UNIVERSITA' CATTOLICA DEL SACRO CUORE
- Milano -

QUADERNI DELL'ISTITUTO DI
ECONOMIA DELL'IMPRESA E DEL LAVORO

The Public-Private Job Satisfaction Differential in Italy

Paolo Ghinetti

n. 46 – settembre 2006

QUADERNI DELL'ISTITUTO DI
ECONOMIA DELL'IMPRESA E DEL LAVORO

Istituto di Economia dell'Impresa e del Lavoro
Facoltà di Economia
Università Cattolica del Sacro Cuore
Largo Gemelli, 1 - 20123 Milano

The Public-Private Job Satisfaction Differential in Italy

Paolo Ghinetti[#]

Istituto di Economia dell'Impresa e del Lavoro

Università Cattolica del S. Cuore, Milano

Abstract: This paper uses Italian survey data for 1995 to study differences between public and private sectors in the level of self-reported workers' satisfaction for non-pecuniary job attributes. Econometric results show that public employees are on average more satisfied, but the size of the differential is rather small in absolute value. A decomposition exercise suggests that two thirds of the premium is due to better working conditions in the public sector, while only one third is attributable to differences in workers' tastes for job attributes between the two sectors.

Keywords: Job Satisfaction, Public Sector, Italy.

J.E.L. Codes: J28, J45, C25.

1. Introduction

In many industrialised countries, public and private sectors differ for several rules and conditions governing the employment relationship - such as type of jobs, job security and stability, working hours, career prospects, health conditions, policies for job flexibility, human resource management practices -, as well as for crucial aspects governing the wage determination process. These features affect the ability of the public sector to attract, select and motivate workers and, more generally, the functioning of labour markets in the two sectors. For this and other reasons, the analysis of differences between public and private jobs have received considerable attention by the economic literature. In many cases, the wage has represented the "metric" used to analyse sector differences, and the "pay premium" received by public employees the key parameter for policy and efficiency considerations.

However, the total benefit that workers receive from their job not necessarily coincides with labour income: when the labour market is not competitive and changing job is costly, wages paid by (heterogeneous) firms may not perfectly adjust to compensate (heterogeneous) workers for non-pecuniary job amenities (Rosen, 1986).

In Italy, wages in both sectors are settled at the central level quite independently to job conditions and individual attitudes; moreover, due to high mobility costs, sector decisions are made once for all. As a consequence, qualitative aspects such as the cultural and social environment, the health conditions, as well as the concern about losing employment may directly affect the total value of jobs.

Since, for the reasons mentioned above, amenities are likely to differ substantially across sectors, we argue that the way they are valued may represent an important part of returns to public employment. Unfortunately, contrary to wages, direct measures of the utility derived from jobs are typically unobservable. The solution adopted by many studies is to use measures of self-reported job satisfaction as a proxy for latent welfare levels.

In this paper we follow the same strategy and we investigate difference between public and private jobs in Italy in workers' satisfaction for non monetary attributes. Our aim is twofold. First, to complement the wage literature on the same topic for Italy; second, to extend the – rather limited - Italian evidence on the determinants of job

satisfaction. On a methodological ground, we also propose an Oaxaca-type decomposition for models with discrete ordered dependent variables.

Despite its importance for policy and efficiency considerations, the analysis of job satisfaction differences between public and private sectors has not received much attention by the economic literature so fat. An exception is the article of Heywood et al. (2002), who estimate the public/private differential using panel data for the US. Here we follow a similar approach, but, instead of longitudinal data, our information is limited to a single cross section based on the 1995 Italian Household Survey run by the Bank of Italy, which is the only wave containing specific questions on workers' satisfaction for non pecuniary job amenities. We use this information to construct an overall indicator of job satisfaction, which is a discrete ordered variable taking values from zero to 5.

Ordered probit estimates of non pecuniary returns to public employment, as well as to other individual and job characteristics, show that workers in the government sector are on average more satisfied than those who work in the private sector. The overall effect of a shift from the private to public sectors on the probability to observe the highest satisfaction level (the "public premium") increases from 2 up the 5 percent level, depending on the specification adopted. Interestingly, factors affecting job satisfaction differ according to the sector considered. In the public sector, individual characteristics, such as education and age, tend to play the biggest role. By contrast, job satisfaction in the private sector is more based on job characteristics, especially the occupational level. Using a decomposition *a la* Oaxaca to figure out how much of the differential depends on personal characteristics and how much is due to differences in returns to similar attributes across sectors, the latter component turns out to be the most important. Thus, workers in the two sectors have different levels of satisfaction not because of their personal characteristics, but, instead, because of the structural differences in the characteristics of jobs across sectors.

The paper is organised as follows. A simple economic framework to analyse public/private differentials in the context of job satisfaction is presented in the next section, which also contains a survey of the related empirical literature. Section 3 describes the data and presents a descriptive analysis of the linkage between job

satisfaction and the sector of employment. Section 4 introduces the econometric model and illustrates the main results. The last section concludes.

2. Conceptual framework and related literature

Our paper relates to two main fields of research. For its focus on of job satisfaction, it ties to the growing evidence on the determinants of happiness as an economic variable. Started with the seminal works of Hamermesh (1977), Freeman (1978) and Borjas (1979), this field has received a renewed impulse both theoretically and empirically from contributions of, among others, Clark and Oswald (1996) and Levy-Garboua and Montmarquette (2004)[1]. For its focus on public private differences on job-related aspects, our paper also aims to complement the literature on public pay gaps.

The remaining part of the section is organised as follows. We first present a simple economic framework to analyse job satisfaction issues and review some key results from the empirical literature. Next, we turn to a brief summary of main findings about the public wage premium, which will prove to be useful for the interpretation of our results.

2.1. Theoretical framework

We argue that jobs offered in public and private sectors are packages that contains both a monetary compensation and working conditions. Being interested in the overall utility generated by the job, some workers may be willing to substitute (lower) wages with (better) job attributes, depending on tastes[2]. In this context, as comapred to wages, subjective measures of self-reported satisfaction levels allow to compute a more general and encompassing measure of the net benefit from public employment.

Our behavioural framework closely relates that of Clark and Oswald (1996). We assume that, under the hypothesis that both workers and jobs are heterogeneous, individuals can derive direct utility from working. Work-related utility is nested in the overall individual's utility (V, sometimes called "life satisfaction") as follows:

---

[1] In particular, the latter have developed a framework which allows to reconcile the theory of perceived satisfaction with the standard microeconomic utility-based approach.
[2] This may explain why some workers "queue" for public jobs when, according to their observable characteristics, they would be better paid in the private sector: they pay to "buy" more favourable working conditions and career prospect. Another explanation for observing queues to join public positions may be that they are rationed in the private sector because of unobservable factors.

$$V_i = V_i[\alpha S_i^*, (1-\alpha)U_i^*]$$ (1)

where S^* is the (latent) utility (satisfaction) derived from the job (market activities) and U^* is that from non labour sources (consumption of leisure and family time), and α and $(1-\alpha)$ are the relative individual weights of the two components. The first term can be also expressed as:

$$S_i^* = S_i^*(w_i, h_i, J_i, E_i), \quad S_i^* \geq S_{RES}^*,$$ (2)

where w is the labour income available for consumption; h are the hours of work; J and E are, respectively, job and employer characteristics and S_{RES}^* is the reservation utility, that is the utility associated to the best alternative in the labour market of the actual job. Life satisfaction may be specified as follows:

$$U_i^* = U_i^*(f_i, H_i, L_i, Q_i)$$ (3)

where f are family characteristics, H is health, L is leisure and Q other variables.

Nested in this specification there is the standard labour supply model, when jobs are homogeneous – so that J and E are excluded from the analysis, as well as one between h and L - and w is the money equivalent of consumption expenditures. Typically, the underlying assumption is that the marginal utility of w is positive, while that of h (L) is negative (positive) because of work disutility.

When jobs are heterogeneous, competitive wages compensate not only for individuals' productivity, but also for all those job attributes that matter for individuals' well being (Rosen, 1986). In other words, the wage conveys all the relevant information about working conditions, and once again, if the wage is explicitly taken into account in the utility function, the direct effect of J, h and E should be negligible. However, if labour markets are not competitive, wage levels may be quite independent of individual productivity or firm characteristics, so that specific working characteristics may directly affect the utility of individuals, and not only indirectly through the wage[3].

Moreover, even if wages are flexible, high mobility costs may prevent workers to take the advantage of expected utility gains by moving from one job to another one. The presence of mobility costs to change jobs or sectors (for example, moving from the public to the private sectors) may also explain why dissatisfied workers do not search for a new job (that is, both search an and mobility costs lower S_{RES}^* toward zero).

