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The compensating differential principle in the public and private sector: A multivariate statistical analysis approach

El principio de diferenciales salariales compensatorios en el sector público y privado: Un análisis estadístico mulivariante

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Abstract

The theory of compensating wage differentials suggests that firms offering jobs with disagreeable attributes such as probability of injury, inflexible work schedules, high risk of unemployment, or offering jobs involving physical effort, repetitive and monotonous activities, or requiring many hours of training and education should pay higher wages to persuade workers to work under such conditions. Using multivariate statistical analysis applied to the information provided by the Health and Retirement Study (1992-2000), this paper aims to compare the working conditions offered in the private sector with those enjoyed in the public sector, as a way to determine whether the compensating differential principle applies. Results indicate that public sector workers are offered both higher wages and better working conditions, which contradicts the equalizing principle.

Key words: Compensating differential principle, working conditions, multivariate statistical analysis.

Resumen

La teoría de los diferenciales salariales compensatorios sugiere que las empresas que ofrecen condiciones de trabajo poco favorables, tales como riesgo de accidente, inflexibles horarios de trabajo, alto riesgo de desempleo; empleos que implican mucho esfuerzo físico, actividades repetitivas y monótonas o actividades que ameritan muchas horas de formación y entrenamiento, deberían pagar salarios relativamente más altos a fin de persuadir a los trabajadores a aceptar tales condiciones laborales. Utilizando análisis estadístico multivariante aplicado a la información proporcionada por la Health and Retirement Study (1992-2000), este estudio busca comparar las condiciones de trabajo ofrecidas en los sectores público y privado, a fin de determinar si el principio de diferenciales compensatorios aplica. Los resultados indican que los trabajadores del sector público reciben mejores salarios y mejores condiciones de trabajo, lo cual contradice el postulado del citado principio.

Palabras clave: Principio de diferenciales salariales compensatorios, condiciones laborales, análisis estadístico multivariante.

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1. Introduction

In the last three decades the general literature has emphasized the differences in wages and other kind of remunerations between the public and private sector in the United States, usually ignoring working conditions probably due to lack of information. The evidence indicates that public sector pays wages higher than those received by similar workers in the private sector. This pay advantage seems to widen once non-wage pecuniary compensation is added to the comparison, in an environment characterized by public sector workers enjoying better working conditions.

On the other hand, the equalizing compensation principle states that good job attributes should imply lower wages, and bad working conditions should imply higher wages. In the case of the public/private comparison, the effect of working conditions on wages has usually been ignored, and in those cases where they were considered the results do not support the theory of equalizing differentials.

Using data from the Health and Retirement Study (HRS) for the period 1992-2000, we apply multivariate statistical methods in order to compare some job attributes and wages between the public and the private sectors. The list of the attributes considered here does not intend to be exhaustive, and it is limited to schedule flexibility, stress, job stability, and some physical requirements of the job. Unfortunately, this data set does not include information regarding fatal and non fatal risk at work.

2. Background

Firms differ in the job attributes they offer. They will compare the costs of offering better working conditions with the wage savings these conditions imply, choosing the option that maximizes their profit. In the same way, workers differ in their skills as well as in their valuations of job attributes, such that they will select the job packages that maximize their utility.

The existence of differences in job attributes and their impact of compensations was first introduced by Adam Smith in 1776 in *The Wealth of Nations,* when he states what lies behind the compensating differential principle: workers "consume" the job attributes they are offered. In this way, firms offering agreeable working conditions must pay lower wages, as if workers were "buying" positive job amenities; firms offering disagreeable working conditions, such as risk of fatal or nonfatal injuries, inflexible work schedules, risk of unemployment, etc., must pay higher wages to persuade workers to work under such conditions.

