

**Public Sector Earnings Comparability**  
**Alternative Estimates for the U.S. Postal Service**  
**La comparabilité des gains du secteur public**  
**nouvelles évaluations pour le service postal des États-Unis**  
**Comparando los ingresos del sector público**  
**calculos alternativos en el Servicio de Correos en EE.UU.**

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Article abstract

Using the postal service as an example, this article highlights the critical role played by a series of “implicit” judgments when estimating the government earnings differential. Regression estimates demonstrate that alternative treatments of location, gender, industry, occupation and union status result in estimates ranging from a double digit advantage for postal workers to no advantage at all. We argue that the standard of comparability, comparing similar workers doing similar work, requires that judgments about samples and controls be made explicit as they largely determine the resulting estimates.

# *Public Sector Earnings Comparability*

## *Alternative Estimates for the U.S. Postal Service*

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**PAULA B. VOOS**

*Using the postal service as an example, this article highlights the critical role played by a series of “implicit” judgments when estimating the government earnings differential. Regression estimates demonstrate that alternative treatments of location, gender, industry, occupation and union status result in estimates ranging from a double digit advantage for postal workers to no advantage at all. We argue that the standard of comparability, comparing similar workers doing similar work, requires that judgments about samples and controls be made explicit as they largely determine the resulting estimates.*

A large and varied North American literature has attempted to estimate the differences in earnings between public and private sector workers. In Canada, Gunderson (1979) and Shapiro and Stelcner (1989) use census data while Mueller (2000) uses the Labour Market Activity Survey. Their conclusions, based on earnings regressions, indicate that public sector earnings are higher while generally showing that the public sector earnings advantage is larger for women than for men and larger for the central government than for the provincial or local governments.<sup>1</sup> Such a

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  - The authors thank Glen Gain, participants in the University of Wisconsin-Madison labour workshop, the referees and editor for many useful comments. Any errors are the responsibility of the authors.
  - 1. Other findings from the Canadian literature include that the government differential is largest in the lower tail of the wage distribution (Mueller 1998) and that the differentials for men has declined or stayed constant while that for women has grown (Prescott and Wandschneider 1999).

summary is appropriate for the United States as well where more than a dozen regression-based studies have addressed the issue (Belman and Heywood 1996). The literature on both sides of the border is motivated by the desire to determine whether or not public sector workers have earnings comparable to those in the private sector.

Private sector comparability, that public employees should be paid the same as similar workers doing similar work in the private sector, remains a widely accepted standard for determining public employee earnings. Its broad appeal stems from its perceived fairness, its practicality and the belief that it promotes economic efficiency (Belman and Heywood 1996). Yet, despite near consensus on the principle, both the extent of comparability and the proper way to measure comparability remain disputed. This dispute has been identified as one of people vs. positions. Traditionally many jurisdictions, including the U.S. federal government, conducted surveys in which earnings for narrow occupations (or "positions") were collected to be used as the basis for setting government wages (see Belman, Franklin and Heywood 1994 for a case study of Wisconsin). For more than twenty years, it has been argued that these occupational surveys traditionally used to determine comparability should be replaced with human capital based regression analysis. According to this argument, the use of large samples of representative workers (or "people") and controlling for individual characteristics avoids many of the difficult and imperfect judgments associated with occupational wage surveys (Smith 1976, 1977; Venti 1987).

This article emphasizes that the regression approach does not avoid these issues as it implicitly judges the appropriate industries, occupations and firms for comparison. Indeed, these judgments determine the specification and sample for the estimated regressions and largely determine the measured extent of comparability.<sup>2</sup> This point has not received the attention it deserves because the regression approach usually assumes, largely without proof or mention, that the appropriate comparison for all public sector workers is to an average private sector worker with similar personal characteristics.

The work reported here consciously avoids an attempt to present the one correct public sector differential. Instead, it uses data on U.S. postal workers to demonstrate the sensitivity of the regression based differential to alternative and, we argue, equally reasonable assumptions about alternative samples for comparison and specifications. Further, we argue that recognizing this sensitivity requires a more finely crafted approach to both

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2. Thus, in reviewing the literature on the U.S. federal wage differential, Bender (1998) concluded that the appropriate estimate was somewhere between 5 and 20 percent but appeared very sensitive to specification.

estimation and policy than has often been implied. The extent of earnings comparability for U.S. postal workers has been disputed (Perloff and Wachter 1984; Asher and Popkin 1984) and this dispute relates precisely to judgments about comparability. In the first section we update this dispute showing that women employees and those in rural locations generate substantial positive postal differentials, while the differentials for men and for urban employees are very modest. Ignoring this point and making policy based on the “average differential” is unlikely to be effective. Lowering all postal wages based on the average would make it hard to hire sufficient qualified men or employees in urban areas. Alternatively, while one might reduce the earnings of only women or rural workers there may be legal or institutional barriers to doing so. More generally, the average regression differential unavoidably reflects wage effects between firms and labour markets that may be impossible or undesirable to replicate within a single employer such as the Postal Service.

In the second section we isolate the crucial role of three job characteristics.<sup>3</sup> The modelling of occupation, industry and union status varies greatly in the literature (Moulton 1990; Moore and Raisian 1991; Belman and Heywood 1988, 1990, 1996) and we demonstrate how different treatments lead to different results in the postal data and suggest how the relevant issues might be handled. Although not every factor influences the comparability estimates in the same way, more closely matched controls and samples generally lower, or even eliminate, the supposed postal service wage premium. Perhaps, more importantly, the estimates give a more accurate picture of which workers, positions, and locations are actually “over” or “under” compensated.

