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Much Ado about Salary: A Comparison of Monetary and Non-Monetary Components of Job Satisfaction*

Cristina Bernini[†] and Alessandro Tampieri[‡]

Abstract

We investigate how specific components of job satisfaction influence overall work happiness. We use the British Household Panel Survey (BHPS), which includes measures of satisfaction with total pay, job security, the nature of work, and hours worked. Our analysis employs a multi-level model to assess the variations in job satisfaction among different types of occupations. This approach allows for a clear comparison of both monetary and non-monetary aspects of job satisfaction. Our findings indicate that the importance of satisfaction with salary in explaining overall satisfaction is lower compared to other non-monetary aspects. This result holds true even when we narrow down the sample by considering factors such as gender (males or females), employment type (full-time or part-time), further job satisfaction components (available for fewer years) and examining income as a second-level factor rather than job occupation.

Keywords: subjective well-being, happiness function, job satisfaction.

JEL codes: I31, R10

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1. Introduction

Economists have extensively studied the analysis of incentive contracts to motivate workers to work harder and increase their productivity. In particular, contract theory has developed models with the goal of designing optimal contracts centred around monetary incentives. The fundamental assumption is that work involves investing time and effort in exchange for money. Empirical evidence has consistently supported the core principle of contract theory, demonstrating that workers' pay varies based on their performance, and they do respond to monetary incentives. Some classical studies supporting this notion include Lazear (2000), Paarsch and Shearer (2000), and Booth and Frank (1999), among others.

Since then, a growing body of evidence has highlighted the significance of non-monetary aspects of work in addition to monetary incentives. These aspects have been explored in various directions.¹ The literature on motivation crowding, for instance, reveals that when monetary incentives are employed, they can either hinder or stimulate intrinsic motivation (Frey and Jegen, 2002, for a detailed discussion). Research on human resource management practices has also demonstrated that non-monetary organisational strategies, such as problem-solving teams, job rotation, worker screening and selection, job security, information sharing, and training,

¹ It is important to note that other social sciences have a longer tradition than economics in studying the importance of aspects of work beyond monetary compensation, especially in the fields of organizational behaviour and organisational psychology (see Rosso, Dekas, and Wrzesniewski 2010 for an exhaustive discussion). One of the most significant contributions in this direction comes from studies in cognitive psychology of motivation, particularly from the works of Deci and Ryan (Deci and Ryan 1985, 2000, and Ryan and Deci 2000).

complement monetary incentives as effective motivators for workers (Ichniowsky and Shaw, 2003). Moreover, some studies have found that workers are willing to accept lower payments for jobs they perceive as more beneficial to society (Frank, 1996; Bryce, 2018; Dur and Lent, 2018). Finally, recent works have delved into the relationship between work and its meaning. Notable contributions in this area include Loewenstein (1999), Karlsson *et al.* (2004), and more recent works by Chater and Loewenstein (2016) and Cassar (2019).²

One aspect that has yet to be explored is the direct comparison of the relative importance of monetary incentives versus other job features. The question at hand is not just whether non-monetary aspects are relevant, but how relevant they are compared to salary. This research question addresses a highly current topic: the post-COVID events of “Great resignations” among skilled, well-paid workers in many Western countries have raised doubts about the importance of salaries as the primary incentive for productivity and overall work motivation (Chugh, 2021).

In this paper, we aim to investigate this question by using data on subjective well-being. In particular, we will analyse job satisfaction and its specific components, such as satisfaction with various job aspects. Our approach is typically employed in assessing overall life satisfaction, assuming that subjective well-being can be derived from a combination of satisfaction in different domains. According to this methodology, overall subjective well-being can be modelled as a function of various

² For a discussion, see Cassar and Meier (2018).

areas of satisfaction (van Praag 2011, 2007, van Praag *et al.* 2003, Sirgy 2002, Diener *et al.* 1999, and Diener 1984, among others).

We adopt this identification strategy to analyse *job rather than overall satisfaction*. Following the same principle, job satisfaction can be determined by satisfaction with different job features. This approach aligns with Locke's (1976) definition of job satisfaction, which entails the calculation of a weighted sum of satisfaction across different work sub-domains, with the worker assigning weights based on their perceived importance to each.

The dataset used for this analysis is the British Household Panel Survey (BHPS), which provides information on satisfaction with total payment, job security, the nature of work, and hours worked for each year of the dataset. The aim is to understand the relative importance of each satisfaction component in explaining job satisfaction. For our analysis, we employ a multilevel model, with the second level represented by job type, classified according to the job classification "SOC". This approach allows us to assess the variability of our results and how the impact of each component of job satisfaction on overall job satisfaction depends on the type of profession.

Our findings reveal that overall job satisfaction is more strongly influenced by its non-monetary aspects than total payment. While this result holds true for most job types, some specific job types exhibit a relatively higher importance placed on total payment. To ensure the validity of our results, we conduct several sensitivity checks to examine whether this pattern is driven by specific types of workers. We perform

separate tests for each gender, full-time or part-time jobs, and additional job satisfaction components available only for a limited number of years, such as promotion prospects, relations with the boss, and use of initiative. Additionally, instead of using job types as the second level of analysis, we consider income grouped into 34 income bands to verify the role of individual wealth on the job evaluation scheme. The general findings in our results are confirmed across these various sensitivity checks. However, we do observe that male workers tend to place a higher importance on salary than hours worked, although it remains less important than job security and the nature of work.

The paper contributes to the vast literature on job satisfaction, which includes earlier works by Hamermesh (1977), Freeman (1978), Borjas (1979), Ross and Reskin (1992), and others. In relation to our current study, the literature on subjective well-being has explored the link between job satisfaction and wages. For instance, Judge *et al.* (2010) conducted a meta-analysis that summarised findings from 92 samples, concluding that the relationship between salary level and job satisfaction is only marginally significant. Our results align with the existing literature, confirming this observation. Moreover, our analysis provides a distinct advantage by enabling a straightforward comparison of the relative importance of job satisfaction with other job characteristics.

Due to its wealth of information, the BHPS has been a valuable resource for numerous studies on happiness. One of the earliest works, Clark and Oswald (1994), focused on the correlation between unemployment and subjective well-being, using the General

Health Questionnaire as a measure. Subsequent papers utilised the BHPS to explore job satisfaction in relation to various individual and job characteristics (Clark, 1996), income comparison (Clark and Oswald, 1996), age (Clark *et al.*, 1996), gender (Clark, 1997), and other factors. In this literature, a worker's job satisfaction is modelled using a utility framework in which individuals derive satisfaction from both job-specific characteristics and the comparison among their peers in terms of salary and working conditions.