To better understand the relationship between wages and job characteristics, Rosen (1986) assumes that homogeneous individuals are offered jobs that differ in the wage (w) and amenities (D). D can take any value between 0 and 1, with the extremes given by clean jobs (D=0) paying w_0, and dirty jobs (D=1) paying w_1. Preferences of workers are defined by the consumption of goods that the wage allows and the job amenities such that $U = u(w, D)$, where the marginal utility increases with the wage and decreases with job disamenities. For a given wage level, it is assumed that $u(w,0) \geq u(w,1)$. This utility function indicates how much income the worker must be compensated in order to accept less preferred jobs. If w^* is the wage level at which $u(w^*,1) = u(w_0,0)$, then the individual is indifferent between choosing $D=1$ jobs or $D=0$ jobs. This implies $w^* \geq w_0$, since $D=1$ means working under bad conditions. Therefore, the only way to persuade a worker to move to a less preferred job, keeping utility constant, is by offering him a higher wage. The distance $Z = w^* - w_0$ represents the compensating difference necessary to make the worker indifferent between choosing any of the two types of jobs. This is also called the reservation wage. The greater the worker's distaste for the disamenities, the steeper the indifference curve and the higher the reservation wage. Assuming that $u(w, D)$ is quasiconcave, so that worker's indifference curves are convex,[1] Z is equal to the distance $\Delta w = w_1 - w_0$ in Figure 1. If Δw is greater than Z, as happens at point c, with $\Delta w = w_1' - w_0$, the utility is larger at $D=1$. That means that the wage differential is more than enough to buy off the distaste for that type of job. If Δw is lower than Z, the compensating differential is not enough, so that the individual will perceive higher utility working at

D=0 type of jobs. Therefore, the labor supply will be determined by the comparison between Δw and Z. As Δw increases, more workers are bribed into the dirty occupations (the supply curve is upward-sloping).

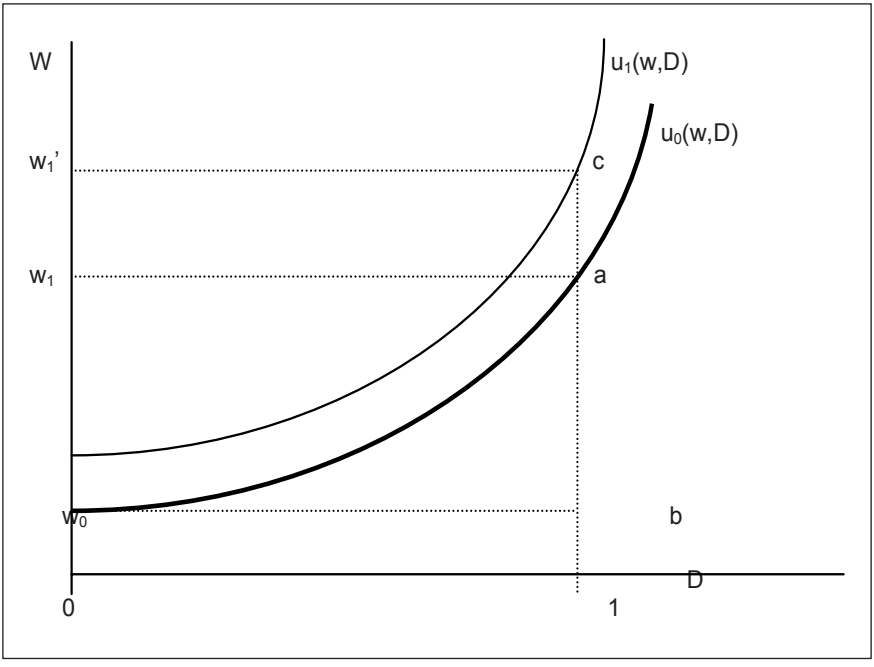

Figure 1. Indifference curves between wages and clean working environment

As stated before, firms can decide whether or not to spend resources to clean up the working environment. The job type to be offered in the market will be chosen based on the comparison of the cost of the working environment offered and the wage savings it implies. If wages savings exceed the cost of cleaning, the optimal strategy is to offer *D=0* type of jobs, otherwise offer *D=1* type of jobs. In other words, the demand for workers in *D=0* jobs is increasing with Δw, while the relative demand for workers in *D=1* jobs is decreasing in Δw. Therefore, the labor demand will be determined by the comparison between marginal

costs of cleaning and wage opportunities. The smaller the wage differential, the smaller the incentive to clean the working environment, and the higher the demand for labor in dirty jobs (the demand curve is downward-sloping).

