

# AN ANALYSIS OF WORKERS' CHOICE BETWEEN EMPLOYMENT IN THE PUBLIC AND PRIVATE SECTORS

REBECCA M. BLANK\*

---

This paper estimates the extent to which workers with different personal characteristics are likely to be employed in the public versus the private sector. The author develops a reduced-form two-way probit model to analyze workers' choice between the two employment sectors, together with a three-way model that breaks this decision down to a choice among private, federal, and state and local government jobs. She estimates these models using May 1979 CPS data. The results show that, other things equal, government employment is preferred by the "protected" groups of veterans, nonwhites, and women. In addition, highly educated and more experienced workers are more likely to choose the public sector. Significant differences are found within the public sector between federal and state-local choices. The results also indicate that sectoral choice is influenced by more than wage comparisons.

---

**D**IFFERENTIALS in public and private sector compensation have been the subject of much recent research, with most attention paid to differences in wages and union contract settlements. Public and private sector jobs may differ in several other ways, however, such as in hiring and advancement opportunities, job security, geographic location, and skill requirements. As a result, one worker with a particular set of personal characteristics and preferences may find public work more attractive, while another worker with a dif-

ferent set of skills and preferences may be attracted to private employment. Until now, the literature on public-private employment differentials has paid little attention to the underlying decision mechanisms by which individual workers choose which sector offers them the best employment opportunity.

This paper attempts to fill that gap by estimating the extent to which workers with different personal characteristics have differing probabilities of choosing public versus private sector employment. A reduced-form two-way probit model is developed to analyze workers' choice between the public and the private sectors, together with a three-way probit model that breaks this decision down to a choice among private, federal, and state and local jobs. Data from the May 1979 Current Population Survey are used to estimate these two models.

---

\*The author is Assistant Professor at the Woodrow Wilson School of Public and International Affairs and the Department of Economics, Princeton University. A grant from the Sloan Foundation supported this research. The author gratefully acknowledges the comments and assistance of Henry S. Farber.

### Explaining Differences in Sectoral Choice

Standard economic theory views workers as possessors of bundles of personal characteristics that determine their marginal product on a particular job. A worker seeks the job that best repays his individual set of characteristics. If particular characteristics are rewarded differently in the public than in the private sector, and if different types of jobs are available in each sector, different types of workers will choose to be public or private employees. This section will first compare direct compensation between the sectors and then look at the other sectoral differences that would encourage different kinds of people to seek employment in different sectors.

Recent research investigating public and private wage-setting mechanisms indicates that significant sectoral wage differences do exist. This is not surprising, since the profit-maximization theories typically applied to the private sector are far less compelling when applied to a governmental unit whose wages can be easily influenced by social, political, and nonlabor budgetary issues. In practice, many governmental units claim to duplicate private sector wage levels by following the "prevailing wage" principle, that is, paying public employees at rates equivalent to those paid for comparable jobs in the private sector. Governmental units have therefore conducted a variety of wage surveys to determine how public and private sector jobs compare and thereby have developed a variety of local, state, and federal governmental pay scales.

Yet differences in the resulting wage rates between the two sectors continue to exist. The major causes of this divergence have been documented by previous researchers and include biases in the surveys themselves;<sup>1</sup> the intrusion of political issues into the determination of public sector wages;<sup>2</sup>

differences in the bargaining power of public and private sector unions;<sup>3</sup> and the stronger impact on governmental wages of policies, such as affirmative action or the minimum wage.<sup>4</sup>

These sectoral differences can be observed when wages are estimated separately by sector. Table 1 defines the set of variables used throughout this paper. Table 2 uses data from the May 1979 Current Population Survey (described below in the section on data) to estimate wage equations.<sup>5</sup> Significant differences emerge between the parameters determining wages in each sector. Table 2 shows the comparative effect of estimating wages for all workers together (column 1) and separately for public and private workers (columns 2 and 3). An F-test comparing the separate regressions of columns 2 and 3 with the unified regression in column 1 indicates that the coefficients are significantly different at the .01 level of confidence. Columns 4 and 5 estimate separate wages for federal and for state and local

---

ermesh, ed., *Labor in the Public and Nonprofit Sectors* (Princeton, N.J.: Princeton University Press, 1975), pp. 1–48; and James E. Annable, Jr., "A Theory of Wage Determination in Public Employment," *Quarterly Review of Economics and Business*, Vol. 12, No. 4 (Winter 1974), pp. 43–58.

<sup>3</sup>Roger W. Schmenner, "Determination of Municipal Employees' Wages," *Review of Economics and Statistics*, Vol. 55, No. 1 (February 1973), pp. 77–86; Orley Ashenfelter, "Municipal Government Structure, Unionization, and the Wages of Firefighters," *Industrial and Labor Relations Review*, Vol. 24, No. 2 (January 1971), pp. 191–202; and Linda N. Edwards and Franklin R. Edwards, "Wellington and Winter Revisited: The Case of Municipal Sanitation Workers," *Industrial and Labor Relations Review*, Vol. 35, No. 3 (April 1982), pp. 307–18.

<sup>4</sup>William Johnson, "Racial Wage Discrimination and Industrial Structure," *Bell Journal of Economics*, Vol. 9, No. 1 (Spring 1978), pp. 70–81; D. Alton Smith, "Government Employment and Black/White Relative Wages," *Journal of Human Resources*, Vol. 14, No. 1 (Winter 1980), pp. 77–86.