More recent contributions employing the BHPS have focused on various aspects of the relationship between job satisfaction and other factors. Sousa-Poza and Sousa-Poza (2003) examined the gender dimension. Other studies delved into job quality (Clark, 2005), working hours, and gender (Booth and van Ours, 2008; Bridges and Owens, 2017). Additionally, researchers have investigated the link between performance pay and each component of job satisfaction, as studied by Green and Heywood (2008), Pouliakas and Theodossiou (2009), and others. Differences across British regions were analysed by Jones and Sloane (2009), while retirement's impact on job satisfaction was studied by Clark *et al.* (2015). Dawson *et al.* (2017) explored the effects of temporary employment, and Manning and Mazeine (2022) looked into subjective job insecurity. Within the body of research using the BHPS, our paper is particularly related to Clark (2001), in which he delved into the relationship between job satisfaction and quits. In particular, he evaluated the link between each of job satisfaction measures in the dataset and quits and separations. His results show that less happy workers are more likely to both quit the job or separate from it.

Importantly, adopting a hedonic approach, Clark (2001) identified the job satisfaction components that possessed the highest predictive power for future resignations. He finds that “Job security” and “Total payment” as the most influential factors in predicting job quits. In contrast, our own findings reveal that “Total payment” holds a relatively lower importance in explaining overall job satisfaction.

The remainder of the paper is organised as follows. Section 2 Provides information on the dataset and the variables considered in the present analysis. Section 3 introduces the identification strategy and the econometric model considered. Section 4 outlines the results, while Section 5 concludes the paper.

2. Data

2.1. BHPS

The British Household Panel Survey (BHPS) is a longitudinal survey that was conducted from 1991 until 2008.³ It was designed to be a nationally representative sample of over 5000 households in the U.K. Each year, interviews were conducted with every adult member of these households, resulting in approximately 10,000 individual interviews per year. The collected data encompass socio-demographic and economic information, household behaviour, income, consumption, job conditions, and more. For our analysis, we considered a sample of 107,891

³ Unfortunately, the follow-up dataset, Understanding Society, which extends for another 13 years as of the time of writing this paper, does not provide information on the domains of job satisfaction.

observations of employed individuals aged between 16 and 65 years, covering the entire duration of the dataset.

All waves of the BHPS contain information regarding job satisfaction. Employed individuals are requested to rate their job satisfaction on a Likert scale, which ranges from 1 (“not satisfied at all”) to 7 (“completely satisfied”). Our dependent variable is the “Overall job satisfaction”, while the main explanatory variables consist of job satisfaction domains. The BHPS collects data on specific domains of job satisfaction, namely, satisfaction with “Total payment”, “Job security”, “Work itself” and “Working hours”. Additionally, for the years spanning from 1991 to 1997, the survey also provides information on job satisfaction related to “Promotion prospects”, “Relations with boss”, and “Use of initiative”.

Furthermore, job satisfaction will be influenced by a range of individual characteristics. On the socio-demographic side, we include age, gender, marital status, self-reported health, whether the individual is responsible for children under the age of 16, income, and whether the partner is employed. The last two variables are included to account for any specific financial constraints that might influence the worker's job choice.

To control for education, we introduce six education qualification dummies, including “no qualification”, “CSE”, “GSCE”, “A level”, “Higher qualification”, and “Bachelor and Higher education”. On the job side, we consider whether the job is permanent or temporary, full-time or part-time, the occupation, and yearly income. Lastly, we account for geographical areas by including six British regional dummies,

following the official division of the country (www.gov.uk): the four countries of the UK (England, Wales, Scotland and Northern Ireland) and the nine English regions (North East, North West, Yorkshire and The Humber, East Midlands, West Midlands, East of England, London, South East, and South West).

2.2. Descriptive analysis

Table 1 presents the descriptive statistics for the variables under consideration. The overall job satisfaction score is 5.378, indicating a high level of happiness among British workers during the studied period. When analysing job satisfaction domains, satisfaction with “Work itself” and “Job security” receive the highest scores, followed by “Hours worked”. Satisfaction with “Total pay” receives the lowest score among the domains. Focusing solely on the period 1991-1997, “Relations with boss” and “Use of initiative” obtain the scores of 5.513 and 5.694, respectively, while “Promotion prospects” yields the lowest score among all domains.

Table 1: Descriptive analysis

Variable	Obs	Mean	St. Dev	Min	Max	
Demographic						
Age		37.583	12.228	16	65	
Female (no=0, yes=1)		0.519	0.500	0	1	
Employed partner		0.582	0.493	0	1	Whether spouse/partner employed now
Responsible for children below 16 (no=0, yes=1)		0.190	0.392	0	1	Self reported health status
Health conditions (excellent=1, other=0)		0.260	0.439	0	1	
Education (no=0, yes=1)						
University		0.160	0.367	0	1	Bachelor or higher
Higher qualification		0.293	0.455	0	1	Teaching, nursing or higher qualifications
A-level		0.140	0.347	0	1	
GCSE		0.202	0.402	0	1	
CSE		0.059	0.236	0	1	
No qualification		0.146	0.353	0	1	
Marital status (no=0, yes=1)						
Married		0.541	0.498	0	1	
Living as a couple		0.150	0.357	0	1	
Single		0.309	0.462	0	1	
Job features (no=0, yes=1)						
Temporary job		0.058	0.234	0	1	
Part time		0.255	0.436	0	1	
Regions (no=0, yes=1)						
London		0.024	0.154	0	1	
South East		0.209	0.407	0	1	
South West		0.075	0.263	0	1	
East of England		0.032	0.175	0	1	
East Midlands		0.069	0.254	0	1	
West Midlands		0.070	0.255	0	1	
Yorkshire and the Humber		0.075	0.263	0	1	
North East		0.050	0.218	0	1	
North West		0.086	0.280	0	1	
Wales		0.130	0.337	0	1	
Scotland		0.169	0.375	0	1	
Northern Ireland		0.004	0.066	0	1	
Nominal income		15,932	13,531	0	1,191,104	
Job satisfaction (not at all=1, completely=7)						
Total job sat.		5.378	1.300	1	7	All things considered, how satisfied or dissatisfied are you with your present job
						How satisfied or dissatisfied are you with that particular aspect of your own present job:
Sat. with total pay		4.864	1.569	1	7	- the total pay, including any overtime or bonuses
Sat. with job security		5.396	1.517	1	7	- your job security
Sat. with work itself		5.459	1.336	1	7	- the actual work itself
Sat. with hours worked		5.223	1.443	1	7	- the hours you work
Years				1991	2008	
Obs.						107,891
Sat. with promotion prospects		4.447	1.830	1	7	- promotion prospects
Sat. with relations with boss		5.513	1.553	1	7	- relations with your supervisor or manager
Sat. with use of initiative		5.694	1.415	1	7	- being able to use your own initiative
Years				1991	1997	
Obs.						28,655

Differences in each type of job satisfaction are displayed in Table 2 based on the nine groups of job classification SOC: Managers/Administrators, Professional occupations, Associate professional/Technical occupations, Clerical/Secretarial occupations, Craft/related occupations, Personal/Protective service occupations, Sales occupations, Plant/Machine operatives, and Others. “Overall job satisfaction” tends to be higher for Managers and Personal/Protective service occupations, while it is lower for Plant/Machine operatives and Craft/related occupations. Analysing the entire period from 1991 to 2008, with just four satisfaction domains, satisfaction with “Total pay” generally receives the lowest scores across the various domains, except for Managers and Professionals, who appear to be less content with their “Hours worked” compared to their pay. Nevertheless, “Hours worked” still ranks as the job satisfaction domain with the second-lowest score after “Total pay”. On the other hand, “Job itself” and “Job security” consistently obtain the highest scores among the domains. When considering all the available job satisfaction domains (1991-1997), “Promotion prospects” obtains the lowest scores among all domains, while “Use of initiative” significantly receives the highest scores.