The equilibrium will be given by the equality between supply and demand for workers of each type of job. This model can be applied to many other job characteristics, such as probability of injury, whether the job involves repetitive and monotonous work, physical effort involved, etc. In any case the reasoning is the same: as long as a job characteristic is generally perceived as "good" or "bad", good job attributes should imply lower wages, and bad working conditions should imply higher wages. Particularly, besides the "agreeableness and disagreeableness" of employment, Smith stresses job characteristics regarding job stability, probability of success (affected by human capital required to perform the job, level of competition in crowded professions, and possibility of recognition), and responsibility borne by workers.

The effect of workplace disamenities such as repetitive activities, stress, the need for physical exertion, risk of fatal and nonfatal injury, inflexible work schedule, and sedentariness on wages are common in the literature on compensating wage differentials, but not as a comparison across sectors. The evidence on the direction and magnitude of compensating differentials for these job attributes however, is inconclusive.

In their attempt to test the theory, researchers of earnings' determinants have found evidence of the existence of compensating differences, providing "clear support with uncomfortable exceptions" to the theory of compensating wage differentials based on job characteristics (Brown, 1980). In the case of the public/private wage comparison, the effect of working conditions on wages has usually been ignored, perhaps due to a lack of information. An exception is Brown (1980), whose results do not support the theory of equalizing differentials. Only studies based on human capital models have found considerable evidence of compensating wage differentials for jobs that require additional training and schooling, in a scenario that is characterized by public sector workers showing, on average, higher levels of education and longer tenure, training and experience.

There is not a clear and reliable measure of equalizing differentials due to fatal and nonfatal risk at the workplace.[2] Fishback (1998) summarizes the estimates of compensating differentials for some specific risky jobs. The results show premiums that go from zero to more than 50 percent of a year's income. *The Census of Fatal Occupational Injuries of the Bureau of Labor Statistics* (BLS) indicates that the fatalities per 100,000 employees in year 2002 were 3 in the federal government, 1.6 at the state level and 2.9 at the local level, much lower than those reported for the private sector as a whole (4.2). Within the private sector, agriculture, forestry, mining, and construction are among the riskiest activities, with fatalities averaging more than 20 per 100,000 workers. These differences in fatal risk between the public and private sector can perhaps be explained by differences in the occupational structure between the two sectors.[3]

The common explanation given to the failure of the compensating principle is that the omission of relevant variables biases the results, in addition to the problems faced when measuring job attributes. In fact, the information about working condition is usually provided directly by workers through surveys or averaged by occupation or industry. In both cases working condition measurements are likely to include substantial amounts of measurement errors. Because of this, only a few studies have attempted to examine the whole package offered to workers in each sector. One approach compares quit rates in both the public and private sectors, assuming that lower quit rates in the former can be taken as evidence that government employees receive higher compensation, since they consider differences not only in wages, but also in benefits and working conditions. Ehrenberg and Schwarz (1986) suggest that better monetary and non-monetary conditions of employment should lead to lower quit rates, which are lower in the public than in the private sector. Long (1982) shows that public workers are less likely to quit, although Ippolito (1987) argues that the low quit rate in the federal sector is due to substantial pension losses imposed on workers who quit early.

Another approach analyzes queues: if individuals perceive government employment relatively more attractive, one could expect longer queues of applicants for government openings than for private

sector jobs. In these models, a worker's utility is a function of observable employment characteristics and public/private wage differentials. An applicant will choose to work in the sector providing the highest level of utility. Studies of this sort generally support the hypothesis of a higher number of applicants for the majority of the jobs offered in the public sector. Krueger (1987) uses job queues data to compare the number of individuals who apply for jobs in the federal government with the number who apply for jobs in the private sector. He finds that for the average job opening, the federal government receives more outside applicants than does the private sector.