<sup>5</sup>These regressions are not unbiased. A problem of self-selectivity bias occurs, since wages are paid only after workers have already chosen their sector of employment. Precise wage estimates would require estimation of a "two-way switching model," usually estimated by Mills ratio techniques or maximum likelihood. The purpose of this paper is not to develop wage regressions, however; the wage results are presented here primarily to allow for comparisons with the existing literature, in which selectivity-bias corrections have not been performed.

<sup>1</sup>Walter Fogel and David Lewin, "Wage Determination in the Public Sector," *Industrial and Labor Relations Review*, Vol. 27, No. 3 (April 1974), p. 410–31.

<sup>2</sup>Ronald G. Ehrenberg, "The Effects of Unionization on Wages in the Public Sector," *Industrial and Labor Relations Review*, Vol. 27, No. 3 (October 1973), pp. 36–48; Melvin Reder, "A Theory of Employment and Wages in the Public Sector," in Daniel S. Ham-

employees. An F-test comparing the separate federal and state-local results with the overall public sector results also indicates statistically different coefficients at the .01 level of confidence.

The sectoral differences indicated by these results are generally consistent with patterns noted by previous researchers.<sup>6</sup> "Protected" groups—women, nonwhites,

and veterans—consistently earn more in the public than in the private sector. The expected negative wage differentials associated with being female are present in all sectors, but they are smaller in public, and especially state and local, employment. Veterans' positive wage differentials are larger in the public sector equations. Nonwhites show small but significant negative wage differentials in the private sector, but race has no significant effect within the separate federal and state-local equations. Higher pay for public sector employees with high education levels is evident, especially in the federal government, while workers with less education appear to do better in the private sector.<sup>7</sup> The occupational mix of the two sectors also differs in a way that will be discussed below.

It is important to note that wage differences between the sectors appear in the coefficients on almost all variables, indicating that the sectors respond quite differently to worker characteristics. This difference supports the proposition of this paper that workers can make clear choices between employment in the two sectors.<sup>8</sup> Moreover, these differences in the wage structures suggest that workers with characteristics more highly rewarded in the public sector should be more likely to choose employment there, and vice versa.

Nonetheless, wage differentials alone do not completely characterize the differences between the sectors. In particular, we might

Table 1. Definitions of Variables.†

Variable	Definition
EXP	Estimated years of experience = Age – Education – 6
RACE	1 = Nonwhite, 0 otherwise
GENDER	1 = Female, 0 otherwise
VET	1 = Veteran, 0 otherwise
<i>Highest Year of Education Completed</i>	
E<8	1 = 8 or fewer years, 0 otherwise
E9–11	1 = More than 8 and fewer than 12 years, 0 otherwise
E12	1 = Exactly 12 years, 0 otherwise
E13–15	1 = More than 12 and fewer than 16 years, 0 otherwise
E16	1 = Exactly 16 years, 0 otherwise
E16+	1 = More than 16 years, 0 otherwise
<i>Geographic Location</i>	
WASH	1 = Resides in Washington, D.C. SMSA, 0 otherwise
NC	1 = Resides in north-central region, 0 otherwise
SOUTH	1 = Resides in southern region, 0 otherwise
WEST	1 = Resides in western region, 0 otherwise
<i>Occupation</i>	
PROF	1 = Professional and technical worker, 0 otherwise
ADM	1 = Administrative or managerial worker, 0 otherwise
CLER	1 = Clerical worker, 0 otherwise
OPER	1 = Operative, 0 otherwise
LABOR	1 = Laborer, 0 otherwise
SERV	1 = Service worker, 0 otherwise

†Farmers, salespeople, and craft workers are excluded, since there are very few government workers in these categories.

<sup>6</sup>Sharon P. Smith, "Pay Differentials Between Federal Government and Private Sector Workers," *Industrial and Labor Relations Review*, Vol. 29, No. 2 (January 1976), pp. 179–97; Joseph Quinn, "Wage Differentials Among Older Workers in the Public and Private Sector," *Journal of Human Resources*, Vol. 14, No. 1 (Winter 1979), pp. 41–62; and James Long, "Are

Government Workers Overpaid?" *Journal of Human Resources*, Vol. 17, No. 1 (Winter 1982), pp. 123–31.

<sup>7</sup>My data show no evidence of higher pay to low-skilled public employment, as other researchers have found. I cannot explain this difference, since my data source—a CPS monthly random sample—is very similar to the data sources of other researchers. The difference may result from the type of data cleaning I do initially, looking only at employed heads of households—a procedure that may eliminate many of the very low skilled.

<sup>8</sup>This difference across all coefficients also indicates that the traditional method of differentiating between public and private employment in wage estimates—including a dummy or shift variable for government workers—is inadequate. The effect is not simply a change in the equation constant but a change in all parameters. This is also noted in Sharon P. Smith, *Equal Pay in the Public Sector: Fact or Fantasy* (Princeton, N.J.: Industrial Relations Section, Princeton University, 1977), pp. 49–52.