Table 2: Job satisfactions by job groups

	Overall job sat.	total pay	Job security	Work itself	Hours worked	Obs.	Promotion prospects	Relations with boss	Use of initiative	Obs.
Managers/Administrators	5.436	5.131	5.447	5.608	5.018	14,743	4.911	5.582	6.066	3,504
Professional occupations	5.365	5.035	5.407	5.554	4.943	10,683	4.491	5.458	5.813	3,057
Technical occupations	5.416	4.923	5.370	5.581	5.306	12,573	4.465	5.448	5.791	3,173
Clerical occupations	5.318	4.818	5.342	5.281	5.451	19,026	4.267	5.556	5.540	5,668
Craft/related occupations	5.287	4.657	5.207	5.459	5.131	10,380	4.185	5.337	5.688	3,121
Service industry	5.603	4.786	5.627	5.722	5.409	13,295	4.601	5.692	5.839	3,041
Sales occupation	5.399	4.858	5.599	5.349	5.317	9,372	4.733	5.709	5.642	2,268
Plant/Machine operatives	5.116	4.617	5.110	5.183	4.948	9,162	4.068	5.212	5.274	2,758
Other occupations	5.389	4.851	5.405	5.304	5.313	8,657	4.422	5.648	5.568	2,061

3. Modelling job satisfaction at occupation level

3.1 Job satisfaction domains

Our analysis of job satisfaction is built following the approach of the *happiness function* (van Praag *et al.*, 2003, among others). With this method, life satisfaction can be defined as a function of different satisfaction domains. Examples of satisfaction domains are, for instance, satisfaction with health, economic conditions, family, with the own partner and, clearly, job satisfaction.⁴ An original part of our methodology is to apply this approach to job rather than life satisfaction. In this case, satisfaction domains refer to fulfilment with specific aspects of job activity, such as satisfaction with the type of job, working hours, salary and so on. In this perspective, we may define the job satisfaction function as:

$$JS = f(JD_1, \dots, JD_S), \tag{1}$$

where JD_s are the satisfactions for specific job aspects $s=1, \dots, S$.

The first appealing feature of this framework is the fact that the answers to job satisfaction domains are the result of workers' perception of the different features of the job. Another interesting aspect of our approach is the fact that Equation (1) is measurable. Indeed, given that job satisfaction questions are categorised on a numerical scale, workers have an idea of a worst and a best condition and state their situation within this scale.

In what follows, we specify the job satisfaction function as Cobb-Douglas:

⁴ For instance, Bernini and Tampieri (2019, 2022) adopt the happiness function to study how overall satisfaction changes according to different cities or levels of urbanisation, respectively.

$$JS = \prod_{s=1}^S JD_s^{\beta_s}, \quad (2)$$

so that we may evaluate the level of substitutability among the job satisfaction domains, while parameter β_s represent the elasticity of job satisfaction related to domain s .

Following Schokkaert (2007), if $\ln JS_i$ and $\ln JD_i$ are the logarithm of overall job satisfaction and job satisfaction domains of worker i , respectively, then the relevance of each domain may be elicited from the estimated coefficients of the log-linearised version of equation (2):

$$\ln JS_i = \beta_0 + \beta_1 \ln JD_i + \beta_z Z_i + \varepsilon_i, \quad (3)$$

where $\ln JD_i$ is a vector of job satisfaction domains of worker i , and ε_i is the error term capturing the idiosyncratic individual factors. Equation (3) is enlarged with a set of Z of socio-demographic, educational and regional variables, as well as variables that indicate the contract type of the job, to control for heterogeneity in the job satisfaction function. All the variables considered have been illustrated in Section 2.

3.2 A Multilevel approach

We adopt a multi-level analysis to consider more than one level of variation in the job satisfaction domains. Multilevel models (MLM) allow to verify whether the job type or the level of income may affect the nexus between overall job satisfaction and its domains.

Our identification strategy is based on Equation (3), which is enlarged by including second level effects of the job type: this analysis allows us to determine whether job

occupation plays a role at determining the composition of job satisfaction over the different satisfaction domains. In addition, we are able to clarify the relative size of the impact of satisfaction domains on the overall job satisfaction based on the job classification. As alternative to job type, in Section 5 we consider income bands at level 2.

In addition, to exploit the panel nature of our data, we also consider second-level effects of the years together with job types. This follows the standard methodology for evaluating longitudinal multilevel models (see Hox, pp. 83-84).⁵

A possible issue with the use of multilevel models is endogeneity, which could be complicated by the assumptions of multiple independence, involving different random elements at both Level 1 and 2. Specifically, correlations between random components and predictors are more likely in MLMs, leading to potential ambiguity of correlated effects. At the same time, multilevel data provide a hierarchical structure that allows for the creation of different internal instruments, leading to robust estimations (Kim and Frees, 2007, 2006). Moreover, the abundance of data enables the evaluation of endogeneity bias and the implementation of different estimators to minimise its effects.

Another potential issue is the fact that the explanatory variables at the first level may be correlated with the group means. To avoid this, we include as instrumental variables the level-1, mean-centred covariates (Hox, 2010). In addition, following Mundlak (1978), if the unobserved heterogeneity at the cluster level is correlated with

⁵ As robustness checks, in Section 5.3, we evaluate standard random effects linear models. All the results are consistent with those presented in the baseline analysis.

the covariates, then the remaining correlation could be cancelled by adding the group means of the regressors.