As observed by Clark and Oswald (1996) and Levy-Garboua and Montarquette (2004), work satisfaction expressed in a given period may also be affected by past and future events. In particular, since individuals typically compare "what has been" with "what would have been", unexpected past events in the working history may affect current perceptions through the modification of expectations for the future (for example, long periods of unemployed may reduce utility because they increase insecurity and raise concerns about future working paths).

Imposing some structure, the utility function may take the following form:

$$S_i^* = S^*(w_i, h_i, J_i, E_i, Z_i, \varepsilon_i) \tag{4}$$

where we assume that taste heterogeneity systematically relates to a set of both observable (Z) and unobservable (ε) characteristics. Typically, Z contains variables such as education, gender and other family or personal attributes. Since some of them are factors that affects productivity and, thus, determine the wage level, it is interesting to ascertain whether they also exert a direct effect on job satisfaction by influencing individual preferences while keeping constant the wage level.

Finally, the two spheres of life satisfaction in (2) – (3) may not be totally independent. For example, a good family climate or possessing a good health may positively affect not only the utility from non-working activities, but also the satisfaction from work. In other words, Z may include family variables (f) like the marital status, health indicators (H), and so on[4].

Because S^* is a latent unobservable propensity, in empirical applications it is typically approximated by (discrete) measures of self-reported satisfaction levels.

2.2. The determinants of job satisfaction

The literature on the determinants of job satisfaction has rapidly expanded over the last decade. Among individual characteristics, age possesses a U-shape relationship with job satisfaction (Clark, 1996, 1997; Clark and Oswald, 1996). One explanation highlights the role that expectations play during the life-cycle (higher at the beginning, lower in the middle, again higher at the end of the career). According to gender considerations, females appear on average more satisfied than males, maybe reflecting self-selection

---

[3] There is no reason why wages contracted with unions or efficiency wages should reflect the productivity and/or the marginal disutility of individuals in a given job.

problems in the sample of working women (Clark, 1997; Bryson et al., 2005; Cappellari et al, 2004). As regards to education levels, results are less terse. On the one hand, when controls for the occupational status and/or for the wage are omitted, the effect of holding a high school degree on job satisfaction is largely positive. Still, when controlling for better educated filling better jobs and earning more, the effect in many cases is not statistically significant or even negative (Clark and Oswald, 1996; Clark, 1997; Bryson et al, 2004). Clark and Oswald (1996) suggest that, ceteris paribus, more educated workers have higher expectations that are more difficult to be realised. On the other hand, the lack of correlation may simply signal that education affects utility indirectly raining productivity and career prospects, but, once controlled for that, has no residual direct effect on preferences for job attributes.

Moving to job-related attributes, wage (or income) has a positive effect on overall job satisfaction, while the effect of hours is usually negative but statistically significant in a smaller number of cases (Clark and Oswald, 1996; Sloane and Williams, 1996).

As regards to employer characteristics, unionisation is associated with lower job satisfaction (Bender and Sloane, 1998; Gordon and Denisi, 1995; Freeman, 1978 and Borjas, 1979). However, once controls for the endogeneity of sorting into union jobs is accounted for, Bender and Sloane (1998) show that the union attracts the "intrinsically" less satisfied in both sectors: others find that the selection mechanism attracts to the union those who are "genuinely" more satisfied but that behave somehow "strategically" according to the exit-voice hypothesis once unionised (see Bryson et al, 2004, for the UK, and Heywood et al, 2002, for the US and Cappellari et al., 2004, for Italy).

While the empirical literature on the public pay premium is at least as popular as that on union pay gaps, quite surprisingly the same has not occurred so far in the field of job satisfaction. Katz and Krueger (1991) report that, despite the public wage premium is approximately zero, blue collars are willing to queue to get public sector jobs. The authors argue that this behaviour may be justified by differences across sectors in some qualitative aspects of the job relationship. Clark and Postel-Vinay (2004) find that public jobs are perceived to be less risky than their private sector counterpart.

---

[4] For example, suppose that $(\partial S_i * / \partial U_1 *) > 0$ and that $(\partial U_1 / \partial f) > 0$. Thus, $(\partial S_i * / \partial f_i) > 0$

Heywood et al. (2002) directly address the issue of the public job satisfaction premium for the US. While using a pooled cross-section the premium is positive, fixed effects estimates reveal an insignificant effect of public employment on satisfaction. Accordingly, on the one side, higher satisfaction from cross-sectional data suggests that the public sector offers better working conditions and wages, and, unsurprisingly, workers queues for government job. On the other side, panel estimates reveals that, this results may be driven a systematic relationship linking satisfaction to the probability to join the public sector. In particular, "intrinsically" more satisfied workers seem to be more likely to become public employees.

2.3. Differences between public and private jobs in Italy

In the last two decades, many studies have looked at the differences between public and private jobs for Italy, usually in terms of wages (among the others, Brunello and Dustmann, 1996; Bardasi, 1996; Comi and Ghinetti, 2002; Lucifora and Meurs, 2006).

On average, it seems that public employees benefit from higher wages. Brunello and Dustmann (1996) report that, at least for males, the positive premium can be largely explained by observable workers' attributes, Bardasi (1996) claims that the larger contribution (40% for male, 50% for women) comes from different returns paid to similar characteristics while the effect of different (observed) characteristics is not significant. Overall, results from quantilic regressions show that the wage structure in the public sector is more compressed than in the private sector, so that highly educated workers and those with high level occupations suffer a wage loss as compared to private workers (Comi and Ghinetti, 2002; Lucifora and Meurs, 2006). From an efficiency point of view, this creates obvious problems for the public sector in selecting, retaining and motivating its skilled workforce.

Moreover, even controlling for endogeneity of sectors, there is a number of (skilled) employees who choose to work in the public sector even if they would probably receive a higher wage in the private sector.

While these features suggest that non-pecuniary job amenities may matter for sector decisions, an explicit analysis of the sector differences in satisfaction for qualitative job attributes has not been undertaken so far in the public/private context.

3. Data and variables

The data set is drawn by the 1995 wave of the Survey of Household Income and Wealth (SHIW). Although the sampling unit is the household, the survey records information on families' components over a wide range of individual characteristics, including education, gender, age, work experience, region of residence, occupation, (net) yearly earnings, average weekly hours of work, number of months worked per year, health, working history - past unemployment experiences, layoffs, number of jobs changed, etc… - and so on.

To facilitate comparisons between public and private jobs, we further restrict the sample to that of non-agricultural employees aged from 20 to 60. Due to the selection criteria, we have approximately 2,500 observations available for the empirical analysis.

Concerning information on job satisfaction, in 1995 the Survey asked to the sub-sample of workers – those whose household head was born in an even year - to judge their job concerning six qualitative (that is, non pecuniary) aspects:

(i)   environmental conditions;

(ii)   dangerousness for life and health;

(iii)   effort needed to perform the tasks;

(iv)   interest for the type of tasks;

(v)   consideration by others (social climate);

(vi)   concerns about losing the employment.

Although certainly not exhaustive, we believe that this list of items captures important dimensions of job satisfaction, since it encompasses many key non pecuniary attributes that the economic literature has recognized as important determinants of individuals' welfare (effort, social climate, job stability,…). To formulate the judgement, employees can use a score from 1 to 5, where 1 is the lowest rating and 5 the highest one (while 2, 3, 4 are intermediate values). To summarise the information on separate items, we construct an "overall" job satisfaction indicator as follows. For each of the six work attributes, we assume that the individual is satisfied if he/she: (1) attributed a high rating (either four or five) to items (job characteristics) that are usually perceived as "goods"; (2) attributed a low rating (either one or two) to those attributes generally considered "bads". We identify (i), (iv) and (v) above as "goods"; while (ii),

(iii) and (vi) are considered "bads"[5]. Accordingly, we construct six dummy variables equal to one if the individual was satisfied as regards to any given attribute and zero otherwise[6]. The "overall" job satisfaction indicator is the sum of the six dummies and counts the number of facets an individual rated him/herself as "satisfied"[7]. In principle, such aggregate indicator can take values from zero to six. However, because only in few cases individuals has reached the highest rate, we have added them to the group of those reporting a value of five. Thus, in its final version our ordered job satisfaction indicator (which will be indicated by S in the methods section) can assume values from zero to five.

Concerning the determinants of job satisfaction, our paper focuses on the role played by employment in either the public and the private sector. In the Survey, the definition of the public sector is complicated by the fact that the reference is to the Italian "*Pubblica Amministrazione*" which excludes firms financed by the state but operating in the market. For this reason, public employees have been identified also through additional information from the variable "firm size", which classifies them in a specific category.