Table 2. Wage Equations.†  
(standard errors in parentheses)

	<i>All Workers</i>	<i>Private Workers</i>	<i>Public Workers</i>	<i>Federal Workers</i>	<i>State-Local Workers</i>
GENDER	-.280** (.011)	-.294** (.013)	-.207** (.022)	-.271** (.043)	-.152** (.025)
VET	.113** (.009)	.103** (.011)	.130** (.019)	.001 (.034)	.129** (.023)
E<8	-.246** (.016)	-.231** (.017)	-.291** (.039)	-.326** (.086)	-.275** (.043)
E9-11	-.111** (.014)	-.109** (.015)	-.095** (.036)	-.105 (.063)	-.086* (.041)
E13-15	.059** (.012)	.051** (.013)	.065** (.025)	.047 (.039)	.073** (.030)
E16	.159** (.014)	.169** (.017)	.164** (.028)	.249** (.045)	.139** (.034)
E16+	.209** (.015)	.196** (.020)	.264** (.028)	.347** (.048)	.284** (.033)
EXP	.003** (.0003)	.003** (.0004)	.005** (.001)	.007** (.001)	.004** (.0003)
RACE	-.035** (.012)	-.060** (.014)	.033* (.022)	-.022 (.037)	.030 (.026)
PROF	.411** (.016)	.494** (.020)	.244** (.028)	.374** (.062)	.183** (.032)
ADM	.446** (.016)	.488** (.019)	.355** (.030)	.470** (.066)	.285** (.034)
CLER	.254** (.015)	.294** (.018)	.168** (.027)	.238** (.058)	.049* (.034)
OPER	.255** (.014)	.305** (.017)	.133** (.042)	.315** (.083)	.072* (.047)
LABOR	.086** (.018)	.136** (.021)	-.033 (.041)	.087 (.086)	-.063* (.045)
Constant	1.511** (.015)	1.479** (.018)	1.539** (.028)	1.604** (.070)	1.539** (.031)
N	10,908	8,344	2,564	645	1,919
R <sup>2</sup>	.342	.358	.304	.392	.288

†Variables defined in Table 1. The dependent variable is log(WAGE), and the data source is the May 1979 Current Population Survey.

\*Significant at the .10 level.

\*\*Significant at the .01 level.

also expect some of the following factors to influence workers who compare the one sector with the other:

1. Those groups "targeted" by government for affirmative action (women, minorities, and veterans) may receive both wage and nonwage advantages from government employment. If the government places greater weight on social welfare commitments than does private industry,

it should be more effective in enforcing affirmative action rules internally than it is in enforcing them in the private sector. Of course this effect is visible in wages, as Table 2 indicates, but there may also be nonwage advantages for these groups in the public sector, such as an increased probability of being hired (or of not being fired or laid off) and better advancement opportunities over the long run.

Table 3. Sectoral Distribution of Employment Within Occupations, 1979.  
(Columns 1 & 2 sum to 100 percent)

Occupation	Private Sector	Public Sector	Federal Sector	State-Local Sector
Professional and Administrative	68.8	31.2	7.1	24.1
Sales	99.4	0.6	0.0	0.6
Clerical	72.5	27.5	13.4	14.1
Craft	90.5	9.5	3.3	6.2
Operative and Laborer	93.2	6.8	1.6	5.2
Service	65.2	34.8	3.4	31.4

Source: May 1979 Current Population Survey.

2. The lack of profit pressures on the government would lead those with more concern for job security to seek jobs in the public sector. Research has indicated that employee turnover is lower in the public sector.<sup>9</sup> Bellante and Link, in one of the few articles that directly address issues of sectoral choice,<sup>10</sup> show that measured risk aversion among workers is significantly correlated with sectoral choice. Those in poor health, and those who are more risk averse, should thus be more likely to seek the less economically pressured, more secure government sector.

3. If some jobs are more likely to be unionized in the public sector than in the private sector, and some people desire union jobs, those people will be apt to choose public sector employment. For instance, many clerical and other white-collar jobs in government are unionized—a rare occurrence in the private sector. Again, an important effect of unionization is on wages, but unions also influence other aspects of the work situation by providing standardized grievance procedures and strict seniority ladders, among other things. Previous research indicates that certain characteristics, such as minority status and low skills, are correlated with the desire for a union job.<sup>11</sup>

4. Geographic preferences may also affect sectoral job choice as the availability of public or private jobs varies among geographic regions. Clearly, the probability of finding a government job is greater in Washington, D.C. and in urban areas. To the extent that people's geographic preferences are determined by such noneconomic factors as the proximity of family and friends or familiarity with an area, sectoral choice probabilities will be affected by the relative sectoral supply of jobs in that area.<sup>12</sup>

5. Certain occupational groups will be more or less likely to choose public or private sector employment as the demand for their skills varies significantly among the sectors. Table 3 indicates the differences in occupational opportunity between the sectors. The government clearly hires a greater percentage of professional, administrative, clerical, and service workers than it does sales and craft workers or laborers. The federal government has a higher percentage of clerical employment, while state and local governments have a higher percentage of service employment. Thus, individuals with different occupational training and preferences will find different distributions of jobs available to them among the sectors. At the extreme, those who are attracted to particular occupations that do not exist in both sectors (such as firefighters and door-to-door salespersons) will all be found in one sector.

<sup>9</sup>James Long, "Are Government Workers Overpaid?" *Journal of Human Resources*, Vol. 17, No. 1 (Winter 1982), pp. 123–31.

<sup>10</sup>Don Bellante and Albert N. Link, "Are Public Sector Workers More Risk Averse than Private Sector Workers?" *Industrial and Labor Relations Review*, Vol. 34, No. 3 (April 1981), pp. 408–12.