Therefore, the MLM proposed builds on equation (3) to control for both the individual deviation from the mean and the mean levels of the job satisfaction domains at the job occupation level, as follows:

$$\begin{aligned}
y_{ijt} &= \beta_{0j} + \beta_{1j}(JD_{ijt} - \overline{JD}_{jt}) + \beta_z Z_{ijt} + \beta_{tj} T_{ijt} + \varepsilon_{ijt}, \quad \varepsilon_{ijt} \sim N(0, \sigma_\varepsilon^2), \quad \text{Level 1} \\
\beta_{0j} &= \gamma_{00} + \beta_{10j} \overline{JD}_{jt} + u_{0j}, \quad u_{0j} \sim N(0, \sigma_{0j}^2), \quad \text{Level 2} \quad (4) \\
\beta_{1j} &= \gamma_{10} + u_{1j}, \quad u_{1j} \sim N(0, \sigma_{1j}^2) \\
\beta_{2t} &= \gamma_{20} + u_{2t}, \quad u_{2t} \sim N(0, \sigma_{2t}^2),
\end{aligned}$$

The model in (4) includes second level effects by assuming random variations of the intercept of the equation and of the slopes of satisfaction domains: $(JD_{ij} - \overline{JD}_{jt})$ is the individual centred satisfaction domain, for every JD , \overline{JD}_{jt} is the group j mean of each job satisfaction domain, while T_{ijt} is the set of years.⁶ Z_{ijt} includes individuals controls as age, education, region of residence, marital status, and so on. Also, β_{10} is the between-group coefficient, γ_{10} is the within-group coefficient and γ_{20} is the wave coefficient. Finally, σ_{1j}^2 is the variance of the random parameters (i.e., the job satisfaction domains), σ_{0j}^2 represents the variance of the random intercept for job types, while σ_{2t}^2 is the variance of the random intercept for waves. Hence, in model (4), the equation at level 1 is defined to control for the individual deviation from the

⁶ In Section 5.3, we extend the baseline analysis by assuming time variability also in the job satisfaction parameters.

mean, and the mean level of the domains' happiness at job type level. Our empirical investigation is conducted by estimating model (4). Notice that, if β_{10} differs from zero, then exogenous group effects occur whenever an individual's job satisfaction tends to be affected by the underlying characteristics of the type of job. If instead γ_{10} differs from zero, then exogenous idiosyncratic factors affect individual job satisfaction (Manski, 1993). This model specification allows us to evaluate whether job satisfactions at occupation level bring about a different effect on workers well-being according to the centred individual-level domains.

3.3 Specification, endogeneity and common variance method tests

We run a number of statistical tests to evaluate the robustness of the model specification. The first statistic is the Likelihood Ratio LR_1 , from which we confront the estimated framework to the linear model. Second, the LR_2 compare the estimated model with the specification by setting aside the job type means. Then, we run the Intraclass Correlation Coefficient (ICC), which yields the total variance considered by the variance between job types.

Given the adoption of a MLM, endogeneity issues must be checked both for variables at level 2, and then for variables at level 1. At level 2, the Hausman test may be employed to evaluate endogeneity bias, with the null hypothesis that the random effects are not correlated with any of the covariates. Particularly, if the null hypothesis is verified, the estimated coefficients are both efficient and consistent.

For Level 1, one needs to control for dependencies between the error term and the explanatory variables. While a common instrumental variable estimation might be used, the inclusion of additional variables may turn things worse by amplifying other biases, and it is generally advised against (Wooldridge, 2002). An alternative approach is Van Praag *et al.* (2003)'s methodology, adopted in linear models, which we here extend to our MLM (Bernini and Tampieri, 2019, 2022). In this methodology, the first step requires the estimation of the direct effects for each job satisfaction domain of a set of socio-economic independent variables. Then, we run a factor analysis on the residuals of the four domains. This procedure allows to estimate the segment common to all residuals and use it as an instrument. Third, we include the principal factor of the error residuals as a supplementary variable. In case this instrument is not significant, then the error is not correlated with the job satisfaction domain and, in turn, the estimators exhibit no endogeneity bias.

Finally, we address the issue of control for common method variance (CMV), a potential concern in studies that rely on self-report measures of subjective well-being. It refers to the variance in responses attributed to the measurement method itself, rather than to the constructs being assessed. In other words, it represents the variance in responses that arises from the measurement process rather than the true underlying relationships between variables.

As suggested by Fuller *et al.* (2016), we employ the Harman's One-Factor Test to assess CMV. This test identifies problematic CMV when an exploratory factor analysis, including all study variables, produces eigenvalues suggesting the first

factor accounts for more than 50% of the variance among variables (Podsakoff and Organ, 1986).

4. Results

Table 3 illustrates the main results of the paper. Second-level variability over the years is significant albeit small. All tests LR_1 , LR_2 and ICC, are satisfied, ensuring the robustness of our estimates. The null hypothesis of not endogeneity bias is accepted at level 1. At level 2, the Hausmann test confirms the lack of endogeneity. Finally, by applying the Harman's One-Factor Test, to our main model, the first factor captures 28.36% of the total variance, strongly rejecting the issue of CVM. In what follows, we discuss the results with a separate focus on level 1 and level 2.

4.1. Level-1 results

The control variables considered are generally significant to explain job satisfaction, albeit their effects are generally small.

Job satisfaction decreases with age, at a slower path, and it is slightly higher for women. All educational qualifications seem negatively correlated with job satisfaction, as well as being single, but for both aspects the estimated coefficient is very small. Workers with temporary or part-time jobs show higher levels of job satisfaction than those with a permanent or full-time job.

Table 3: Overall job satisfaction.

	Main analysis		Main analysis	
Year	-0.002	***	Job sat domains (occupational mean variables)	
	0.000		Sat. with total pay	0.118 ***
Demographics				0.011
Female	0.006	***	Sat. with job security	0.165 ***
	0.002			0.012
Age	-0.355	***	Sat. with work itself	0.522 ***
	0.043			0.013
Age squared	0.048	***	Sat. with hours worked	0.157 ***
	0.006			0.011
Employed partner	-0.004	*	Intercept	
	0.002		Constant	4.843 ***
Responsible for children below 16	0.011	***		0.611
	0.002		Variances	
Health conditions	0.009	***	Residual	0.0447 ***
	0.002			0.0002
Education (omitted: no qualification)			Constant: Wave	0.0000 ***
Higher education	-0.017	***	Constant: Job occupation	0.0001 ***
	0.003		Sat. with total pay	0.0040 ***
Higher qualification	-0.014	***		0.0003
	0.002		Sat. with job security	0.0052 ***
A-level	-0.017	***		0.0004
	0.003		Sat. with work itself	0.0134 ***
GSCE	-0.007	***		0.0009
	0.002		Sat. with working hours	0.0045 ***
CSE	-0.003			0.0004
	0.003		Statistics and test	
Marital status (omitted: single)			LL	12659.78
Married	0.007	***	LR1 (LR test vs. linear regression)	3258.60 ***
	0.003		LR2	1487.51 ***
Living as a couple	0.004		ICC	0.110
	0.003		Endogeneity test: level 1	0.01
Job features			Endogeneity test: level 2	-76.64
Temporary job	0.022	***	Harman's One-Factor Test	28.36%
	0.003			
Part time job	0.009	***	Observations	107,891
	0.002			
Regional dummies (omitted: London)	Yes	*		
Job sat. domains (centered variables)				
Sat. with total pay	0.139	***		
	0.003			
Sat. with job security	0.148	***		
	0.003			
Sat. with work itself	0.503	***		
	0.005			
Sat. with hours worked	0.154	***		
	0.003			

We turn now on satisfaction domains. Quite expectedly, both the mean-centred and the mean-group variables are strongly significant to explain overall satisfaction. Focusing on the parameter of interest (i.e., the centered job satisfaction), the most interesting result is the fact that satisfaction with salary exhibits the lowest estimated coefficient, indicating that overall job satisfaction is less explained by “Total pay” rather than other job features. In particular, “Work itself” is what explains most of job satisfaction, followed by “Hours worked” and “Job security”.

