Do Wage Subsidies Alleviate Employment Discrimination Against Women? The Case of Turkey

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Do wage subsidies alleviate employment discrimination against women?: The case of Turkey[*]

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This paper investigates the employment effects of the employment subsidy programs implemented in Turkey since 2008. The Turkish government put into practice active labor market programs (Law 4447 Provisional Articles 7 and 10) to generate new employment for all women and younger men, which are the relatively disadvantaged groups in the Turkish labor market. We use a nationally representative micro-level dataset and a difference-in-differences approach to estimate the causal effect of these programs. We find that although these incentive programs are relatively costly, they help to decrease discrimination faced by women especially in the low-skilled blue-collar jobs and high-skilled white-collar jobs. These wage subsidies result on average a 1.2 percentage points increase and at most, a 3.5 percentage points increase in the share of women in newly hired workers.

Keywords: Difference-in-differences, employability, gender discrimination, micro-level data, subsidy programs

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1. Introduction

Employment discrimination exists when minority or female employees are treated differently than similarly productive whites or men (Gwartney et al., 2014). This discrimination restricts employment and earnings opportunities compared to others of similar productivity. Employment gender gap concerns not only wages but also hiring decisions (Reuben et al., 2014). Via anti-discrimination programs, governments put in effort to undertake hiring discrimination. For instance, in Norway, a 2006 Law imposed a 40 percent gender quota for women as directors of listed companies (Beaurain & Masclet, 2016).

Employment gender gap are also an issue in the Turkish labor market. In 2008, Turkey's female employment rate at 23.5% was the lowest -still the lowest- among OECD countries, while the employment rate of men was 66.5%. In July 2008, Turkish Government initiated an active labor market program (Law 4447 Provisional Article 7, 2008) to subsidize the employers' social security contributions for all women above 18 years old and young men aged between 18 and 29 years old. This incentive has been applied up to 5 years to eligible firms.[1] In February 2011, a new incentive program was initiated by Law 4447 (Provisional Article 10) with a new arrangement that included some of the men over 29 years of age. These revised incentives also include positive discrimination against women and younger men, namely, they provide social security premium cut for relatively longer periods to firms employing women and youth.

This paper contributes to the literature by documenting the impact of employment subsidies on discrimination faced by women in hiring for a job by providing evidence from Turkey. In the existing literature, employment gender gap is mainly studied in the wage gap context. In our model, we consider gender discrimination as the share of women in newly hired workers.

Estimating the true impact of these employment subsidies requires constructing counterfactuals of what would have been the share of women in newly hired workers in the absence of the subsidies. The novelty of this research is that different from the existing literature, we consider women in the informal sector as a control group. Most of the studies analyzing the effect of employment incentives consider older men (of age 30 and above) as a control group in a difference-in-differences (DD) setup, however using men as a control group is problematic. Assume that men and women are inputs in production. When the wage of a woman decreases to the employer due to a subsidy, one input becomes relatively cheaper. The substitution effect implies that employers should substitute women for men. However, when one input becomes cheaper there is also a scale effect because the marginal cost of production decreases and a firm will increase both inputs. Therefore, a firm will increase its demand for women but the effect of the subsidy on the employment of men is ambiguous since the substitution effect implies that the employment of men should decrease and the scale effect implies that the employment of men should increase. Hence using men as a control group is

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[1] Four conditions must be held for eligibility. (1) Firm should be a private sector workplace. (2) The average number of insured notified to the Authority between 2007/July and 2008/June must be exceeded. It is calculated as follows whether the average number of insured notified to the Authority between 2007/July and 2008/June has been exceeded. For example; the total number of insured persons whose monthly premium and service certificate were given to the Authority by the firm between 2007/July and 2008/June is 84, the monthly average; 84/12 = 7 are insured. Assuming that the firm employs four insured persons with the necessary conditions in 2008/October and the total number of insured persons working with the insured in that month is 10 (since there will be an Additional Insured = 10 - 7 = 3), the incentive will be available for three insured persons. (3) Incentive period monthly premium and service certificate should be given to the Authority within the legal period. (4) Incentive period premiums of the month must be paid.

problematic, since the employment of men is also affected by the subsidy and in an ambiguous way. We assume that the supply of labor is elastic and the input prices remain constant in the informal sector.[2] These assumptions imply that the gender composition among newly hired workers does not change with the subsidies. Therefore, we can test whether the share of women in the newly hired workers increases after the employment subsidies.

