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Union Wage Premium in Turkey

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Introduction

- Unions are important for various reasons.
  1. They enforce formality
  2. They compress wage dispersion, hence enhance income inequality
  3. They provide training and voice.
  4. More importantly, supply cash and in kind benefits to the members through collective bargaining agreements.
- The obstacles hampering the unionization attempts are ubiquitious in Turkey
- However, if the benefits are as large as presupposed the workers could put effort to overcome these obstacles.
- One has to compare the real benefits to real implicit and explicit costs of union membership.

Motivation

- There has been no study of union wage premium in Turkey based on sound economic analysis.
- The superficial comparisions of average wages of union members and non-members indicate a premium as large as 50-100%.
- That puts all the blame on 'political and social obstacles'
- This paper is first on the union wage premiums in Turkey. We find that depending on the sector, and controlling for observed characteristics the unionized workers could earn about 6 to 8 % more in terms of net monthly wages.

Related Literature

Table: Studies on Union Wage Premiums

Country	wage	dispersion
Mexico	10-15%	lower
Brazil	5 % to 12 %	higher
Uruguay	5%?	
South-Africa	10% to 20%	lower
Ghana	6% -16%	lower
Senegal	- 13%	
Zimbabwe	-17 %	
Malaysia	15%-20%	
S. Korea	3% -7%	

- The importance of matching in terms correcting the 'bias' in OLS regression is thoroughly explained in Myoung-Jae Lee (2005)
- The relative success of various propensity score matching methods is convincingly demonstrated in Dehejia and Wahba (2002)
- Alex Bryson (2002) is the first study to employ propensity score matching techniques to evaluate the union wage premium. He finds that although the raw -OLS- estimates indicate 17-25% union wage premium in the British private sector the post-match estimation merely shows a difference of 3-6%.
- Özkan Eren (2007) using PSID data for 1993 and restricting the data to private sector finds that linear regression method underestimates the union wage premium. More importantly using propensity score matching and avoiding log transformation of the wages the paper provides a more reliable estimation, 21.5 % for the premium.
- İlkkaracan and Selim (2002) is the only study which has an estimation the effect of collective labor bargaining on montly wages based on Census Survey of 1990 and Household Expenditure and Income Survey of 1994. They find a very high effect compared to international studies; 54 % collective agreement premium. Since in their paper they have not indicated how they had constructed their 'collective labor agreement', we have little room to infer why the effect could be as great as they have observed.

Data

We use Household Budget Survey (2006) supplied by TURKSTAT.