These results raise questions about the appropriateness of monetary incentives to design job contracts compared to alternative incentives, such as hours flexibility, security or the enlargement of job tasks.

4.2. Job types

In this section we focus on the results related to job types. The second level in Table 3 considers 49 types of jobs. It shows that the variability of satisfaction domains over different job types is significant, albeit small. On Table 4, we show the means of the estimated coefficient of job satisfaction domains based on each of the nine SOC90 job groups. “Total pay” is the least important for jobs classified as: “Technical occupations”, “Clerical,” “Plant/Machine operatives”, “Service industry”, “Craft-related occupations” and “Professional”. It is more relevant to explain job satisfaction for the macro group “Managers/Administrators”: its importance is larger than “hours worked”, and yet lower than “Job security” and “Work itself”. Finally, for “Sales occupation” and “Other occupations”, “total pay” is more important than “Job

security”, but less important than “Hours worked” and “Job itself”. Considering that commercial activities often feature variable payments based on the level of sales, it is reasonable to think that individuals who choose that type of career are less motivated by job security. From this we may conclude that salary does not appear to be the main driver of job satisfaction for any of the job types considered.

Table 4: Parameter estimates by job group

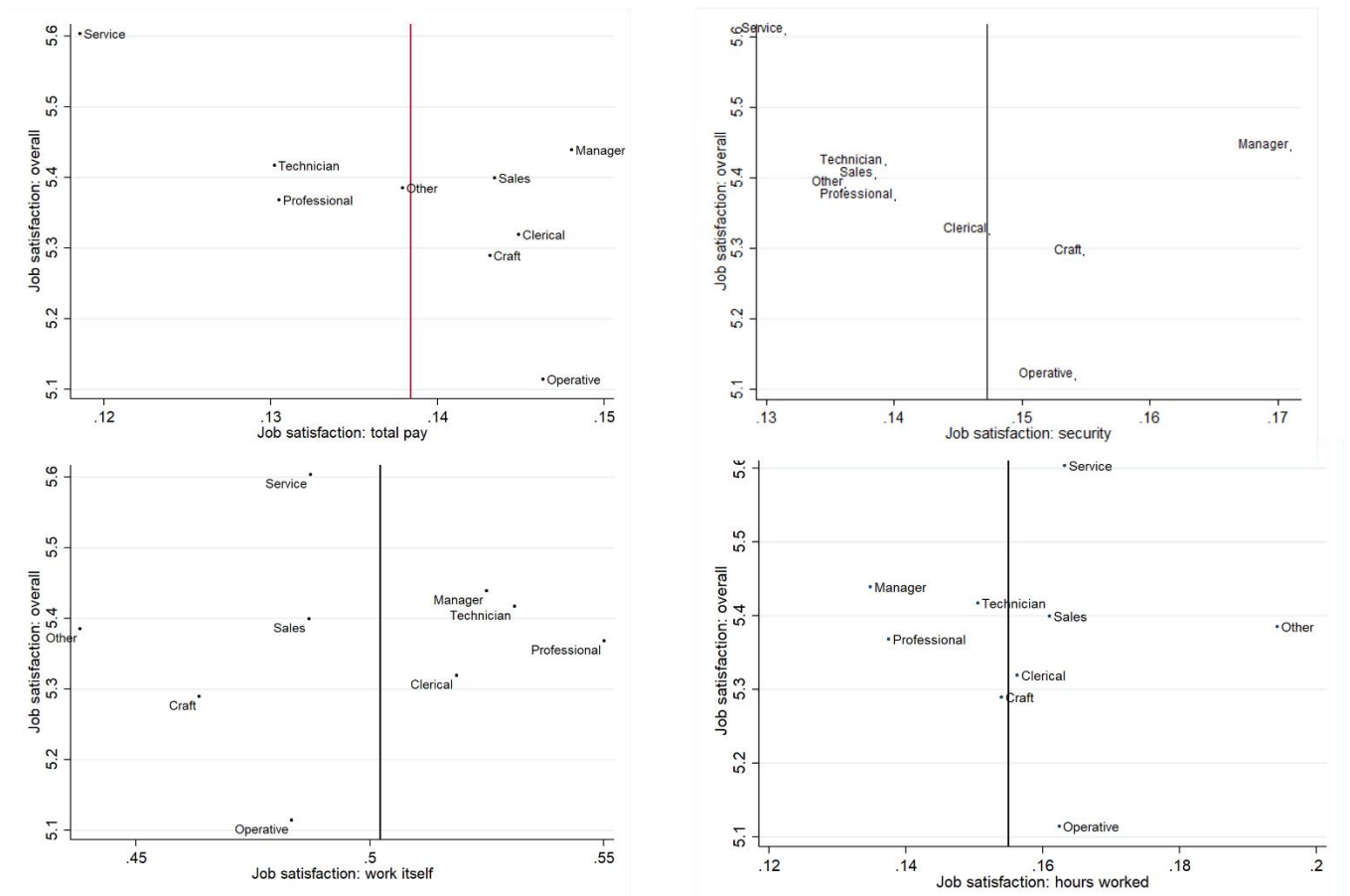
	Total pay	Job security	Work itself	Hours worked	Overall job satisfaction
Managers/Administrators	0.148	0.171	0.525	0.135	5.438
Professional occupations	0.130	0.140	0.550	0.137	5.368
Technical occupations	0.130	0.139	0.531	0.151	5.417
Clerical occupations	0.145	0.148	0.519	0.156	5.319
Craft/related occupations	0.143	0.155	0.464	0.154	5.289
Service industry	0.119	0.132	0.487	0.163	5.603
Sales occupation	0.143	0.139	0.487	0.161	5.399
Plant/Machine operatives	0.146	0.154	0.483	0.162	5.114
Other occupations	0.138	0.136	0.438	0.194	5.385
Mean	0.138	0.147	0.502	0.155	5.394

In Figure 1 then, we plot the estimated coefficient according to job types with respect to the level of overall job satisfaction: in each panel, the vertical red line shows the mean value of the estimated coefficient among different jobs, corresponding to the last line of Table 4.