The final section concludes that the usefulness of regression-based estimates of the earnings differential depends on judgments regarding the sample, which job characteristics should be included, and which comparisons should be made. It is exactly these judgments which have not received the attention they deserve.

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3. Traditional regression research reflects the assumption that individual rather than job characteristics matter most. For example, in Smith's initial studies explanatory variables were limited to measures of education, experience, marital status, race, ethnicity, size of urban area, three broad regional dummies, dummies for major occupation, part-time and/or dual job holding and union membership (1976, 1977). Separate equations were estimated for men and women. More than a decade later Krueger (1988) estimated public/private wage differentials over time with a similar set of controls: age, education, major occupation, marital status, gender, race, region, and union status.

### ***COMPARABILITY, OCCUPATIONAL WAGE SURVEYS AND REGRESSION-BASED APPROACHES***

The principle of comparability has shown notable persistence in the standards of the U.S. government. Smith (1977: 177) traces the principle at least as far back as an 1862 law requiring wages of U.S. government blue-collar workers to “conform with those of private establishments in the immediate vicinity.” In the 1960s and 1970s a series of Pay Comparability Acts set the broad framework for current determination of U.S. government wages. Four major wage schedules codify this determination: the general schedule for white-collar workers, the federal wage schedule for blue-collar workers, the postal service schedule and the military schedule. Each of these is guided, to various degrees, by the principle of comparability. Even military wages are to be indexed to those of federal civilian workers which are, in turn, tied to private sector earnings. Thus, although military comparisons are particularly complex (Phillips and Wise 1987), comparability remains an implicit guideline.

It is worth noting that the principle of comparability is not as ingrained in other industrial countries. For instance, in 1982 the Netherlands consciously abandoned an explicit comparability standard and allowed public sector earnings to lag behind those in the private sector (van Ophem 1993). In that same year a British government-sponsored inquiry virtually repudiated comparability in favour of an “ability to pay” standard, arguing that comparability was just one standard among many and was not the most important one given the problems facing the economy (Gregory 1990). The conservative U.K. governments set lower public sector awards in the hope that they would serve as a standard for bargainers in the private sector and as an informal incomes policy (Elliot, Murphy and Blackaby 1994). In Canada, federal government earnings grew at a rate slower than those in the private sector from 1978 to 1994. Gunderson and Hyatt (1996) attribute this, in part, to the pressure placed on the government to be “a model of restraint.”

In the U.S. federal government and in many state governments as well, the first step in wage setting has been to determine the current wages of comparable workers in the private sector. This has usually been done by use of a wage survey which compares public and private earnings within similar narrow occupations. Thus, accountants are compared with accountants and labourers with labourers (Fogel and Lewin 1974). These earnings differences can be aggregated across occupations to construct a measure of central tendency.

This approach has been subject to numerous criticisms. First, many occupations are unique to either the public or private sectors. In examining

509 three-digit occupation codes from the Current Populations Survey, Belman and Heywood (1999) found that 150 were unique to the private or the federal government sector. Those unique to the federal sector accounted for 29 percent of the federal government workforce. Thus, as occupational surveys only compare positions common to both sectors, aggregate comparisons of earnings are derived from an unrepresentative sample of the sectors and should only apply to that part of the federal workforce with well defined private sector counterparts. This problem can be even more extreme at the state and local level. Examining the Wisconsin State Wage Survey, Belman, Franklin and Heywood (1994) found that of more than 600 occupations in the survey, only 102 were in both the state government and the private sector with 86 occupations common to both the local government and the private sector. Workers in these matched occupations included only 43 percent of private sector workers in Wisconsin, only 66 percent of local government workers and only 80 percent of state government workers. Thus, far from all workers or positions are being used in the comparability exercise. This contrasts with the more inclusive regression approach that tends to use all workers and positions.

Second, judgement is often required even to match the occupations. For example, a single category such as lawyer incorporates enormous variation in what those workers may be doing. Further, it is unclear whether public school teachers should be compared with private school teachers. Many of the latter are in religious institutions with different objectives and students than those working in public schools. Restricting analysis to more nearly identical occupations increases the accuracy of the comparisons but with further reduction in the extent of the workforce involved in the comparison. Recognizing these difficulties, some government surveys have begun with a job evaluation and the assignment of points in proportion to the nature of the tasks involved. In this way jobs not identical can be aggregated and compared (Van der Hoek 1989). Clearly any consensus on points and their weighting may prove elusive.

Third, wage surveys often limit the sample in ways which further reduce its representativeness. It is common not to survey those in small private sector establishments (say below 20 workers). While often identified as a shortcoming (Venti 1987), it might be considered that governments as large employers should be compared to other large employers.

Starting in the 1970s, economists began using large representative samples of the workforce to estimate earnings equations comparing the public and private sectors. Building on Human Capital theory, which suggests that individuals with equal levels of investment in human capital (education and on-the-job experience) should receive similar returns to that investment, these estimates were developed around detailed information

on the workers such as their education, experience, tenure, marital status, race and gender. These traditional determinants of earnings were used as controls to focus on the remaining differential associated with government employment. While more recent studies have introduced modest controls for the nature of the position or the employer (e.g., employer size and occupation controls), these studies largely control for characteristics of the worker and are so labelled “people” based studies (Belman and Heywood 1996).

The regression based, or people, approach implicitly compares workers across detailed occupations, work settings and employer characteristics. To the extent these are important wage determinants, the problems identified with the earlier position based studies have not been solved but merely hidden. We now turn to this point in more detail using the U.S. Postal Service as an illustration.