The general evidence tends to indicate that differences in non-wage benefits reinforce wage differentials apparently enjoyed by public sector workers. This overpayment seems to be difficult to explain in the context of the compensating differential theory, especially if one considers the fact that public employees enjoy better working conditions, particularly job stability.

3. Research design

The specific objective of this paper is to compare some of the job attributes offered in the public and private sectors trying to find some support to the idea that the compensating differential principle does not apply, under the context of a positive wage premium paid to public sector workers. This study mainly uses multivariate statistical methods, such as principal components analysis and multiple correspondence analysis to compare working conditions between the two sectors, based on the information provided by the Health and Retirement Study (HRS).

The Health and Retirement Study is a national panel data set that focuses on individuals aged 51-61 at baseline (1992). Its main goal is to collect information on demographics, labor force status, health, retirement, and working conditions at the individual level, through a cooperative agreement between the Institute for Social Research at the University of Michigan and the National Institute of Aging. This longitudinal study consists of waves or cohorts interviewed every other

year, starting in 1992. The five waves used here (1992-2000) were pooled into a single data set with 22,267 observations, in order to gain efficiency.[4] Besides the usual demographic variables, the HRS provides information related to the following job attributes: hours flexibility at work, indicating whether the worker can increase (*IH*) or decrease (*DH*) hours at work without affecting the compensation received; stressing conditions (*SR*); job stability as measured by the worker perception about the probability of loosing the job (*LJ*), as well as job requirements regarding lifting heavy loads (*LF*), strong physical effort (*PH*), stooping an kneeling (*ST*), and good eyesight (*SI*).

In general all studies start with a basic description of the sample under consideration based on the comparison of the first moments of the variables. However, this may not be enough when dealing with very large data sets as the HRS. Multivariate statistical analysis (MSA) can be applied whenever the data sets include simultaneous measurements on many variables and for many individuals or units, since the relationships among them are not easily discernible by common statistical measures. Among the MSA techniques, there are those focused on dimension reduction, whose main feature resides in the fact that they reduce the number of variables by identifying relationships among them, and grouping them into new variables called factors, based on the correlation among such variables and their dispersion. By doing so, the phenomenon under study is presented as simply as possible, without sacrificing valuable information. In this study, we attempt to identify the internal structure of the data and their links through multivariate correspondence analysis (MCA) and principal components analysis (PCA).

Principal components explain the variance-covariance structure of the data through linear combinations of the variables, in order to reduce the data dimensionality and to facilitate its interpretation. Therefore, even if the data contain n observations for p variables, almost all the information is collected in k 'principal components', for $k<p$, so that the final sample set contains nxk observations. Since PCA often reveals unsuspected relationships among variables and allows interpretations that would not usually be reached, it is considered a necessary step in the analysis of the structure of the public and private sector.

Multivariate correspondence analysis is a descriptive/exploratory technique designed to analyze multi-way tables containing some measure of correspondence between the rows and columns. This analysis provides a graphical procedure designed to represent associations among qualitative variables in a low-dimensional space. MCA is based on Chi-2 distances, which is a modification of a natural Euclidean distance applicable to any kind of variable, continuous and/or discrete.[5] In other words, MCA is equivalent to applying PCA on variables for which Chi-2 distance has been defined. The results provide information that allows one to explore the structure of variables included in the table.

4. Research results

a) *Data description*: Multivariate statistical analysis, particularly principal components (PCA), is used to reveal the internal structure of the data, by identifying linear combinations of the demographic variables and grouping them into components, based on the correlation among such variables and their dispersion. Graphically, these components are represented on the axes, and can be interpreted as follows: Variables grouped on the same side of one axis are positively related to each other, and negatively related to the variables on the other side of the same axis.