The figure shows that, when controlling for job groups, the effect of single domains is not uniform across different job types, irrespective of the level of overall job satisfaction. For instance, satisfaction with “Total pay” has the lowest impact on explaining job satisfaction for people working in the service sector, yet these workers exhibit the highest level of overall satisfaction. On the other hand, they attribute relatively higher importance to “Hours worked” compared to other job types. In

contrast, managers exhibit the second-highest level of overall job satisfaction and, for them, “Job security” has a higher impact than “Total pay” and “Hours worked”. Despite the variability in importance, the intensity of “Total pay” to explain overall job satisfaction is either the lowest or the second lowest.

Figure 1: Job sat domains estimations and overall job satisfaction by job group



5. Sensitivity analysis and robustness checks

In this section, we verify our results by narrowing down our analysis to specific type of workers. The point is to verify whether the lower impact of satisfaction with “Total pay” on overall satisfaction applies generally or only to specific cases, such as gender-

specific or job contract-specific scenarios. Notice that separating the two samples according to either gender or job contract type allows us to see whether the order in the importance of job satisfaction domains gender is- or job contract-related. Thus, we also test the null of equal satisfaction domain parameter estimates across subgroups “females vs males”, “part vs full time jobs”.

Table 5: Overall job satisfaction, Estimations of subsamples/income as level 2.

	Males		Females		Full-time		Part-time		All job sat dom		Level-2: Income	
Year	0.004	***	-0.002	***		***		***		*	***	
	0.000		0.000									
Demographics												
Female	/		/		0.007	***	-0.004		0.005		0.005	***
					0.002		0.004		0.003		0.002	
Age	-0.396	***	-0.276	***	-0.375	***	-0.271	***	-0.233	***	-0.341	***
	0.060		0.063		0.053		0.080		0.088		0.044	
Age squared	0.054	***	0.037	***	0.051	***	0.037	***	0.029	**	0.046	***
	0.008		0.009		0.007		0.011		0.013		0.006	
Employed partner	-0.003		-0.005									*
	0.003		0.004									
Responsible for children below 16	0.013		0.010	***	0.010	***	0.011	***	0.015	***	0.011	***
	0.012		0.002		0.003		0.003		0.004		0.002	
Health conditions	0.008	***	0.010	***	0.010	***	0.008	**	0.003		0.009	***
	0.002		0.002		0.002		0.003		0.003		0.002	
Education (omitted: no qualification)												
Higher education	-0.013	***	-0.020	***	-0.014	***	-0.024	***	-0.021	***	-0.015	***
	0.004		0.004		0.003		0.005		0.005		0.003	
Higher qualification	-0.013	***	-0.015	***	-0.013	***	-0.017	***	-0.017	***	-0.012	***
	0.003		0.003		0.003		0.004		0.004		0.002	
A-level	-0.014	***	-0.019	***	-0.018	***	-0.009	**	-0.019	***	-0.015	***
	0.004		0.004		0.003		0.004		0.005		0.003	
GSCE	-0.005		-0.009	***	-0.006	*	-0.007	*	-0.006		-0.006	**
	0.003		0.003		0.003		0.004		0.004		0.002	
CSE	-0.004		-0.004		0.001		-0.010	*	0.000		-0.001	
	0.005		0.004		0.004		0.005		0.006		0.003	
Marital status (omitted: single)												
Married	0.008	**	0.007	*	0.007	**	0.008		-0.004		0.007	***
	0.003		0.004		0.003		0.005		0.005		0.003	
Living as a couple	0.009	**	0.001		0.005	*	0.001		-0.003		0.004	
	0.004		0.004		0.003		0.006		0.006		0.003	
Job features												
Temporary job	0.028	***	0.018	***	0.035	***	0.007	*	0.015	**	0.020	***
	0.005		0.004		0.005		0.004		0.007		0.003	
Part time job	0.013	***	0.008	***	/		/		0.012	***	0.008	***
	0.004		0.002						0.004		0.002	
Regional dummies (omitted: London)												
	yes	***	yes	***	yes	*	yes		yes	***	yes	*

Table 5: Overall job satisfaction, Estimations of subsamples/income as level 2 (continued).

	Males		Females		Full-time		Part-time		All job sat dom		Level-2: Income	
Job sat. domains (centered variables)												
Sat. with total pay	0.159	***	0.119	***	0.143	***	0.112	***	0.088	***	0.138	***
	0.004		0.004		0.003		0.005		0.004		0.003	
Sat. with job security	0.165	***	0.130	***	0.154	***	0.120	***	0.096	***	0.148	***
	0.004		0.005		0.004		0.006		0.005		0.003	
Sat. with work itself	0.490	***	0.520	***	0.514	***	0.462	***	0.409	***	0.497	***
	0.006		0.007		0.005		0.009		0.009		0.004	
Sat. with hours worked	0.145	***	0.164	***	0.150	***	0.169	***	0.135	***	0.154	***
	0.004		0.005		0.004		0.006		0.005		0.003	
Sat. with promotion prospects	/		/		/		/		0.071	***	/	
									0.004			
Sat. with relations with boss	/		/		/		/		0.145	***	/	
									0.006			
Sat. with use of initiative	/		/		/		/		0.098	***	/	
									0.008			
Job sat domains (occupational mean variables)												
Sat. with total pay	0.119	***	0.118	***	0.115	***	0.086	***	0.066	***	0.177	***
	0.015		0.018		0.012		0.026		0.021		0.013	
Sat. with job security	0.166	***	0.144	***	0.159	***	0.122	***	0.141	***	0.229	***
	0.015		0.018		0.012		0.026		0.020		0.019	
Sat. with work itself	0.507	***	0.545	***	0.552	***	0.439	***	0.456	***	0.452	***
	0.019		0.018		0.014		0.024		0.032		0.028	
Sat. with hours worked	0.139	***	0.173	***	0.139	***	0.201	***	0.133	***	0.214	***
	0.016		0.017		0.012		0.024		0.022		0.018	
Sat. with promotion prospects	/		/		/		/		0.011		/	
									0.020			
Sat. with relations with boss	/		/		/		/		0.155	***	/	
									0.032			
Sat. with use of initiative	/		/		/		/		0.069	**	/	
									0.035			
Intercept												
Constant	4.293	***	4.857	***	3.789	***	6.824	***	3.075	**	7.508	***
	0.793		0.687		0.632		0.911		1.574		0.799	
Variances												
Residual	0.0441	***	0.0420	***	0.0456	***	0.0367	***	0.0446	***	0.0457	***
	0.0003		0.0003		0.0002		0.0003		0.0004		0.0002	
Constant: Wave	0.0000	***	0.0000	***	0.0000	***	0.0000	**	0.0000	***	0.0000	***
	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Constant: Job occupation	0.0001	***	0.0001	***	0.0000	***	0.0002	***	0.0001	***	0.0000	***
	0.0000		0.0000		0.0000		0.0001		0.0000		0.0000	
Sat. with total pay	0.0061	***	0.0052	***	0.0046	***	0.0045	***	0.0023	***	0.0024	***
	0.0006		0.0006		0.0004		0.0008		0.0004		0.0003	
Sat. with job security	0.0089	***	0.0080	***	0.0068	***	0.0122	***	0.004	***	0.0034	***
	0.0008		0.0008		0.0005		0.0014		0.001		0.0003	
Sat. with work itself	0.0179	***	0.0204	***	0.0156	***	0.0261	***	0.016	***	0.0078	***
	0.0014		0.0017		0.0011		0.0026		0.002		0.0007	
Sat. with working hours	0.0058	***	0.0082	***	0.0054	***	0.0090	***	0.0044	***	0.0033	***
	0.0007		0.0009		0.0005		0.001		0.0008		0.0003	
Sat. with promotion prospects	/		/		/		/		0.0022	***	/	
									0.0004			
Sat. with relations with boss	/		/		/		/		0.0070	***	/	
									0.001			
Sat. with use of initiative	/		/		/		/		0.0117	***	/	
									0.0016			
Observations	51,899		55,992		80,532		27,539		28,651		107,230	