A detailed description of the variables that, besides sector affiliation and satisfaction, are used in the empirical analysis is reported in Table1. They include standard controls for personal and job-related characteristics. The first group includes demographic, geographic and human capital variables; the latter controls capturing the working history of individuals, their occupation, as well as their wage, seniority and type of the job.

[TABLE 1]

3.1. Descriptive evidence on job satisfaction

Summary statistics for the variables of interest are presented in Table 2. First, we can notice that the mean of the overall satisfaction indicator in the whole sample is around

---

[5] To support our interpretation, it suffices that all individuals are risk averse, dislike job effort, derive utility from esteem by others, and prefer interesting tasks to uninteresting ones.

[6] A group of around 200 workers did not answer any question concerning qualitative work characteristics. Although a priori there might exist any systematic relationship between their characteristics and perceived level of job satisfaction, they have been excluded from the final sample.

[7] Of course, this is not the only possible way to proceed, and answers could be aggregated in several different ways. However, our procedure is similar in the spirit to those proposed, among the others, by Bryson et al. (2004), Cappellari et al. (2004), Clark (1997).

2.9, higher that the value it would assume if answers were uniformly distributed (2.5): thus, our sample is made of relatively "satisfied" individuals. Public employees represent are a substantial fraction (39 percent) of the total employment, similar to the percentage of males (around 40 percent). As regards the schooling distribution, the largest fraction of individuals hold a secondary education degree (either low secondary or high school), while both college graduates and those with primary schools or less are the 12 percent. Our sample is unevenly distributed over different geographic areas and approximately the 10 percent of individuals live in urban areas.

[TABLE 2]

As far as far as other personal characteristics are concerned, more than the 80 percent of the sample is in good health and more than 70 percent of individuals are married. In 1995 the average monthly wage was little above 2 millions of liras (which is equivalent to 1,000 €) and people worked an average of 38 hours a week. Part timers represent the 5 percent of the sample, while people having experienced past long term (more than 6 months) unemployment represent the 12 percent of the sample, close to the fraction of those who have searched in the year for a new job. Finally, the majority of workers are white collars (either in low or high occupations).

Columns (2) and (3) of Table 2 contain summary statistics for the two sub samples of public and private employees. Clearly, the distribution of many observable personal characteristics is (statistically) significantly different across the two groups. Public employees are on average more educated, older, more likely to belong to the sample of females and of those living in the south, better paid, working less hours, with a more stable working history and with less desire to change job. Moreover, they are more likely to belong to the group of white collars and less to that of managers. Finally, they are on average more satisfied.

However, as many characteristics potentially correlated with job satisfaction differ between the public and the private sector, at this point it is almost impossible to ascertain whether differences in mean job satisfaction across sectors are "genuine" or due to spurious correlation induced by other factors beside the sector of employment.

A more detailed description of satisfaction patterns is given in Table 3, which shows the distribution of the satisfaction indicator against a set of individual characteristics.

The first row, which tabulates the index for the whole sample, shows that the first two classes contains only the 20 percent of observations, and that the value with the highest frequency is $S = 3$ (25 percent of the sample). Moreover, the distribution is concentrated for the 63 percent in the highest three values. Looking at sub-samples defined by personal characteristics, high school and university graduates as well as white collars and, especially, managers are by far more satisfied than the average. Concerning regional differences, the more satisfied are the workers from the north east and from the islands, as well as those who live in urban areas.

[TABLE 3]

Also possessing a good health displays a positive association with job satisfaction, while there is not a strong correlation with the marital status. Moving to job-related attributes, working part time has a strong positive association with satisfaction, while, as we may expect, the opposite happens for those who want to change job, who experienced past unemployment or layoff spells and who have changed more than three jobs. In other words, past job instability seems to impact negatively on actual job satisfaction. Finally, the comparison of public and private employees clearly identifies the former as the group in which the satisfaction indicator assumes more frequently higher values. In particular, the probability to observe a public employee in the group with the lowest level of satisfaction (equal to zero) is one third the probability to find there a private one, while in the highest rank there is a 40 percent higher probability to find someone working in the public sector. In the central values, this difference is however less pronounced.

Summing up the results of the descriptive analysis, public employees appear to be on average more satisfied than their private counterparts, but, at the same time, they both greatly differ for a number of personal characteristics that are strongly correlated with job satisfaction. Thus, to ascertain the "net" effect of sector affiliation on satisfaction, we need to control for the (observable and unobservable) differences in individual attributes that may simultaneously affect satisfaction besides the sector of employment. To this purpose, the next sections illustrate the model(s) used in the empirical analysis and presents the econometric results.

11

4. Empirical analysis

This section is divided into three parts. We first describe the main features of the base model used to study the impact of personal attributes on job satisfaction; next, we present a first set of estimates. Finally, we present and estimate a model that relaxes some of the restrictions imposed by the baseline specification.

4.1. The base specification: a public sector dummy model

A linear specification of (4) for job satisfaction may take the following form:

$$S_i* = Z_i'\theta + \gamma w_i + \lambda h_i + J_i'\psi + \delta E_i + \varepsilon_i \qquad (5)$$

where $S*$ is the latent random utility indicator which depends on a number of observable and unobservable factors related to individual and family attributes, work-related characteristics and an error term. The vector Z contains educational dummies, age and its square, regional dummies, the marital status, a dummy for being head of the household, the dummy for good health and the gender dummy; the vector J includes a set of occupational dummies, as well as controls for part time work, seniority, overtime hours, past unemployment, search activity; employer's characteristics are condensed into a sector dummy (D) taking value one when the individual works in the public sector and zero if he/she is a private employee. We further assume that the error term follows a standard normal distribution. Thus, we can rewrite (5) as:

$$S_i* = X_i'\beta + \delta D_i + \varepsilon_i \qquad (6)$$

where $X = [Z, K]$ and $K = [w, h, J]$ being the vector of work-related characteristics -; $\beta = [\theta, \pi]$, $\pi = [\gamma, \lambda, \tau]$ vectors of unknown parameters (marginal utilities).

However, instead of the "true" utility level $S*$ we can observe the job satisfaction indicator S, which is a ordered variable taking values from 0 (lowest value) to 5 (highest value) and that relates to the original index $S*$ through the following rule:

$$S_i = t(S_i*) = j \quad \text{if} \quad \mu_j < S_i* \le \mu_{j+1}$$
$$j \in \{0,...,5\}, \quad \mu_j < \mu_{j+1} \; \forall j, \quad \mu_0 = -\infty, \quad \mu_6 = +\infty \qquad (7)$$

where $t(.)$ is an increasing monotonic transformation and the μ's are a set of cut-off parameters. Because of the ordinal nature of the observed job satisfaction variable and

the normality of unobserved heterogeneity, an ordered probit model can be used to estimate the parameters' vector $\Gamma = [\beta, \delta, \mu_1, ..., \mu_5]$ [8].

In our discussion, the key parameter is δ, which captures the marginal effect of public employment on the latent utility index. However, its interpretation in terms of the observed outcome is not straightforward: if δ is positive, we only know that moving from private to public employment increases the probability of the highest satisfaction level ($S = 5$) and decreases the probability of the lowest outcome ($S = 0$). What happens in the middle of the distribution depends on the value of the cut-off points.

Fortunately, estimation results can be used to compute a class of "marginal effects", for example the effect of D_i (public employment) on the (conditional) probability that $S_i = j$, that is, on the probability of ranking the perceived level of satisfaction as j. Since this measure is individual-specific, it is usually computed for a "stylised" individual with "mean" characteristics ("X bar"):

$$\Pr(S_i = j \mid \Gamma, \overline{X}_i, D_i = 1) - \Pr(S_i = j \mid \Gamma, \overline{X}_i, D_i = 0) =$$
$$= [\Phi(\mu_{j+1} - \overline{X}_i'\beta - \delta) - \Phi(\mu_j - \overline{X}_i'\beta - \delta)] - [\Phi(\mu_{j+1} - \overline{X}_i'\beta) - \Phi(\mu_j - \overline{X}_i'\beta)] \tag{8}$$

Using (8) it also possible to recover the so called Average Treatment effect (ATE), which measures the mean partial effect of the sector dummy on the value of the satisfaction indicator S [9].

Finally, since in our framework we are not able to control for the potential endogeneity of sector decisions, particular care should be used in the interpretation of results as structural [10].

---

[8] In this case, a generic contribution to the likelihood takes the following form:

$L_i = \prod_{j=0}^{5} [\Phi(\mu_{j+1} - X_i'\beta - \delta D_i) - \Phi(\mu_j - X_i'\beta - \delta D_i)]^{d_{ij}}$, $d_{ij} = I(R_i = j)$, where $\Phi(\,.\,)$ is the c.d.f. of the standard normal.