The general literature describes the public sector as characterized by having, on average, an older population compared to the private sector, with relatively higher levels of education, a higher proportion of minorities (supposedly due to a more strict application of anti-discrimination policies), a higher but declining trend to unionize, less likely to quit or shift jobs and therefore with longer tenure (since this sector offers more job stability and better working conditions), and earning higher wages. The HRS sample set of 22,267 workers for the period 1992-2000 (91.12% from private sector and 8.88% from public sector) used in this study seems to support this general characterization of the public sector population, at least partially, according to Table 1.

Table 1. Summary of demographic characteristics

Variables definition		Values	Private	Public
CENREG	Census region division (%): Northeast(1); Midwest (2); South (3); West (4)	1 2 3 4	18.47 26.00 40.04 15.49	17.20 23.18 42.52 17.10
GENDER	Gender (%): male (1); female (0)	0 1	52.98 47.02	52.07 47.93
MARTST	Marital status (%): married (1); otherwise (0)	0 1	21.09 78.91	20.70 70.30
RACE	Race (%): white (1); otherwise (0)	0 1	18.17 81.83	17.05 82.95
TRAING	100+ hours of on-job-training (%): no (0); yes (1); more than 12 years (2)	0 1 2	33.45 24.44 42.11	13.82 27.60 58.58
UNION	Union status (%): yes(1); no(0)	0 1	76.25 23.75	70.41 29.59
VETERN	Veteran status (%): yes(1); no(0)	0 1	74.60 25.40	68.83 31.17
EDU	Level of education: high school dropouts (1); high school (2); some college (3); college and more (4)	1 2 3 4	36.14 29.54 20.80 13.52	20.55 29.70 28.90 20.85
AGE	Age (years)	Mean s.d	56.61 5.56	55.62 5.83
CHILDN	Number of children	Mean s.d	3.29 1.94	3.03 1.86
EDUYRS	Years of education	Mean s.d	12.61 2.91	13.790 2.270
TENURE	Length of service with current employer (years)	Mean s.d	14.12 11.06	15.27 10.87
WAGEHR	Hourly wage	Mean s.d	15.66 19.50	17.27 14.91
N	Sample size		20,291	1,976

This conclusion is corroborated by the results obtained from the PCA shown in Figure 2. The first component (horizontal axis), which explains 18.85 percent of the total variability of the variables, associates *WAGEHR* to human capital variables (*EDUYRS*, *TRAING*, *TENURE*), and to *SECTOR*, *UNION*, *AGE* and *VETERN*. These variables are strongly opposed to gender, and weakly opposed to other workers' characteristics namely marital status, race, and family size. This can be interpreted by saying that women earn lower wages, compared to men. Also, workers with higher levels of human capital accumulation (education, and training) are paid higher wages and work in the public sector. These workers tend to be married, white, with relatively smaller families although these variables are not strongly related to the others. Older workers tend to be veterans and to be represented by unions. Notice that this description tends to resemble the characteristics of the typical public sector worker. On the other hand, the second component (vertical axis on Figure 2), which explains 14.00 percent of the total variability, opposes *GENDER*, *EDUYRS* and *TRAING* to *VETERN* and *AGE*. This means that older workers are more