We investigate the issue of employment discrimination against women in Turkey by analyzing the pre-policy and post-policy periods. These employment subsidy programs are types of active labor market programs that are "employer-side hiring subsidies". For this aim, unlike the current literature in Turkey, we reach this issue from the labor demand side. We control for job characteristics and firm characteristics to analyze the effect of the subsidy programs on the formal job accessibility of women. To achieve our main goal, we perform a DD estimation strategy. The design of the subsidy programs looks like a natural experiment that puts women in the formal sector into the treatment group and women in the informal sector into the control group.

The DD estimates show significant effects of the subsidy programs on the discrimination faced by women. We have found that the incentives given by Law 4447 Provisional Articles 7 and 10 help to decrease discrimination faced by women especially in the low-skilled blue-collar and high-skilled white-collar jobs. We have found that these wage subsidies result on average a 1.2 percentage points increase and at most, a 3.5 percentage points increase in the share of women in newly hired workers high-skilled white-collar jobs.

The structure of the paper is as follows: we review related literature in Section 2. We document employment subsidy programs in Turkey in Section 3. In Section 4, we present the dataset that we used. Then we introduce our model in Section 5. In Section 6, we show our empirical results. In the last section, we conclude.

2. Related Literature

Active labor market policies aim to reduce the gaps in employment rates between men and women by subsidizing employers' costs of new hires from the female working age population. The theoretical literature mostly agrees that this type of employer-side subsidies should be effective (Phelps, 1994; Snower, 1994; Katz, 1998). However, empirical research is relatively sparse and gives mixed results. The effects of affirmative-action programs have been extensively studied in the literature (e.g. Ashenfelter & Heckman, 1976; Rodgers & Spriggs, 1996; Holzer & Neumark, 1999). Most of the studies conclude that affirmative-action programs are successful in increasing minority and female employment.

There is a growing literature that studies the effects on the labor market of employment subsidy schema in Turkey. Betcherman et al. (2012) examine the incentives given by Law 5084 (2004) and by Law 5350 (2005). They implement a DD methodology. They find significant net increases in the registered jobs in the eligible provinces. Additionally, their results suggest that these subsidies do not create new economic activity.

The following studies deserve to be mentioned as they analyze the effect of the same set of employment subsidies on the Turkish labor market. First, Uysal (2013) uses Turkish Household Labor Force Survey (HLFS) macro data and the employment status of the target group and men under 30 years of age are compared with a DD method over time. She finds that incentives affect positively the registered employment of married women who are not high school graduates. She also draws attention to the fact that large firms operating in the industrial

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[2] The Figures 1-4 in the Appendix B support our assumption that the supply of labor is elastic.

sector benefit from the incentives. Similarly, Balkan et al. (2014) analyze whether the incentive program implemented in 2008 influences the employment chance of the target group using the HLFS microdata set covering the 2004-2011 period. In the study design, older men (of age 30 and above) who are not given an employment subsidy are the control group and the rest (i.e., the target groups) are in the treatment group. They perform a DD estimation strategy and find that employment subsidies do not effectively increase the employment probabilities of women but have a negligible effect on the informality of targeted groups. Differently from these two studies, Balkan et al. (2016) use the Survey of Income and Living Conditions (SILC) panel data set covering the 2006-2012 period. Using the panel dimension of the data, they suggest that employment subsidies help women to transition into the formal sector. Moreover, using data set covering 2006-2010 period in a DD setup they propose that employment subsidies increase the employability of women and decrease their informality and unemployment probability.

The second strand of the related literature is that of the gender discrimination studies. In the existing literature, gender discrimination is mainly studied in the wage gap[3] context (Yamak & Topbaş, 2004; Tansel, 2005). Similar to our perspective Balkan and Cilasun (2018) try to identify gender discrimination at the hiring decisions of the firms. They employ a correspondence audit methodology. Although their results suggest weak but positive discrimination against women application, this discrimination is not the reason for the low level of female participation in the labor market.