[9] The exact formula for the ATE is the following:

$ATE(\overline{X}) = E(S_i \mid \Gamma, \overline{X}_i, D_i = 1) - E(S_i \mid \Gamma, \overline{X}_i, D_i = 0) = \sum_{j=0}^{5} j * [\Pr(S_i = j \mid \Gamma, \overline{X}_i, D_i = 1) - \Pr(S_i = j \mid \Gamma, \overline{X}_i, D_i = 0)]$

It can be also shown that $ATE = \sum_{j=1}^{5} [\Phi(\mu_j - X_i'\beta) - \Phi(\mu_j - X_i'\beta - \delta)]$

[10] If, conditional on the X's, the assignment of workers to sectors is systematically related to satisfaction through unobservables, estimates of δ are inconsistent. Unfortunately, in our data there are no variables that could be used as instruments. As a consequence, we cannot use the strategy of modelling simultaneously the satisfaction equation and an instrumented selection equation for sector choices, as proposed by Cappellari et al. (2004) in the context of union/non union decisions. Moreover, the availability of a single cross-section prevents us to use fixed effects as in Heywood et al. (2002). However, we control for a large set covariates besides the sector of employment; this may reduce, but not eliminate, endogeneity problems (if any).

4.2. Main results

Columns (1) to (4) of Table 4 present ordered probit estimates of different specifications of equation (5). Besides the public sector dummy (*D*), the specification in column (1) includes only personal characteristics (*W*). Column (2) adds to this benchmark specification the monthly labour income (wage) and a series of work-related variables for the type of job, hours worked and past working history (a partition of *K*). Column (3) controls also for the type of occupation ("full" *K*) but not for the educational dummies. Finally, in column (4) all the controls are included.

[TABLE 4]

First column estimates show that the coefficient of the sector dummy is positive and significant. In other words, public employees have on average a higher propensity than comparable private employees to be highly satisfied for non-pecuniary aspects of their job. For what concerns other individual characteristics, the higher the education level, the higher is the perceived satisfaction level. This is unsurprising, as better educated workers have access to better job positions. The opposite is true for age, which, as found in many studies of job satisfaction, has a U-shaped relationship with age. This may be interpreted in terms of both intrinsic motivations and expectations: young workers are more satisfied because they are more enthusiastic and confident about the future, while for middle age employees, who are situated at the minimum of the convex age-satisfaction profile, past beliefs about career progression may be frustrated by the present and, maybe, also by expectations for the future. On the contrary, seniority has a positive effect on satisfaction: keeping constant the age, people with higher working experience tend to be more satisfied. Moreover, differently to age, this relationship has a linear shape[11]. Perhaps, longer seniority increases job satisfaction through higher job security expectations (Clark, 1997).

Coefficients for regional dummies show that, compared to the north west (which is the excluded category), workers are much more satisfied in the north east and, to some extent, in the islands. Since these dummies should capture both local labour market conditions and average quality of jobs in a given geographic area, our findings may be due to the fact that in the north east, where the distribution of jobs is similar to

---

[11] We also experiment with a second order polinomial in seniority, coefficients were poorly estimated.

the north west, the unemployment is lower. Overall, there is little evidence of a North-South divide in job satisfaction, which is instead a typical "stylised fact" in wage comparisons (De Paola et al., 2005)[12].

Living in an urban area increases satisfaction, maybe due to higher urban wages, as well as better quality of associated jobs. With respect to other individual and family variables, good health has a positive effect on job satisfaction, while the role of marital status and other dummies seem insignificant. Overall, excluding health, the degree of complementarity in job satisfaction between working and family spheres appears rather small[13]. In this case, our results are in line with previous literature (see Clark, 1997; Bauer, 2004).

In column (2) of Table 4 we augment the previous specification with a set of work-related variables, with the exception of the occupational dummies. The coefficient of the monthly wage is positive and significant, meaning that a higher labour income raises the overall satisfaction indicator over non pecuniary job attributes (dangerousness, interestingness, consideration by others and so on). There are two alternative explanations for that: first, job satisfaction for non money attributes strictly relates to pay satisfaction: second, wages compensate for unpleasant work attributes and acts as an insurance against unfavourable current and future working conditions. Not surprisingly, the inclusion of the wage reduces the impact of schooling dummies, which nevertheless retain their individual and joint significance.

Hours of work have a positive effect on satisfaction, but this may be driven by reverse causality: those who work more may also be the "intrinsically" more satisfied. Alternatively, when environmental and social conditions at the workplace are on average pleasant and of good quality, people can derive direct utility from hours of work. Part time workers has a considerable higher propensity to be more satisfied, while those who have searched for a new job are on average much less satisfied. This is consistent with the theoretical prediction that on the job searchers should be close to their reservation utility in their current job.

---

[12] For example, jobs in the north may be better paid and the probability of unemployment lower, but they may be more stressful and effort-extracting. In the south, wages are lower, but, due to high unemployment, expectations are probably lower and the working environment less stressful and less demanding. In addition, prices in the south are lower, so that, ceteris paribus, a given job with an associated wage may produce higher returns in terms of satisfaction in the south (Clark, 1996).
[13] We also experimented with a dummy for children in the family, which turned out to be insignificant.

Moreover, the past matters: former layoff workers and those who with unstable careers are on average less satisfied. However, having experienced long term unemployment in the past does not produce lower mean satisfaction in the current job: on the one hand, unemployment in the past may lower permanently expectations, so that it becomes relatively easier to be satisfied with any new job; on the other hand, the market may be able to relocate long term unemployed in jobs similar to those they had before becoming unemployed. When controls for wage differences (and, thus, for wage discrimination) are included, females report on average higher levels of satisfaction than males, but this probably reflect the positive selection in terms of "intrinsic" motivation of women at work.

When controls for work related variables are included, the coefficient of the public sector dummy increases. The explanation is not straightforward: perhaps, although the wage in the public sector is higher than in the private sector, pay gaps less than compensate qualitative differences between jobs in the two sectors.

In the third column we add occupational dummies and we exclude education variables. The effect of occupation on the probability to display high levels of satisfaction is positive and increases monotonically with the qualification level. Even controlling for wage differences, manager are much more satisfied than blue collars. This fact may be explained by prestige, career or power motivations for the former.

The introduction of controls for the occupation reduces the impact and the significance of the coefficient associated to the public sector dummy: in other words, in the previous set of estimates the public premium was disproportionately high because the government sector employs the highest proportion of skilled workers[14].

The last column of Table (4) reports estimates of the full model. The most striking result is that when we control for wage and occupation, with the partial exclusion of university graduates, the effect of education on satisfaction vanishes. In other words, education affects job satisfaction (for non pecuniary aspects) only through the productivity channel as a labour input (by wages), and by the mapping between high education and high level occupations; while *per se* education does not affects

---

[14] For similar reasons, coefficients of wages, working in a city and being female are now smaller: on average, females are less likely to be found in blue collar jobs and the percentage of managerial and high skill occupations in concentrated in urban areas.

significantly preferences and job-related utility, so that job satisfaction is wage-specific and job-specific and much less education-specific within a single job [15].

Thus, tastes for job amenities of individuals with similar occupations and receiving the same wage does not display a systematic relationship with their education level.

The coefficient of the public sector dummy is now smaller than before and borderline significant, maybe reflecting that in the public sector the percentage of university graduates (the only category still maintaining a statistical relationship with satisfaction) is above the average.

As previously discussed, ordered probit coefficients can only give qualitative information on the effect of covariates on observed satisfaction. An assessment of the quantitative impact of public employment on satisfaction judgements is presented in Table 5, which uses Table 4 -column (4) results, to compute marginal effects of public employment on satisfaction probabilities, that is, the shift in the predicted probability of any satisfaction level induced by public employment, both at different points of the satisfaction distribution and for the whole distribution.

[TABLE 5]

Overall, the positive effect of working in the public sector on the propensity to be highly satisfied is rather limited. If we sum the marginal effects for the two highest satisfaction ranks (4 and 5) we can conclude that the public/private differential in terms of the probability to be highly satisfied (S larger or equal to 4) is 3.5 percent. If we look at the size of the "premium", the mean value of job satisfaction for public employees is 0.11 higher than for private employees.

One limitation of the approach adopted so far is that the public employment acts as a simple satisfaction "intercept shifter", leaving returns to personal characteristics unaffected. Since the two sectors differ in many dimension of the employment relationship, in the remainder of this section we investigate the relationship between public employment and job satisfaction fitting separate satisfaction equations for the two sectors, and, therefore, allowing marginal utilities from individual characteristics to vary across sectors.

---

[15] As reported in Table 4, the null of joint insignificance of the education dummies cannot be reject using a likelihood ratio test (associated probability of 0.457).

