"Recent Longitudinal Evidence of Size and Union Threat Effects across Genders"

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Abstract: Based on data from the National Longitudinal Surveys of Youth covering years 2000 through 2008, it is evident that both male and female workers in medium/larger establishments receive not only higher wages but also have a higher probability of participating in benefit programs than those in smaller establishments. This reinforces the well-documented *'size'* effect. Further, the firm size wage effects are much larger for men than women. The union wage effect decreases with establishment size for both genders. This supports the argument that large nonunion firms pay higher wages to discourage the entrance of unions (i.e., the '*threat'* effect argument). In addition, the union wage premium is higher for males for small and medium firm sizes relative to females. This implies that unions in the large establishments may have a role to play in achieving a narrowing of the gender union wage gap. In other words, the threat of unionization could reduce union wage premiums for both genders as firm size increases. Given the presence of noticeable 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.

Keywords: *size effect, threat effect, fringe benefits, compensation, gender, union-nonunion, random effects*

JEL Classification: *J16*, *J31*, *J32*, and *J51*

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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) highlights 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; Lallemand et al., 2005, and 2007). Other researchers were guarded about accepting this possible positive link between firm size and wage premium (Idson and Oi, 1999; Kruse, 1992). 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). In a recent empirical study based on the National Employer Survey covering 1994 and 1997, Pedace (2010) provides a number of reasons for positive firm size effect on wages. Specifically, worker sorting and matching (Champlin, 1995; Troske, 1999; Garicano and Rossi-Hansberg, 2006), paying efficiency wages to deter shirking or/and lowering turnover costs (Campbell, 1993; Krueger, 1991; Cappelli and Chauvin, 1991; Allgulin and Ellingsen, 2002), and operation of internal labor markets (Doeringer and Piore,1971; Robinson and Wunnava, 1991).

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) and for both genders (Wunnava and Ewing, 2000). This is a timely issue given the importance of 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, the documented research in the area of union-nonunion wage/benefit differentials across establishment sizes is somewhat dated and is mostly cross-sectional.[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 National Longitudinal Survey of Youth79 data for the years 2000-08[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 in a longitudinal framework. 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. Firm 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/firm 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 compensation in order to maintain worker satisfaction and discourage unionization (Voos, 1983; 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.

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 tend to 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 elative weights between wages and benefits.

3. Data, methodology, and empirical analysis

The data are from the National Longitudinal Surveys of Youth (NLSY), which has interviewed respondents annually from 1979 to the present. Our NLSY79 sample consists of persons who worked full time for pay for the waves 2000, 2002, 2004, 2006, and 2008 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 non-union members. See Table III for selected variable definitions and descriptive statistics of the overall sample as well as the sample disaggregated by gender and 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 workers belonging to a union increased over all three size-categories for men, while for females, the union membership was slightly lower (19.5 percent) in the third category relative to the second category (20.4 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 fulltime male and female workers:

$$P_{it} = \alpha + \beta \mathbf{s_2}(Size_2)_{it} + \beta \mathbf{s_3}(Size_3)_{it} + \beta \mathbf{ms_1}(MSize_1)_{it} + \beta \mathbf{ms_2}(MSize_2)_{it} + \beta \mathbf{ms_3}(MSize_3)_{it} + \beta \mathbf{u_1}(U_1)_{it} + \beta \mathbf{u_2}(U_2)_{it} + \beta \mathbf{u_3}(U_3)_{it} + \beta \mathbf{mu_1}(MU_1)_{it} + \beta \mathbf{mu_2}(MU_2)_{it} + \beta \mathbf{mu_3}(MU_3)_{it} + \underline{\text{Other Controls}}^* + v_i + \varepsilon_{it}$$

*Other Controls: $\beta_{13}(\text{Actual Experience})_i + \beta_{14}(\text{Actual Experience}^2)_i + \beta_{15}(\text{Tenure})_i + \beta_{16}(\text{Tenure}^2)_i + \beta_{17}(\text{Education})_i + \beta_{18}(\text{Marital Status})_i + \beta_{19}(\text{Number of Children})_i + \beta_{20}(\text{Race})_i + (\text{Vector of Industry Dummies})\omega + (\text{Vector of Occupation Dummies})\eta$

where $P_{it} = 1$ if the respondent 'i' reported that his/her employer offered or provided the particular benefit in year 't', zero otherwise; v_i = the random individual differences; ε_{it} = the usual error tem.

