

# Is There a Union Wage Premium in Turkey? An examination of private and public sectors

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## Abstract

The paper analyzes the union wage premium in Turkey, which has not been investigated comprehensively. We employ different empirical techniques to assess the impact of union membership on earnings across public and private sectors. While ordinary least squares results slightly overestimate the premium, propensity score matching and quintile regression techniques also reveal sizable wage premiums. Despite the low levels of unionization, the pay differential is considerable in Turkey, and the unionization has significantly higher effects in the private sector. We argue that firm heterogeneity and underlying employee characteristics lead to these differences in premiums. Additionally, wage setting practices in the public and private sector are distinct as the former is more institutionalized and similar contractual terms can be applicable to non-unionized workers. In the private sector, on the other hand, the bargaining framework is decentralized and bilateral, which does not allow most of the benefits to be extended to non-members.

## 1. Introduction

The trade unions can serve multiple functions such as providing higher monetary, reducing job loss risks, enhancing training and education opportunities, and improving work conditions. In the literature, the impact of unions on wage determination and wage levels are discussed widely. On the one hand, it has been suggested that after the workplace and employee characteristics are taken into account there is no significant union premium (Booth and Bryan, 2004). On the other hand, many researchers found substantial union wage premium even after controlling for individual, sectoral, and firm characteristics (Freeman and Medoff, 1984; Linneman, et al., 1990; Hirsch and Schumacher, 2001; Blanchflower and Bryson, 2004). However, most of these studies analyze advanced countries, and there is relatively little research on the wage effects of membership and collective agreements in developing nations. Not only sizable union

wage premiums exist in many developing countries but there are also significant cross country differences; for instance the premium in Mexico ranges between 10-15% while in S. Korea it is around 3-7% (Freeman, 2009). Thus, it could be useful to delve more into the developing country cases to understand the impact of union membership on wages.

Our paper aims to expand such an analysis to Turkey, which is potentially an interesting case given the ever decreasing trade union density and fluctuating coverage rates over time. There are hardly any studies that consider the labor market institutions and industrial relations for individual level wage setting in Turkey. In the few existing papers, the collective bargaining and union membership are found to be positively and significantly related to the wages (Selim and Ilkcaracan, 2007; Bayazitoglu and Ercan, 2001). Nevertheless, these studies use very restricted samples and standard techniques to estimate the union and collective bargaining premiums. The considerably high pay gaps between the covered and non-covered employees are partly due to these limitations. Our paper employs both propensity score matching and quintile regression techniques to overcome the potential sources of bias from endogeneity and selection problems<sup>i</sup>. Propensity score matching attempts to compare the most similar samples from unionized and non-unionized workers hence controlling for the unobserved differences while quintile regression looks at the differential impact of unionization along the earnings distribution, thus accounting for the endogeneity of union membership. Together they can provide more accurate estimates for union wage premium in Turkey. We also split the sample into private and public sector employees as the union premium might vary significantly across these sectors. It has been suggested that the public sector unions are able to offer smaller wage premiums due to limited bargaining power as a result of budgetary constraints and legal restrictions on collective bargaining (Bahrami et al., 2009). Additionally, the qualifications of the unionized and non-unionized employees can be distinct in public and private sectors.

In the literature, there are a number of studies empirically testing the impact of unions on wage determination using different techniques. The propensity score matching (PSM) results in UK show that the union wage premium in the private sector is

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<sup>i</sup> For the importance of matching in terms correcting the ‘bias’ in OLS regression, see Lee (2005) and for the usefulness of quintile regressions to correct for endogeneity see Koenker, (2005).

approximately 3-6% while the OLS estimates identify an impact of 17-25% (Bryson, 2007). PSID data from US suggest that linear regression methods do not correctly estimate the union premiums and particularly in the private sector overstate the union premium compared to PSM (Eren, 2007). When it comes to the quintile regression results, the existing studies generally find asymmetric effects of unions as the wage premium for the bottom end of the distribution is larger than the premium for the upper end. In US, the union wage premium is reported to be considerably larger for the low wage earners for the entire economy and for each state (Schmitt, 2008). Similar results were obtained for the UK where both in public and private sectors the bottom quintile of the wage earners receives higher returns from being a union member (Manquilef-Bachler, 2009).