Back to Table 4, this strategy is also supported by a likelihood ratio test for different slopes between the two sub groups of individuals (public *vs* private employees)[16]. The null of a single equation is rejected at the 1 percent confidence level.

4.3. An extension: "switching regimes" in job satisfaction across sectors

In terms of the latent utility framework, the extended model may be specified as follows:

$$S_i* = \begin{cases} S*(X_i, D_i = 1, \varepsilon_i) \equiv S_{iG}* = X_i'\beta_G + \varepsilon_i & \text{if} \quad D_i = 1 \\ S*(X_i, D_i = 0, \varepsilon_i) \equiv S_{iP}* = X_i'\beta_P + \varepsilon_i & \text{if} \quad D_i = 0 \end{cases} \tag{9}$$

where β_G captures the relationship between observed attributes and the latent satisfaction propensity of public employee (where G stands for government), and similarly β_P for private employees. Again, only a discrete ordered realisation of S_i* can be observed, but now the set of latent thresholds shifts according to the realisation of the public sector dummy. Now, the ordered probit model is fitted separately on the two sub samples[17].

As before, we assume that, conditional on the vector of observable characteristics, the switching across sectors is uncorrelated with the unobservable propensity to display satisfaction. Concerning marginal effects, i. e. shifts in predicted satisfaction probabilities induced by the movement across sectors, and average treatment effects, their computation closely parallel that for the baseline sector dummy model in the previous subsection[18].

Results from the estimation of separate ordered probit equations over the subsamples of public and private employees are illustrated in Table 6. To save space,

---

[16] The restricted model is the one in column (4), while the unrestricted contains the full set of interactions between the dummy for public sector and the covariates.

[17] The observational rule linking S, D and $S*$ is now the following:

$$S_i = \begin{cases} S_{iG} = t(S_{iG}*) = j & \text{if} \quad \mu_{Gj} < S_{iG}* \leq \mu_{Gj+1} \quad \text{and} \quad D_i = 1 \\ S_{iP} = t(S_{iP}*) = j & \text{if} \quad \mu_{Pj} < S_{iP}* \leq \mu_{Pj+1} \quad \text{and} \quad D_i = 0 \end{cases}$$

$j \in \{0,...,5\}$, $\mu_{aj} < \mu_{aj+1} \; \forall j$, $\mu_{a0} = -\infty$, $\mu_{a6} = +\infty$ and $a \in \{G, P\}$

[18] For example, the marginal effects take now the following form:

$$\Pr(S_i = j \mid \Gamma_G, \overline{X_i}, D_i = 1) - \Pr(S_i = j \mid \Gamma_P, \overline{X_i}, D_i = 0) = \Pr(S_{Gi} = j \mid \Gamma_G, \overline{X_{iG}}) - \Pr(S_{Pi} = j \mid \Gamma_P, \overline{X_{iP}}) =$$

$$= [\Phi(\mu_{Gj+1} - \overline{X_{iG}}'\beta_G) - \Phi(\mu_{Gj} - \overline{X_{iG}}'\beta_G)] - [\Phi(\mu_{Pj+1} - \overline{X_{iP}}'\beta_P) - \Phi(\mu_{Pj} - \overline{X_{iP}}'\beta_P)]$$

where the Γ's are vectors containing the β's and the cut-off points from the separate estimates on the two sub samples.

we report results only for the two specifications with and without the occupational dummies.

A first general comment is that factors affecting job satisfaction depend to the sector considered: while controls for location and health play a positive role in both sectors, individual characteristics such as education, age and experience tend to be statistically associated with job satisfaction especially in the public sector, while job attributes tend to exert a higher effect in the private sector.

[TABLE 6]

By concentrating on column (2), the main determinants of job satisfaction in the private sector are the characteristics of the job performed, especially the type of occupation: highly qualified employees display a significantly higher propensity to express high satisfaction. In the context of the underlying factors driving our satisfaction indicator, they thus benefit from better environmental conditions, more consideration by others, perform more attractive tasks, for them the working does not prove to be very demanding (but maybe their effort disutility is lower), have low concern to loose employment.

In addition, their satisfaction is quite independent of the wage they earn. However, coefficients associated with the occupational dummies may not capture genuine causal effects as individuals in high occupations may be selected, for example on the basis of (unobservable) effort disutility and career concern, and may thus display less dissatisfaction than the average. Private workers are significantly less satisfied when married and divorced (as compared to singles). In this case, the channels through which it is possible to achieve high levels of job satisfaction in the private sector may stand in contrast with the familiar sphere.

Moreover, within private employees, expressed utility levels does not seem to be significantly related to any individual characteristic, as if only job attributes matters for satisfaction with the job.

In the public sector, the situation is reversed: workers do not appear to be concerned to their actual occupation, and evaluate their well-being attaching more value to their set of individual characteristics – especially age and education. Family-related variables are not associated with job satisfaction, while both the wage and working under part time contracts positively affect satisfaction for non pecuniary job attributes.

19

By contrast, the type of job is only occasionally important as a determinant of overall satisfaction. This is probably the consequence that careers and, therefore, expectations for the future, are in the public sector quite flat as compared to the private sector. In addition, the personal "identification" with the job and the attachment to a specific job may be lower in the public sector.

One advantage of the "switching regime" specification is that, similarly to Oaxaca-type decompositions for linear models, parameter estimates can be used to decompose the public/private satisfaction differential into a part due to differences in personal characteristics holding fixed coefficients (the "endowment" effect) and a part due to differences in coefficients keeping constant the characteristics (the "remuneration" effect), everything evaluated at mean characteristics. For $S = j$ the decomposition is as follows[19]:

$$\Pr(S_{Gi} = j \mid \Gamma_G, \overline{X_{iG}}) - \Pr(S_{Pi} = j \mid \Gamma_P, \overline{X_{iP}}) =$$
$$= \{\Pr(S_{Gi} = j \mid \Gamma_G, \overline{X_{iG}}) - \Pr(S_{Pi} = j \mid \Gamma_P, \overline{X_{iG}})\} + \{\Pr(S_{Gi} = j \mid \Gamma_P, \overline{X_{iG}}) - \Pr(S_{Pi} = j \mid \Gamma_P, \overline{X_{iP}})\} \qquad (10)$$

where probabilities are estimated using ordered probit coefficients from the regressions fitted on the two sub samples. The first term in (11) is the mean difference between public and private employees in predicted satisfaction probability for the j-th satisfaction level. The first term in the second row is the difference in predicted probability for an average public employee when assigned to the private sector. This is the term capturing shifts in parameters evaluated at public characteristics ("remuneration" effect). The second term in the second row is the difference in mean endowments of personal characteristics between public and private employees, weighted by the coefficient vector for the private sector (the "endowment" effect).

Using the decomposition of satisfaction probabilities at any rank of the satisfaction indicator, it also possible to decompose the Average Treatment Effect.

Decomposition results are presented in Table 7. To compute the predicted probabilities we have used the coefficients estimated from the Model (2) in Table 6. The first column contains the overall difference in satisfaction probabilities for any given value that satisfaction can take (from zero to 5), as well as an estimate of the corresponding Average Treatment Effect.

As compared to results of Table 5, relaxing the assumption of equal slopes across sectors raises the effect of public employment on predicted probabilities of high satisfaction outcomes. For example, the shift in probability of rank 5 induced by sector reallocation goes from the 1.9 percent of the previous analysis to the 5 percent here, and similarly for rank 4. Thus, imposing the restriction of equal coefficients for observable characteristics across sectors leads to underestimate the marginal effect of public employment on job satisfaction. This is also evident from the estimate of the ATE, which raises from 0.11 of Table 5 to 0.4 of Table 7.

Overall, it seems that differences in parameters account for the largest part of the overall variability across sectors, and this is true for all the values along the distribution of the satisfaction index. According to this evidence, differences in the value of jobs across sectors does not depend to the "quality" of workers, but (more) to the utility that similar workers derive from their personal characteristics in the two sectors. In the end, the positive satisfaction differential for public workers is based less on the ability of the government sector to select "better" and "more motivated" workers, and more on the non-monetary characteristics included in the job package available to public employees.

5. Concluding remarks

In the literature, the comparison of public and private jobs is typically done looking at the wage differential differences between the two sectors. In this paper we have taken an alternative but complementary route, estimating the public premium in terms of workers' satisfaction for qualitative job attributes. We motivate our approach by arguing that also differences in non-pecuniary aspects of the employment relationship should enter the computation of the return to a public job as they exert a direct - that is, not mediated by wages - influence on individuals well-being, especially because wages settled at the central level cannot compensate for non-pecuniary job amenities.

