivan and Powdthavee (2014), we also include a dynamic element that they failed to control for. Following Conti and Pudney (2011), we include lagged job satisfaction as a determinant of present job satisfaction. Therefore, our framework amalgamates the approaches of Conti & Pudney and Chongvilaivan and Powdthavee (2014).

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¹ Kevin T. Reilly sadly passed away after the acceptance of the paper.

2. Data and empirical methodology

We use a sample of 2815 workers (1324 males and 1491 females) with a total of 8825 observations from the 1996–2000 and 2002–2007 waves (numbers 6–10 and 12–17) of the BHPS.² We concentrate on the self-reported version of overall job satisfaction instead of the interviewer version of this variable. The variable we use asks the employed individuals to rate their level of job satisfaction on a 7-point scale (1 = *not satisfied at all* up to 7 = *completely satisfied*).

Our most general specification of the job satisfaction model is:

$$Y_{it}^* = X_{it}^{(1)} \beta^j + X_{it}^{(2)} \beta + \sum_{j=2}^7 \alpha_j \xi_{it-1}^j + \sum_{j=2}^7 \delta_j \theta_{i1}^j + \bar{X}_i \gamma + \omega_i + \vartheta_t + \varepsilon_{it}, \quad \text{where } i = 1, \dots, N; t = 1, \dots, T \text{ and } j = 1, \dots, 7. \quad (1)$$

$$\tilde{Y}_{it} = j \quad \text{iff } Y_{it}^* \in [\Gamma_{j-1}, \Gamma_j). \quad (2)$$

$$\xi_{it-1}^j = 1 \quad \text{iff } \tilde{Y}_{it-1} = j. \quad (3)$$

$$\theta_{i1}^j = 1 \quad \text{iff } \tilde{Y}_{i1} = j. \quad (4)$$

The variable Y_{it}^* denotes the unobserved latent variable of job satisfaction associated with our observed ordered response outcomes, \tilde{Y}_{it} , which is outlined in Eq. (2). Heterogeneity enters in Eq. (1) through the effects of the explanatory variables (X_{it}). We deviate from the standard literature and allow for certain variables to have effects on the thresholds and therefore the marginal effect of explanatory variables on job satisfaction is category-specific. We restrict the number of variables that are allowed to vary across the job satisfaction categories to the wage, hours, family income, age and tenure. The other variables in Eq. (1) are restricted to have a constant parameter across the seven job satisfaction categories ($X_{it}^{(2)}$). Following Conti and Pudney (2011), we introduce lagged values of job satisfaction which are captured in Eq. (3) by the term ξ_{it-1}^j . Using the work of Wooldridge (2005), Eq. (4) controls for the initial condition problem in the dynamic context (θ_{i1}^j) and the inclusion of time varying means of variables relaxes the independence assumption associated with the individual fixed effect. The presence of v_t allows for the wave-specific intercept, thereby controlling for any macro-economic shocks that we are unable to capture in other ways. We estimate Eq. (1) separately for the male and female samples.

3. Results

Table 1 presents the coefficients along with the average partial (marginal) effects for the male and female samples using the GDREOP specification.³ For the male sample, we observe that a 1% increase in log pay per hour significantly increases the probability of individuals reporting “6” (and “7”) on the job satisfaction scale by 1.7% (and 0.5%) in our model. In contrast, a 1% increase in log pay per hour significantly reduces the probability of individuals reporting low job satisfaction (those reporting “1”, “2”, and “3”) on average by 1%. For the female sample, the marginal effects are positive and significant only for those reporting “6” on the job satisfaction scale, whereas they are negative and significant only

for those reporting a job satisfaction score of “4”. Based on these results, it seems that males reporting high job satisfaction care most about pay. The effect of pay is negative for males who report low job satisfaction. The results for females suggest that pay is only an area of significant concern for those reporting relatively high job satisfaction: for those reporting low job satisfaction, the effect of pay on job satisfaction is mostly negative. There is no evidence that males care more about pay than females, which is a result found in previous studies (Clark et al., 1996).

The coefficients associated with age reveal some interesting patterns. For females, none of the coefficients associated with age are significant whereas for males the coefficients are significant only for those who report “5” and “6” implying a U-shape relationship only for these categories. The marginal effects remain insignificant for the female sample irrespective of the job satisfaction scale, whereas for the male sample, the marginal effects are positive and significant at “6” and negative and significant for “5”. These results appear to provide no supporting evidence for the well-established finding of a U-shape of job satisfaction in age (Clark et al., 1996).

The tenure term can be seen as another way of capturing the impact of age on job satisfaction.⁴ For males, the coefficients for tenure are negative and significant for those reporting job satisfaction scores of “3”, “4”, “5”, and “6”. Square of tenure enters with a positive and significant coefficient for levels “4”, “5”, and “6”. For females, the tenure coefficient is negative and significant for all levels whereas the coefficient for tenure squared is positive and significant for all levels. Therefore, a clear U-shape relationship exists between job satisfaction and tenure for the female sample. A similar U-shape relationship is found in the male sample only in the case of those reporting job satisfaction scores of “4”, “5” and “6”. For males, the marginal effects are negative and significant for “3” and “4” and positive and significant for “7”. For females, the marginal effects are negative and significant up to scores “5” except for “2” and positive and significant for “6” and “7”. This suggests that longer tenure increases job satisfaction for the most satisfied group of workers, a result that we might have expected. These results contrast with those of Barmby et al. (2012) who find a negative linear relationship between tenure and job satisfaction.

4. Conclusion

Using an innovative methodology, namely a GDREOP model, we investigate the effects of age and tenure on job satisfaction. Our results indicate that age has no strong relationship to job satisfaction, which contrasts with previous evidence. Any idea of a consistent U-shape relationship between age and job satisfaction is not supported by our results. We also find a non-linear relationship between tenure and job satisfaction. It seems that increased tenure improves job satisfaction for the most satisfied male and female workers. In contrast for female workers, those reporting low job satisfaction suffer falls in job satisfaction as tenure rises.

Taken together, our results suggest the need to model job satisfaction in a more general way than a simple ordered probit specification. They indicate, in particular, differences in the impact of age and tenure on job satisfaction when allowance is made for responses across categories. Further, our results suggest that the analysis of males and females should be done separately in that the patterns of the effects of the different determinants of job satisfaction do vary by gender. Future research on job satisfaction data should look to develop new applications for the more general and dynamic specification used in this paper.

⁴ There is a possible endogeneity problem with tenure as well as age, which means the derived results should be treated with caution.

² Wave 11 was omitted as it did not include equivalent data on job satisfaction.

³ We follow Carro and Traferri (2012) in calculating the marginal effects. The likelihood ratio test, reported in Table A.1, selects our model over Conti and Pudney’s (2011) dynamic ordered probit and the static generalized ordered probit utilized by Chongvilaivan and Powdthavee (2014). This is strong evidence that the data prefers our generalization of the existing methods.

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