The estimation strategy of this paper is conceptually similar to the method employed by Holzer and Ihlanfeldt (1998).[4] They investigate the effects of customer discrimination on the employment of minorities, especially blacks. They show that there is a strong association between the racial composition of a firm's customers and the race of those hired, especially in contact job. In our paper, women correspond to blacks, the subsidy programs correspond to varieties of the racial composition of a firm's customers, and formality of a firm corresponds to the involvement of direct contact with customers.

3. Employment Subsidy Programs in Turkey

Turkish Government put the insurance premium incentives into practice in order to increase the employment of registered workers, to increase the employment of disadvantaged groups such as women, youth and disabled people, and to encourage strategic investments with regional and large-scale investments. The main incentives in Turkey are the following:

   i.) Additional Employment Support (Law 4447 Provisional Article 7)
  ii.) Five-Point Discount (Law 5510)
 iii.) Incentives to Employers Recruiting Unemployment Beneficiaries (Law 5921)
  iv.) Incentive for Young and Women's Employment and Men's Employment with Professional Certificate (Law 4447 Provisional Article 10)
   v.) Incentive of Disabled Employment (Law 4857)
  vi.) R&D Insurance Premium Incentive (Law 5746)
 vii.) Insurance Premium Incentive for Cultural Investments and Initiatives (Law No. 5225)

The following incentives need to be mentioned as these are supposed to have the largest impact on the labor market. In July 2008, incentives by Law 4447 Provisional Article 7 were introduced to create additional employment and were targeted women and younger men (15-29

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[3] The Figures 1-4 in the Appendix B point that in the post-policy period, most probably with the help of the employment subsidies, women in the formal sector were affected less from the 2009 crisis compared to women in the informal sector and men.

[4] Raphael et al. (2006) and Holzer et al. (2006) also used the same estimation strategy.

years old). These incentives were designed to reduce firms' contribution to the social security payment of new workers for five years. For the first year, incentives reduced the full amount, and then the reduction ratio gradually decreased through the following four years by 20%. Turkish Government was planned to end these incentives in July 2014. While the incentives by Law 4447 Provisional Article 7 were law in force, in October 2008 Law 5510 offered the five-percentage-point discount to firms. Private sector employers working under 4/1-a coverage can benefit from these incentives. The aim was to keep existing workers be employed. The program was designed not to reduce the impact of the incentives by Law 4447 Provisional Article 7, but in practice, firms may choose older men benefited from the five-percentage-point discount over women or younger men. Lastly, in March 2011, similar to the incentives by Law 4447 Provisional Article 7, incentives by Law 4447 Provisional Article 10 was announced. Addition to the former one, this program included older men who have an occupational document.

Table 1: Data on Beneficiaries of Some Incentive Laws

		2008	**2009**	**2010**	**2011**	**2012**	**2013**
Law 5510	*Workplace*	632,280	749,196	858,674	989,367	1,050,731	1,174,209
	Male	3,806,139	4,214,019	4,883,944	5,092,488	5,380,789	6,437,338
	Woman	1,153,270	1,272,175	1,474,566	1,709,299	1,884,739	2,262,463
Law 4447/7	*Workplace*	11,172	22,619	26,878	15,740	9,059	5,521
	Male	16,090	30,133	29,835	14,457	7,478	4,391
	Woman	15,652	31,482	33,395	18,012	9,471	5,311
Law 4447/10	*Workplace*	-	-	-	65,258	102,974	129,185
	Male	-	-	-	74,167	100,567	112,058
	Woman	-	-	-	73,424	118,705	145,991
Law 5225	*Workplace*	-	-	-	13	14	18
	Male	-	-	-	177	173	212
	Woman	-	-	-	213	233	250
Law 5746	*Workplace*	540	828	1,119	1,586	1,810	2,135
	Male	7,017	13,077	16,295	21,248	24,813	24,410
	Woman	1,875	3,584	4,360	5,588	6,713	7,232

In Table 1, the number of employees and firms benefiting from the insurance premium incentives are reported as of the end of the corresponding year. Note that the beneficiaries of the incentives by Law 5510 are the largest group. It can be inferred that firms benefited more from these subsidies compared to other available incentives. Besides, most of the beneficiaries of incentives by Law 4447 Provisional Articles 7 and 10 were women. Although Law 4447 Provisional Article 10 contains older men, women benefited from the incentive relatively more than men did.

Implementing similar incentives at the same period, especially the incentives by Law 5510 may result in an undesired impact of the women-oriented incentives. Consequently, this may underestimate our conclusion about the effect of incentives on gender discrimination.