<sup>11</sup>John Abowd and Henry S. Farber, "Job Queues and the Union Status of Workers," *Industrial and Labor Relations Review*, Vol. 35, No. 3 (April 1982), pp. 354–67.

<sup>12</sup>This hypothesis should not be confused with the argument that individuals will move to areas where preferred jobs exist. This data set indicates nothing about individual migration history. For the purposes of this analysis, geographic location is interpreted as an indicator of sectoral job supply. To the extent that both effects are occurring, the coefficient on location has an unclear interpretation.



The above discussion provides the background necessary to specify a model of sectoral employment choice. But before we turn to this model, one additional sectoral difference must be addressed.

All public sector employment cannot necessarily be treated as similar. The factors that differentiate public and private workers may operate to different degrees within different levels of government employment. Very little research has compared state, local, and federal employees with one another. (An important exception is work by Sharon Smith). Most analyses of wage differences either look at a mixed group of all public workers or take survey data from one particular state or city. This paper not only examines sectoral choice at the aggregate level, but also investigates employment differences between the federal and the state and local levels. Among the differences that we might expect to observe between the two public sector levels are the following:

1. The federal government is often assumed to be more effective at enforcing certain social goals because it is protected from local biases and pressures. For instance, if affirmative action procedures can be more easily enacted and enforced at the federal level, we might expect minorities, women, and veterans to find federal employment more attractive than state or local employment.<sup>13</sup>

2. The unionization of workers by occupation varies among the government sectors. A smaller percentage of employees are unionized at the state and local level than at the federal level.<sup>14</sup> In choosing a

job, if union-nonunion choices are made simultaneously with sectoral choices, those characteristics that affect union choice should also affect sectoral choice. In particular, we would expect those characteristics associated with a preference for unions to be associated with a preference for federal employment over state and local employment.

3. The geographic preferences that place some workers in areas where more government jobs are available also result in a higher probability of federal employment in Washington, D.C., and more state and local employment opportunities in other urban areas.

4. Occupational opportunities also vary among government levels, as Table 3 demonstrates. The federal government employs a higher percentage of all clerical workers than it does of all professional and administrative employees (who include those in the educational establishment, most of whom, of course, work in the state and local sectors). And service jobs are more prevalent within state and local government, as noted above. This distribution of occupations across sectors should affect sectoral choice probabilities for workers with particular occupational training.

The empirical work of this paper investigates the factors discussed above. Differentiating between public and private workers, between federal and state and local public workers, and among occupational categories, the analysis attempts to determine how differences in worker and job characteristics affect the likelihood of employment in different sectors.

## Estimation Procedure

*Two-way choice estimation.* Let us first assume that workers make two-way choices between public and private sector employment. Assume each worker has informa-

<sup>13</sup>The wage estimates in Table 2 imply uniformly better wage opportunities for all three of the "targeted" groups—women, minorities, and veterans—at the state-local level. It would be interesting to know if this is a recent phenomenon. (The data here represent the year 1979.) It would also be interesting to investigate more case-specific data to determine whether these higher wages reflect a greater propensity to be hired into high-paying positions or whether they reflect higher wages for the same job.

<sup>14</sup>These statistics have been most exhaustively discussed by John F. Burton, Jr., "The Extent of Collective Bargaining in the Public Sector," in Benjamin Aaron, ed., *Public Sector Bargaining* (Washington, D.C.: Bureau of National Affairs, 1979), p. 17. He indicates

that 48.7 percent of federal employees are covered by bargaining agreements, while 37.0 percent of state and local employees are similarly covered. (For certain groups, the coverage is much higher; for instance, it is greater than 90 percent for postal and federal executive-branch employees.)

tion on the best public and private sector jobs available to him. Given his personal preferences and the characteristics of each job, he can calculate the utility he would receive from employment in either sector. Write these two utilities as  $V_p$ , the utility an individual expects to receive from a job in the private sector, and  $V_g$ , the utility an individual expects to receive from a comparable job in the public sector. A worker will choose the government job if his utility from public employment is higher than his utility from private employment, implying  $V_g - V_p > 0$ . A worker will choose the private sector job if  $V_g - V_p < 0$ . Assume these utilities can be characterized as linear functions, such that:

$$(1) \quad V_i = d_i \cdot Z + u_i,$$

where  $i$  indexes the sectors;  $Z$  is a vector of personal and job characteristics;  $d$  is a vector of coefficients associated with  $Z$ ; and  $u$  is a random error term. Since the choice between sectors is determined by the difference between  $V_g$  and  $V_p$ , we can call this difference  $S$  and use Equation 1 to write:

$$(2) \quad S = V_g - V_p = a \cdot Z + e,$$

where  $a = d_g - d_p$  and  $e = u_g - u_p$ . If the government job is chosen, then  $S$  is greater than zero. If the private job is chosen, then  $S$  is less than zero.

Unfortunately, we cannot observe the utilities  $V_g$  or  $V_p$ , making it impossible to observe the value of  $S$  for any individual. Nevertheless, it is possible to observe an individual's final choice between public or private sector employment. Thus, rather than estimating Equation 2, we must estimate a discrete choice model, in which an individual is part of one of two categories, defined by  $S'$ :  $S' = 1$  if  $S > 0$ , and  $S' = 0$  if  $S < 0$ . If we assume  $e$  is normally distributed, with a normalized variance of one, this discrete model can be simply estimated by probit techniques to obtain estimates of the coefficient vector  $a$ .