Further, ***Size***/***MSize*** is a vector of establishment size/gender interaction terms. $Size_2$ equals 1 for workers in the second establishment size [i.e., 101-499 workers] and 0 otherwise, $Size_3$ equals 1 for workers in the third establishment size [i.e., 500 or more workers], and 0 otherwise (hence first establishment size [i.e., 100 or less workers] is the omitted category). ***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, $\beta\mathbf{ms_i}$ captures the male establishment size differential relative to females (captured by $\beta\mathbf{s_i}$), and the sum of ($\beta\mathbf{s_i} + \beta\mathbf{ms_i}$) will be the establishment size effect for males.[4] Similarly, ***U***/***MU*** is a vector of union-establishment 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.[5] The ***MU*** vector is entered into the model as an interaction between the ***U*** vector and a male (*M*) dummy. So, $\beta\mathbf{mu_i}$ captures male union differentials relative to females (captured by $\beta\mathbf{u_i}$) for each of the establishment sizes. In other words, the sum of ($\beta\mathbf{u_i} + \beta\mathbf{mu_i}$) 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; '0' otherwise) and the longitudinal nature of our data, we

estimated the above model for each of the fringe benefits by a random effects logistic model.[6] Given the richness of the NLSY79 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 does not draw a distinction between time working and time not 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 capture 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), and region etc. The summary [7] of random effects estimates of logistic regression models of four benefits [i.e., 'med', 'retire', 'lifeins', and 'matlv'] are presented in Tables IV through VII. In addition to the coefficient estimates of $size_2$, $size_3$, u_1, u_2, and u_3, in columns, the corresponding 'marginal' probabilities are also reported for both genders [females: column 5, and males: column 10]. An intuitive interpretation of reported marginal probabilities is in order. For example, the reported marginal probabilities for females in Table IV column 5 could be interpreted as follows: The workers in the medium firm size [i.e., $size_2$] and larger firm size [i.e., $size_3$] have a 3.9% and 3.7%, respectively, *higher* probability of employer provided 'medical' insurance relative to the smaller firm size [i.e., omitted category]. The reported marginal probabilities for u_1, u_2, and u_3 could be interpreted as union workers having a 3%, 1.6%, and 2%, respectively, *higher* probability of employer provided 'medical' insurance than non-union workers, in each of the firm sizes. Similar logic could be used to interpret the reported marginal probabilities for males and for each of the other benefits. Further, the summary of random effects GLS estimates of the log wage model is provided in Table VIII.

Briefly, the major empirical findings of this study are as follows:

(i) Based on Table III [Panels B and C], both male and female workers in medium/larger establishments receive not only higher wages but also have a higher probability of participating in benefit programs than those in smaller establishments. This reinforces the well-documented *'size'* effect.

(ii) Specifically, based on Table VIII wage regression results:
- The firm size wage effects are much larger for men than women.
- The union wage effect decreases with establishment size for both genders. This supports the argument that large nonunion firms pay higher wages to discourage the entrance of unions (i.e., the '*threat'* effect argument).
- Furthermore, the union wage premium is higher for males for small and medium firm sizes relative to females. This implies that unions in the large establishments may have a role to play in achieving a narrowing of the gender union wage gap. In other words, not only the threat of unionization could reduce

union wage premiums for both genders as firm size increases, but also play a critical role in narrowing gender wage gap.
(iii) Regarding the availability of maternity (paternity) leave (usually valued highly by females), the size effects for females are much stronger than for males [see Table VII]. Accordingly, unions could use availability of this benefit in attracting more female workers to join larger firms.

(iv) For both genders, union-nonunion benefit differentials for retirement [see Table V] and life insurance [Table VI] decrease with the size of the establishment. This once again supports the union threat effects argument. However, for medical insurance [see Table IV] this pattern seems 'U' shaped.

Given the presence of noticeable 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 provide opportunities for women to join large establishments.

Notes

[1] Robinson and Wunnava (1991) controlled for the number of employees (i.e., plant size) while investigating the effects of cost of supervision on earnings of both males and females.

[2] These data are biannual consisting of the years 2000, 2002, 2004, 2006, and 2008.

[3] The correlations between tenure and availability of fringe benefits were relatively low. Specifically, correlations were 0.2194 (medical), 0.2246 (retirement), 0.2035 (life insurance), and 0.1917 (maternity (paternity) leave). Hence the presence of certain benefits does not seem to have any significant effect on tenure.

[4] $(MSize_1)_i$ 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.