Table 2: Insurance Premium Incentives Accrual Amounts, Million TL

	2008	2009	2010	2011	2012	2013
Law 5510	692.1	3,296.6	4,073.7	4,732.2	5,549.7	7,180.9
Law 4447/7	14.3	69.0	145.4	54.5	17.5	7.8
Law 4447/10	120.1	334.5	496.7			
Law 5225	0.5	0.7	0.8			
Law 5746	12.6	48.4	70.0	76.3	89.3	102.8

Table 2 indicates that the share of the five-percentage-point discount program was quite high. The main objective of this incentive was to encourage registration of workers, especially the sectors in which informal employment is widespread. However, this incentive is thought to have an indirect effect on additional job creation.

4. Data

In this study, we use the HLFS data that is compiled and published by the Turkish Statistical Institute (TURKSTAT). HLFS is the main data source that provides information about those employed; economic activity, occupation, employment status and working hours, while the unemployed; search for job search time. The HLFS has been applied in each month since 2000 to the households selected according to the two-stage stratified clustered probability sample involving eight subsamples. Based on the address, a rotation pattern is formed to ensure a 50 percent of overlap between two consecutive periods and in the same periods of the two consecutive years and eight subsamples have been used at each period. The households, which are the final sampling unit, have been visited four times in 18 months time period. The monthly sample size of the survey is approximately 13,000. In the HLFS, all private households who are living in the territory of the Republic of Turkey are covered. Residents of schools, dormitories, kindergartens, rest homes for elderly persons, special hospitals, military barracks and recreation quarters for officers are not covered.

We restrict the data set for this analysis to the period 2004-2013. We had two reasons for this restriction. First, the incentives by Law 4447 Provisional Article 7 was launched at the end of the year 2008.[5] This restriction gives us observations of five years each for the periods before and after the incentives. Second is the Syrian Refugee Crisis that has the labor market effects especially after 2013.[6] After excluding the people who are not newly employed, our final sample covers 229,587 people. By using frequency weights provided by TURKSTAT, we have 36 million people for ten years.[7]

5. Model

The differential treatment of the subsidy programs in the post-policy period to the women working in the formal sector allows us to assess the effects of the subsidies by employing a DD

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[5] We assume that the adaptation of the policy by the firm takes at least five or six months from the approval of the regulation by the government. Thus, this makes the year 2008 as a pre-policy period.

[6] Aşık (2018) reviews the literature that provides evidence on the labor market effects of Syrian refugees in Turkey. See Akgündüz et al. (2015), Del Carpio et al. (2015), Tümen (2016) and Ceritoğlu (2017) for detail information.

[7] Weighting is a method used to obtain parameters from the data set resulting from sampling to represent the universe. In the study, while reaching the final weight, the design weights have been calculated depending on the selection criteria; have been controlled for external distribution and corrected for non-responses. In weighting, age group, gender, NUTS Level 2, urban-rural and household size are based on an external control.

strategy. Some of the results that we present below obtained from estimating equations with the following general form:

$$G_i = \alpha + \beta S_i \times F_i + \gamma X + \lambda_1 Time + \lambda_2 Time \times i + \varepsilon_i \qquad (1)$$

where G is the gender of the last hired worker i. We have three types of gender: young (1), women (2), and men (3). S takes value 1 for the observations in the subsidy period or 0 otherwise. F denotes the formality of a job. X is a vector of occupation dummies, the formality of a job and a variety of variables for hiring requirements of jobs. The hiring requirements of a job are a set of characteristics that former workers working in this firm have. These include the share of school graduation types. The same vector also include one-digit industry, firm size and geographic location of the job. We also control for the 2009 crisis in our model. Despite the controls described above, our results still might be driven by occupation-specific unobserved factors. To deal with this, we include interactions between subsidy period and occupation in some of our estimated equations:

$$G_i = \alpha + \beta S_i + \rho_1 S_i \times F_i + \rho_2 S_i \times O_i + \gamma X_i + \lambda_1 Time + \lambda_2 Time \times i + \varepsilon_i \qquad (2)$$

where O represents a dummy variable for a set of occupation dummies.