### THE POSTAL WAGE SYSTEM IN THE U.S.

The U.S. federal government has slightly more than three million civilian employees of whom 879,000 work for the Postal Service.<sup>4</sup> Prior to 1970, the Postal Service was a department of the federal government and postal employees were paid on the general service schedule, and most were classified as lower grade clericals. The combination of inflation and lagging federal pay increases in the late 1960s resulted in large declines in the real earnings of postal employees, particularly in urban areas, and was the proximate cause of an illegal national postal strike in 1969. Despite its illegality, the U.S. Congress responded to the strike with the Postal Reform Act of 1970, which turned the Department of the Post Office into the quasi-public U.S. Postal Service, provided postal employees with a large pay increase, and granted postal employees collective bargaining rights comparable to those enjoyed by private sector employees and administered by the National Labor Relations Board. Postal employees are not, however, permitted to strike. If the parties are not able to achieve an agreement through bargaining, contract terms are decided through tri-partite interest arbitration.

Although the statute provides that: “It shall be the policy of the Postal Service to maintain compensation and benefits for all officers and employees on a standard of comparability to the compensation and benefits paid for comparable levels of work in the private sector of the economy,”<sup>5</sup> the

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4. “Postal Service Plans Layoffs and Three Cent Rise on Postage.” *New York Times*, January 8, 2002, electronic edition.

5. Postal Reorganization Act, 39 U.S.C. §1003.

measurement of comparability was not stipulated in the postal statute. The postal unions favour comparisons to the major private sector organizations with which the Postal Service competes, UPS and Federal Express (more nearly a “position” based approach). The Postal Service has favoured application of regression methodology (a “people” based approach). Since arbitrators have come to evaluate both types of evidence, the precise specification of the comparability regression has often been in dispute.

We explore the regression approach by estimating a series of log wage equations with the 1998 Outgoing Rotation File (ORG) of the Current Population Survey (CPS). The CPS is a monthly survey of individuals age 16 and older residing in 50,000 U.S. households. Although initially designed to measure the unemployment rate, it has evolved into a primary source of labour market information on employment, unemployment, hours and earnings. It is used extensively in labour market research and is the principal source of data used by the Postal Service in their regression estimates of comparability. The annual compilation of the surveys includes more than 600,000 individuals of whom approximately one third have information on hourly or weekly earnings.

In order to examine the impact of various decisions (often implicit) about specification of regression models, we start with a base equation that is similar to many used in the public sector comparability literature. It includes measures of age, age squared, educational attainment, race, gender, union status, city size, major occupation (manager, professional, labourer, administrative support, etc.), part-time, and overtime work. To simplify the presentation, we use a single equation and obtain estimates of the postal differential with a dummy variable designating employment in the postal service industry. We limit the sample to prime age employees (age 25 to 64) to ensure that the sample represents individuals who have begun career employment and receive the full return to their human capital. The base results indicate that postal employees enjoy a 9.9% premium relative to otherwise equal workers.<sup>6</sup> Table 1 contains this estimate and others that will be discussed below. This stands as a starting point for our presentation, which focuses on the issues of (1) location, (2) gender, (3) industry, (4) union status and (5) occupation. Some issues—location, gender, and industry—are ones which almost solely involve the appropriate comparison group, whereas union status and industry involve this plus additional issues.

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6. Research of postal wages studies study somewhat different populations, but these differences have modest effects on the estimated differential. Removing postal managers from the data set increases the postal differential by one percentage point while removing all managers results in a 0.6 percentage point increase in the differential. Removing part time employees reduces the differential by one percentage point.



**TABLE 1**  
**Postal Earnings Differentials under Alternative Comparisons**  
**Ranked in Order of Size**

<i>Equation</i>	<i>Specification</i>	<i>Postal Differential</i>	<i>Sample Size</i>
BASE	Age, age <sup>2</sup> , education, race, gender, union status, city size, major occupation, part-time, over-time	9.9%	120,093
Differential in the Absence of Gender Discrimination	Like Base but equations split by gender: Use female differential as appropriate	21.0%	male 60,843 female 59,250
	Remove control for gender	14.6%	
	Average male and female differentials	9.0%–13.8%	
	Take male differential as appropriate	6.6%	
Urban/Rural Differentials	Like Base but separate equations for residents of urban and rural areas: 50 largest cities are considered urban	urban 6.6% rural 14.4%	rural 66,764 urban 53,329
	186 largest cities are considered urban	urban 7.1% rural 20.4%	rural 82,248 urban 37,845
Compare to Similar Private Sector Industries	Like Base but limited to: Workers in Transportation Industry Workers in Transportation, Utilities and Communications	4.7% 1.8%	5,738 9,588
Compare Urban Workers with Similar Private Sector Industries	Like Base but limited to residents of 186 largest cities working in: Transportation Transportation, Communications and Utilities	3.6% -0.1%	4,234 6,877
Include Union Wage Effects	Like Base but incorporate weighted union wage effect from OLS model Like Base but incorporate weighted union wage effect from Fixed Effects model	20.4%* 8.1%	120,093 **

\* This is calculated according to a method essentially similar to that used by the Postal Service in several recent postal arbitrations.

\*\* Extrapolation from NLSY estimates applied to CPS base estimate.

### *Urban/Rural Differences*

Wages are lower in rural areas. Jobs viewed as paying only moderately well in cities are eagerly sought in rural parts of the country. This difference has long been recognized in research on wages and our base equation, like most in the literature, contains a simple control for urban

residence. Yet, the implications of urban/rural wage differences for the measurement of public sector comparability have gone largely unstudied.<sup>7</sup>

We examine this by estimating separate regressions for urban and rural residents. Using a restrictive definition of urban area, a person is classified as residing in an urban area if he or she resides in one of the 50 largest CMSA's (Consolidated Metropolitan Statistical Areas). These urban areas, with a population of 1.2 million or more, account for 48.5% of the U.S. population. Postal employees in these urban areas are paid 6.6% more than their private sector counterparts, while those living in rural areas (non-urban) earn 14.4% more than their private sector counterparts. More inclusive definitions of urban residence do not greatly alter the results. If the 72.2% of the U.S. population residing in the 186 CMSA's of 250,000 or more are defined as urban, the urban postal differential rises a modest .5 percentage points to 7.1% while the rural differential rises to 20.4%.