Our findings reveal that the simple OLS regressions result in a slightly higher wage premium in Turkey compared to the propensity score matching and quintile regressions. While the overall premium is around 12% for all workers when linear estimation technique is used, this decreases to 11% with propensity score matching, and ranges from 10% to 15% between the 50<sup>th</sup> and 90<sup>th</sup> quintiles. Besides, there is considerable difference between what the unions can offer to their members in the public versus private sectors. When the sample is divided into public and private sectors, the simple OLS regressions indicate 7% premium in the former and 22% premium in the latter. The propensity score matching technique supports the separation as the premium drops to 6% with PSM in the public sector and to 19% in the private sector. Although, the differences between the OLS and PSM might not appear large in the public sector, there is overestimation for the private sector wage effects if unobservable characteristics are not taken care of. These differences exist due to the relative heterogeneity of firm characteristics in the private sector compared to the public sector. Public firms are generally large, and the wage settings in large public firms have to follow a set of institutional rules. The non-members also manage to gain from the improved terms that are negotiated by unions. On the contrary, private firms are quite heterogeneous and bilateral bargaining is the most widespread practice as a result most of the non-members are largely excluded from the benefits. Thus, the unions wherever they exist in the private sector can have a greater leverage in determining earnings.

The quintile regression shows a number of interesting findings; first for the private sector wage premium is not in line with the previous findings that emphasize the distributional role of the unions. In Turkey, the high earning groups in the private sector gain most from membership while the lower quintiles experience relatively less wage benefits. For the 10<sup>th</sup> quintile in the private sector, the premium is 21% which increases up to 32% in the 90<sup>th</sup> quintile. The opposite holds true for the public sector where the union premium distribution is more in line with the literature. While the premium is 11% for the 10<sup>th</sup> quintile, this steadily decreases to 3% in the 90<sup>th</sup> quintile and become insignificant. Wage compression in Turkey seems to be non-existent in the private sector suggesting that the wage increases are more in line for the high ability individuals (Card et al., 2004). One of the main reasons is the minimum wage acting as an anchor, and the minimum wage earners constitute the majority of the Turkish private sector. Unions representing these workers are less capable of raising wages above the minimum levels.

The rest of the paper is organized as follows. The next section reviews the industrial relations framework in Turkey and its relation to wage setting with a special emphasis on the developments in the public and private sectors. In the third section we provide the summary statistics, and discuss the data and the econometric methods we used for our estimations. The fourth section presents the findings and possible explanations for having differential union wage premium across sectors in Turkey. The fifth section concludes.

## **2. Industrial Relations and Wage Determination in Turkey**

The contemporary Turkish industrial relations system is marked by the 1980 military coup, which is based on severe restrictions and heavy administrative controls. In 1983 Trade Unions Act (TUA) and Collective Labour Agreement, Strike and Lock-out Act (CLASLA) were passed. These include a number of measures that weaken the institutional power of unions and limit their activity. Trade union membership and density have deteriorated significantly since 1980s partly due to the new regulatory constraints, and partly due to the structural adjustments brought by the increasing exposure to competition in the international markets. Especially the second half of 1990s

showed an extremely bleak picture for unionism in Turkey. Privatization and expansion of informal sector decreased the overall density as well as the organizational strength of the unions. As the share of temporary employment, self-employment and sub-contracting increased, the unions became even less capable of drafting new members or maintaining the existing ones.

There are contending data about the union density and membership in Turkey; however it is clear that since mid-1980s, unionism faces significant challenges. According to the most recent data from OECD, union density was around 21.9% in 1986 and went down to 5.9% in 2009 (OECD, 2011). Data collected from the trade unions about membership show considerably higher rates. For instance in 2008, there were 3.18 million union members, and the total number of workers under Ministry of Labour and Social Security (MLSS) jurisdiction was 5.41 million. The workers who were unionized belong to 92 trade unions in the private sector, and there are significant regional disparities in unionization rates. The more industrialized parts of Turkey have a higher union density. In the public sector, 930 thousand were unionized in 54 unions out of a total of 1.69 million public servants (MLSS, 2011). These workers are covered by a different jurisdiction than MLSS. In certain sectors such as health and education, unionization rates are much higher than the average, which is in line with several other European countries.

While the unionization rates according to these figures appear to be much higher, it should be noted that the official membership rates are inflated due to union rivalry. Thus, the coverage of collective agreements can provide a better understanding of the extent of the decline of unionism in Turkey. For example out of 3.18 million unionized workers in the private sector only 891,000 were covered by a collective agreement. There are no data at the individual level for the type of collective agreement and coverage of it in Turkey but it is also not possible to extend the collective agreements to the sectoral or industrial level as the entire bargaining takes place at the enterprise level. The coverage fluctuates vastly for the public sector while it is more stable in the private sector. Although there was an increase in the total number of workers covered by a collective agreement since 2000s, the share of these to the total number of employees went down to 2%. The highest coverage rate was achieved in 2001, approximately 7.6%, which was

mainly due to the agreements signed in the public sector (ibid). In 2006, a total of 1,704 collective agreements were concluded in Turkey covering 2.4% of the total work force and two thirds of this agreement was in the public sector.