If we assume that, any effects of subsidy policy on hiring into informal jobs reflect only unobserved heterogeneity and not policy effect, and then the coefficient of $S_i \times F_i$ yields an estimate of the effect of subsidy policy on the hiring of women in the formal sector. This DD estimate is unbiased if there are no formality unobservable variables correlated with subsidy policy period.

We also make comparisons of the policy effects across occupations by assuming the policy effect on hiring in unskilled blue-collar jobs reflects only unobserved heterogeneity. Again, DD estimate is unbiased only if there is no correlation between occupation specific unobservable variables and with the subsidy policy. In theory, this assumption should be held because there is no occupation-specific term in the subsidy policy.

Finally, we can have a "difference-in-differences-in-differences" (DDD) estimates of gender discrimination from the coefficient on the interaction between subsidy, formality, and occupation:

$$G_i = \alpha + \beta S_i + \rho_1 S_i \times F_i + \rho_2 S_i \times O_i + \rho_3 O_i \times F_i + \gamma X_i + \lambda_1 Time + \lambda_2 Time \times i + \varepsilon_i \qquad (3)$$

6. Empirical Results

Table 3 presents sample weighted means on the percentages of newly hired women workers for the different policy periods. We have also means on the gender of newly hired workers by the formality of a job. The differences in women employment rates between formal jobs and informal jobs are implied DD estimates between subsidy program periods and the formality of a job. Note that these DD estimates are unadjusted for other covariates.

The results show that the hiring of women rises with the introduction of subsidy policies. Specifically, the share of women in newly hired workers rises from 7 percent to 10.1 percent in the formal sector. Furthermore, these differentials by periods are quite similar in both formal and informal sectors. There exist small but statistically significant DD estimates. At first sight, the DD estimates suggest that there is no alleviation in employment discrimination against women. We will analyze whether this dis-improvement still exists after controlling for unobserved heterogeneity across jobs and firms.

Table 3: The Share of Women in Newly Hired Workers: Means (Standard Errors)

	Pre-Policy	Post-Policy	Difference
All jobs	0.0968	0.1262	0.0294***
			(0.0003)
By Registration of Firm:			
Informal	0.1212	0.1580	0.0368***
			(0.0005)
Formal	0.0700	0.1070	0.0370***
			(0.0005)
Difference	-0.0512***	-0.0510***	0.0002
	(0.0005)	(0.0004)	(0.0002)

Notes: **(1)** All means are sample-weighted. **(2)** Standard errors appear in parentheses. **(3)** The sample size is 229,587. **(4)** * significant at the .1 level, ** significant at the .05 level, *** significant at the .01 level or lower.

We expect the reduction of employment cost to firms by the wage incentives to matter for hiring women into formal jobs. Tables 4-5 present DD estimates of the effects of the wage incentives on the employment for Eqs. (1) - (2) above.[8] While Eq. (1) includes only interaction between the dummy variable for the subsidy period and formality of a job, Eq. (2) also includes the interaction between the dummy variable for the subsidy period and occupation. In each table, column 1 estimates include controls for firm size, hiring requirements (percentage of college graduates, etc.), occupation dummies, sector dummies, and location dummies. Column 2 estimates exclude only sector dummies from controls.

Table 4: Effect of Subsidy Policy on Gender of Last Hire: By Formality (DD Estimates)

	Young		Women		Men	
	1	**2**	**1**	**2**	**1**	**2**
subsidy	-0.038***	-0.038***	-0.019***	-0.022***	0.057***	0.060***
	(0.0006)	(0.0007)	(0.0004)	(0.0004)	(0.0006)	(0.0006)
formality	0.075***	0.098***	-0.052***	-0.070***	-0.023***	-0.028***
	(0.0008)	(0.0008)	(0.0004)	(0.0005)	(0.0007)	(0.0007)
subsidy × formality	**0.005*****	**0.003*****	**0.011*****	**0.013*****	**-0.016*****	**-0.016*****
	(0.0005)	(0.0005)	(0.0003)	(0.0004)	(0.0005)	(0.0005)
R^2	0.105	0.065				

Notes: **(1)** All means are sample-weighted. **(2)** Standard errors appear in parentheses. **(3)** The sample size is 229,587. **(4)** * significant at the .1 level, ** significant at the .05 level, *** significant at the .01 level or lower.

