Union-Nonunion Gender Wage and Benefit Differentials across Establishment Sizes

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ABSTRACT. Based on data from the National Longitudinal Surveys of Youth (NLSY), both male and female workers in larger establishments receive not only higher wages but also have a higher probability of receiving benefits than those in smaller establishments. This phenomenon reinforces the well documented size effect. This study also provides evidence of vast gender differences in estimated union effects on the different components of the compensation structure. Hence unions should not treat both genders similarly with respect to wages and benefits. Specifically, unions may be successful in attracting more female workers to join rank and file if unions could play an active role in making available maternity (paternity) leave, and also provided opportunities for women to join large establishments.

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1. Background

Evidence from past studies (Oaxaca, 1975; Parsley, 1980; Freeman and Leonard, 1987; Even and Macpherson, 1993; Hartmann et al., 1994; Wunnava and Peled, 1999) show two important findings. First, the union wage premium for women exceeds that of men, and second, women are more likely than men to *vote* for union representation. Despite the female propensity to vote for representation, other studies (Freeman and Medoff, 1984; Even and Macpherson, 1993) show that women are 50% less likely than men to be union members. The positive relationship between employer size and earnings is also well-documented (Lester, 1967; Masters, 1969; Mellow, 1982; Dunn, 1986; Brown and Medoff, 1989; Evans and Leighton, 1989; Morissette, 1993). Recent national figures support this relationship: for private industry, total compensation (i.e., wages plus benefits) as well as relative weight of fringe benefits increases with the size of the establishment (see Table I).

Podgursky (1986) was one of the first researchers to merge the effect of firm size and union affiliation on wages in a study. Podgursky has shown empirically the impact of firm size on union-nonunion wage differentials for men. He concludes that union-nonunion wage differentials are largest in small plants. He attributes this phenomenon to union threat effects, i.e., large nonunion firms are able to pay higher wages to decrease the threat of unionization. Following Podgursky's lead, later studies investigated the pattern of union-nonunion benefit differentials across plant sizes for men (Bramley et al., 1989; Okunade et al., 1992; Wunnava and Ewing, 1999). This is a timely issue given the importance of

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TABLE I
Hourly employee compensation and costs for private industry, by establishment employment size, March 1998

Compensation component	All workers in private industry		1–99 workers		100–499 workers		500 or more workers	
	Cost	Percent	Cost	Percent	Cost	Percent	Cost	Percent
Total compensation	$18.50	100.0%	$15.92	100.0%	$17.52	100.0%	$25.56	100.0%
Wages and salaries	13.47	72.8	12.01	75.4	12.67	72.3	17.78	69.6
Total benefits	5.02	27.1	3.91	24.6	4.85	27.7	7.78	30.4

Source: Employment Cost Trends (Bureau of Labor Statistics) – Table 8.
URL: ocltinfo@bls.gov/news.release/ecec.t08.htm.

fringe benefits as a part of total compensation for union workers relative to nonunion workers (see Table II).

However, as far as women are concerned, to date, there is no documented research in the area of union-nonunion wage/benefit differentials across establishment sizes.[1] Accordingly, this study focuses on female union-nonunion wage/benefit differentials across establishment sizes, and compares the results to those of their male counterparts. This is relevant given a relatively higher concentration of women in smaller firms, and unions' realization in recent years that treating men and women similarly with respect to wages and fringe benefits is not necessarily a good idea. For example, provision of such benefits as maternity (parental) leave, day care, and flex time is likely to be of greater interest to women than to men. We employ the 1990 wave of National Longitudinal Survey of Youth[2] [covering wages and such benefits as medical, retirement, life insurance, and maternity (paternity) leave] to estimate the gender union-nonunion wage/benefit differentials across establishment sizes. Considering the conclusions from this study may refocus collective bargaining agendas to support women's concerns. Such issues could include increasing the representation of women in leadership positions, and designing compensation packages tailor made for women.