The large gap between the urban and rural postal differential suggests that the comparability estimates from a single nationwide equation are a misleading guide to appropriate wages, if the Postal Service wishes to continue using a single nationwide pay scale (as opposed to implementing a locality-based wage structure). A consideration of a simple economic model, one with nationwide supply and demand for postal employees, is informative. The supply price of a postal employee depends on his or her alternatives: individuals in urban areas have a higher supply price because they have better alternative jobs than individuals in rural areas. Assuming the supply curve rises, urban employees are located to the right of rural employees—in economic parlance they are the “marginal” workers who set the market-determined wage where the supply curve crosses the demand curve for the market as a whole. Thus, the supply price of the marginal employee is greater than the supply price of the average employee. The market wage—the relevant comparable—is set in urban, not rural, areas. Ignoring this reality, and calibrating postal pay to the nationwide average of the 9.9%, would result in a wage below comparability in urban areas. This would make it difficult to attract and retain high quality employees in these crucial locales, while this wage would remain too high in rural areas.

An alternative would be to move to a locality-based pay system, but political and institutional factors make that difficult. First, the general approach of the U.S. federal government has been that disbursements/receipts (e.g. veterans' benefits, the cost of a postage stamp, social security) are not adjusted for cost of living differences across areas. Second, the Postal

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7. Smith (1977) estimates federal wage differentials by city size, but does not explore the ramifications for studies which combine urban and rural populations.

Service is a large employer and may parallel large private sector employers who voluntarily use a single nation-wide salary schedule. Rebitzer and Robinson (1991) and Doeringer and Piore (1971) suggest that such policies, characteristic of multi-plant firms with internal labour markets, reflect a need for corporate consistency in wage policy and a desire to avoid restructuring wages in response to local market shocks to wages. Finally, unified nationwide wage scales also facilitate the easy movement of management personnel across localities.

Despite these factors, the U.S. federal government has begun implementing locality pay for its non-postal white-collar employees (historically it used a single nationwide pay scale). As of 2000, the three largest locality differentials were 17.0% for San Francisco, 14.3% for Los Angeles and 13.6% for New York (<http://www.opm.gov>). These estimates of pay differentials are, as might be expected, larger than those produced by more aggregated samples presented in this work. If the Postal Service were to attempt to follow the federal government in differentiating pay by locality, it would have to negotiate a new pay system with its unions with a complex system of differentials.

Perhaps because of the complexity of such a system, neither the postal unions nor postal management have shown strong interest in moving to locality-based pay, even where collective bargaining relationships divide along urban-rural lines. Postal letter carriers are split between two organizations with rural carriers represented by the Rural Letter Carriers Association (RLCA), and urban carriers represented by the National Association of Letter Carriers (NALC). To date, the Postal Service has negotiated pay rates with the RLCA that are only modestly lower than those of urban carriers.

### *Issues of Gender*

We next split the sample by gender (ignoring the locality issue for the moment) in order to highlight a second issue regarding the appropriate comparison group. Estimating separate models for men and women, we find that men in the Postal Service earn a 6.6% differential relative to comparable workers in the private sector, while women in the Postal Service earn 21.0% more than comparable women in the private sector. As a single employer, the Postal Service operates under laws and policies forbidding gender discrimination. Paying men and women different wages, the implication of a literal reading of the regression estimates, might satisfy definitions of comparability but would be an illegal (and presumably undesirable) policy.

How should comparability be interpreted in light of the difference in male and female comparability obtained from regression estimates? The

appropriate public sector wage might then be the wage that would exist in the absence of gender discrimination. The most common economic model of discrimination suggests that men, the group which is not discriminated against, are paid according to their marginal revenue product in the private sector but groups subject to discrimination are paid less. As such, the non-discriminatory wage differential is the male differential (Cotton 1988). There are, however, other models in which discrimination results in overpayment to men. Neumark (1988) proposes that, under certain assumptions, the female differential might be the appropriate measure of the postal differential. Other analysts find that in the absence of gender discrimination, wages would be an average of those now earned by men and women. Various weighting schemes have been used: one, used by Perloff and Wachter (1984), weights the gender differentials by the proportions of men and women in private employment. A second, suggested by Cotton (1988), uses the overall sample weights, while a third possibility would be to use public sector weights. The typical regression differential provides another approach to averaging the male and female differentials, one which allows for full interactions between gender, public sector employment status and other explanatory variables. The estimates under these different averaging schemes vary from 9.9% (using the typical approach) to 11.9% (using the proportion of men and women in the public sector) to 14.6% (eliminating all controls for gender in the base equation).

Were the estimates of the differential in the absence of discrimination reasonably similar, the absence of consensus on the appropriate theory would be moot. However, lacking more certain guidance from theory, the range of estimates, from 6.6% to 21.0%, provides only weak guidance in establishing comparable earnings. Further, whatever method is preferred, the particular "comparable" wage may be incompatible with the proper functioning of any single employer. Paying some average of these wages to Postal employees might not be desirable as the resulting wage will be below that needed to recruit sufficiently able men, and above that required to recruit able women.<sup>8</sup> The net result could reduce organizational effectiveness.