Table 4 shows DD estimates based on interactions between the dummy variable for the subsidy period and formality of a job. DD estimates are both statistically significant. We observe that the introduction of wage subsidies that promotes women and young has a significant positive effect on the hiring of women into formal sector compared to the informal sector. The effect of wage subsidy remains low for young workers. Particularly, in the hiring decision firms in formal sector prefer women in the subsidy period more compared to pre-policy period. DD estimates for young show a small significant effect of the wage subsidies on the hiring of young.

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[8] Estimated equations in Tables 4-6 are sample-weighted. In Appendix, we present estimated equations that are not sample-weighted in Tables 7-9.

Table 5: Effect of Subsidy Policy on Gender of Last Hire: By Formality or Occupation

	Young		Women		Men	
	1	**2**	**1**	**2**	**1**	**2**
subsidy	-0.028***	-0.027***	-0.019***	-0.025***	0.048***	0.052***
	(0.0007)	(0.0007)	(0.0004)	(0.0005)	(0.0006)	(0.0006)
formality	0.078***	0.103***	-0.050***	-0.067***	-0.028***	-0.036***
	(0.0008)	(0.0008)	(0.0005)	(0.0005)	(0.0007)	(0.0007)
subsidy × formality	**0.002*****	**0.000**	**0.010*****	**0.010*****	**-0.012*****	**-0.009*****
	(0.0005)	(0.0006)	(0.0003)	(0.0004)	(0.0005)	(0.0005)
subsidy × occupation:						
high skilled white collar	0.007***	0.014***	0.004***	0.012***	-0.011***	-0.026***
	(0.0008)	(0.0008)	(0.0005)	(0.0006)	(0.0008)	(0.0008)
low skilled white collar	-0.002***	0.000	0.014***	0.025***	-0.011***	-0.025***
	(0.0006)	(0.0006)	(0.0004)	(0.0004)	(0.0006)	(0.0006)
high skilled blue collar	-0.027***	-0.032***	-0.021***	-0.025***	0.048***	0.057***
	(0.0007)	(0.0007)	(0.0003)	(0.0004)	(0.0006)	(0.0006)
occupation:						
high skilled white collar	0.145***	0.180***	-0.066***	-0.077***	-0.080***	-0.103***
	(0.0007)	(0.0007)	(0.0003)	(0.0003)	(0.0007)	(0.0006)
low skilled white collar	0.199***	0.218***	-0.036***	-0.052***	-0.163***	-0.166***
	(0.0005)	(0.0004)	(0.0002)	(0.0003)	(0.0004)	(0.0004)
high skilled blue collar	0.072***	0.089***	-0.041***	-0.070***	-0.031***	-0.019***
	(0.0005)	(0.0005)	(0.0002)	(0.0002)	(0.0004)	(0.0004)
R^2	0.106	0.065				

Notes: **(1)** All means are sample-weighted. **(2)** Standard errors appear in parentheses. **(3)** The sample size is 229,587. **(4)** The reference category is low-skilled blue-collar. **(5)** * significant at the .1 level, ** significant at the .05 level, *** significant at the .01 level or lower.

The estimates in Table 5 also show a significant positive effect on the hiring of women into formal sector compared to the informal sector. Note that the non-interacted formality and occupational variables in these equations represent the effects of formal job accessibility on the hiring of women in the pre-policy period. We would expect to find negative effects of these variables when there is discrimination against women in the pre-policy period. If there exists positive discrimination against women in the formal sector in the post-policy period, we would expect that the sum of a DD estimate and the corresponding formality or occupation non-interacted effect would be positive for the post-policy period.

In Table 5, the estimated coefficients on the non-interacted occupation dummies show that the hiring of women in the pre-policy period is lower into all jobs in comparison to low-skilled blue-collar jobs. The addition of these estimates to the DD estimates shows that the hiring of women in the post-policy period is also lower into all jobs in comparison to low-skilled blue-collar jobs. The absence of symmetry in hiring into jobs other than low-skilled blue-collar jobs suggests discrimination toward women exists in a job other than low-skilled blue-collar jobs.