Table: Summary statistics for Unionized Workers

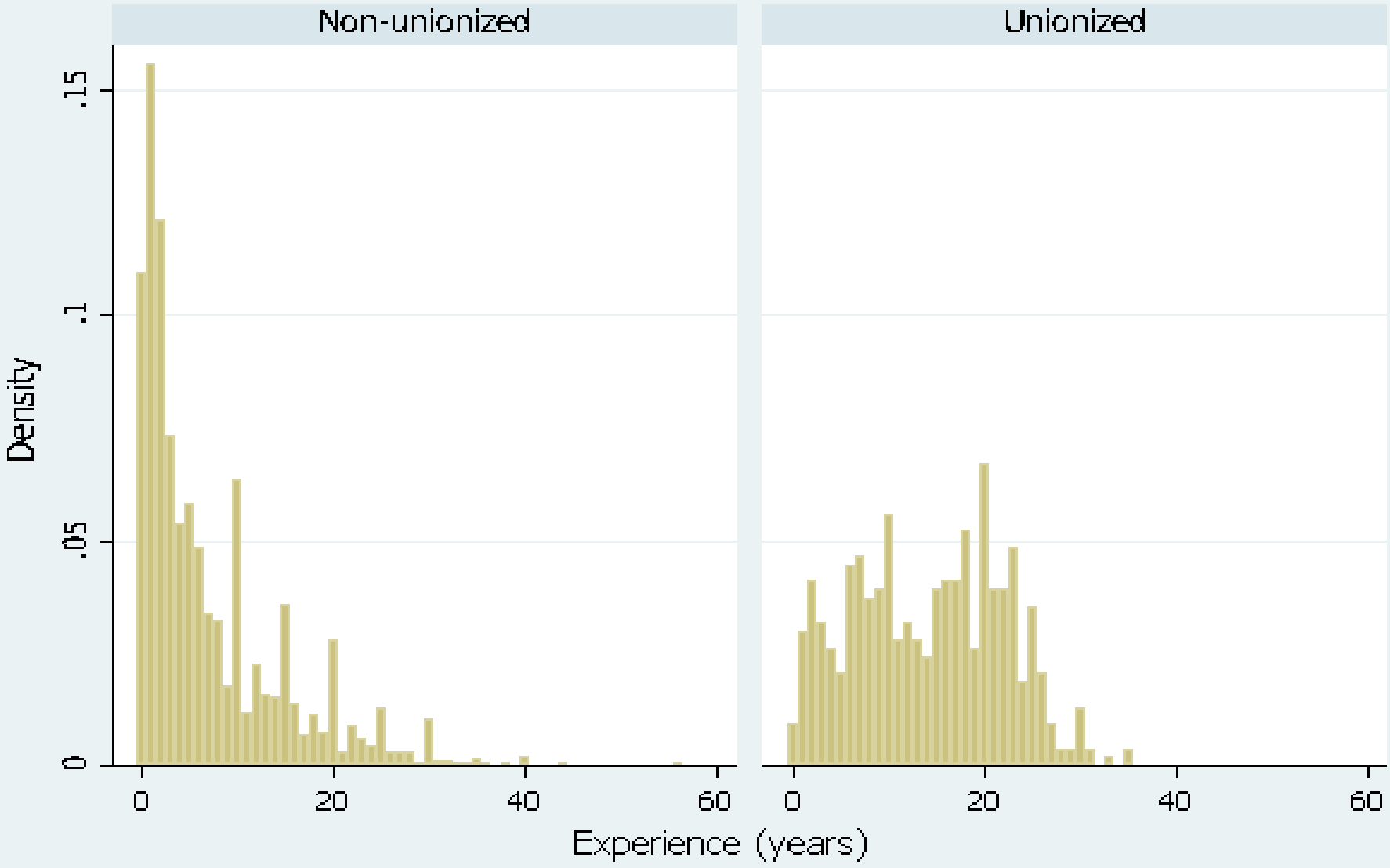
Variable	Mean	Std. Dev.
lnwage	6.934	0.433
experience	13.684	7.852
hours	43.089	8.678
male	0.85	0.358
security	0.991	0.097
private	0.259	0.439
FULLTIME	0.992	0.089
FSIZE1	0.059	0.235
FSIZE2	0.119	0.324
FSIZE3	0.12	0.326
FSIZE4	0.703	0.458
N	632	

Table: Summary statistics for Non-unionized Workers

Variable	Mean	Std. Dev.
lnwage	6.194	0.759
experience	6.532	7.291
hours	51.151	15.406
male	0.791	0.406
security	0.578	0.494
private	0.821	0.383
FULLTIME	0.815	0.389
FSIZE1	0.392	0.488
FSIZE2	0.212	0.409
FSIZE3	0.102	0.303
FSIZE4	0.294	0.456
N	5819	

- Average experience of a unionized worker is 13.7 years which is considerably higher than the non-unionized workers, 6.35 years.
- Unionized workers labor less, 43 hours per month. The non-unionized workers work much longer, 51.1 hours per month.
- All of the unionized workers are covered by a social security organization. About 40 percent of non-unionized workers are not covered.
- Only 25 % of the unionized workers are employed in private firms whereas 80% of the non-unionized workers are in private firms.
- Only 25 % of the unionized workers are employed in private firms whereas 80% of the non-unionized workers are in private firms.
- More importantly, 70% of the unionized workers belong to the largest firms (50 +) whereas the majority of the non-unionized workers (60%) are in firms with less than 25 workers.
- Approximately 34 % of the unionized workers have obtained a two-year university degree or higher. The figure for the non-unionized workers is 21 %.