Moreover, the inclusion of extra job satisfaction domains (available only for a limited number of years) may clarify further the role of salary to explain job satisfaction. Finally, alternative to the control of job type performed in the main analysis, we may instead verify if the role of salary changes according to different levels of income. The section is organised according to whether the checks refer to changes to first or second level analysis.

5.1. First level: Subgroups and domains

In Table 5 we estimate equation (4) for the subsample of men or women, full-time or part-time jobs, and finally, we check whether the results hold if we consider all job satisfaction domains available in the dataset, which can be done only by considering the years from 1991 to 1997. By separating workers by gender, we find that male workers attribute more importance to total pay than women. In particular, the order of importance of satisfaction domains for males, from least to most important, is “hours worked”, “total pay”, “job security”, and “job itself”, while for females it is “total pay”, “job security”, “hours worked”, and “job itself”. Estimations of subsamples of full-time and part-time jobs instead are qualitatively similar to those outlined in the main analysis: job satisfaction by “Total pay” is what explains less overall job satisfaction. In Table 6, we perform a t test to compare job satisfaction parameters across groups. We find that all estimated coefficients are statistically different in the two subgroups based on either gender or job contract.

By including further three job satisfaction domains (second last column of Table 5), we find that satisfaction with “Total pay” maintains the lowest relevance to explain job satisfaction than the usual domains, except for “Satisfaction with promotion prospects”.

Table 6: t test.

	Female	Male	diff		sd	t-test
Job sat. domains (centered variables)						
Sat. with total pay	0.12	0.16	-0.04	***	0.00	-69.46
Sat. with job security	0.13	0.16	-0.03	***	0.00	-23.20
Sat. with work itself	0.52	0.49	0.03	***	0.00	9.51
Sat. with hours worked	0.16	0.15	0.02	***	0.00	7.18
	Part time	Full time	diff		sd	t-test
Sat. with total pay	0.11	0.14	-0.03	***	0.00	-8.73
Sat. with job security	0.12	0.15	-0.03	***	0.01	-6.46
Sat. with work itself	0.46	0.51	-0.05	***	0.01	-7.13
Sat. with hours worked	0.17	0.15	0.02	***	0.01	3.64

5.2. Second level: Income

In this section extend our results by considering income per year as the second-level variable. To do so, we create 35 income bands to verify if the results emerge only for specific levels of income. The results can be found in the last column of Table 5: estimations of level-1 variables are qualitatively similar to that obtained in the main

analysis, while the second-level variability for income bands is significant. In Table 7 instead, like what we did in table 4 for job types, we show the different estimations of job satisfaction domains by income bands. To ease the readability, we reduce the number of bands to 12. Also, in Figure 2, we plot the estimated coefficient according to income bands with respect to the level of overall job satisfaction: again, the vertical line indicates the mean value of the estimated coefficient.

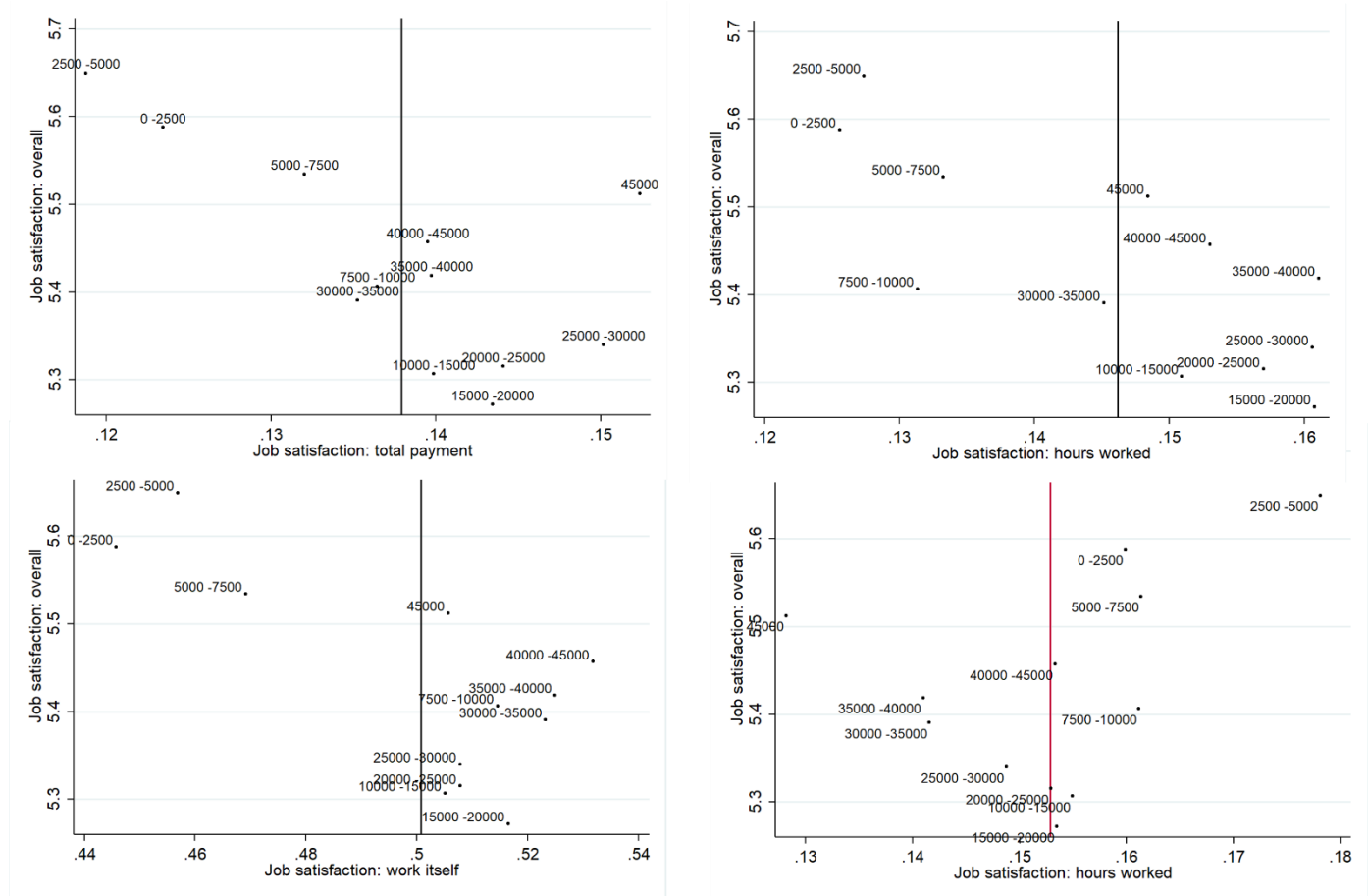
Table 7: Job sat domains estimation by income band