Real wage developments followed a similar pattern where there was a rapid decline right after the military coup in 1980 and temporary recovery in the first half of the 1990s. Partly due to the militant industrial action and partly due to the positive growth rates in the first half of 1990s, the real wages took a positive upturn<sup>ii</sup>. In public sector, the wages were doubled in 1991 and even though the private sector real wages rose as well, it was at a much lower pace. However the real wage increases came to a halt with the 1994 currency crisis and recovered only slightly until the beginning of 2000s. In 2001-2002, Turkey went through another round of banking and currency crisis and since then the real wages in both public and private sectors are declining with a more rapid pace in the latter. On the other hand the productivity gains have reached to 26% in the same period (Safak, 2006). One of the reasons for the divergent wage and productivity developments is the minimum wage legislation. Indeed, the main anchor for wage setting is the minimum wage in Turkey, which is decided by the state, and does not necessarily reflect the productivity trends. For instance, 70% of people working in the private sector receive wages close to the minimum wage

Five different categories of workers are defined with regard to wage setting mechanisms in Turkey: namely, civil servants, employees of state-owned enterprises, employees covered by collective agreements in the private sector, formal private sector employees not covered by collective agreements, and informal sector employees. Substantial wage differentials are evident between these five categories, mainly due to the prevailing wage setting. In two of the five categories –civil servants and employees of state owned enterprises (who make up about 10% of manufacturing employment), where the government plays a key role in wage setting, and private sector employees covered by collective agreements (who account for around 20% of employees in private manufacturing) – wages are considerably higher compared with the other two categories. As we will attempt to show in the following sections the differences are both due to the

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<sup>ii</sup> Between the years of 1988-1989 the real wages rose 129% in private sector and 188% in the public sector (Celasun, 2002).

sectoral characteristics and unionization rates. In other words, we attempt to show that high earnings in these categories are for different reasons. For the first two categories, the main determinant is belonging to the public sector while for the third category being a trade union member is crucial. Indeed, the union premium in private sector is significantly higher in Turkey despite the low levels of unionization perhaps indicating the strength of few concentrated unions.

### **3. Data and Methodology**

#### **3.1 Data**

The estimations look at the union wage premium in Turkey by accounting for a number of individual, firm and sectoral characteristics. Our main data source is the Household Income and Consumption Expenditure Survey (HICES) conducted in 2006. The survey includes 34,939 individuals around the country, and has detailed information on demographic, firm related and sectoral variables. For our purposes we focus on the information about the size of firm, industry, sector, age, experience, education, gender, union membership and detailed data on various earnings categories. For this paper, we use the gross monthly earnings which is calculated by adding all monetary and monetary value of in kind payments received from the employer. Since our main goal is to analyze the impact of unions on wages, first we eliminated the non-wage earners. The majority of the employment in the sample is wage employment and this left us with a sample of 6,451 individuals.

In the survey there is no information about the firm level wage setting process or collective agreement coverage. Therefore, it is impossible to distinguish the workers who are covered by the collective agreements from the ones who are not. Simple membership data do not tell us if there are non-unionized workers who enjoy the same wage and non-wage benefits due to the general coverage at the firm level. A matched employer-employee dataset could solve this problem but for the Turkish labor market such information is not collected. Besides, the share of unionized workers is significantly different in public and private sector. While it reaches to 31% in the former, it is merely

3.32% in the latter. We also argue that there are individual and firm level variances between the two sectors leading to a non-linear relationship between the wage determination and unionization. Hence, it becomes crucial to control for the self-selection and endogeneity of trade union membership, and also dividing the samples to reveal some of the differential impacts. Table 1 provide the summary statistics for gender, age, education, experience, social security and firm size and wage for the public and private sectors.

### **Insert Table 1**

As can be seen from the above table the average gross wages are significantly lower in the private sector; 622.45 TL as opposed to 1,080.53 TL. Indeed the only variable that does not significantly vary between the two sectors is gender as male workers are predominant in both cases. Otherwise, the employees are more experienced, educated and are older in the public sector on average. Besides, the share of firms with more than 50 workers is much higher in the public sector and almost all of the employees have social security coverage. While in the private sector, the firm size is smaller and approximately half of the workers have social security. Figure 1 and Figure 2 show the density of education and experience for unionized and non-unionized workers. Not only that these vary significantly across public and private sectors but also across membership. For instance, education levels are higher on average among the unionized workers and the experience is more normally distributed. Given these salient differences between the two sectors and unionization rates, we in the following sections, argue that non-linear estimation techniques provide a better explanation for the impact of trade unions in Turkey as the endogeneity and self-selection problems are overlooked in the standard linear estimation techniques.

### **Insert Figure 1**

### **Insert Figure 2**

## **3.2 Methodology**



OLS estimations enable us to look at the effect of union membership on wages by establishing a linear relationship between the explanatory and dependent variables. However, some of the assumptions for the linearity can not be easily met with unionization data as it is not necessarily random to become a trade union member. On the one hand there are some unobserved characteristics – social networks, workplace heterogeneity and industry characteristics affecting the likelihood of being a union member as well as earning higher wages. Additionally, the members who had chosen union membership could have observed characteristics bringing them higher wages even without the union membership - greater experiences or being in a larger public firm. Therefore, to accurately estimate the union premium the self-selection and endogeneity issues need to be controlled. We employ two different techniques to cope with each; propensity score matching for endogeneity and quintile regression for self selection.