2. Establishment size and union-nonunion differential

As described in Bramley et al. (1989), there are at least two theoretical explanations of why the union-nonunion wage/benefit differential may vary by establishment size. Firstly, large establishments may offer higher compensation than smaller firms to lessen the likelihood of unionization. Larger nonunion firms recognize that they are the best union targets since the large firm provides a larger worker pool than a small firm. The larger worker pool allows more workers to be solicited into entering the union at a lower cost to the union organizers than at a small firm. There are economies of scale in union organization. Consequently, the large nonunion firm raises

TABLE II
Employer costs per hour worked for employee compensation and costs as a percent of total compensation: Private industry workers, by bargaining status, March 1998

Series	Total compensation	Wages and salaries	Fringe benefirs
All union workers, private industry	$23.59	$15.38	$8.22
Percent	100.0%	65.2%	34.8%
All nonunion workers, private industry	$17.80	13.21	4.58
Percent	100.0	74.2	25.7

Source: Employment Cost Trends (Bureau of Labor Statistics) – Table 13.
URL: ocltinfo@bls.gov/news.release/ecec.t13.htm.

compensation in order to maintain worker satisfaction and discourage unionization (Podgursky, 1986).

Secondly, as pointed out in Bramley et al. (1989) there appears to be a maximum wage for a particular job. This is because the wage dispersion effects of unions presuppose the existence of a binding upper limit constraint on the wage for a particular job (Freeman and Medoff, 1982). In large nonunion firms the wage is often close to the maximum, but in smaller nonunion firms the wage is far below the maximum. When the large firm becomes unionized there will only be a small increase in wages so that the maximum is not surpassed. However, if the small firm becomes unionized the wage can increase a relatively large amount without reaching the maximum. Consequently, the same factors that lead to higher wages in larger firms also lead to larger union-nonunion wage differentials in small firms relative to large firms.

These arguments clearly predict larger union-nonunion benefit differentials should occur in small plants. However, given the finding by Bramley et al. (1989) of the U-shaped pattern with regard to pension coverage, it is unclear if that is an anomaly, or if other benefits also follow a similar pattern. Thus, by studying a number of benefits for both genders we may be able to discern how union strategies differ across establishment sizes and gender when it comes to the distribution between wages and benefits.

3. Data, methodology, and empirical results

The data are from the National Longitudinal Surveys of Youth (NLSY) which has interviewed respondents annually from 1979 to the present. Our sample consists of persons who worked full time for pay in the year prior to the 1990 wave in the nonagricultural, private sector. We categorize workers as belonging to one of the following three employer establishment sizes: $Size_1$ (1 to 100 workers), $Size_2$ (101 to 499 workers), and $Size_3$ (500 or more workers). Workers are identified as being union or nonunion members. See Table III for selected variable definitions and descriptive statistics by establishment size.

The "fringe benefit" variables are based on responses to the question of whether or not the respondent's employer offers or makes available a particular benefit. Dummy variables are constructed such that they equal one (i.e., $P_i = 1$) if the respondent reported that his/her employer offered or provided the particular benefit, zero otherwise (i.e., $P_i = 0$). We focus on a total of *four* benefits:[3] medical, retirement, life insurance, and maternity (paternity) leave. As shown in Table III, the proportion of workers reporting the availability of benefits increases by establishment size for all of the fringe benefits for both genders. The average of the natural log of wage also increased by establishment size for both genders (as one would expect male wages are higher than their female counterparts for every firm size). The proportion of female workers belonging to a union increased over all three size categories, while for males union membership was slightly lower (22.6 percent) in the third category relative to the second category (23.4 percent). Since our main objective is to investigate the pattern of union-nonunion gender wage and benefit differentials across establishment sizes, the following is our empirical specification based on a stacked sample of full-time male and female workers:

$$P_i = \alpha + \beta_{S2}(Size_2)_i + \beta_{S3}(Size_3)_i + \beta_{MS1}(MSize_1)_i + \beta_{MS2}(MSize_2)_i + \beta_{MS3}(MSize_3)_i + \beta_{\mathbf{U1}}(U_1)_i + \beta_{\mathbf{U2}}(U_2)_i + \beta_{\mathbf{U3}}(U_3)_i + \beta_{\mathbf{MU1}}(MU_1)_i + \beta_{\mathbf{MU2}}(MU_2)_i + \beta_{\mathbf{MU3}}(MU_3) + \beta_2(\text{Actual Experience})_i + \beta_3(\text{Actual Experience}^2)_i + \beta_4(\text{Tenure})_i + \beta_5(\text{Tenure}^2)_i + \beta_6(\text{Education})_i + \beta_7(\text{AFQT})_i + \beta_8(\text{Marital Status})_i + \beta_9(\text{Urban})_i + \beta_{10}(\text{Number of Children})_i + \beta_{11}(\text{Black})_i + (\text{Vector of Regional Dummies})\mu + (\text{Vector of Industrial Dummies})\omega + (\text{Vector of Occupational Dummies})\eta + \text{Error}_i,$$

where ***Size***/***MSize*** is a vector of establishment size/gender interaction terms. $Size_2$ equals 1 for workers in the second establishment size and 0 otherwise, $Size_3$ equals 1 for workers in the third establishment size, and 0 otherwise (hence first establishment size is the omitted category).[4] ***Msize*** is a vector of interactions between ***Size*** and a male (*M*) dummy (= 1 if an observation belongs to a male, and 0 otherwise). Hence, $\beta_{\mathbf{MSi}}$ captures the male establishment size differential relative to females (captured by $\beta_{\mathbf{Si}}$), and sum of ($\beta_{\mathbf{Si}} + \beta_{\mathbf{MSi}}$) will be the establishment size effect for males.[5] Similarly, ***U***/***MU*** is a vector of union-establish-

TABLE III
Sample means of selected variables

Variable*	$Size_1$ (1 to 100 workers) n = 915		$Size_2$ (101 to 499 workers) n = 405		$Size_3$ (500 or more workers) n = 316	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
A. *Female*						
Employees	27.78689	23.6396	221.2568	101.2484	1538.364	1180.395
Union	0.073224	0.2606464	0.162963	0.3697887	0.1993671	0.4001582
Med	0.720442	0.4490302	0.9185185	0.2739115	0.9588608	0.1989272
Retire	0.4788571	0.4998385	0.7666667	0.4234959	0.8980892	0.3030139
Lifeins	0.6000000	0.4901719	0.8664987	0.3405448	0.9365079	0.2442339
Matlv	0.7413588	0.4381492	0.8959391	0.3057278	0.9419355	0.2342435
Lwage	2.024972	0.4573696	02.091597	0.4482818	2.253822	0.4253423
Variable*	$Size_1$ (1 to 100 workers) n = 1296		$Size_2$ (101 to 499 workers) n = 406		$Size_3$ (500 or more workers) n = 287	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
B. *Males*						
Employees	24.57022	22.15114	221.8424	101.1941	1618.063	1240.295
Union	0.1041667	0.3055946	0.2339901	0.4238883	0.2264808	0.4192849
Med	0.7013189	0.4578573	0.9381188	0.2412384	0.9721254	0.1649009
Retire	0.4445319	0.4971094	0.8165829	0.3874952	0.8975265	0.3038072
Lifeins	0.5615142	0.4963974	0.8571429	0.3503743	0.9187279	0.2737366
Matlv	0.3868996	0.4872532	0.5793872	0.4943464	0.6556017	0.4761606
Lwage	2.223706	0.5214584	2.327924	0.4531508	2.515846	0.4157205

* Variable definitions
Employees = size of the establishment (measured as number of employees).
Union = 1 if belongs to a union, 0 otherwise.
Med = 1 if medical/health insurance is offered/provided by the employer, 0 otherwise.
Retire = 1 if retirement plan is offered/provided by the employer, 0 otherwise.
Lifeins = 1 if life insurance is offered/provided by the employer, 0 otherwise.
Matlv = 1 if maternity (paternity) leave is offered/provided by the employer, 0 otherwise.
Lwage = natural log of hourly wage.