*Three-way choice estimation.* Estimation of a three-way sectoral choice model requires

a more sophisticated procedure:<sup>15</sup> a choice model according to which people choose simultaneously among private (sector  $p$ ), federal (sector  $f$ ), and state and local (sector  $s$ ) jobs. To develop such a model, we can start at the same place as before, assuming a worker attaches particular utilities to jobs in the different sectors. As before, the utility associated with a job in sector  $i$  is a linear function:

$$(3) \quad V_i = d_i \cdot Z + u_i,$$

where  $i$  indexes the sectors and equals either  $p$ ,  $f$ , or  $s$ .

The worker will choose the private sector if it is superior to both alternatives  $V_p - V_f > 0$  and  $V_p - V_s > 0$ . Similarly, he will choose the federal sector if  $V_p - V_f < 0$  and  $V_f - V_s > 0$ , or the state and local sector if  $V_p - V_s < 0$  and  $V_f - V_s < 0$ . As before, we can rewrite these utility comparisons as:

$$(4) \quad S_1 = V_p - V_f = a_1 \cdot Z + e_1,$$

where  $a_1 = d_p - d_f$  and  $e_1 = u_p - u_f$ ;

$$(5) \quad S_2 = V_p - V_s = a_2 \cdot Z + e_2,$$

where  $a_2 = d_p - d_s$  and  $e_2 = u_p - u_s$ ;

$$(6) \quad S_3 = V_f - V_s = a_3 \cdot Z + e_3$$

where  $S_3 = S_2 - S_1$ , and  $a_3 = a_2 - a_1$  and  $e_3 = e_2 - e_1$ .

As in the two-way choice model, underlying utility values are unobservable, as are the values of  $S_1$ ,  $S_2$ , and  $S_3$ . Only a final, discrete choice for each individual  $i$  is observable, which can be indexed as  $P_i = 1$  if the private sector is chosen, and  $P_i = 0$  if otherwise; and  $F_i = 1$  if the federal

<sup>15</sup>This discussion is an application of the three-way probit model described in Jerry Hausman and David Wise, "A Conditional Probit Model for Qualitative Choice," *Econometrica*, Vol. 46, No. 2 (March 1978), pp. 403–26; and Henry S. Farber, "The Determination of the Union Status of Workers," *Econometrica*, Vol. 51, No. 5 (September 1983), pp. 1417–37. For a full theoretical discussion and a comparison to other discrete-choice estimation procedures see G. S. Maddala, *Limited Dependent and Qualitative Variables in Econometrics* (Cambridge: Cambridge University Press, 1983), pp. 13–78.

sector is chosen, and  $F_i = 0$  if otherwise. The state-local sector is chosen if  $P_i = 0$  and  $F_i = 0$  simultaneously.

We now have a model according to which workers make bivariate choices. The probability that individual  $i$  will be a private sector employee is:

$$pr(P_i = 1, F_i = 0) = pr(S_{1i} > 0, S_{2i} > 0);$$

the probability that individual  $i$  will be a federal employee is:

$$\begin{aligned} pr(P_i = 0, F_i = 1) \\ = pr(S_{1i} < 0, S_{2i} - S_{1i} > 0) \end{aligned}$$

and the probability that individual  $i$  will be a state or local worker is:

$$\begin{aligned} pr(P_i = 0, F_i = 0) \\ = pr(S_{2i} < 0, S_{2i} - S_{1i} < 0) \\ = 1 - pr(P_i = 1, F_i = 0) \\ - pr(P_i = 0, F_i = 1). \end{aligned}$$

The likelihood function to be estimated for any individual  $i$  is thus:

$$\begin{aligned} (7) \quad L_i = & P_i (1 - F_i) pr(S_{1i} > 0, S_{2i} > 0) \\ & + (1 - P_i) F_i pr(S_{1i} < 0, S_{2i} - S_{1i} > 0) \\ & + (1 - P_i) (1 - F_i) \\ & pr(S_{2i} < 0, S_{2i} - S_{1i} < 0). \end{aligned}$$

Assuming  $e_1$  and  $e_2$  are bivariate normal with correlation coefficient  $r_{12}$ , the probabilities in Equation 7 can be written as standard bivariate normal distribution functions, and Equation 7 then defines a three-way probit model.

The log of the sum of the likelihood function over all individuals can be maximized, providing estimates of the parameters  $a_1$ ,  $a_2$ , and the correlation coefficient  $r_{12}$ . From these,  $a_3$ ,  $r_{13}$ , and  $r_{23}$  are easily calculated.<sup>16</sup> Note that the underlying

determinants of  $V_p$ ,  $V_f$ , and  $V_s$  ( $d_p$ ,  $D_f$ , and  $d_s$ ) are not identified. Only the coefficients for the differences in utilities ( $a_1$ ,  $a_2$ , and  $a_3$ ) can be estimated.