A further complication in the application of regression is that individual private firms cannot be identified in cross sectional representative

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8. Although it is tempting to consider a policy which sets the wage at the female private sector comparable, this is unlikely to provide a labour force with adequate skills and abilities. The Postal Service has actively pursued policies to eliminate discrimination for more than thirty years. It has also developed a sophisticated screening program for new entrants. It is therefore reasonable to suppose that the current gender balance in the Service reflects an equilibrium between the Service's demand for particular skills and abilities and the desires of the potential labour force. Substantially lowering the wage would reduce access to appropriately skilled men, with consequences for organizational effectiveness.

data sources such as the CPS and so the average within firm difference in male and female wages cannot be estimated. Thus, even if the postal service wished to pay gender differences comparable to firms in the private sector, the typical regression approach could not identify those differences. It is quite possible that large private firms have gender differentials similar to that of the Postal Service. Even if no firm in the private sector had any gender differential, the CPS could present one if women are disproportionately concentrated in lower paying firms. Thus, it seems that comparisons to the actual gender differences within larger firms (the very information in the wage surveys) holds the most hope for future guidance on this issue. As with the urban/rural issue, demanding that a single "firm," the postal service, mirror the national average across firms provides an uncertain foundation for compensation policy.

### *Industry Differentials*

Wages vary systematically by industry with those paying well in one occupation tending to also pay well in other occupations and with high paying industries continuing to pay well for many decades. The industry specific component of wages has its sources in industry specific human capital, compensating differentials, efficiency wage policies, and monopoly rents (Krueger and Summers 1988). For all these reasons, the position approach might well demand comparing pay in postal jobs to similar jobs in similar industries.

As emphasized, most regression based studies of public differentials, including studies of the postal system, compare public employees wages to an average of wages for the entire private sector. This was done in our base equation by omitting controls for industry. A more explicit approach to averaging industry effect is to add variables for major industry to the equation and construct an average of the industry specific estimates to obtain an "economy wide" average. Two alternative averaging concepts have been used: the first weights the estimated industry differentials in the private sector by employment and compares postal wages to that average (Perloff and Wachter 1984), the second method treats each industry as a single observation with equal weights (Krueger and Summers 1988).<sup>9</sup> Employment weighted results are higher than in the base estimates: postal employees earn 13.8% more than comparability. Using the second method, the average deviation from comparability is 9.0%, close to the estimate from the base equation without controls for industry (see column 3 of

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9. Appendix 1, containing the estimated industry differentials that are used in these methods, is available upon request from the first author.

Table 1). Despite differences in estimates obtained with three approaches to averaging, they are conceptually alike in comparing postal employees to the entire private sector labour force.

At issue however is whether the postal service should be compared to a set of industries that includes everything from harvesting fruit to providing haircuts. There is considerable variation in wages between industries in the private sector.<sup>10</sup> These differences are generally held to reflect inter-industry variations in conditions of work which must be compensated if firms are to obtain adequate supplies of labour. Occupational wage surveys account for industry differentials by limiting the survey to industries deemed appropriate. The failure of regression approaches to limit the comparison sample by industry is appropriate only if one is convinced that industry differentials do not matter or that working conditions in the postal service are reflected in the implicit average of private sector industry differentials.

As neither seems likely, we compare the wages of postal employees to those in “similar” industries. The system of standard industrial classifications (SICs) of the U.S. Department of Commerce places the Postal Service within the transportation industry. If one estimates a standard wage equation (like our base equation and including controls for major occupation) using only transportation workers, the postal differential declines to 4.7% from the 9.9% differential obtained from comparison with the full private sector. Alternatively, another comparison might be with employees in the Transportation, Utility, and Communications industries (TUC), which includes the Postal Service. The Postal Service shares many functions and characteristics with the firms in this broad classification. It transports materials and information and shares extensive government regulation in the form of universal service requirements and regulation of rates. In such a comparison, the estimated differential associated with the Postal Service is 1.8% but is *not* statistically different from zero.<sup>11</sup>

Obviously, the treatment of industry is an essential judgment in determining estimates of comparability. To date, regression research implicitly assumes that the Postal Service should be compared to the average of all industries in the private sector. Yet, the standard of comparability, “similar workers doing similar work,” would seem to require investigation and debate over the industries which are sufficiently similar to provide information on the appropriate wage for postal workers.

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10. As indicated in the estimates in Appendix 1.

11. The t-statistic for comparison to transportation is 2.94 and for comparison to TUC it is 0.83.

As an illustration of how these three implicit judgements to look at averages of the economy interact, a variety of explicit choices can be explored. If the comparison is limited to urban workers in transportation, the postal differential declines to 3.6%. The differential for urban workers in transportation, utilities and communications is effectively zero (see table 1) and the differential for males in transportation is -1.5%, at the Postal Service *disadvantage*.

### *Union Status*

The public sector is considerably more unionized than the private sector. While private sector union membership declined from 35% in 1956 to 9.9% in 1999 (Hirsch and MacPherson 2000), public sector membership rose from 12.6% to 48% over this period (Burton and Thomason 1988; Kearney and Carnevale 2001). Unions in the U.S. public sector differ from those in the private sector along many dimensions, most notably in operating under alternative legal regimes than those established for the private sector by the National Labor Relations and the Railway Labor Acts. Unionized public employees have more limited rights regarding bargaining and concerted activity than their private sector counterparts.<sup>12</sup> Moreover, the relevant legislation varies by state and level of government on issues such as union recognition, employers duty to bargain, method of resolving interest disputes and treatment of concerted activity (Kearney and Carnevale 2001; Belman, Heywood and Lund 1997).

Despite the high level of organization among public employees, the literature on public wage differentials does not typically consider union membership and its returns as part of the public sector earnings differential.<sup>13</sup> This may reflect the widely held view that public sector unions have smaller economic consequences than do private sector unions. Consistent with this view, estimates of returns to unionization in public employment are typically smaller than those found for private sector employees.