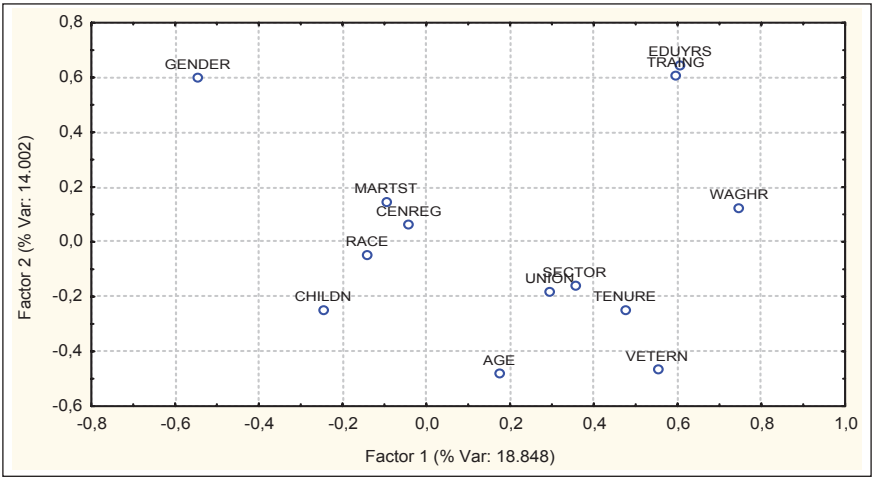

Figure 2. Demographic characteristics

likely to be veterans, are usually men and tend to have lower levels of education and training (see Table A1 in appendix for the factor loadings).[6]

b) *Working conditions:* The multivariate correspondence analysis (MCA) helps to visualize the structure of qualitative variables by sector of employment. The variables are grouped according to the level of association between their categories and the values of some grouping or *supplemental variable*. The graphs show the categories of the variables that are associated with a specific sector of employment and wage level.

The HRS data set provides information about workplace conditions by sector of employment, particularly inflexibility of work schedule as measured by the facility to increase (*IH*) or reduce (*RH*) the hours at work without substantially affecting wages, and the frequency with which physical effort (*PH*), lifting heavy loads (*LF*), good eyesight (*SI*), stooping and/or kneeling (*ST*) and stressful activities (*SR*) are required (see Table 2 for variables definition and frequencies).

Table A1. Principal components: factor loadings

Variables	Factor 1	Factor 2	Factor 3
UNION	-0.251557	-0.201404	0.581926
RACE	0.158181	-0.018399	0.391845
GENDER	0.517153	0.640405	0.223738
EDUYRS	-0.664482	0.589783	-0.078506
TRAING	-0.643853	0.553166	-0.146119
VETERN	-0.549261	-0.516761	-0.332125
CENREG	0.031059	0.080143	-0.333326
AGE	-0.167594	-0.513805	0.084069
TENURE	-0.429287	-0.273654	0.503235
WAGEH	-0.744064	0.072870	0.135444
CHILDN	0.277358	-0.226701	-0.252586
SECT	-0.199415	0.095965	-0.023509
MARTST	0.095255	0.162069	0.489760

Table 2. Working conditions and other related variables (%)

Variables definition		Values	Private	Public
IH	Hours flexibility: could increase number of hours at work (Y / N)	0 1	60.67 39.33	67.26 32.74
LF	Current job requires lifting heavy loads: all / almost all / most of the time (1); some of the time (2); none / almost none of the time (3)	1 2 3	17.62 28.49 53.90	3.24 19.12 77.65
LJ	Probability of losing the job within the next year: no chance / almost no chance (1); some chance (2); almost sure / sure (3)	1 2 3	72.18 20.68 7.18	78.54 14.99 6.47
PH	Current job requires a lot of physical effort: all / almost all / most of the time (1); some of the time (2); none / almost none of the time (3)	1 2 3	41.54 27.98 30.48	18.24 29.41 52.35
RH	Hours flexibility: could reduce number of hours at work: yes (1); no (0)	0 1	70.06 29.94	86.18 13.82
SI	Current job requires good eyesight: all / almost all / most of the time (1); some of the time (2); none / almost none of the time (3)	1 2 3	89.40 7.55 3.05	90.59 6.76 2.65
SR	Current job involves a lot of stress: all / almost all / most of the time (1); some of the time (2); none / almost none of the time (3)	1 2 3	62.25 33.56 4.18	77.22 20.41 2.37
ST	Current job requires stooping and kneeling: all / almost all / most of the time (1); some of the time (2); none / almost none of the time (3)	1 2 3	27.76 38.41 33.83	10.00 40.88 49.12