[5] For a justification of introducing establishment specific union dummy variables as well as gender specific union dummy variables into the model, see Wunnava and Ewing (2000).

[6] A likelihood ratio [LR] test could be conducted to see whether a random effects model is preferred to a regular logistical model for pooled data. For all four benefits, the LR test is highly significant and hence the random effects model is employed. Please refer to the test statistic results 'LR test of [$\rho = 0$]' reported for Tables IV through VII. The Breusch and Pagan Lagrangian multiplier test to see whether a random effects is preferred for the log wage model [reported at the bottom of Table VIII] was also highly significant.

[7] Full regression results can be obtained by a request.

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Table I. Employer costs per hour worked for employee compensation and costs as a percent of total compensation: Private industry workers, by establishment employment size [September 2011]

	1-99 workers		100-499 workers		500 workers/+	
	Cost	Percent	Cost	Percent	Cost	Percent
Total compensation	$23.32	100.0	$33.89	100.0	$40.75	100.0
Wages and salaries	17.22	73.9	22.99	67.8	26.86	65.9
Total benefits	6.10	26.1	10.90	32.2	13.89	34.1

Source: http://www.bls.gov/news.release/ecec.t08.htm

Table II. Private industry, by major industry group and establishment size and bargaining status [Cost per hour worked] [September 2011]

	Compensation [C]	W&S	Benefits[B]
a. All workers, goods-producing* industries	$33.30 [100%]	$22.10 [66.4%]	$12.21 [33.6%]
1-99 workers	27.85 [100%]	19.57 [70.5%]	8.29 [29.5%]
100-499 workers	32.53 [100%]	21.35 [63.9%]	11.17 [36.1%]
500 workers or more	45.44 [100%]	28.26 [62.2%]	17.18 [37.8%]
Union [U]	40.94 [100%]	23.86 [58.3%]	17.08 [41.7%]
Nonunion [NU]	31.54 [100%]	21.69 [68.8%]	9.85 [31.2%]
b. All workers, service-providing** Industries	$27.17[100%]	$19.44 [71.6%]	$7.72 [28.4%]
1-99 workers	22.51 [100%]	16.81 [74.7%]	5.70 [25.3%]
100-499 workers	27.89 [100%]	19.83 [71.1%]	8.06 [28.9%]
500 workers or more	39.57 [100%]	26.50 [67.0%]	13.06 [33.0%]
Union [U]	36.95 [100%]	22.95 [62.1%]	14.00 [37.9%]
Nonunion [NU]	26.34 [100%]	19.15 [72.7%]	7.19 [27.3%]

Source: http://www.bls.gov/news.release/ecec.t13.htm

Table III. Sample means of selected variables [NLSY79 2000-08 pooled sample]

Panel A: Overall sample [n=22358]

Variable	Mean	Std. Dev
lnwage	2.759926	.6023061
med	.8257447	.3793374
lifeins	.732892	.4424591
matlv	.727659	.4451744
retire	.74877	.4337302
male	.4949906	.4999861
$Size_1$	.5810448	.4933991
$Size_2$	.2339655	.4233599
$Size_3$	.1849897	.3882979
union	.1810538	.3850713

Panel B: Female sample disaggregated by firm size

	$Size_1$ [n=6533]		$Size_2$ [n=2699]		$Size_3$ [n=2059]	
Variable*	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
lnwage	2.542621	.5880404	2.677535	.5067892	2.882057	.5175583
med	.718506	.4497622	.926269	.2613811	.9567751	.2034123
lifeins	.6017144	.4895823	.8732864	.3327135	.9310345	.253457
matlv	.6820756	.4657056	.9003335	.2996104	.9329772	.2501223
retire	.6355426	.4813145	.8736569	.3322972	.9373482	.2423944
union	.1293433	.3356052	.2048907	.4036965	.1952404	.396482

Panel C: Male Sample disaggregated by firm size

	$Size_1$ [n=6458]		$Size_2$ [n=2532]		$Size_3$ [n=2077]	
Variable*	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
lnwage	2.789049	.6057699	2.937447	.5762358	3.122463	.5731399
med	.7533292	.4311068	.9541864	.2091219	.9711122	.1675316
lifeins	.6162899	.4863263	.8981043	.3025709	.9277805	.2589134
matlv	.5517188	.4973565	.8289889	.376593	.8666346	.3400511
retire	.6237225	.4844885	.9056082	.2924308	.953298	.2110506
union	.1486528	.3557735	.2669826	.4424706	.2946558	.4559976

*Definitions:

lnwage = natural log of hourly wage.

med = 1 if medical/health insurance 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.
retire = 1 if retirement plan is offered/provided by the employer, 0 otherwise.

male = 1 if gender of the respondent is male; 0 otherwise

$Size_1$ = 1 if employed in a firm with 1-100 workers; 0 otherwise.
$Size_2$ = 1 if employed in a firm with 101-499 workers; 0 otherwise.
$Size_3$ = 1 if employed in a firm with 500 or more workers; 0 otherwise.
union = 1 if belongs to a union, 0 otherwise.