ment size/gender interaction terms. U_1 equals 1 for union workers in the smallest establishment size and 0 otherwise, U_2 equals 1 for union workers in the second establishment size, and U_3 equals 1 for union workers in the third establishment size.[6] The ***MU*** vector is entered into the model as an interaction between ***U*** vector and a male (*M*) dummy. So, β_{MUi} captures male union differentials relative to females (captured by β_{Ui}) for each of the establishment sizes. In other words, the sum of $(\beta_{Ui} + \beta_{MUi})$ will be the union effect for males.

Given the qualitative nature of dependent variables (which take a value of "1" if a particular fringe is offered or provided by the employer or "0" otherwise) for a stacked male and female sample, we estimated the above model for each of the fringe benefits by a logistic model. Union effects on the probability of being offered a fringe benefit (across establishment sizes/gender) are found by examining the coefficients on U_1 $(+MU_1)$, U_2 $(+MU_2)$, and U_3 $(+MU_3)$ in the above specification. Given the richness of the NLSY it is possible to construct a measure of work experience that represents actual weeks worked. There are several reasons why a measure of actual experience is preferred to using potential work experience (usually defined as age-education-6). Potential experience may understate the returns

to experience because it treats time not working the same as time working. This is particularly troublesome when estimating wages of persons who are more likely to have intermittent labor force participation. The use of both actual experience and tenure at the current firm should capture the total work experience of the respondent. Additionally, we include vectors of industry and occupation controls, which presumably captures much of the heterogeneity in monitoring technology not captured by establishment size. Other variables include controls for marital status, actual number of children in the household, race, education level (as measured by number of years of schooling completed), AFQT score, region, and urban area. The summary[7] of logit estimates of the benefits and OLS estimates of the wages are provided in Tables IV through VIII. Briefly, our major empirical findings follow:

(i) Both male and female workers in larger establishments receive not only higher wages but also have a higher probability of participating in benefit programs than those in smaller establishments. This further reinforces the well-documented size effect. The only exception to this general phenomenon is a negative and statistically significant coefficient for male size variables in the maternity (paternity) leave equation.

(ii) The union wage effect decreases with establishment size for males. This supports the argument that large nonunion firms pay higher wages to discourage the entrance of unions (i.e., the threat effects argument).

(iii) The union wage effect increases with establishment size for females and is significant only for the largest establishments. This implies that unions in the large establishments may have a role to play in achieving a narrowing of the gender wage gap.

A possible explanation for the phenomenon observed in (ii) and (iii) could be the following. Unions are known to reduce wage variation within establishments. In addition, large establishments will be more heterogeneous – having significant representations of each gender and a larger variation in skills across workers. In all likelihood, women in large establishments will be concentrated in lower skill pools (due to lower levels of education, experience, etc.). Because of this, unions representing workers in large establishments will bring female wages up a greater amount, since women will be located at the bottom of the wage distribution[8] within their units and unions will be reducing wage variation. Further, unions representing workers in small units will face low variations in skill levels, and, therefore, stimulate less of a wage effect for women relative to the average in those groups. In the case of men in larger firms who are generally near the top of the wage distribution, one would expect the divergence between union and non-union wages to be small. In addition, the threat of unionization reduces union wage premiums for men as firm size increases. In other words, as firm size increases, the union and non-union wage curves for men approach ever closer to one another.

(iv) Regarding the availability of maternity (paternity) leave (usually valued highly by females), unions have a major impact across all establishment sizes only for females. In other words, unions could use availability of this benefit in attracting more women workers to join.

(v) For both genders, union-nonunion benefit differentials for retirement and life insurance decrease with the size of the establishment. This once again supports the union threat effects argument.