Figure 3 shows the results of the MCA on these variables for the public and the private sector. The graph indicates that the public sector (*SCT1*) is associated with non-stressful jobs for which lifting heavy loads, good eyesight, stooping and kneeling, and especially physical effort are, most of the time, not required (right-side circle). In the same way, the private sector (*SCT0*) is associated with more stressful jobs for which physical effort, stooping and kneeling, good eyesight, and lifting heavy loads are required most or some of the time (circle at the center of the graph). Notice that in this data set, very stressful jobs, and those involving a lot

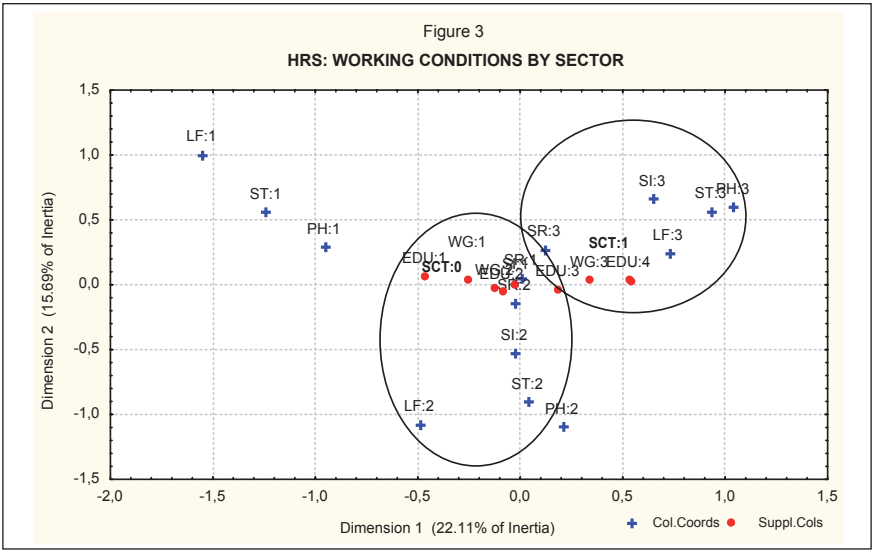

Figure HRS: Working conditions by sector

of physical effort, are not associated with any particular sector. Workers in the public sector also enjoy more work-hour flexibility. In fact, 77.22 percent of the workers indicate they can decrease the number of hours at work, compared to only 62.25 percent for private sector workers.[7] (Figure 3 here)

According to these results and following the theory of equalizing compensating differentials, public sector workers should be paid lower wages since they in general seem to enjoy better working conditions. However, the graph shows that public sector jobs are associated with higher wages (*WG*),[8] perhaps because workers in this sector tend to have higher levels of education (some college and more). Private sector jobs, on the other hand are related to lower wages and lower levels of education (some college or less).

Another relevant job attribute is job stability. According to Bernhardt, *et al.* (1999), compared to the private sector, the public sector seems to enjoy higher job security, but declining over time, although there is no consensus about the hypothesis of generally declining job stability. The HRS working conditions summarized in Table 2 include

information about how workers perceive their probability of losing their jobs (*LJ*). Based on this measurement, 78.54 percent (72.18 percent) of the public (private) workers think that there is no chance of losing their jobs, while 6.47 percent (7.18 percent) are sure or almost sure they will be losing their jobs within a year. Considering the unemployment rate by sector as an indicator of the risk of unemployment, one can conclude that private sector workers are more likely to lose their jobs compared to public sector workers. In fact, according to the BLS, the unemployment rate for the period under study (1992-2000) averaged 5.32 percent in the private sector and only 2.86 percent in the public sector.