### *3.2.1 Propensity Score Matching*

Propensity score matching technique tries to minimize the biases due to the self-selection and endogeneity issues by distinguishing between the treatment and non-treatment groups. When we have the treatment to be the union membership,  $U=1$  indicates that the worker has received the treatment. Naturally,  $U=0$  means that the worker has not received the treatment, thus that worker is not a union member. The potential outcomes, the monthly wages, are then  $W_1$  and  $W_0$  respectively for the treated and the non-treated. It is impossible to estimate the individual treatment effect since there is no way to observe the potential outcome of a worker who has a treatment as if she had no treatment at the same time (the counterfactual case). However, ATT (Average Treatment Effect on the Treated) on those who received treatment compared to what they could have obtained without the treatment can be estimated, albeit with a great deal of bias. The equation is as follows:

$$ATT = E(W_1 - W_0 | U = 1, X)$$

$E(W_1/U = 1, X)$  is observable from the observational data but  $E(W_0/U = 1, X)$  is unobservable and there is a missing counterfactual problem for the averages. Utilizing observed sample means to construct the counterfactual can lead to biases. Heckman et. al. (1998) divide the bias for ATT into three subcomponents:

$$E(W_0)/U = 1, X) - E(W_0)/U = 0, X) = B1 + B2 + B3$$

where  $B1$  is the bias due to lack of sufficient overlap in the two groups (densities of common characteristics),  $B2$  is the bias due to differences in the distribution of observational characteristics  $X$ s under the common support region and finally  $B3$  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 imilar 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,  $X$ .

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.

$$p(X) = \Pr(U = 1|X) \text{ for } X \in S$$

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.

We employ “full-matching” algorithm by using R package “MatchIt” (Ho et.al., 2011). Before matching, average propensity scores in the treatment and control groups are 0.31 and 0.08 respectively. After full-matching the average propensity scores turn out to be almost equal at 0.31 and 0.30 respectively. The resulting dataset is then used to estimate the union premium. As the covariates that influence the likelihood of becoming a union member are similar in both the control and treatment groups in the new dataset, union premium can be estimated as the coefficient on the union discrete variable.

### 3.2.2 Quintile Regression

The technique involves the minimization of the weighted absolute values of the residuals and uses all of the available data. In this sense it offers a more complete picture about the linkage between the outcome variable and the regressors at different points of the conditional wage distribution. Given the generally low skills and high degrees of substitutability, the low wage workers typically have very limited bargaining power unless they belong to a union. Besides, due to the wage compression effect, the highly skilled unionized employees might earn less than their non-unionized counterparts (Freeman and Medoff, 1984). Since the explanatory variables can have differential effects on wages along the distribution for the mentioned reasons, it is useful to employ quintile regression analysis. Estimates at the 10<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 90<sup>th</sup> quintiles are presented. The impact of the above mentioned factors on wage determination across quantiles is estimated by method of quintile regressions for the entire sample and for each sector separately. The regression equation is as follows:

$$\log w_i = \beta_q X_i + u_{qi} \text{ with}$$

$$Quant_q(\ln w_i | X_i) = \beta_q X_i \text{ and } E[u_q] = 0$$

This allows us to estimate the intercept and slope coefficients at each particular quintile. By employing quintile regression method, we obtain both the location shift and the variation in the slope parameter at each quintile. The coefficient for each quintile is

the derivative of the dependent variable in the  $q$ th conditional quintile with respect to a unit change in the explanatory variable. The method assumes that the independent variables at each quintile are not correlated with the mean of the unobservables at that quintile. For example, the union membership needs to be independent from the unobserved ability. Since these variables can be correlated, conditional quintiles might have heteroscedastic error terms which will lead to biased standard errors. To remedy for this, we employed bootstrap estimation of the standard errors with 50 repetitions.

#### **4. Results and Implications**

In Turkey, the union premium is around 12% when OLS method is used for the entire sample and all of our variables are explanatory<sup>iii</sup>. Having a university or post graduate education has the highest impact on wages while social security coverage has the second highest magnitude, around 42%. Public sector also plays an important role and positively affects the wages in Turkey. Moreover, the comparison between the OLS and quintile regression estimations show that the union premium is not uniformly distributed and unlike some of the earlier findings in the literature, in Turkey both the upper and lower end of the wage earners gain from being a trade union member. While the coefficient on membership is 15% for the 10<sup>th</sup> and 90<sup>th</sup> quintiles, it is 10% for the 50<sup>th</sup> quintile. Also, the public sector ceases to be explanatory for the high wage earners as the coefficient is not statistically significant for the 90<sup>th</sup> quintile. This is in line with the majority of the existing findings, which show that there is a positive bias in earnings for the workers at the low end of the distribution (Falaris, 2008). Table 2 presents the OLS and quintile regression results for the entire sample.