Figure: Unionized Workers have more Experience



Empirical Analysis: (1) OLS Regressions

We have two types of workers; unionized workers and non-unionized workers. For each type there can be two different models to estimate by OLS depending on the union status, D. If a worker belongs to a union then, $D = 1$ and if she does not $D = 0$.
We can proceed to estimate

$$Y_0 = \beta_0 X + \epsilon_0 \tag{1}$$

for the subsample of workers who do not belong to a union.

$$Y_1 = \beta_1 X + \epsilon_1 \tag{2}$$

We divide the whole sample into two groups: non-unionized workers and unionized workers. Then we use multivariate OLS technique to estimate the effects of X variables on lnY, log of monthly wages.
Note that we can observe $D = 1$ only if $Z\gamma > u$ meaning that unionized workers' choice is not random; union status depends on the benefits of the unions compared to costs.
Note that the difference we have calculated reflects both the difference in terms of observed characteristics, X and the unobserved characteristics, ϵ.

$$Y = \beta X + (\beta_1 - \beta_0) DX + \epsilon \tag{3}$$

Table: **Union Wage Premiums for Male Workers Across Firm Size,%**

FIRM SIZE	Premium	N
All firms	15.9*	5142
1-9	7.78	1830
10-24	4.68	1031
24-49	18.8*	514
25-49	17.11*	1767

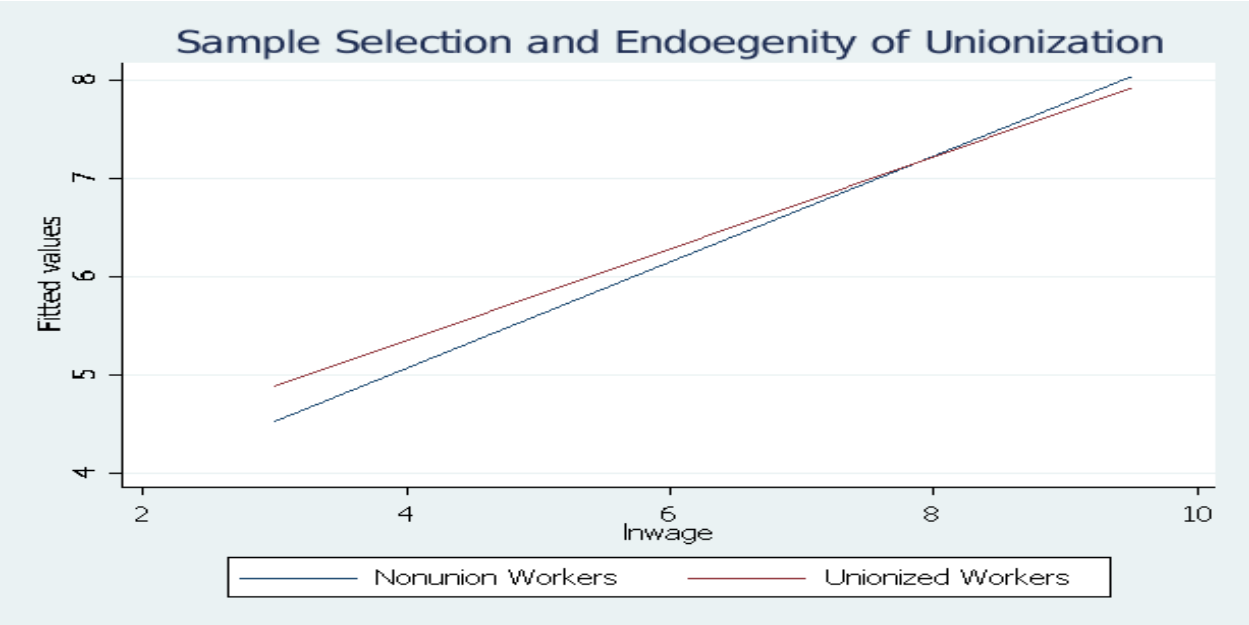
* significant at 1%

Table: **Union Wage Premiums for Male Workers Across Sectors,%**

SECTORS	Premium	N
All sectors	16.1*	5142
Manufacturing	26.8*	1356
Non-manufacturing	12	3786
Trade	40**	709
PRIVATE	28.9*	3944
PUBLIC	10.18*	1198

* significant at 1%, ** significant at 5%

- However, these OLS regressions suffers from idendification, endogeneity and sample selection problems.
- Unionized workers are not drawn randonly
- There are some unobserved characteristics, ie. political or social connections that may affect the likelihood of being a union-member which could also influence their earnings.
- Furthermore, the members who had chosen union membership could have observed characteristics that would bring them higher wages even without the union membership, ie. greater experiences or being in a larger public firm.