Information on job satisfaction and on other personal characteristics comes from the 1995 Survey of Household Income and Wealth for Italy. Main results indicates that, controlling for a large number of individual and job characteristics, public employees are on average more satisfied than comparable workers in the private sector. However,

---

[19] Its functional form is: $\{[\Phi(\mu_{Gj+1} - \overline{X}'_{iG}\beta_G) - \Phi(\mu_{Gj} - \overline{X}'_{iG}\beta_G)] - [\Phi(\mu_{Pj+1} - \overline{X}'_{iG}\beta_P) - \Phi(\mu_{Pj} - \overline{X}'_{iG}\beta_P)]\} +$

$+ \{[\Phi(\mu_{Pj+1} - \overline{X}'_{iG}\beta_P) - \Phi(\mu_{Pj} - \overline{X}'_{iG}\beta_P)] - [\Phi(\mu_{Pj+1} - \overline{X}'_{iP}\beta_P) - \Phi(\mu_{Pj} - \overline{X}'_{iP}\beta_P)]\}$

the size of the premium is rather small: depending on the specification, public employment raises the probability to report high levels of job satisfaction (either 4 or 5 from an ordered satisfaction indicator ranging from 0 to 5) by a value between 3.5 and 10%, depending on the specification. Moreover, two thirds of the gap can be explained by more favorable working conditions in the public sector, while only one third is due to better individual characteristics of public employees.

These features may have important implications for the functioning and the efficiency of the public sector. On the one hand, "better" quality jobs in the government sector may not contribute to raise productivity levels of risk averse workers that dislike effort, also creating perverse effects on recruitment and retaining policies. On the other hand, a more favorable health, cultural and environmental climate in the public sector may stimulate high levels of trust and social cohesion, which may stimulate effort even when money incentives are lacking. Since the two forces work in opposite direction, their final effect on productivity levels and the quality of the services produced by the public sector is however uncertain.

To shed further light over these issues it would be interesting to ascertain "who" are the public employees. For example, Heywood et al. (2002) argue that public employees are positively selected, as they would be "intrinsically" more satisfied in both sectors. This calls into question the endogeneity of sorting into the public sector, which is an important issue left for future research.

References

Bardasi E. (1996) "I differenziali salariali tra pubblico e privato: un'analisi microeconometrica", *Lavoro e Relazioni Industriali*, 3: 3-51.

Bauer T.K. (2004) "High Performance Work Practices and Job Satisfaction: Evidence from Europe", *IZA discussion paper*, 1265.

Bender K.A. and Sloane P.J. (1998) "Job Satisfaction, Trade Unions, and Exit-Voice Revisited", *Industrial and Labor Relations Review*, 51(2): 222-40.

Borjas G.J. (1979) "Job Satisfaction, Wages and Unions", *Journal of Human Resources*, 14(1): 21-40.

Bryson A., Cappellari L. and Lucifora C. (2004) "Does Union Membership Really Reduce Job Satisfaction?", *British Journal of Industrial Relations*, 42(3): 439-59.

Brunello G. and Dustmann C. (1996) "Wage Differentials in the Private and Public Sector. A Comparison Between Germany and Italy", in *Comparisons des Salaires International*, INSEE, Paris, July.

Cappellari L., Lucifora C. and Piccirilli G. (2004) "Union Activism, Workers' Satisfaction and Organisational Change", *Labour*, 18(1): 1-28.

Clark A. (1996) "Job Satisfaction in Britain", *British Journal of Industrial Relations*, 34(2): 189-217.

Clark A. (1997) "Job Satisfaction and Gender: Why are Women so Happy at Work?", *Labour Economics*, 4(4): 341-72.

Clark A. and Oswald A. (1996) "Satisfaction and Comparison Income", *Journal of Public Economics*, 61(3): 359-81.

Clark A. and Postel-Vinay F. (2004) " Job Security and Job Protection", *CEPR Discussion Paper*, 4927.

Comi S. and Ghinetti P. (2002) "La distribuzione dei salari in Italia: un confronto tra pubblico e privato", *Rivista Internazionale di Scienze Sociali*, 110:165-185.

De Paola M., Lupi C. and Ordine P. (2005) "Wage expectations in northern and southern Italian regions: An interpretation based on psychological and social factors", *International Review of Applied Economics*, 19(3): 343-358.

Freeman R. (1978) "Job Satisfaction as an Economic Variable", *American Economic Review*, 68(2): 135-41.

Gordon M. E. and Denisi A. S. (1995) "A re-examination of the relationship between union membership and job satisfaction", *Industrial and Labour Relations Review*, 48: 222-236.

Hammermesh D.S. (1977) "Economic Aspects of Job Satisfaction", in O. Ashenfelter and W.E. Oates (Eds.) *Essays in Labour Market Analysis*, New York: John Wiley.

Heywood J.S., Siebert W.S. and Wei X. (2002) "Worker Sorting and Job Satisfaction: The Case of Union and Government Jobs", *Industrial and Labor Relations Review*, 55(4): 595-609.

Katz L. and Krueger A. (1991) "Changes in the Structure of Wages in the Public and Private Sectors", *Research in Labor Economics*, 12: 137-172.

Levy-Garboua L. and Montmarquette C. (2004) "Reported Job Satisfaction. What does it Mean?", *Journal of Socio-Economics*, 33(2): 135-151.

Lucifora C. and Meurs D. (2006) "The Public Sector Pay Gap in France, Great Britain and Italy", *Review of Income and Wealth*, 51(1): 43-59.

Rosen S. (1986) "The Theory of Equalizing Differences", in O. Ashenfelter and R. Layard (Eds.), *Handbook of Labor Economics*, New York: North-Holland.

Sloane P.J. and Williams H. (1996) "Are overpaid workers really unhappy? A test of the theory of cognitive dissonance", *Labour*, 10: 3-15.

Table 1 - Variables' Definition

Variables	Description
Job satisfaction	Ordinal satisfaction indicator from 0 (low satisfaction) to 5 (high satisfaction)
Public	Dummy for employment in the public sector
Primary	Dummy for no or primary school degree (5 years of education or less)
Low secondary	Dummy for junior secondary school degree (8 years of education)
Profess secondary	Dummy for professional secondary school degree (11 years of education)
High school	Dummy for high scool degree (13 years of education)
University	Dummy for university degree (16 years of education or more)
Age	Age of the individual (in years)
Seniority	Years of experience in the labour market
Female	Dummy for females
North-west	Dummy for living in the north-west regions of Italy
North-east	Dummy for living in the north-esat regions of Italy
Centre	Dummy for living in the central regions of Italy
South	Dummy for living in the southern regions of Italy
Islands	Dummy for living in the main islands of Italy (Sicily and Sardinia)
City	Dummy for living in an urban area (500,000 citizens or more)
Wage	Monthly labour income (milions liras, 1995 nominal values)
Hours	Number of average hours worked a week
Good health	Dummy for being in very good or good health
Head	dummy for being a household head
Single	dummy for being a single
Married	dummy for being married
Divorced or widowed	dummy for being divorced of widow
Partime	dummy for part-time work
Change	dummy for having searched for a new job during the year
Past unemployment	dummy for having experienced past unemployed (more than 6 months)
Past layoff	dummy for having experienced periods of layoff in the past
Overtime	dummy for overtime work during the year
Instability	dummy for having changed more than 3 jobs during the life
Blue collar	dummy for blue collar occupation
White collar low	Dummy for office workers and teachers
White collar high	dummy for junior managers/cadre
Manager	dummy for managers, senior officials, headmasters, university professors, etc.

Table 2 – Summary statistics: means and standard deviations

Variables	Whole sample Means & St. Dev.	Only public sector Means & St. Dev.	Only private sector Means & St. Dev.	t-test
	(1)	(2)	(3)	
Job satisfaction	2.931	3.165	2.781	
	(1.394)	(1.301)	(1.431)	
Public	0.392			
Primary	0.120	0.059	0.159	
Low secondary	0.310	0.208	0.377	
Profess secondary	0.068	0.054	0.077	
High school	0.375	0.436	0.335	
University	0.127	0.243	0.052	
Age	38.957	41.476	37.331	
	(9.817)	(8.417)	(10.303)	
Seniority	19.637	20.352	19.175	
	(10.708)	(9.609)	(11.341)	
Female	0.386	0.489	0.319	
North west	0.260	0.226	0.283	
North east	0.235	0.191	0.264	
Centre	0.218	0.218	0.218	
South	0.201	0.244	0.174	
Islands	0.085	0.121	0.062	
City	0.101	0.099	0.102	
Good health	0.870	0.883	0.862	
Head	0.542	0.563	0.528	
Single	0.233	0.141	0.291	
Married	0.717	0.799	0.665	
Divorced or widowed	0.050	0.060	0.044	
Wage	2.088	2.201	2.015	
	(0.976)	(0.784)	(1.076)	
Hours	38.261	34.621	40.610	
	(8.666)	(8.399)	(8.001)	
Partime	0.051	0.015	0.074	
Change	0.110	0.028	0.163	
Past unemployment	0.120	0.095	0.137	
Past layoff	0.031	0.017	0.039	
Overtime	0.947	0.923	0.962	
Instability	0.270	0.210	0.310	
Blue collar	0.428	0.164	0.599	
White collar low	0.458	0.695	0.304	
White collar high	0.084	0.100	0.073	
Manager	0.029	0.040	0.022	
Observations	*2,504*	*983*	*1,521*	

Notes: Standard deviation of non dichotomous variables in parenthesis.