#### **Insert Table 2**

Since there are significant differences between the public and the private sector firms and employees in Turkey, we divide the sample into two. The OLS estimates for

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<sup>iii</sup> There are statistically insignificant coefficients on occupational and industrial dummies but for space limitations we did not report them individually. These can be obtained from the authors upon request.

the union premium in the public sector is around 7% and there are a number of unexpected findings regarding the educational categories. Compared to the reference category, less than primary schooling, it appears that there are no wage gains in obtaining higher levels of education up until high school level. Only then there is a positive link between the wages and education but still statistically insignificant. This can be due to the wage compression effects in the public sector which suggests that the lower pay differentials can be a punishment for highly educated employees in the public sector as they are not allowed to be rewarded according to their skills and training (Mueller, 1998). The rest of the variables continue to carry their expected signs and are significant. In the quintile estimations, we find that once again the premium is not proportional. The lower wage earners benefit much more from being a union member as the coefficient is around 10% points for the 10<sup>th</sup> quintile. While the upper end of the distribution, 90<sup>th</sup> quintile, in the public sector does not gain from becoming a member although there is still a positive association between wages and membership. However, the coefficient is around 3% points, much lower than the other quintiles and statistically insignificant. The unions act in line with the theoretical expectation in the Turkish public sector, raising the earnings of the bottom quintiles more than the upper ones.

### **Insert Table 3**

Finally, we run the same regressions for the private sector workers and it turns out that the union premium is quite distinct. In the OLS estimations, the coefficient turns out to be 22% for the private sector employees. Educational variables and social security continue to have a significant and large impact on the wages. Firm size is also positively related to earnings with a coefficient of 18%. The quintile estimates are rather different and are to a certain extent unexpected. First, the union premium for the bottom quintile is lower than the upper quintile, 21% and 32% respectively. In the private sector, being a trade union membership is more beneficial for the employees who lie on the upper end of the wage distribution. This is in contrast with the most of the findings in the literature, for instance Eren (2009) proposed that the earnings differences between the members and covered non-members are more crucial for low wage earners. Unions are expected to

increase the wages of the lower earners more as the higher earner groups have other traits such as higher education and skills that make the trade unions' influence less effective. However, in the Turkish context, we found that the union membership is on average much more important for wage determination in the private sector compared to public sector but also, the high wage earners get a bigger share of the pay benefits. This can be due to the inability of the unions to bargain for the bottom earners as their wages are set primarily by the minimum wages, which are decided at the central government level. On the contrary, the firm level bargaining allows the more able employees to strategically use their union membership and get higher compensation.

#### **Insert Table 4**

Table 5 shows the full-matching estimations for the full sample and for each sector separately using the PSM method. The important point in the full-matching algorithm is to match as many control group units as possible that fall in a given neighborhood of a treated group unit. We also have tried nearest-neighbor and genetic matching algorithms and obtained better results in terms of improvements in the mean differences of matched covariate variables between the treatment and control groups units after matching in the full-matching case. After full-matching, 4,370 observations are discarded since they are out of bounds given the common support in the dataset covering all workers. In the full sample, raw mean difference in wages among union members and non-members is as high as 73.5% of the control group, namely that of the non-union members. However, after full matching on propensity scores the mean difference in wages drops to 22.9% in the full sample. After controlling for individual and firm characteristics the mean difference of wages further declines as the following discussion illustrates. The union premium in Turkey for all workers, using PSM, is around 11% and significant at 99% level, which is marginally lower than the OLS regression results.

The OLS estimation of union premium in the public sector is slightly greater than the PSM estimation; former is 7% and the latter is 6%. The quintile regression also shows that union premium declines almost consistently across quintiles in the public sector. Since the full-matching selects mostly from the better workers of the control group units

which are more likely to be within the neighborhoods of the treatment (unionized) group units, the union premium observed as the average treatment effect on the treated is expected to be lower compared to the OLS estimation in which all public workers are considered. In general union premiums, estimated either by OLS, quintile or PSM, are greater in the private sector than in the public sector. Our findings confirm this common observation. We find that the PSM estimation for the union premium in the private sector is 19%, which is almost three times of the public sector union premium. Although Blanchflower and Bryson (2010) find that public sector workers enjoy a higher union premium compared to the private sector workers in UK, they underline the fact that rather the opposite result should be normal. "...it seems implausible that there should be a substantial union wage premium in the public sector. Unlike in the private sector, the majority of public-sector workers have pay set directly through collective bargaining or through pay review bodies, whether or not they are union members." (p.92)