Given the presence of vast gender differences in estimated union effects on the different components of the compensation structure, unions should not treat both genders similarly with respect to wages and benefits. For example, unions may be successful in attracting more female workers to join rank and file if unions could play an active role in making available maternity (paternity) leave, and also provided opportunities for women to join large establishments.

TABLE IV
Summary of logit estimates of dependent variable = med

Female					Male				
Variable*	Coef.	*z*	$P > \|z\|$	Marginal** probability	Variable*	Coef.	χ^2	$P > \|\chi^2\|$	Marginal** probability
$Size_2$	1.460563	6.713	0.000	0.1093118	($Size_2$+$MSize_2$)	1.9511	52.96	0.000	0.1132651
$Size_3$	2.141396	6.218	0.000	0.844712E-01	($Size_3$+$MSize_3$)	2.4760	32.47	0.000	0.6709367E-01
U_1	1.879435	3.054	0.002	0.3785282	(U_1+MU_1)	1.5083	23.25	0.000	0.3159447
U_2	1.192383	1.574	0.115	0.892406E-01	(U_2+MU_2)	0.1354	0.07	0.786	0.7860230E-02
U_3	–0.0563457	–0.081	0.935	–0.222267E-02	(U_3+MU_3)	0.3480	0.17	0.681	0.9429967E-02

Log likelihood = –1389.2388: χ^2_{38} = 801.18, $P > |\chi^2|$ = 0.000, n = 3625

* Variable definitions:
- $Size_2$ = 1 if worker belongs to a firm with 101-499 workers, 0 otherwise.
- $Size_3$ = 1 if worker belongs to a firm with 500 or more workers, 0 otherwise.
- U_1 = 1 if worker is a union member of an establishment with 0–100 workers, 0 otherwise.
- U_2 = 1 if worker is a union member of an establishment with 101–499 workers, 0 otherwise.
- U_3 = 1 if worker is a union member of an establishment with 500 or more workers, 0 otherwise.
- M = 1 if an observation belongs to a male, 0 otherwise.
- $MSize_2$ = ($M \times Size_2$).
- $MSize_3$ = ($M \times Size_3$).
- MU_1 = ($M \times U_1$).
- MU_2 = ($M \times U_2$).
- MU_3 = ($M \times U_3$).

** Marginal probability is derived as $\partial P_i/\partial X_{ji} = [\beta X_{ji} \times P_i\ (1 - P_i)]$ evaluated at gender specific sample mean.

TABLE V
Summary of logit estimates of dependent variable = retire

Female					Male				
Variable*	Coef.	z	$P > \|z\|$	Marginal** probability	Variable*	Coef.	χ^2	$P > \|\chi^2\|$	Marginal** probability
$Size_2$	1.359512	8.445	0.000	0.2432016	($Size_2$+$MSize_2$)	1.7058	88.12	0.000	0.2554867
$Size_3$	2.189036	9.592	0.000	0.2003515	($Size_3$+$MSize_3$)	2.2491	78.24	0.000	0.2068558
U_1	1.870803	4.743	0.000	0.4668645	(U_1+MU_1)	1.2144	68.56	0.000	0.5467869
U_2	1.852432	2.032	0.042	0.1524906	(U_2+MU_2)	0.7199	4.01	0.045	0.1078232
U_3	0.720756	1.245	0.213	0.6597E-01	(U_3+MU_3)	0.4747	0.79	0.374	0.4365943E-01

Log likelihood = –1740.6029: χ^2_{38} = 1216.33, $P > |\chi^2|$ = 0.000, n = 3625

* Variable definitions:
- $Size_2$ = 1 if worker belongs to a firm with 101-499 workers, 0 otherwise.
- $Size_3$ = 1 if worker belongs to a firm with 500 or more workers, 0 otherwise.
- U_1 = 1 if worker is a union member of an establishment with 0–100 workers, 0 otherwise.
- U_2 = 1 if worker is a union member of an establishment with 101–499 workers, 0 otherwise.
- U_3 = 1 if worker is a union member of an establishment with 500 or more workers, 0 otherwise.
- M = 1 if an observation belongs to a male, 0 otherwise.
- $MSize_2$ = ($M \times Size_2$).
- $MSize_3$ = ($M \times Size_3$).
- MU_1 = ($M \times U_1$).
- MU_2 = ($M \times U_2$).
- MU_3 = ($M \times U_3$).