An exception to this general approach is provided in the work of Wachter, Linneman, Hirsch and Gillula (Linneman and Wachter 1990; Hirsch, Wachter and Gillula 1999; Wachter, Hirsch and Gillula 2001) who argue that part of the returns to union membership are appropriately incorporated into public sector wage differentials. In this view, both public and

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12. In contrast, it is easier for public employee to gain recognition in most states than is currently the case for private sector employees (Bronfenbrenner and Juravich 1994).

13. These issues are absent from recent reviews of economic research on the public sector by Bender (1998) and Gregory and Borland (1999), but are discussed in Belman and Heywood (1996).



private unions produce economic premiums for their members. Public sector employees are, however, more likely to enjoy these premiums because they are more likely than private sector employees to be union members. A measure of the total earnings premiums of public employment should then incorporate the gains to union membership weighted by the difference in union membership between the public and private sector.<sup>14</sup>

Obviously this approach will increase the estimated postal wage differential. In the base estimate, returns to postal employment *per se* (the coefficient on the postal indicator) are 9.9% while the returns to union membership are estimated at 16.6%. Union membership among wage earners in the CPS private sector sample was 10.7% in 1998, membership in the postal service was 73.6%, and the difference in membership was 62.9%. Using the method suggested by Wachter et al., the postal differential inclusive of the weighted returns to union membership would be 20.4% ( $= 9.9\% + 16.6\% * (.736 - .107)$ ).

Even if one agrees that part of the returns to unionization might be incorporated in the public wage differential, issues remain over how the effect of unions on wages should be conceived and measured. There is long standing debate over whether the entire return to union membership is an economic rent, as assumed by the Wachter et al. approach. Many economists contend that unions operate to improve firm performance and therefore firms are partially compensated for the wage increases associated with unions (Hirsch and Addison 1986; Addison and Hirsch 1989; Belman 1992; Belman and Bloch forthcoming). At a minimum, economically rational firms will use the wage increase brought about by unionization to improve the quality of their workforce over time. This raises productivity, lowers costs, and reduces the economic burden imposed by unions (Johnson 1975). If employers use the higher union wage to attract superior workers and the characteristics which make such workers superior are unobserved by the researcher, part of the returns to unobserved productivity enhancing characteristics will be misattributed to union membership in a cross sectional earnings model.<sup>15</sup>

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14. A formal exposition of the approach is exposed in Appendix 3, available upon request from the first author.

15. The issue of bias of the returns to union membership from unobserved individual characteristics is not related solely to productivity. For example, unionization is more common in hazardous industries (Belman 1988) and compensating differentials may only occur in the presence of unions (Dorman and Hagstrom 1998). Individuals who, due to a "taste for danger" are willing to accept higher job hazards in return for higher compensation would then be more likely to be union members. As the "taste for danger" is unobserved in labour market data sets, the compensating differential for hazardous work will be captured in the estimated return to union membership.



One solution to this problem has been to estimate individual fixed effects (FE) models with longitudinal micro-data. Application of FE models to such data allows the researcher to distinguish effects which are unique to the individual (and unobserved) from those produced by observable characteristics such as union membership. The effect of FE correction on estimates of union wage effects has been dramatic in other research. Hirsch found that estimated returns to union membership among truck drivers declined from 28 to 9% between a national cross sectional model and a FE model (Hirsch 1993).

We use the National Longitudinal Survey of Youth (NLSY) to estimate both cross sectional and FE models data for 1990–1996. The difference between these models suggests the degree to which the coefficient on union membership in our CPS estimates might be biased by unobserved individual characteristics. The specification is similar to that used in our base model. The cross sectional estimates, the counterpart of the CPS estimates used in the balance of this study, are obtained by estimating a log wage equation for each year from 1990 to 1996. The coefficients for postal and union membership are then averaged using the proportion of the observations in a year as its weight.<sup>16</sup> Possibly reflecting the youth of the participants in the NLSY, the cross sectional estimates for union membership and postal employment are substantially larger than those obtained from the CPS (see table 2). The estimated postal differential is 22.1% and the union differential is 15.1%.<sup>17</sup>

The fixed effects model is estimated across the period from 1990 to 1996 and incorporates indicator variables for the year. Approximately 1,100 individuals joined or left union membership during this period; 59 began or ended postal employment.<sup>18</sup> The FE estimates are considerably smaller than the cross sectional estimates, 8.2% for postal employment and 6.5% for union membership.<sup>19</sup> This finding suggests that the cross-sectional return

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16. The dependent variable has been converted into real 1996 dollars. Standard errors for the averaged coefficient are calculated by the delta method.

17. Applying Wachter et al.'s method of attributing part of the union differential to public sector status, the estimated postal differential would be 32.7%.

18. The postal sample size is smaller than might be desired but the estimate is statistically significant in a 5% test, indicating that the sample size is not a source of excessive inaccuracy in the estimate.

19. The decline in the measured effect of union membership between the OLS and FE estimates obtained from the NLSY are similar in magnitude to those found by Hirsch for truck drivers. Applying the weighting suggested by Wachter et al., the postal differential would be 12.8%.