Our results show that in Turkey there are significant wage gains from becoming a member, especially for the private sector employees, and these benefits even increase along the earnings distribution. We claim that this is mainly due to firm characteristics, and seem to be similar to the Spanish case where firm specific contracts benefit the members most and the premium is much larger for the highly paid workers (Card and De La Rica, 2006). Also, we suggest that the different wage setting policies in Turkey contribute to the sectoral differences in terms of unions' impact. In the public sector the wage setting is more institutionalized and the dispersion is much lower. Collective bargaining is widely used and the terms apply to the sectors rather than the members. On the contrary, the Turkish private sector is characterized by decentralized bargaining and very low levels of coverage. Hence, only the unions that are in specialized firms and sectors are able to extract quasi-rents to advance higher wages for their members.

## **5. Conclusion**

The paper studied the impact of unions on wage determination in Turkey by looking at the public and private sectors as well as the entire set of employees. There are a number of studies examining the union wage premium in several countries but Turkey

is not a well researched case. With its declining union density rates and sectoral differences, Turkey is argued to offer new insights to the old debate about the role of unions in wage determination. The few previous findings, which base their estimations only on OLS, found sizable union premiums. However, these studies overlooked endogeneity and self-selection problems that can severely bias the results. In order to deal with these issues we used different empirical tools, PSM and QR techniques, and concluded that despite the low levels of unionization, the premium is considerable and the unionization has significantly higher effects in the private sector. The union premium on average in Turkey is quite sizable and does not change much when different estimation techniques are employed. While the OLS estimations for public sector revealed a premium of 7%, the PSM findings indicated 6%. These rise to 21% and 19% for the private sector for each method respectively. When QR technique is employed we found that the unions are much more beneficial for the lower end of the wage earners in the public sector but the opposite is true for the private sector. Thus, the sectoral differences are not only explanatory for the premium but also distribution of it in Turkey.

We suggested that firm heterogeneity and underlying employee characteristics across sectors lead to the differences in premiums. While the firms in the public sector are generally larger and the employees have more education as well as experience on average, the firm size, education and experience of workers are much lower in the private sector compared to the public sector. Besides, private sector firms have a much more unequal distribution over these features, thus the differences between the unionized and non-unionized workers are much less pronounced in the public sector hence the wage gap is expected to be lower. However, the private sector unions representing the highly educated and experienced workers in larger firms appear to have high leverage.

Additionally, the wage setting practices in Turkey across the public and private sectors are quite distinct. The former has institutional rules and most of the earnings related conditions are bargained for all workers regardless of their membership status. In the private sector, the minimum wage is used as the main anchor for wage setting. Besides, the collective agreements are negotiated at the firm level hence the terms do not apply much beyond the members. Therefore, the public sector wages in Turkey are at least partly set by non-union related variables while in the private sector, the active



unions have a big impact even after controlling for a large list of individual, firm and industry level factors. However, it should be noted our findings do not reveal that how much of the union premium is transferred to non-members in Turkey, which can be the core of future research.