** Marginal probability is derived as $\partial P_i/\partial X_{ji} = [\beta X_{ji} \times P_i\,(1 - P_i)]$ evaluated at gender specific sample mean.

TABLE VI
Summary of logit estimates of dependent variable = lifeins

Female					Male				
Variable*	Coef.	*z*	$P > \|z\|$	Marginal** probability	Variable*	Coef.	χ^2	$P > \|\chi^2\|$	Marginal** probability
$Size_2$	1.641987	8.524	0.000	0.1899429	($Size_2$+$MSize_2$)	1.3306	46.07	0.000	0.1629306
$Size_3$	2.469970	8.032	0.000	0.1468665	($Size_3$+$MSize_3$)	1.8578	42.78	0.000	0.1387163
U_1	1.618486	3.788	0.000	0.3884366	(U_1+MU_1)	0.9172	15.97	0.000	0.2258293
U_2	–0.079409	–0.190	0.850	–0.9186E-02	(U_2+MU_2)	0.7550	3.44	0.064	0.9244896E-01
U_3	–0.713249	–1.386	0.166	–0.4241E-01	(U_3+MU_3)	0.1099	0.04	0.833	0.8205897E-02
Log likelihood = –1673.362: χ^2_{38} = 969.15, $P > \|\chi^2\|$ = 0.000, n = 3625									

* Variable definitions:
- $Size_2$ = 1 if worker belongs to a firm with 101-499 workers, 0 otherwise.
- $Size_3$ = 1 if worker belongs to a firm with 500 or more workers, 0 otherwise.
- U_1 = 1 if worker is a union member of an establishment with 0–100 workers, 0 otherwise.
- U_2 = 1 if worker is a union member of an establishment with 101–499 workers, 0 otherwise.
- U_3 = 1 if worker is a union member of an establishment with 500 or more workers, 0 otherwise.
- M = 1 if an observation belongs to a male, 0 otherwise.
- $MSize_2$ = ($M \times Size_2$).
- $MSize_3$ = ($M \times Size_3$).
- MU_1 = ($M \times U_1$).
- MU_2 = ($M \times U_2$).
- MU_3 = ($M \times U_3$).

** Marginal probability is derived as $\partial P_i/\partial X_{ji} = [\beta X_{ji} \times P_i\,(1 - P_i)]$ evaluated at gender specific sample mean.

TABLE VII
Summary of logit estimates of dependent variable = matlv

Female					Male				
Variable*	Coef.	*z*	$P > \|z\|$	Marginal** probability	Variable*	Coef.	χ^2	$P > \|\chi^2\|$	Marginal** probability
$Size_2$	1.055577	5.350	0.000	0.98414E-01	($Size_2$+$MSize_2$)	–0.7177	19.45	0.000	–0.1749018
$Size_3$	1.598393	5.727	0.000	0.87421E-01	($Size_3$+$MSize_3$)	–0.5260	7.60	0.006	–0.1187645
U_1	1.503235	2.832	0.005	0.2882392	(U_1+MU_1)	0.6675	10.41	0.001	0.1583365
U_2	1.095451	1.754	0.079	0.1021313	(U_2+MU_2)	0.2675	1.04	0.309	0.6518913E-01
U_3	0.905848	1.174	0.241	0.49543E-01	(U_3+MU_3)	0.4177	1.48	0.223	0.9431169E-01
Log likelihood = –1722.7733: χ^2_{38} = 850.95, $P > \|\chi^2\|$ = 0.000, n = 3625									