**TABLE 2**  
**Estimating Union and Postal Effects Differentials: Issues in the Treatment of Individual Fixed Effects and Bargaining Power**

<i>CPS Estimates (OLS)</i>		
Postal Effect		9.9%
Union Effect		16.6%
Postal Estimate with Weighted Union Membership Effect		20.4%
Application of NLSY Ratio to CPS Results (39.7% of the original postal effect)		8.1%
<i>NLSY Estimates (OLS and FE)</i>		
<i>1990–1996</i>	<i>NLSY without Controls (OLS Estimate)</i>	<i>NLSY with Controls (Fixed Effect Estimate)</i>
Postal	22.1%	8.2%
Union	15.1%	6.5%
Ratio of Fixed Effect to OLS-Postal	37.1%	
Ratio of Fixed Effect to OLS-Union	43.0%	

to postal employment reflects, in part, unobserved productivity characteristics. If one assumes that there would be a similar proportional reduction in the postal effect in the CPS data, as occurs in the NLSY data with the FE method, then the postal wage effect would be 8.1% rather than 20.4%.

To summarize, increased union coverage is viewed as flowing from public employment and it is argued part of the resulting union premium should be viewed as part of the public earnings differential. The estimate of the union premium depends on the method of estimation and results in postal differentials vary considerably.

### *The Treatment of Occupation*

Two persistent criticisms of occupational wage surveys are that they do not provide useful information on occupations unique to the public sector and that, even when occupations are not unique, matching is arbitrary as job duties might well differ between sectors (Smith 1977; Venti 1987).

Yet, regression estimates have typically controlled only for very broad occupational groups; for instance, in our base equation, controls are present only for “major occupations.” Hence, postal workers are implicitly compared to an average of all “administrative support” (clerical) workers. However, the work of clericals is diverse with considerable variation in skills, job requirements and working conditions between clerical occupations, with consequent considerable variation in wages. It may be that, similar to postal workers, few clerical occupations have wages which are close to the average for all clericals. Here we examine that variance among clericals and find that although the pay of the major postal occupations is above the average for all clerical occupations, it is similar to that of many of the largest clerical occupations.

We illustrate this point by estimating occupational specific wage components for the two largest occupations in the Postal Service (and in the federal sector as a whole), letter carriers and postal clerks, and compare these with occupational specific wage components for the 54 occupations which compose the broad private sector administrative support group. We estimate an equation similar to others in the article except that we drop the intercept and the postal indicator, replace the controls for major occupation with controls for all three digit occupations, and limit the sample to private sector employees, postal letter carriers, and postal clerks. This approach assures that the occupational coefficients for clerks and letter carriers capture effects associated both with their work and with employment by the postal service.<sup>20</sup> Since we control for factors such as education, age, race, union membership and gender, the occupational wage payments may be interpreted as a residual occupational effect.<sup>21</sup>

Weighing the private sector occupational components by the sample occupational distribution, the mean private sector occupational wage is \$12.69, 45¢ less than the occupational earnings of Letter Carriers. This average conceals considerable variation in wages between occupations and in their difference from the wages of letter carriers. Computer equipment supervisors receive \$3.78 per hour more than letter carriers, other things equal, whereas material recording and scheduling clerks receive \$3.56 per hour less. Typists occupational wage is 47 cents an hour higher than Letter Carriers while secretaries, the largest private sector clerical occupation,

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20. The same result might be achieved by keeping all postal workers in the model, adding a postal indicator variable, and obtaining an estimate of the postal effect for letter carriers and clerks by summing their occupational and postal component. The approach adopted for this research is easier to implement and avoids additional calculations to obtain measures of significance.

21. Estimated occupation specific components for clericals are provided in Appendix 2, available upon request from the first author.

earn 33 cents less. However, neither of the last two differences is statistically significant. Indeed, the occupational wage of the four largest private sector clerical occupations, and 30 of the 52 private sector occupations, are either greater than or not statistically different from the occupational earnings of Letter Carriers.<sup>22</sup>

The typical comparability regression implicitly compares the earnings of postal employees to the average earnings of private sector clericals. A closer consideration of the comparison to clericals suggests that, although the earnings of Letter Carriers are above the average of private sector clericals, they are similar to those of many important private sector clerical occupations. The magnitude of these differences tends to be modest and may be explained by differences unmeasured skills and abilities, working conditions, and other characteristics of the detailed clerical occupations. While this more disaggregate approach moves away from using broad averages, it would seem to provide a more complete portrait of the clerical wage structure and returns some of the emphasis in the comparability exercise to the nature of the duties being performed.

### ***CONCLUSIONS ON REGRESSION APPROACHES***

We have argued that the implicit assumption of much regression analysis on comparability is that the proper private sector standard is a weighted average from a representative sample. This standard reflects the influence of wage determination across firms rather than within firms and, as such, may be inappropriate for setting earnings within a single employer, the Postal Service. Rather than decide which industry or occupations most closely resemble the postal service and its workers, the assumption has been that postal earnings should reflect the average contribution of various wage determining factors across private sector firms. For instance, the gender and urban differentials evident from the private sector reflect the distribution of workers across employers yet are unlikely to reflect the actual differentials within any firm. We have suggested that there exist other logical comparisons than the weighted average that seem equally sensible and yield very different estimates.

Ultimately, this study is not a call to abandon regression based estimates of comparability but to recognize that still at centre stage is the issue of which private sector workers form the proper comparison. The regression estimates should follow once the private sector sample is defended as appropriate and the controls defended as logical. A simple

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22. The occupational comparison is less favourable to Postal Clerks as their occupational wage component is 53¢ above that of letter carriers.

reflex that the full private sector sample is a representative cross-section does not meet this standard.