## Data

As noted above, this paper uses data from the May 1979 Current Population Survey (CPS). That was the first year in which the CPS data identified all employees by private, federal, state, or local employment.<sup>17</sup> The analysis employs a randomly selected subsample consisting of one-fourth of the employed heads of households in the sample. Excluded were all farmers, salespeople, and craft workers, since these occupations have almost no government job opportunities, making the issue of sector choice a moot point. The remaining subsample provides 10,908 observations, of which 8,344 (76.5 percent) are private and 2,564 (23.5 percent) are public. Among the public workers, 645 (25.2 percent) are federal and 1,919 (74.8 percent) are state or local. The selection of variables from the CPS questionnaire is adequate for the purposes of this analysis, with one exception: there is no good measure of health problems or other proxy indicating risk aversion or desire for job security. This variable therefore had to be omitted from the model.

The variables chosen to identify worker characteristics (the components of the  $Z$  vectors in Equations 1 through 7 above) are educational level, experience, gender, minority and veteran status, location, and occupation, as defined in Table 1. Based on the discussion above, these characteristics will be used to estimate a reduced-form model of sectoral choice. For instance, educational levels affect union-nonunion preferences and wages, and may also independently affect choice. (Many academics, for example, expect as a matter of course to do a few years of public service in Washington.) The coefficient on education will describe only the net impact of all these effects; they cannot be separately identified. Other variables have similar multiple

<sup>16</sup> A more complete description of the maximization process and the underlying variance-covariance assumptions of this three-way probit model is available from the author upon request.

<sup>17</sup> Previous years' data tapes had reported this breakdown only for employees in public administration.



effects and are interpretable only as reduced-form coefficients.

### Empirical Results

Table 4 displays results from estimating sector choice for both the two-way and three-way models. Column 1 shows the coefficients demonstrating the likelihood of being in public versus private employment. These results match the predictions well. Those with lower education prefer the private sector, while those with higher education or more experience seem to prefer the public sector, correlating with the wage disparities of these groups discussed above. Nonwhites and veterans—groups protected by federal employment laws—prefer the public sector, but women have no statistically distinguishable preference between the sectors. The geographic variables also clearly have an effect: people living in Washington, D.C., are more likely to be public workers. Among the occupations, service workers are most likely to be public employees, and operatives are least likely.

The three-way choice equation disaggregates these effects even more. Note, first, that the three-way estimation is significantly different from the two-way estimation, implying that the federal and state-local sectors present different job choices to a worker.<sup>18</sup> Many of the coefficients of choice between federal and state-local jobs are significant.<sup>19</sup> In addition,  $r_{1,2}$ , which measures the correlation between the residuals in the choice of the private over the federal sector and the residuals in the choice of the private over the state-local sector, is positive but less than 1. If these two choices were indistinguishable,  $r_{1,2}$  would equal exactly one.

<sup>18</sup>Because of the difference in the variance-covariance structures of the two- and three-way choice models, a likelihood-ratio test comparing the two sets of estimates is not entirely valid. Nevertheless, that test does show a significant difference between the coefficients of the two- and three-way models at the .01 confidence level.

<sup>19</sup>A four-way choice model separating state and local workers was also attempted, but the correlation between state and local choice consistently went to one and prevented convergence, implying that no identifiable difference between these employees existed.

Second, the coefficients comparing the private, federal, and state-local sectoral choices indicate that the federal and state-local coefficients are almost always grouped on the same side of the private sector coefficients. In other words, for each variable, all public sector employees seem to react similarly with respect to the likelihood of their being in government versus private employment, but they vary in the magnitude of their response between the federal and state-local levels.

Women are more likely to be employed at the state level, while nonwhites and veterans are more likely to be employed at the federal level. Interestingly, the last two groups make this choice despite the fact that wages are higher at the state and local level for all three groups of workers, as shown above. This suggests that nonwhites and veterans are influenced in their choice of a sector by nonwage sector characteristics. (Their choice of the federal sector could also be interpreted as a result of misinformation about where the most advantageous employment opportunities are located in the public sector. This possibility is most probable for blacks, who may have strong memories of past local government discrimination.)

Workers with the lowest educational levels prefer the private sector of employment, but those with the highest levels of education and experience prefer public and particularly state and local employment. Again, this finding contradicts our expectations based on the general wage results in Table 2, which showed that the federal government offered the highest monetary reward for high educational achievement. We therefore see further evidence that sectoral employment choice is affected by more than wages. Within occupational choice categories, all groups, relative to the omitted service worker category, seem to choose the federal over the state level. This implies the opposite for service workers, who are far more predominantly employed at the state and local level than elsewhere in the economy.

In short, these results support the predictions about which groups choose to work in the public sector and also provide additional information on how those workers

Table 4. Estimation of Sector-Choice Equations.  
(standard errors in parentheses)