Abowd and Ashenfelter (1980) estimate the wage premium paid according to the unemployment risk by industry. Using data from the Panel Study of Income Dynamics for the years 1967 and 1975, they estimate a probit equation for unemployment and use the results to estimate a bias-corrected OLS model of the conditional expectation of the personal unemployment variable controlling for industry, schooling, experience, and tenure. This estimated personal history of unemployment, together with region, union status, industry and human capital variables, is then used in the right-hand side of fixed-effects and nonlinear least squares models of wages to estimate the premium due to unemployment risk. They conclude that public sector workers receive substantially smaller compensation for risk of unemployment compared to private sector workers. The former receive on average 2.67 percent of the hourly wage in exchange for bearing the unemployment risk, while private sector workers receive on average 3.93 percent of the hourly wage. This premium increases with the estimated unemployment risk[9] and the length of the conditional unemployment spell. Within the private sector, construction workers and automobile workers receive the highest premiums (8.20 percent and 8.98 percent), since they also show the highest levels of unemployment risk.

Based on the results discussed above it can be concluded that public sector workers enjoy better non-pecuniary working conditions, which are also associated to higher levels of wages. According to this evidence we could conclude that the compensating differential principle does not work.

5. Conclusions

It is not easy to account for job attributes since they are offered in many different combinations, and most often the information is simply not available. Moreover, not all benefits can be translated into dollars, as it is the case of job security, or workplace conditions, making the comparison even more difficult. This may explain why most of the studies comparing the public and private sector are limited to the calculus of wage differentials adjusted, at most, by the proportion of fringe benefits offered in each sector.

The theory of compensating differentials suggests that firms offering jobs with disagreeable attributes should pay higher wages to attract workers into these jobs.

This study uses multivariate statistical analysis techniques applied to the information provided by the Health and Retirement study for the period 1992-2000, to compare working conditions in the public and private sector. The findings suggest that the higher wages paid in the public sector are accompanied by better working environments, which would contradict the equalizing compensation principle. One of the reasons that could explain why better non-pecuniary benefits should be expected in the public sector could be that unions in that sector have more bargaining power to influence the provision of these benefits, than to influence wages.

Another reason can be the fact that remunerations in the public sector are not determined by the same forces driving the labor market in the private sector, *i.e.* labor productivity and supply, since government is not a profit-maximizing agent. Therefore its remuneration-setting system differs from the rest of the economy and is particularly influenced by political issues that could lead the government to pay more than what would be paid in the private sector for the same stock of human capital.

6. Notes

1 Notice that the indifference curves are upward-sloping since dirty is "bad". If they were downward-sloping, firms could be offering low wages with bad working conditions.

2 The measure of the value of safety is, together with the theory of discrimination, the earliest and most widespread field of application for the theory of equalizing differences.

3 Unfortunately, the data set used in this study does not provide information about the risk level of the job performed.

4 Excluded from the sample were those individuals working in the agricultural sector, those self-employed or in the armed forces as well as those working less than 10 or more than 80 hours a week or who earned less than half of the minimum hourly wage in effect at the time of the interview.

5 Consider two points in a plane, $P = (X1, X2)$ and $Q=(Y1,Y2)$. The straight-line distance, or Euclidean distance from P to Q, $d(P,Q)$, is given by $d(P,Q) = \sqrt{[(X1-Y1)2 + (X2-Y2)2]}$. Chi-2 distance is a weighted Euclidean distance.

6 The third component explains 10.72 percent of the variability, and opposes tenure, marital status and union status to veteran status, indicating that high tenure workers tend to be unionized, married and not veterans. The eigenvalues for these three components are 2.45, 1.82 and 1.39 respectively. The remaining components are excluded since their eigenvalues are less than 1.

7 The percentage of inertia of this graph adds 37.80, being the eigenvalues 0.442 and 0.313, respectively. The other two dimensions considered basically repeat the conclusions already obtained from figure 3.

8 Since MCA is based on qualitative variables, wages (WG) and years of education (EDU) were categorized as follows: for wages: less than $6/hour (1), between $6 and $15/hour (2) more than $15/hour (3); for education: high school dropout (1), high school (2), some college (3), college or more (4).

9 According to the authors, the expected unemployment risk is measured as the variance of the expected unemployment spell. The estimated unemployment spell lasts about 45 working hours (about one week) in

the private sector and only 17.2 hours in the public sector. The corresponding measures of unemployment risk are 0.024 and 0.009.

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