Table 3 – The distribution of satisfaction by employees characteristics (per cent)

Rank	0	1	2	3	4	5	N. obs.
Whole sample	*4.98*	*12*	*20.21*	*25.15*	*23*	*14.67*	*2,504*
Private employee	6.75	13.77	21.05	24.26	21.38	12.79	1,520
Public employee	2.24	9.25	18.9	26.52	25.51	17.58	984
Primary school	7.31	18.27	26.91	23.26	15.61	8.64	301
Low secondary	6.43	15.17	21.85	24.16	22.62	9.77	777
Profess second	4.65	12.79	15.12	30.23	27.33	9.88	171
High school	4.57	8.83	18.19	25.96	25	17.45	938
University	0.63	7.23	18.55	24.21	22.64	26.73	317
Male	5.52	13.43	20.77	24.66	21.67	13.95	1,537
Female	4.13	9.71	19.32	25.93	25.1	15.81	967
North west	6.43	12.25	19.75	24.96	22.51	14.09	650
North east	3.38	9.46	18.41	27.2	23.65	17.91	591
Centre	4.76	13.92	21.06	23.81	23.26	13.19	546
South	5.94	12.48	22.77	26.14	20.4	12.28	503
Islands	3.29	12.21	18.31	21.13	28.17	16.9	214
Not city	5.19	11.92	20.48	25.58	22.87	13.96	2,253
City	3.16	12.65	17.79	21.34	24.11	20.95	251
Not in good health	6.44	19.63	26.99	18.1	18.1	10.74	326
Good health	4.76	10.86	19.19	26.2	23.73	15.25	2,178
Single	4.1	11.62	21.88	26.15	22.91	13.33	580
Married	5.23	12.12	19.3	25.14	22.97	15.24	1,798
Divorced or widowed	5.56	11.9	25.4	20.63	23.81	12.7	126
Not partime	4.96	12.14	20.29	25.16	23.14	14.32	2,376
Partime	5.47	9.38	18.75	25	20.31	21.09	128
Not want to change	4.48	11.46	19.75	25.57	23.42	15.32	2,230
Want to change job	9.06	16.3	23.91	21.74	19.57	9.42	274
No past unemploym	4.53	11.6	19.17	25.83	23.7	15.18	2,203
Past unemployment	8.28	14.9	27.81	20.2	17.88	10.93	301
No past layoff	4.56	11.72	20.19	25.29	23.4	14.84	2,427
Past layoff	18.18	20.78	20.78	20.78	10.39	9.09	77
No overtime	5.93	8.89	23.7	30.37	20.74	10.37	135
Overtime	4.93	12.17	20.01	24.85	23.13	14.91	2,369
No career instability	4.48	11.41	19.66	25.12	23.76	15.57	1,827
Instability	6.34	13.57	21.68	25.22	20.94	12.24	677
Blue collar	8.65	17.77	23.72	23.53	19.07	7.26	1,073
White collar low	2.62	7.41	19.01	27.81	25.02	18.13	1,147
White collar high	0.95	9.95	11.37	21.33	32.70	23.70	211
Manager	-	5.48	13.7	17.81	20.55	42.47	72

27

Table 4 – The determinants of job satisfaction: ordered probit

Dep. Var.: satisfaction	Model 1: (1) Coef.	z	Model 2: (2) Coef.	z	Model 3: (3) Coef.	z	Model 4: (4) Coef.	z
Public sector	0.152***	3.22	0.191***	3.67	0.099*	1.86	0.090*	1.68
Low secondary	0.226***	3.09	0.175**	2.32			0.086	1.13
Profess secondary	0.354***	3.57	0.273***	2.66			0.076	0.72
High school	0.520***	6.62	0.410***	4.71			0.082	0.86
University	0.727***	7.22	0.570***	4.91			0.204*	1.67
Age	-0.052***	-2.59	-0.058***	-2.84	-0.059***	-2.91	-0.064***	-3.13
Age2	0.001***	2.85	0.001***	2.82	0.001***	2.77	0.001***	2.92
Seniority	0.012**	2.26	0.014**	2.49	0.013***	2.59	0.016***	2.87
Female	0.087	1.55	0.126**	2.09	0.083	1.39	0.086	1.44
North east	0.228***	3.68	0.239***	3.84	0.258***	4.19	0.255***	4.12
Centre	0.012	0.19	0.031	0.5	0.042	0.68	0.042	0.66
South	-0.016	-0.25	0.016	0.25	0.027	0.4	0.030	0.46
Islands	0.154*	1.85	0.183**	2.17	0.195**	2.29	0.196**	2.3
City	0.164**	2.16	0.151**	2	0.122*	1.62	0.116	1.54
Good health	0.309***	4.76	0.271***	4.14	0.253***	3.85	0.251***	3.84
Head	-0.047	-0.79	-0.050	-0.81	-0.065	-1.06	-0.062	-1
Married	-0.039	-0.58	-0.089	-1.34	-0.099	-1.48	-0.096	-1.44
Divorced or widowed	-0.111	-0.95	-0.143	-1.21	-0.133	-1.11	-0.129	-1.08
Wage			0.150***	3.69	0.103***	2.65	0.095**	2.44
Hours			0.005*	1.75	0.002	0.69	0.003	0.97
Partime			0.448***	3.71	0.345***	2.8	0.360***	2.9
Change			-0.239***	-3.23	-0.213***	-2.92	-0.217***	-2.97
Past unemployment			-0.038	-0.53	-0.013	-0.18	-0.014	-0.2
Past layoff			-0.486***	-3.51	-0.479***	-3.52	-0.473***	-3.44
Overtime			0.193**	2.21	0.193**	2.2	0.192**	2.18
Instability			-0.097*	-1.84	-0.097	-1.86	-0.100*	-1.91
White collar low					0.469***	8.64	0.451***	7.25
White collar high					0.667***	7.13	0.639***	6.44
manager					0.818***	4.69	0.748***	4.14

Test 1: joint excludability of the education dummies from the model (df =)				$\chi^2 = 54.05$ $P>\chi^2 = 0.0004$
(§) Test 2: equality of slopes across the subsamples of public and private employees except for the intercept (df = 24)				$\chi^2 = 54.05$ $P>\chi^2 = 0.0004$

Log likelihood	-4,137.19	-4,094.703	-4,065.7	-4,063.8
Wald chi2(29)	193.82	259.38	327.56	331.62
Prob > chi2	0.000	0.000	0.000	0.000
Number of obs	2,504	2,504	2,504	2,504

Notes: all regressions include five cutoff points. *: significant at 10% level. **: significant at 5% level. ***: significant at 1% level. Excluded categories: primary school, north west, single, blue collar. §: the test is constructed estimateing an unrestricted model that contains the original set of regressors and the full set of interactions between them and the the public dummy, and imposing the restriction that the vector of coefficients for interacted variables is equal to zero.