	Two-Way Choice	Three-way Choice		
	Public > Private	Private > Federal	Private > State-Local	Federal > State-Local <sup>a</sup>
GENDER	.052 (.040)	.067 (.075)	-.091* (.045)	-.158* (.085)
VET	.255** (.035)	-.377** (.069)	-.200** (.045)	.177* (.088)
E<8	-.196** (.062)	.253** (.085)	.186** (.063)	-.067 (.069)
E9-11	-.210** (.057)	.214** (.069)	.206** (.058)	-.008 (.050)
E12 <sup>b</sup>	—	—	—	—
E13-15	.024 (.044)	.004 (.051)	-.037 (.046)	-.041 (.040)
E16	.368** (.050)	-.284** (.073)	-.395** (.053)	-.111* (.070)
E16+	.783** (.052)	-.570** (.130)	-.841** (.059)	-.271* (.149)
EXP	.005** (.001)	-.004** (.001)	-.005** (.001)	-.001 (.005)
RACE	.221** (.042)	-.273** (.052)	-.200** (.044)	.073* (.046)
WASH	.624** (.086)	-.921** (.171)	-.318* (.187)	.603* (.314)
NC	-.024 (.043)	.040 (.052)	.019 (.043)	-.021 (.039)
SOUTH	.050 (.041)	-.108* (.055)	-.031 (.042)	.077* (.050)
WEST	.110** (.041)	-.188** (.059)	-.084* (.044)	.104* (.059)
PROF	-.266** (.053)	.009 (.148)	.322** (.060)	.313* (.167)
ADM	-.759** (.053)	.480** (.164)	.811** (.060)	.331* (.182)
CLER	-.248** (.050)	-.186 (.226)	.398** (.091)	.584* (.295)
OPER	-1.260** (.057)	1.026** (.154)	1.285** (.059)	.259* (1.57)
LABOR	-.696** (.066)	.525** (.126)	.706** (.067)	.181* (.117)
SERV <sup>b</sup>	—	—	—	—
Constant	-.673** (.058)	1.294** (.318)	.679** (.059)	-.615* (.311)
N	10,908		10,908	
r <sub>1,2</sub>			.908** (.103)	

<sup>a</sup>The coefficient estimates in this column are computed as the differences of the previous two columns. See Equations 4 through 6 in the text. Standard errors are calculated from the variance/covariance matrix.

<sup>b</sup>Excluded for identification.

\*Significant at the .05 level.

\*\*Significant at the .01 level.

Table 5. Occupational Effects on Sector Choice Probabilities.<sup>a</sup>  
(asymptotic standard errors in parentheses)

Sector	Professional and Administrative	Clerical	Service	Operative and Laborer
<i>Individual 1<sub>b</sub></i>				
Private	50.5 (6.2)	61.2 (8.3)	63.4 (12.3)	90.8 (8.6)
Federal	42.7 (6.5)	33.1 (7.7)	21.8 (10.9)	3.3 (4.7)
State-Local	6.8 (2.2)	5.7 (4.3)	14.8 (8.9)	5.9 (5.5)
<i>Individual 2<sup>c</sup></i>				
Private	76.9 (4.5)	65.6 (7.4)	54.4 (5.9)	93.5 (1.7)
Federal	5.3 (2.4)	27.1 (7.2)	5.5 (3.2)	.9 (.7)
State-Local	17.7 (4.0)	7.3 (2.8)	40.1 (5.8)	5.6 (1.6)
<i>Individual 3<sup>d</sup></i>				
Private	61.1 (2.2)	69.0 (5.0)	38.3 (6.8)	82.6 (4.7)
Federal	6.4 (1.1)	20.3 (4.5)	8.2 (4.9)	1.2 (1.1)
State-Local	32.5 (2.2)	10.7 (2.9)	53.5 (7.0)	16.2 (4.7)

<sup>a</sup>Probability estimates calculated from the coefficients in sectoral choice equations which were estimated separately for each occupation.

<sup>b</sup>Individual 1 is a white female nonveteran, with exactly 12 years of education and with five years of experience, who lives in the Washington, D.C., area and the southern region.

<sup>c</sup>Individual 2 is a black male veteran, with more than 8 and fewer than 12 years of education and with 21.5 years of experience, who lives in the north-central region.

<sup>d</sup>Individual 3 is a white male veteran, with more than 16 years of education and with 21.5 years of experience, who lives in the north-central region.

choose between federal and state-local employment. More than just compensation issues appear to influence sectoral choice within the public sector.

Many of our hypotheses about the differences between government sectors are related to occupational differences. Unionization, educational level, and gender and race employment ratios all vary by occupation, as does sectoral demand (as illustrated in Table 3). It is therefore worthwhile to estimate separate sectoral choice equations for each occupation. This has been done, but space considerations prevent a

detailed presentation.<sup>20</sup> The major pattern of these estimations is shown in Table 5, however, where choice probabilities are calculated for three different individuals in each occupational grouping.

The results demonstrate the extent to which sectoral choice probabilities change as occupation changes. Individual 1 is a white woman with a high school degree and five years of experience, living in the Wash-

<sup>20</sup>Detailed estimation results of sectoral choice by occupational grouping are available from the author upon request.

ington, D.C., area. If she is a professional or administrative worker, she has a 50.5 percent probability of working in a private sector job and a 42.7 percent probability of working for the federal government. If she is a clerical worker, her probability of private employment is 61.2 percent and her probability of working in the federal sector is 33.1 percent. Her Washington, D.C., location makes a federal job far more likely than a state or local job, except in the operative and laborer occupations, where few federal jobs exist.

Individual 2 is a black male worker without a high school degree. He is older, with 21.6 years of experience, and lives in the North Central region. As a black and a veteran, the public sector is attractive to him, but the extent of that attraction and its effect on his likelihood of being in federal or state-local employment varies across occupations. In a service job, he is far more likely to work for a state or local government (40.1 percent), whereas he is more likely to work for the federal government if he holds a clerical job (27.1 percent probability.) Nonetheless, because there are more private than public jobs in general, in all occupations he is more likely to be in a private sector job.