	Income per year (GBP)	Total pay	Job security	Work itself	Hours worked	Overall job satisfaction
1	0 -2,500	0.123	0.126	0.446	0.160	5.588
2	2,500 -5,000	0.119	0.127	0.457	0.178	5.650
3	5,000 -7,500	0.132	0.133	0.469	0.161	5.535
4	7,500 -10,000	0.136	0.131	0.515	0.161	5.407
5	10,000 -15,000	0.140	0.151	0.505	0.155	5.307
6	15,000 -20,000	0.143	0.161	0.516	0.153	5.272
7	20,000 -25,000	0.144	0.157	0.508	0.153	5.315
8	25,000 -30,000	0.150	0.161	0.508	0.149	5.340
9	30,000 -35,000	0.135	0.145	0.523	0.142	5.391
10	35,000 -40,000	0.140	0.161	0.525	0.141	5.419
11	40,000 -45,000	0.139	0.153	0.532	0.153	5.457
12	45,000-	0.152	0.148	0.506	0.128	5.513
Mean		0.137	0.146	0.500	0.155	5.425

Consistent with the findings of Clark and Oswald (1996), who studied job satisfaction and the impact of relative income using the BHPS for year 1991, annual income and overall job satisfaction appear quite disconnected. Turning to the effects of single domains, the relative intensity of each satisfaction domain in explaining overall job satisfaction varies across different income bands, with satisfaction with “Work itself” remaining predominant. Both the relevance of satisfaction with “Work itself” and

“Job security” changes non-monotonically with the increase in annual income. In contrast, as annual income increases, the intensity of satisfaction with “Total pay” tends to increase while satisfaction with “Hours worked” tends to decrease.

Figure 2: Job sat domains estimations and overall job satisfaction by income bands



5.3 Robustness checks

As robustness checks, we estimate the model by using the alternative estimators.

First, we extend the baseline MLM by considering time variability in the job satisfaction parameters. Then, we estimate equation (4) by using a random effect

estimators. Tables 8 and 9 show that model results are similar in terms of parameter signs and values to multilevel estimates.

6. Concluding remarks

In this paper we have analysed the importance of the components of job satisfaction domains to explain overall job satisfaction. For that purpose, we have employed the BHPS for its richness of information available on job satisfaction domains. Interestingly, the monetary aspect of job satisfaction seems to play a marginal role to determine the level of overall satisfaction. These results appear to be robust to a number of sensitivity checks, by controlling to specific types of workers. Our findings may help economists as a reference to design working contracts with a focus on non-monetary rather than monetary incentives.

Table 8: MLM with time-varying parameters.

Year	-0.002	***	Job sat domains (occupational mean variables)		
	0.000		Sat. with total pay	0.118	***
Demographics				0.011	
Female	0.006	***	Sat. with job security	0.165	***
	0.002			0.012	
Age	-0.355	***	Sat. with work itself	0.522	***
	0.043			0.013	
Age squared	0.048	***	Sat. with hours worked	0.157	***
	0.006			0.011	
Employed partner	-0.004	*	Intercept		
	0.002		Constant	4.843	***
Responsible for children below 16	0.011	***		0.611	
	0.002		Variances		
Health conditions	0.009	***	Residual	0.0447	***
	0.002			0.0002	
Education (omitted: no qualification)			Constant: Wave	0.0000	***
Higher education	-0.017	***		0.0000	
	0.003		Constant: Job occupation	0.0001	***
Higher qualification	-0.014	***		0.0000	
	0.002		Sat. with total pay	0.0040	***
A-level	-0.017	***		0.0003	
	0.003		Sat. with job security	0.0052	***
GSCE	-0.007	***		0.0004	
	0.002		Sat. with work itself	0.0134	***
CSE	-0.003			0.0009	
	0.003		Sat. with working hours	0.0045	***
Marital status (omitted: single)				0.0004	
Married	0.007	***	Observations		
	0.003			107,891	
Living as a couple	0.004				
	0.003				
Job features					
Temporary job	0.022	***			
	0.003				
Part time job	0.009	***			
	0.002				
Regional dummies (omitted: London)	yes	*			
Job sat. domains (centered variables)					
Sat. with total pay	0.139	***			
	0.003				
Sat. with job security	0.148	***			
	0.003				
Sat. with work itself	0.503	***			
	0.005				
Sat. with hours worked	0.154	***			
	0.003				

Table 9: Random Effects.

Year	-0.002	***	Job sat domains (occupational mean variables)		
	0.000		Sat. with total pay	0.116	***
Demographics				0.011	
Female	0.006	**	Sat. with job security	0.150	***
	0.002			0.011	
Age	-0.392	***	Sat. with work itself	0.534	***
	0.053			0.013	
Age squared	0.053	***	Sat. with hours worked	0.174	***
	0.008			0.012	
Employed partner	-0.001		Intercept		
	0.003		Constant	4.855	***
Responsible for children below 16	0.010	***		0.421	
	0.003		Observations		
Health conditions	0.010	***		107,891	
	0.002				
Education (omitted: no qualification)					
Higher education	-0.018	***			
	0.004				
Higher qualification	-0.016	***			
	0.003				
A-level	-0.018	***			
	0.004				
GSCE	-0.009	***			
	0.003				
CSE	-0.002				
	0.005				
Marital status (omitted: single)					
Married	0.007	**			
	0.003				
Living as a couple	0.000				
	0.003				
Job features					
Temporary job	0.023	***			
	0.003				
Part time job	0.009	***			
	0.002				
Regional dummies (omitted: London)					
	yes				
Job sat. domains (centered variables)					
Sat. with total pay	0.133	***			
	0.002				
Sat. with job security	0.149	***			
	0.002				
Sat. with work itself	0.482	***			
	0.002				
Sat. with hours worked	0.159	***			
	0.002				

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