Table 5 – Marginal effects of public employment on satisfaction probabilities and mean satisfaction

Differences in predicted probabilities induced by the public sector dummy	Value
Prob(S = 0|D = 1) - Prob(S = 0|D = 0)	-0.007
Prob(S = 1|D = 1) - Prob(S = 1|D = 0)	-0.014
Prob(S = 2|D = 1) - Prob(S = 2|D = 0)	-0.013
Prob(S = 3|D = 1)- Prob(S = 3|D = 0)	-0.0002
Prob(S = 4|D = 1)- Prob(S = 4|D = 0)	0.015
Prob(S = 5|D = 1)- Prob(S = 5|D = 0)	0.019
ATE (Average Treatment Effect)	0.116

Table 6 – Determinants of job satisfaction: separate ordered probit for the two sectors

Dependent variable: satisfaction	Model 1: (1)				Model 2: (2)			
	Public employees		Private employees		Public employees		Private employees	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z
Low secondary	0.286*	1.89	0.117	1.35	0.253*	1.64	0.019	0.21
Profess secondary	0.271	1.45	0.252**	2.04	0.188	0.93	0.036	0.28
High school	0.464***	2.97	0.335***	3.08	0.363**	2.05	-0.112	-0.95
University	0.539***	2.99	0.652***	3.69	0.421**	2.1	0.068	0.37
Age	-0.149***	-3.64	-0.017	-0.69	-0.152***	-3.67	-0.024	-1.01
Age2	0.002***	3.61	0.000	0.6	0.002***	3.62	0.000	0.65
Seniority	0.024***	2.85	0.010	1.26	0.025***	2.98	0.013	1.58
Female	0.087	0.79	0.125*	1.69	0.096	0.87	0.040	0.54
North east	0.219**	2.09	0.289***	3.7	0.228**	2.18	0.308***	3.93
Centre	-0.011	-0.11	0.069	0.85	-0.013	-0.13	0.093	1.14
South	0.080	0.79	-0.034	-0.39	0.077	0.76	-0.004	-0.05
Islands	0.200*	1.71	0.210*	1.66	0.214*	1.8	0.224*	1.8
City	0.112	0.93	0.185*	1.91	0.113	0.94	0.098	1.01
Good health	0.292***	2.66	0.266***	3.19	0.288***	2.63	0.241**	2.89
Head	-0.230**	-2	0.057	0.74	-0.223*	-1.94	0.042	0.54
Married	0.042	0.39	-0.176**	-2.02	0.039	0.36	-0.175**	-2.02
Divorced or widowed	0.224	1.28	-0.366**	-2.28	0.213	1.23	-0.354**	-2.19
Wage	0.179***	3.11	0.132***	2.66	0.157***	2.62	0.054	1.25
Hours	-0.003	-0.53	0.012***	2.89	-0.005	-0.97	0.010**	2.34
Partime	0.857***	2.94	0.529***	3.78	0.810***	2.7	0.442***	3.1
Change	-0.021	-0.09	-0.287***	-3.74	-0.017	-0.07	-0.252***	-3.31
Past unemployment	0.075	0.61	-0.088	-1	0.081	0.66	-0.066	-0.76
Past layoff	-0.540	-1.47	-0.474***	-3.2	-0.559	-1.52	-0.442***	-3.05
Overtime	0.226*	1.94	0.164	1.17	0.234**	1.99	0.151	1.11
Instability	-0.274***	-2.89	-0.031	-0.48	-0.274***	-2.88	-0.043	-0.68
White collar low					0.106	0.98	0.602***	7.82
White collar high					0.314**	1.97	0.819***	6.23
Manager					0.242	0.91	1.222***	4.87
Log likelihood	-1,544.84		-2,524.49		-1,542.77		-2,488.96	
Wald chi2	112.23		156.82		119.63		238.98	
Model p-value	0.000		0.000		0.000		0.000	
Number of obs	983		1,521		983		1,521	

Notes: all regressions include five cutoff points. *: significant at 10% level. **: significant at 5% level. ***: significant at 1% level. Excluded categories: primary school, north west, single, blue collar.

Table 7 – Decomposition of the public employment marginal effects on satisfaction probabilities and mean satisfaction

Differences in predicted probabilities induced by the public sector dummy	Overall differences	Due to paramenters	Due to characteristics
Prob($S = 0\|D = 1$) - Prob($S = 0\|D = 0$)	-0.038	-0.029	-0.009
Prob($S = 1\|D = 1$) - Prob($S = 1\|D = 0$)	-0.051	-0.038	-0.013
Prob($S = 2\|D = 1$) - Prob($S = 2\|D = 0$)	-0.033	-0.022	-0.010
Prob($S = 3\|D = 1$)- Prob($S = 3\|D = 0$)	0.025	0.024	0.001
Prob($S = 4\|D = 1$)- Prob($S = 4\|D = 0$)	0.048	0.033	0.014
Prob($S = 5\|D = 1$)- Prob($S = 5\|D = 0$)	0.049	0.032	0.017
ATE (Average Treatment Effect)	0.395	0.284	0.112

Quaderni dell'Istituto di Economia dell'Impresa e del Lavoro

1. Solimene L., *Market Failures and State Intervention*
2. Solimene L., *The Efficiency under Private and Public Ownership: Some Empirical Evidence*
3. Baici E., Dell'Aringa C., *The EMS Effect on the Italian Labour Market*
4. Lucifora C., *Union Density and Relative Wages: Is there a Relationship?*
5. Lucifora C., Sestito P., *Determinazione del salario in Italia: una rassegna della letteratura empirica*
6. Martini G., *Testing Different Bargaining Theories: A Pilot Experiment*
7. Lucifora C., Rappelli F., *Profili retributivi e carriere:un'analisi su dati longitudinali*
8. Dell'Aringa C., Lucifora C., *Wage Dispersion and Unionism: Are Unions Egalitarian?*
9. Martini G., *Horizontal Price Fixing and Antitrust Policy: A Sequentially Rational Design*
10. Cassuti G., Dell'Aringa C., Lucifora C., *Labour Turnover and Unionism*
11. Solimene L., *Regolamentazione ed incentivi all'innovazione nel settore delle telecomunicazioni*
12. Bigard A., Guillotin Y., Lucifora C. e F. Rappelli, *An International Comparison of Earnings Mobility: The Case of Italy and France*
13. Martini G., *Laboratory Tests of a Kinked Demand Curve Model with Discounting and Game-theoretic Foundations*
14. Martini G., *A Multi-period Antitrust Game: The Dynamic Effects of Competition Policy*
15. Piccirilli G., *Monetary Business Cycles with Imperfect Competition and Endogenous Growth*
16. Dell'Aringa C., *Pay Determination in the Public Service: An International Comparison*
17. Lucifora C., *Rules Versus Bargaining: Pay Determination in the Italian Public Sector*
18. Piccirilli G., *Hours and Employment in a Stochastic Model of the Firm*
19. Cappellari L., *The Covariance Structure of Italian Male Wages, 1974 – 1988*
20. Lucifora C., *Working Poors? An Analysis of Low Wage Employment in Italy*
21. Lucifora C., Origo F., *Alla ricerca della flessibilità: un'analisi della curva dei salari in Italia*
22. Dell'Aringa C., Vignocchi C., *Employment and Wage Determination for Municipal Workers: The Italian Case*
23. Cappellari L., *Wage Inequality Dynamics in the Italian Labour Market: Permanent Changes or Transitory Fluctuations?*
24. Cappellari L., *Low-pay transitions and attrition bias in Italy: a simulated maximum likelihood approach*
25. Pontarollo E., Vitali F., *La gestione del parco tecnologico elettromedicale tra outsourcing e integrazione verticale*
26. Cappellari L., *Do the 'Working Poors' Stay Poor? An Analysis of Low-Pay Dynamics in Italy*
27. Dell'Aringa C., Lucifora C., *Inside the black box: labour market institutions, wage formation and unemployment in Italy*
28. Filippini L., Martini G., *Vertical Differentiation and Innovation Adoption*
29. Lucifora C., Simmons R., *Superstar Effects in Italian Football: an Empirical Analysis*
30. Brunello G., Lucifora C., Winter-Ebmer R., *The Wage Expectations of European College Students*

31. Cappellari L., *Earnings dynamic and uncertainty in Italy: How do they differ between the private and public sectors?*

32. Piccirilli G., *Unions and Workforce Adjustment Costs*

33. Dell'Aringa C., *The Italian Labour Market: Problems and Prospects*

34. Bryson A., Cappellari L., Lucifora C., *Does Union Membership Really Reduce Job Satisfaction?*

35. Cappellari L., *The effects of high school choices on academic performance and early labour market outcomes*

36. Cappellari L., Jenkins S. P., *Transitions between unemployment and low pay*

37. Dell'Aringa C., Pagani L., *Collective Bargaining and Wage Dispersion*

38. Comi S., *University enrolment, family income and gender in Italy*

39. Ghinetti P., *The Wage Effect of Working in the Public Sector When Education and Sector Choices Are Endogenous: An Empirical Investigation for Italy*

40. Piccirilli G., *Unions, Job Protection and Employment*

41. Bryson A., Cappellari L., Lucifora C., *Why so unhappy? The effects of unionisation on job satisfaction*

42. Brunello G., Cappellari L., *The Labour Market Effects of Alma Mater: Evidence from Italy*

43. Dell'Aringa C., Pagani L., *Regional Wage Differentials and Collective Bargaining in Italy*

44. Dell'Aringa C., *Industrial Relations and Macroeconomic Performance*

45. Prandini A., *Structural Separation or Integration in Italian Fixed Tlc: Regulatory and Competition Issues*

46. Ghinetti P., *The Public-Private Job Satisfaction Differential in Italy*