Individual 3 is a well-educated white man, again living in the North Central region. Because of his higher education, the public sector is attractive to him (through its higher wages), an effect that is especially strong with state and local employment. Again, however, the extent of this effect varies between occupations and is especially strong if this person works in a service occupation.

Table 5 confirms that sectoral choice probabilities differ across occupations for any given individual. For example, the estimation results showed that minorities, women, and the highly educated all prefer the public sector, but the magnitude of these effects differs, as does the relative attractiveness of federal versus state or local employment.

Table 5 also indicates the extent to which different sets of characteristics influence sectoral choice. Different individuals show quite diverse patterns of choice. Table 5 takes a given set of personal characteristics and allows the occupation to vary. In a more

detailed examination of how personal characteristics affect choice, Table 6 holds occupation constant and lets other characteristics vary. The same three individuals from Table 5 are placed in one occupation and the effect on selection probabilities of varying their characteristics one at a time is indicated. The figures in Table 6 show the elasticities of selection probabilities with respect to personal characteristics for the chosen individuals. For instance, if individual 1 were black rather than white, the public sector would be more attractive, and her probability of private sector employment would decrease by over 18 percentage points, from 61.2 to 42.8 percent, with an increase in the probabilities of both federal and state-local employment. If individual 3 were black, his probability of private employment would decrease 14 percentage points (from 61.1 to 47.1 percent.) If individual 3 were female, her private sector employment probability would fall 17.5 points, while her probability of state-local employment would increase by 21.1 points.

Table 6 quantifies the extent to which selection choice is affected by the characteristics of the individual. It confirms the same patterns discussed above and demonstrates that very large changes in the magnitude of selection probabilities can occur among individuals when only one or two personal characteristics vary. In particular, these effects are demonstrated for changes in educational level, race, and location in Washington, D.C. The underlying factors that cause these sectoral choices to vary by individual, such as wage differences, hiring and promotional opportunities, and job availability, cannot be determined with the available data, but their net influences are clearly large.

### Final Comments

Previous research has described the difference in monetary rewards to employees in the public and private sectors. This study has looked at the other side of the picture and quantified the extent to which individuals with certain characteristics choose different sectors of employment. The results represent one step in the process of understanding how workers perceive and react

Table 6. The Effect of Changing Characteristics on Sectoral Choice.†  
(asymptotic standard errors in parentheses)

	Base	Individual 1 in Clerical Occupation		
		Set E9-11 = 1	Set E13-15 = 1	Set RACE = 1
Private	61.2 (8.3)	72.8 (8.5)	59.3 (8.7)	42.8 (8.2)
Federal	33.1 (7.7)	23.0 (8.0)	31.9 (7.4)	46.8 (7.9)
State-Local	5.7 (4.3)	4.2 (4.0)	8.8 (5.6)	10.4 (5.1)
	Base	Set E12 = 1	Set E12 = 1, RACE = 0	Set E12 = 1 WASH = 1
		Individual 2 in Service Occupation		
Private	54.4 (5.9)	40.4 (5.4)	41.1 (4.0)	15.6 (9.8)
Federal	5.5 (3.2)	9.9 (4.6)	4.9 (2.1)	62.7 (15.8)
State-Local	40.1 (5.8)	49.7 (5.6)	53.9 (4.1)	21.7 (13.7)
	Base	Set RACE = 1	Set GENDER = 1, VET = 0	Set WASH = 1
		Individual 3 in Professional or Administrative Occupation		
Private	61.1 (2.2)	47.1 (3.7)	43.6 (2.9)	40.3 (5.6)
Federal	6.4 (1.1)	9.2 (2.2)	2.8 (.9)	47.0 (6.1)
State-Local	32.5 (2.2)	43.7 (3.9)	53.6 (2.9)	12.7 (3.4)

†Probability estimates calculated from the coefficients in sectoral choice equations that were estimated separately for each occupation. Individuals 1, 2, and 3 are as defined in Table 5, notes b, c, and d.

to sectoral differences and in investigating the differences among the labor market forces that operate in the private, federal, and state and local sectors.

We have found that the government is more effective at internally enforcing its employment guidelines for "protected" groups—nonwhites, women, and veterans—than it is at enforcing them in the private sector. In addition, the fact that highly educated and more experienced workers are far more likely to choose the public sector suggests that the public sector provides extra rewards for these workers, through either higher wages or other job characteristics. Workers in different occupations perceive distinctly different opportunities across sectors. Similarly, state and

local employees respond differently from federal employees, indicating the public sector cannot be considered as one uniform labor market. Finally, though there are clear correlations between wages and sectoral choice, the results presented here indicate that sectoral choice (especially between the federal and state-local sectors) involves more than just wage comparisons.

Further research is needed to understand these effects more fully. In particular, there is a need to investigate the nonwage differences among sectors, including the strong attraction of women and minorities to federal jobs and the special attraction of highly educated workers to public sector jobs in general. A better understanding of occupational choice deci-



sions might also shed more light on why sectoral choice differs so much by occupation.

Finally, although the results have been referred to as choice equations throughout this paper, they are really less than that, since the reduced-form specification combines both demand and supply variables. A better model would specify government

hiring probabilities (and the availability of government jobs) separately from worker choice probabilities. At this time, our knowledge of how government units make labor market decisions is unfortunately still quite sketchy, and neither the data nor the theory is available to specify a better model by which both sides of the market can be estimated separately but simultaneously.