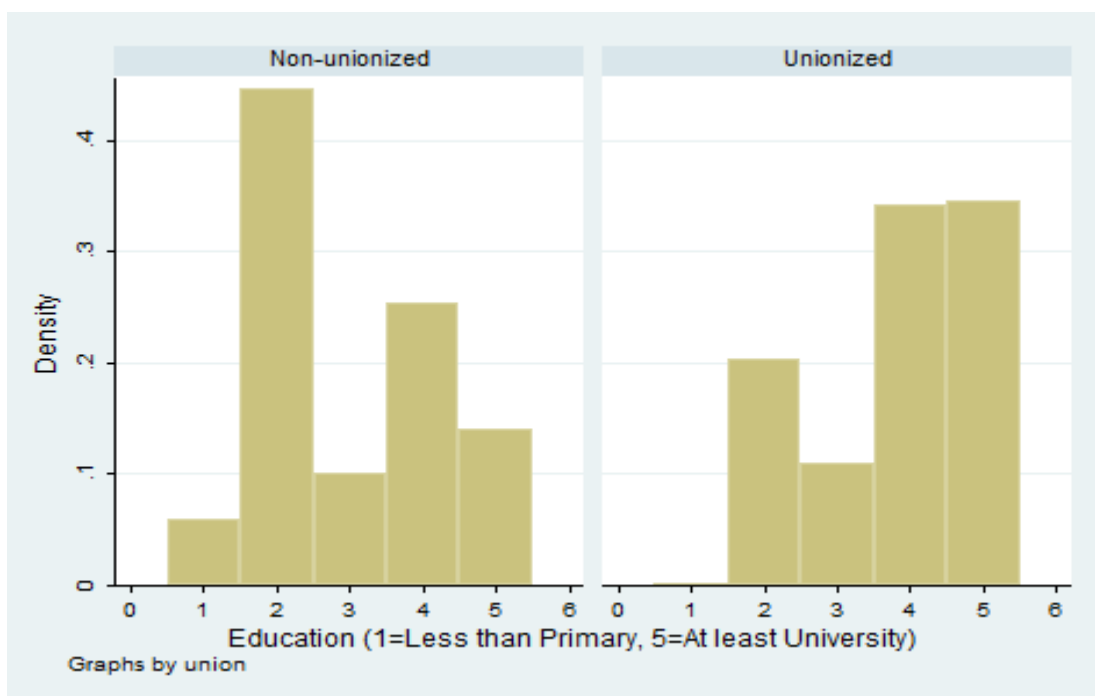
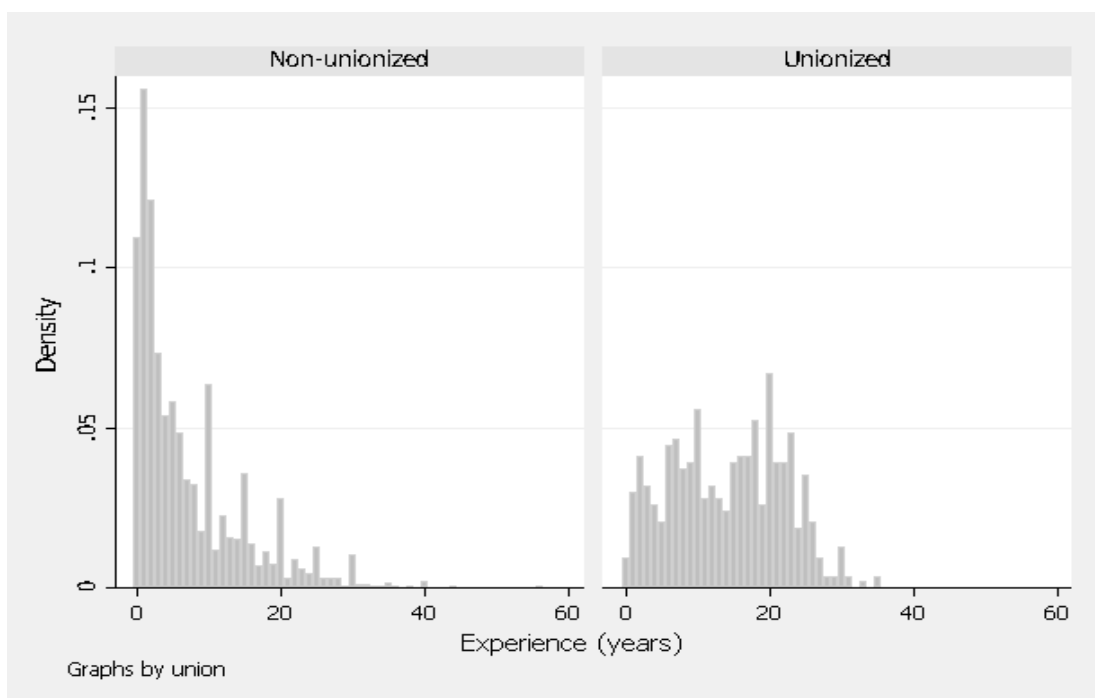
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**Table 1.** Summary Statistics

	<b>Mean</b>	<b>Std. Deviation</b>		<b>Mean</b>	<b>Std. Deviation</b>
<b>Public</b>			<b>Private</b>		
Wage	1,080.53	554.435	Wage	622.45	538.73
Union	.31	.463	Union	.033	.18
Gender	.79	.404	Gender	.79	.4
Age	7.41	1.79	Age	6.2	2.2
Education	7.5	2.56	Education	4.75	2.37
Experience	12.67	8.27	Experience	5.57	6.61
Firm Size	.55	.49	Firm Size	.27	.44
Social Security	.96	.19	Social Security	.51	.5

**Figure 1. Education Density****Figure 2. Experience Density**

**Table 2.** Union Wage Premium for All Workers with OLS and QR

	<b>OLS</b>	<b>10<sup>th</sup> quintile</b>	<b>50<sup>th</sup> quintile</b>	<b>90<sup>th</sup> quintile</b>
<b>Union</b>	0.12**	0.15**	0.1**	0.15**
<b>Public</b>	0.09**	0.16**	0.17**	0.05
<b>Middle Aged</b>	0.24**	0.26**	0.2**	0.3**
<b>Older</b>	0.18**	0.15*	0.2**	0.25**
<b>Experience</b>	0.3**	0.4**	0.3**	0.2**
<b>Experience<sup>2</sup></b>	-0.0006**	-0.001**	-0.0007**	-0.0005**
<b>Gender</b>	0.26**	0.34**	0.17**	0.16**
<b>Primary</b>	0.24**	0.31*	0.19**	0.18**
<b>Secondary</b>	0.31**	0.39**	0.23**	0.24**
<b>High School</b>	0.38**	0.46**	0.3**	0.32**
<b>University</b>	0.66**	0.69**	0.56**	0.61**
<b>Social Security</b>	0.43**	0.74**	0.35**	0.23**
<b>Firm Size</b>	0.18**	0.18**	0.15**	0.13**
<b>Industry</b>			Yes	
<b>Occupation</b>			Yes	
<b>Observations</b>			6451	
<b>R<sup>2</sup></b>	0.52	0.38	0.33	0.3