* Variable definitions:
- $Size_2$ = 1 if worker belongs to a firm with 101-499 workers, 0 otherwise.
- $Size_3$ = 1 if worker belongs to a firm with 500 or more workers, 0 otherwise.
- U_1 = 1 if worker is a union member of an establishment with 0–100 workers, 0 otherwise.
- U_2 = 1 if worker is a union member of an establishment with 101–499 workers, 0 otherwise.
- U_3 = 1 if worker is a union member of an establishment with 500 or more workers, 0 otherwise.
- M = 1 if an observation belongs to a male, 0 otherwise.
- $MSize_2$ = ($M \times Size_2$).
- $MSize_3$ = ($M \times Size_3$).
- MU_1 = ($M \times U_1$).
- MU_2 = ($M \times U_2$).
- MU_3 = ($M \times U_3$).

** Marginal probability is derived as $\partial P_i/\partial X_{ji} = [\beta X_{ji} \times P_i\,(1 - P_i)]$ evaluated at gender specific sample mean.

TABLE VIII
Summary of OLS estimates of dependent variable = lwage

Female				Male			
Variable*	Coef.	*t*	*P* > |*t*|	Variable*	Coef.	*t*	*P* > |*t*|
$Size_2$	0.0646625	2.678	0.007	$(Size_2+MSize_2)$	0.1874	7.26	0.000
$Size_3$	0.134690	4.924	0.000	$(Size_3+MSize_3)$	0.2704	9.07	0.000
U_1	0.059853	1.268	0.205	(U_1+MU_1)	0.2049	5.94	0.000
U_2	0.015797	0.315	0.753	(U_2+MU_2)	0.1975	4.51	0.000
U_3	0.121168	2.298	0.022	(U_3+MU_3)	0.1580	2.98	0.003
Adjusted-R^2 = 0.4562, sample = 3625							

* Variable definitions:
$Size_2$ = 1 if worker belongs to a firm with 101–499 workers, 0 otherwise.
$Size_3$ = 1 if worker belongs to a firm with 500 or more workers, 0 otherwise.
U_1 = 1 if worker is a union member of an establishment with 0–100 workers, 0 otherwise.
U_2 = 1 if worker is a union member of an establishment with 101–499 workers, 0 otherwise.
U_3 = 1 if worker is a union member of an establishment with 500 or more workers, 0 otherwise.
M = 1 if an observation belongs to a male, 0 otherwise.
$MSize_2$ = $(M \times Size_2)$.
$MSize_3$ = $(M \times Size_3)$.
MU_1 = $(M \times U_1)$.
MU_2 = $(M \times U_2)$.
MU_3 = $(M \times U_3)$.

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Notes

[1] Robinson and Wunnava (1991) controlled for number of employees (i.e., plant size) while investigating the effects of cost of supervision on earnings of both males and females.
[2] Wunnava and Ewing (1999) used the same data.
[3] The correlations between tenure and availability of fringe benefits were relatively low [specifically, correlations were 0.1957 (medical), 0.2437 (retirement), 0.2236 (life insurance), and 0.1422 (maternity (paternity) leave)]. Hence the presence of certain benefits does not seem to have any significant effect on tenure.
[4] Okunade et al. (1990) used a similar set up to capture establishment size specific effects on wages (compensation).
[5] Since $(MSize_1)_i$ is included in the specification to capture the differential effect of first establishment size on males, to avoid the problem of perfect multicollinearity, "pure" dummy variable M is omitted from the specification.
[6] See Okunade et al. (1990) for a justification in introducing establishment specific union dummy variables into the model.
[7] Full regression results can be obtained by a request.
[8] Another angle may be observing the phenomenon of a larger union wage premium for workers who may otherwise earn less. To get a rough idea assume one can identify high end – low end workers via AFQT (low: score 1–32; middle: score 33–65, and high: score 66–99). By running three separate wage regressions (with all standard controls), it was found that the union coefficients (which were statistically significant) decreased over these three groups. Specifically, the estimated coefficients on union were: 0.1800 (low score),

0.1616 (middle score), and 0.0631 (high score). These supplementary regression results can be obtained by a request.

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