Table IV. Random Effects Logistic regression results [dependent variable: 'med']

Number of obs = 22358 Wald $\chi^2_{(38)}$ = 1691.09 [Prob > χ^2 = 0.0000]

Log likelihood = -6904.7041 LR test of [ρ = 0] $\chi^2_{(1)}$ = 1953.75 [Prob > χ^2 = 0.0000]

	Female					**Male**			
Variable	Coefficient	z	P > |z|	Marginal Probability**	Variable	Coefficient	z	P > |z|	Marginal Probability**
$size_2$	2.123326 **[S]**	14.69	0.000	.039491	[$size_2$ + $msize_2$]	2.83335 **[S, +M]**	14.73	0.000	.0546188
$size_3$	2.299237 **[S]**	12.13	0.000	.037738	[$size_3$ + $msize_3$]	2.79510 **[S, +M]**	12.04	0.000	.0489569
u_1	2.338718 **[T]**	9.58	0.000	.030217	[u_1 + mu_1]	2.35831 **[T]**	10.18	0.000	.0307454
u_2	.86293 **[F+, T]**	2.54	0.011	.016702	[u_2 + mu_2]	.77647 **[T]**	2.14	0.032	.0142620
u_3	1.16427**[F+, ?]**	2.43	0.015	.020042	[u_3 + mu_3]	.86604 **[?]**	1.93	0.053	.0107660

** Marginal probability is derived as $\delta P_{it}/\delta X_{j,it} = [\beta_{X_j} * P_{it}(1-P_{it})]$ evaluated at gender specific sample mean

[S] ***Size Effect*****; [T]** ***Union Threat Effect*****; [+M]** ***Male Advantage*****; [?]** ***Union Premium for size 2 < size 3***

Table V. Random Effects Logistic regression results [dependent variable: 'retire']

Number of obs = 22358 Wald $\chi^2_{(38)}$ = 2159.8 [Prob > χ^2 = 0.0000]

Log likelihood = -6904.7041 LR test of [ρ = 0] $\chi^2_{(1)}$ = 2162.19 [Prob > χ^2 = 0.0000]

	Female					**Male**			
Variable	Coefficient	z	P > |z|	Marginal Probability**	Variable	Coefficient	z	P > |z|	Marginal Probability**
$size_2$	1.986693 **[S]**	16.54	0.000	.105381	[$size_2$ + $msize_2$]	2.38307 **[S, +M]**	15.88	0.000	.0546188
$size_3$	2.568051 **[S]**	15.51	0.000	.114736	[$size_3$ + $msize_3$]	3.08449 **[S, +M]**	15.37	0.000	.0489569
u_1	2.309479 **[T]**	11.09	0.000	.086620	[u_1 + mu_1]	2.38210 **[+M, T]**	12.78	0.000	.0307454
u_2	.4286691 **[T]**	1.65	0.098	.027576	[u_2 + mu_2]	.80153 **[+M, T]**	2.95	0.003	.0142620
u_3	.3100975 **[T]**	.88	0.379	.020772	[u_3 + mu_3]	.44764 **[+M, T]**	1.29	0.198	.0107660

** Marginal probability is derived as $\delta P_{it}/\delta X_{j,it} = [\beta_{X_j} * P_{it}(1-P_{it})]$ evaluated at gender specific sample mean

[S] ***Size Effect*****; [T]** ***Union Threat Effect*****; [+M]** ***Male Advantage***

Table VI. Random Effects Logistic regression results [dependent variable: 'lifeins']

Number of obs = 22358 Wald $\chi^2_{(38)}$ = 2114.63 [Prob > χ^2 = 0.0000]

Log likelihood = -8986.3153 LR test of [ρ = 0] $\chi^2_{(1)}$ = 2344.62 [Prob > χ^2 = 0.0000]