- \*\* indicates 99% significance level and \* indicates 95% significance level

- Occupation dummies include management, professional assistants, office sales, crafts, machinists and unskilled categories.

- Industry dummies include mining, manufacturing, electricity, construction, trade, restaurants, real estate, public services, education, health and other services.

**Table 3.** Union Wage Premium for Public Sector Workers with OLS and QR

	<b>OLS</b>	<b>10<sup>th</sup> quintile</b>	<b>50<sup>th</sup> quintile</b>	<b>90<sup>th</sup> quintile</b>
<b>Union</b>	0.07**	0.1**	0.07**	0.03
<b>Middle Aged</b>	0.28**	0.66**	0.27**	0.04
<b>Older</b>	0.37**	0.66*	0.32**	0.3**
<b>Experience</b>	0.4**	0.6**	0.2**	0.2**
<b>Experience<sup>2</sup></b>	-0.0009**	-0.001**	-0.0005**	-0.0004**
<b>Gender</b>	0.15**	0.13**	0.09**	0.18**
<b>Primary</b>	-0.14	-0.22	-0.23	0.07
<b>Secondary</b>	-0.08	-0.07	-0.23	0.15
<b>High School</b>	0.06	0.1	-0.04	0.2*
<b>University</b>	0.31*	0.26	0.18	0.43**
<b>Social Security</b>	0.89**	1.26**	0.75**	0.68**
<b>Firm Size</b>	0.13**	0.09**	0.11**	0.16**
<b>Industry</b>			Yes	
<b>Occupation</b>			Yes	
<b>Observations</b>			1507	
<b>R<sup>2</sup></b>	0.53	0.44	0.3	0.29

- \*\* indicates 99% significance level and \* indicates 95% significance level

- Occupation dummies include management, professional assistants, office sales, crafts, machinists and unskilled categories.

- Industry dummies include mining, manufacturing, electricity, construction, trade, restaurants, real estate, public services, education, health and other services.

**Table 4.** Union Wage Premium for Private Sector Workers with OLS and QR

	<b>OLS</b>	<b>10<sup>th</sup> quintile</b>	<b>50<sup>th</sup> quintile</b>	<b>90<sup>th</sup> quintile</b>
<b>Union</b>	0.22**	0.21**	0.21**	0.32**
<b>Middle Aged</b>	0.23**	0.26**	0.19**	0.28**
<b>Older</b>	0.15**	0.2**	0.14**	0.12**
<b>Experience</b>	0.2**	0.2**	0.2**	0.3**
<b>Experience<sup>2</sup></b>	-0.0005**	-0.0005**	-0.0006**	-0.0005*
<b>Gender</b>	0.29**	0.44**	0.19**	0.14**
<b>Primary</b>	0.25**	0.38*	0.21**	0.14**
<b>Secondary</b>	0.32**	0.46*	0.27**	0.19**
<b>High School</b>	0.38**	0.46*	0.29**	0.27**
<b>University</b>	0.64**	0.68**	0.57**	0.63**
<b>Social Security</b>	0.39**	0.68**	0.31**	0.18**
<b>Firm Size</b>	0.18**	0.2**	0.14**	0.08**
<b>Industry</b>			Yes	
<b>Occupation</b>			Yes	
<b>Observations</b>			4944	
<b>R<sup>2</sup></b>	0.44	0.32	0.24	0.29

- \*\* indicates 99% significance level and \* indicates 95% significance level

- Occupation dummies include management, professional assistants, office sales, crafts, machinists and unskilled categories.

- Industry dummies include mining, manufacturing, electricity, construction, trade, restaurants, real estate, public services, education, health and other services.



**Table 5.** Union Wage Premium with Propensity Score Matching

	<b>All Workers</b>	<b>Public</b>	<b>Private</b>
<b>Estimate</b>	0.11**	0.06**	0.19**
<b>Standard Errors</b>	0.02	0.02	0.04
<b>Original number of obs.</b>	6451	1507	4944
<b>Original number of treated obs.</b>	632	468	164
<b>Matched number of obs.</b>	1449	624	825
<b>Discarded number of obs.</b>	4370	415	3955

- \*\* indicates 99% significance level
- Industry and occupational variables are controlled for
- Full-matching algorithm is used