As the figure demonstrates the influence of unionization is not limited to a mere intercept effect. The unionized workers also have different slope coefficients on their observable characteristics. Unless Z and X are independent -which is very unlikely in non-experimental data-, ϵ's and u are not independent. Thus, the error terms ϵ_0 and ϵ_0 are correlated with X and the OLS estimators will provide inconsistent estimators of β_0 and β_1.

(2) Propensity Score Macthing

Let the treatment be the union membership, U, where $U = 1$ indicates that a person has recieved the treatment and $U = 0$ indicates that the person has not recieved the treatment. The potential outcomes are then w_1 and w_0 depending on the treatment status.
We can not find the individual treatment effect since there is no way to observe the potential outcome of a person who has a treatment as if she had no treatment (counterfactual case). However we can measure the ATT (average treatment effect) on those who received treatment compared to what they would experience without treatment albeit with a great deal of bias.

$$ATT = E(w_1 - w_0|U = 1, X) \tag{4}$$

$E(w_1|U = 1, X)$ is observable from the observational data. Nevertheless $E(w_0|U = 1, X)$ is unobservable and there is a missing counterfactual problem for the averages. Utilizing observed sample means to construct the counterfactual can lead to biases

$$Bias = [E(w|U=1,X) - E(w|U=0,X)] - [E((w_1 - w_0)|U=1,X)] \quad (5)$$

$$= E(w_0)|U=1,X) - E(w_0)|U=0,X) \quad (6)$$

Heckman et. al. (1998) divide the bias for ATT into three subcomponents:

$$E(w_0)|U=1,X) - E(w_0)|U=0,X) = B_1 + B_2 + B_3 \quad (7)$$

where B_1 is the bias due to lack of sufficient overlap in the two groups (densities of common characteristics), B_2 is the bias due to differences in the distribution of observational characteristics Xs under the common support region and finally B_3 is the bias due to unobservables. This bias arises if the treatment is correlated with the unobserved characteristics.

The matching procedure tries to solve for the counterfactual problem by selecting a control group from the nontreated group such that the selected control group is as similar as possible to the treatment group based on observavle covariates. The Conditional Independence Assumption (CIA) is a necessary presumption which states that the outcome in the selected control group is independent of the treatment conditional on a set of covariates, X.
$w_0 \perp U|X$
A potential difficulty with matching is the high dimensionability of characteristics. As the number of covariates increase the probability of matching the treatment group and the selected control group becomes lower and lower. Rosenbaum and Rubin (1983) propose to solve this dimensionability problem by using propensity score as a matching criteria.
$p(X) = Pr(U = 1|X)$ for $X \in S$
Treated and nontreated observations in the selected control group with the same (or very close) value of propensity scores have the same distribution of the observed covariates X and satisfy the balancing argument. Matching is a powerful technique in the sense that it can potentially overcome the first sources of bias by avoiding the need to define a specific functional form for the outcome equation and by avoiding extrapolation beyond the common support.

Table: Propensity Score Matching Estimates

Sample	Treated	Controls	Difference	S.E.	T-stat
ATT	6.96	6.82	0.139	0.037	3.73
ATU	6.29	6.50	0.212		
ATE			0.204		

Table: Propensity Score Matching Estimates, Private Sector

Sample	Treated	Controls	Difference	S.E.	T-stat
ATT	6.73	6.57	0.16	2.14	
ATU	6.14	6.38	0.24		
ATE			0.237		

Table: Propensity Score Matching Estimates, Public Sector

Sample	Treated	Controls	Difference	S.E.	T-stat
ATT	7.00	6.94	0.06	0.025	2.25
ATU	6.78	6.928	0.145		
ATE			0.118		

Conclusion

We have examined the union wage premium in Turkey by employing OLS and propensity score techniques using Household Budget Survey (2006). We find that controlling for many important determinants of net monthly wages there still exist a union wage premium both in public and private sectors; however these premiums are much smaller than the often cited 50 to 100 percent differences.

The propensity score techniques could let us at least partially overcome the selection and endogeneity problems. However, we still note that the robustness of findings should be limited by the quality of the data. The next step will be to apply the similar analysis to a different survey, namely Structure of Earnings Survey (2006) in order to see whether our findings are confirmed or not.