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## RÉSUMÉ

### **La comparabilité des gains du secteur public : nouvelles évaluations pour le service postal des États-Unis**

La comparabilité avec le secteur privé, c'est-à-dire le fait que les travailleurs du secteur public obtiennent la même rémunération que dans le privé pour des emplois similaires, demeure la norme largement acceptée pour décider des gains des employés du secteur public. Son vaste attrait origine de la perception de son caractère équitable, de sa faisabilité et de la croyance qu'elle contribue à l'efficacité économique (Belman et Heywood 1996). Encore qu'en dépit du consensus presque atteint sur le principe, l'étendue de la comparabilité et la façon correcte de la mesurer demeurent toutes deux contestées. On a identifié ce débat comme étant « la personne versus le poste occupé ». Conformément à une tradition,



plusieurs juridictions, incluant celle du gouvernement fédéral aux U.S.A., ont effectué des enquêtes qui retenaient des occupations simples (ou positions) comme bases servant à l'établissement des salaires au sein de la fonction publique (Belman, Franklin et Heywood 1994). Pendant plus de vingt ans, on a soutenu que les enquêtes sur les occupations habituellement retenues aux fins de comparabilité mériteraient d'être remplacées par des analyses de régression faisant appel au concept de « capital humain ». Conformément à ce point de vue, le recours à de vastes échantillons de travailleurs représentatifs en s'assurant de contrôler les caractéristiques individuelles permet d'éviter bien des difficultés et des évaluations imparfaites associées aux enquêtes salariales (Smith 1976, 1977 ; Venti 1987).

Cet article met l'accent sur le fait que l'approche de l'analyse de régression ne permet pas non plus d'éviter ces difficultés au moment où elle retient implicitement pour fins de comparaisons des secteurs industriels, des entreprises et des occupations. En effet, ces choix définissent le devis descriptif et l'échantillon pour les régressions estimées et déterminent largement l'ampleur de la comparabilité. C'est un point qui n'a pas reçu toute l'attention qu'il méritait, parce que l'approche de la régression tient habituellement pour acquis sans autre preuve ou indication que la comparaison appropriée dans le cas des travailleurs du secteur public est celle du travailleur moyen du privé montrant des caractéristiques personnelles similaires.

La présente étude évite ici de façon consciente la tentation de présenter le différentiel correct pour le secteur public. Elle se sert plutôt des données sur les travailleurs du service postal américain pour démontrer la sensibilité d'un différentiel basé sur les régressions face à d'autres hypothèses également raisonnables que l'on formule au sujet des échantillons servant aux comparaisons et aux spécifications. De plus, nous soutenons que le fait de reconnaître cette sensibilité fait appel à une approche à l'évaluation et à la politique plus finement ciselée que celle souvent utilisée. L'ampleur de la comparabilité des gains dans le cas des travailleurs des services postaux aux U.S.A. a été contestée (Perloff et Wachter 1984 ; Asher et Popkin 1984) et ce débat renvoie précisément aux évaluations concernant la comparabilité. Dans la première section, nous avons mis à jour ce débat en réalisant que l'avantage salarial du travailleur moyen de la poste s'établit à 9,9 %. Nous réalisons aussi que, lorsque les employés féminins et ceux des régions rurales génèrent des différentiels de l'ordre de 21,0 % et 14,4 % respectivement, les différentiels pour les hommes et les salariés des régions urbaines se situent tous deux à 6,6 % et ils sont plutôt modestes. En délaissant ce fait et en basant la politique sur le « différentiel moyen », il est probable qu'on arrive à un système de rémunération fonctionnel. En abaissant tous les salaires du service postal basés sur la moyenne, il

deviendrait difficile d'embaucher dans les régions urbaines des salariés qualifiés et en nombre suffisant. En alternance, alors qu'on réduirait les salaires des femmes et des travailleurs ruraux seulement, on ferait face à des limites juridiques et institutionnelles. D'une façon plus générale, le différentiel moyen issu de la régression reflète les effets « salaire » entre les entreprises et les marchés du travail à un point tel qu'il serait indésirable, voire même impossible, de les reproduire au sein d'un employeur unique tel que le service postal.

Dans la seconde section de cette étude, nous isolons le rôle crucial joué par trois caractéristiques de l'emploi. L'image de l'industrie, de l'occupation et du régime syndical varie considérablement dans les écrits (Moulton 1991 ; Moore et Raisian 1991 ; Belman et Heywood 1988, 1990, 1996). La comparaison du secteur public avec le reste de la main-d'œuvre du secteur privé de façon implicite met en regard les employés des postes avec d'autres employés qui travaillent dans des conditions différentes et des emplois également différents. Nous démontrons que, lorsque les travailleurs des postes sont comparés avec les travailleurs de d'autres secteurs considérés comme semblables (le transport, les communications et les services publics, par exemple), le différentiel se situe entre 0 et 4,7 % selon la comparaison retenue. L'effet de mieux contrôler la variable « occupation » est aussi évident. Les employés qui forment le noyau du service postal sont classés comme employés de bureau. Nous observons, en tenant constant le facteur « capital humain » et en limitant la comparaison à ces travailleurs, que la composante salaire de l'occupation n'est pas différente de celle des autres travailleurs de bureau. La composante « salaire » de l'occupation de bon nombre de ces emplois de bureau n'est pas statistiquement distincte des travailleurs des postes. En général, même si aucun facteur n'influence les estimés de comparabilité de la même façon, des contrôles et des échantillons étroitement appareillés tendent généralement à réduire, voire même à éliminer, la soi-disant prime de salaire du service postal. Peut-être, et d'une manière plus importante, les évaluations fournissent une image plus précise des endroits, des occupations et des travailleurs qui sont présentement sous-rémunérés ou sur-rémunérés.

Dans la dernière section de notre étude, nous concluons que l'utilité des évaluations basées sur l'analyse de régression des différentiels de gains dépend des choix que l'on effectue à l'endroit de l'échantillon, des caractéristiques de l'emploi qu'il faut retenir et des comparaisons qu'il faut établir. Ce sont là des choix qui n'ont pas eu toute l'attention qu'ils méritaient.