	Female					**Male**			
Variable	Coefficient	z	P > |z|	Marginal Probability**	Variable	Coefficient	z	P > |z|	Marginal Probability**
$size_2$	1.985519 **[S]**	16.86	0.000	.135221	[$size_2$ + $msize_2$]	2.3979 **[S, +M]**	16.27	0.000	.1701815
$size_3$	2.557597 **[S]**	15.76	0.000	.147269	[$size_3$ + $msize_3$]	2.7057 **[S, +M]**	14.80	0.000	.1608298
u_1	1.8259 **[+F, T]**	10.14	0.000	.100515	[u_1 + mu_1]	1.65726 **[T]**	10.08	0.000	.0847049
u_2	.3310181 **[T]**	1.36	0.174	.028302	[u_2 + mu_2]	.35224 **[T]**	1.41	0.158	.0303229
u_3	.1787633 **[T]**	.55	0.580	.016093	[u_3 + mu_3]	-. 73029 **[T]**	-0.26	0.797	-.0104227

** Marginal probability is derived as $\delta P_{it}/\delta X_{j,it} = [\beta_{X_j} * P_{it}(1-P_{it})]$ evaluated at gender specific sample mean

[S] ***Size Effect*****; [+F]** ***Female Advantage*****; [+M]** ***Male Advantage*****; [T]** ***Union Threat Effect***

Table VII. Random Effects Logistic regression results [dependent variable: 'matlv']

Number of obs = 22358 Wald $\chi^2_{(38)}$ = 2012.17 [Prob > χ^2 = 0.0000]

Log likelihood = -9986.5148 LR test of [ρ = 0] $\chi^2_{(1)}$ = 1660.77 [Prob > χ^2 = 0.0000]

	Female					**Male**			
Variable	Coefficient	z	P > |z|	Marginal Probability**	Variable	Coefficient	z	P > |z|	Marginal Probability**
$size_2$	1.732979 **[+F, S]**	15.67	0.000	.1649211	[$size_2$ + $msize_2$]	.672463 **[S]**	5.9	0.000	-.0112788
$size_3$	2.004483 **[+F, S]**	13.88	0.000	.1706584	[$size_3$ + $msize_3$]	.926268 **[S]**	6.92	0.000	-.0113203
u_1	1.5353 **[+F, T]**	9.00	0.000	.1255048	[u_1 + mu_1]	1.2969 **[T]**	9.33	0.000	.0926833
u_2	.5443429 **[T]**	2.17	0.030	.0585345	[u_2 + mu_2]	.85326 **[+M, T]**	4.25	0.000	.0941364
u_3	.4641405 **[T]**	1.48	0.139	.05103	[u_3 + mu_3]	.46207 **[T]**	2.08	0.038	.0507666

** Marginal probability is derived as $\delta P_{it}/\delta X_{j,it} = [\beta_{X_j} * P_{it}(1-P_{it})]$ evaluated at gender specific sample mean

[S] ***Size Effect*****; [+F]** ***Female Advantage*****; [+M]** ***Male Advantage*****; [T]** ***Union Threat Effect***

Table VIII. Random Effects GLS regression results [dependent variable: 'lnwage']

Number of obs = 22358 Wald $\chi^2_{(38)}$ = 8965.84 [Prob > χ^2 = 0.0000] Overall R^2 = .4256

Breusch and Pagan Lagrangian multiplier test for random effects: $Var(v_i) = 0$ ➔ $\chi^2_{(1)}$ = 9040.43 [Prob > χ^2 = 0.0000]

	Female				**Male**		
Variable	Coefficient	z	P > |z|	Variable	Coefficient	z	P > |z|
$size_2$	.0686396 **[S]**	6.64	0.000	$[size_2 + msize_2]$	.248484 **[S, +M]**	17.51	0.000
$size_3$	.1235733 **[S]**	10.02	0.000	$[size_3 + msize_3]$	.31292 **[S, +M]**	19.94	0.000
u_1	.0643878 **[T]**	3.83	0.000	$[u_1 + mu_1]$	.137507 **[+M, T]**	8.49	0.000
u_2	.0341403 **[T]**	1.67	0.095	$[u_2 + mu_2]$	.0639334**[+M,T]**	3.21	0.001
u_3	.024330 **[T]**	1.02	0.308	$[u_3 + mu_3]$	.018362 **[+M,T]**	.83	0.407

[S] ***Size Effect*****; [T]** ***Union Threat Effect*****; [+M]** ***Male Advantage***