Table 6: Effect of Subsidy Policy on Gender of Last Hire: By Formality and Occupation

	Young		Women		Men	
	1	**2**	**1**	**2**	**1**	**2**
subsidy	-0.011***	-0.011***	-0.028***	-0.034***	0.038***	0.045***
	(0.0008)	(0.0008)	(0.0004)	(0.0005)	(0.0007)	(0.0007)
formality	0.104***	0.137***	-0.056***	-0.076***	-0.047***	-0.061***
	(0.0010)	(0.0010)	(0.0006)	(0.0007)	(0.0009)	(0.0009)
subsidy × formality	**-0.030***	**-0.031***	**0.024***	**0.030***	**0.006***	**0.001**
	(0.0008)	(0.0008)	(0.0005)	(0.0005)	(0.0007)	(0.0007)
subsidy × occupation:						
high skilled white collar	-0.003	0.002	-0.007***	0.001	0.010***	-0.004*
	(0.0015)	(0.0015)	(0.0008)	(0.0011)	(0.0014)	(0.0014)
low skilled white collar	-0.032***	-0.028***	0.025***	0.041***	0.007***	-0.013***
	(0.0008)	(0.0008)	(0.0005)	(0.0006)	(0.0008)	(0.0008)
high skilled blue collar	-0.050***	-0.049***	-0.006***	-0.008***	0.056***	0.057***
	(0.0008)	(0.0009)	(0.0004)	(0.0005)	(0.0008)	(0.0008)
occupation:						
high skilled white collar	0.154***	0.187***	-0.067***	-0.079***	-0.087***	-0.108***
	(0.0008)	(0.0008)	(0.0003)	(0.0004)	(0.0008)	(0.0007)
low skilled white collar	0.208***	0.230***	-0.036***	-0.055***	-0.171***	-0.175***
	(0.0005)	(0.0005)	(0.0003)	(0.0003)	(0.0005)	(0.0005)
high skilled blue collar	0.068***	0.088***	-0.035***	-0.068***	-0.033***	-0.020***
	(0.0006)	(0.0006)	(0.0003)	(0.0003)	(0.0005)	(0.0005)
formality × occupation:						
high skilled white collar	-0.263***	-0.235***	0.218***	0.166***	0.044***	0.069***
	(0.0045)	(0.0045)	(0.0055)	(0.0051)	(0.0046)	(0.0047)
low skilled white collar	-0.150***	-0.182***	0.067***	0.046***	0.083***	0.136***
	(0.0027)	(0.0027)	(0.0021)	(0.0021)	(0.0028)	(0.0029)
high skilled blue collar	0.022***	0.014***	-0.028***	-0.012***	0.006***	-0.002***
	(0.0011)	(0.0012)	(0.0006)	(0.0008)	(0.0010)	(0.0010)
formality × subsidy × occupation:						
high skilled white collar	0.023***	0.029***	0.011***	0.005***	-0.034***	-0.034***
	(0.0018)	(0.0018)	(0.0012)	(0.0013)	(0.0016)	(0.0016)
low skilled white collar	0.067***	0.068***	-0.023***	-0.034***	-0.044***	-0.034***
	(0.0012)	(0.0012)	(0.0005)	(0.0006)	(0.0011)	(0.0011)
high skilled blue collar	0.050***	0.041***	-0.035***	-0.045***	-0.015***	0.003*
	(0.0012)	(0.0013)	(0.0006)	(0.0008)	(0.0011)	(0.0012)
R^2	0.106	0.066				

Notes: **(1)** All means are sample-weighted. **(2)** Standard errors appear in parentheses. **(3)** The sample size is 229,587. **(4)** The reference category is low-skilled blue-collar. **(5)** * significant at the .1 level, ** significant at the .05 level, *** significant at the .01 level or lower.

The DDD estimates appear in Table 6 are obtained by estimating Eq. (3). These estimates compare the hiring of women between formal and informal sector within the occupation and different policy periods. These wage subsidies result at most a 3.5 percentage points increase in the share of women in newly hired workers in the high-skilled white-collar job. The DDD estimates indicate that the discrimination toward women get worse only in high-skilled blue-collar, and in some cases in low skilled white-collar. One can rationalize this result as follows. In general, women do not prefer high-skilled blue-collar jobs and most of the jobs in the low-skilled white-collar sector is informal.

7. Conclusion

In this paper, we have investigated the issue of employment discrimination against women in Turkey by analyzing the pre-policy and post-policy periods. First, we have examined the differences in skills and labor market outcomes of women compared to the rest of the newly hired workers in the labor market. We have concluded that women can get a job in the low-skilled but formal sector with an increasing rate in the post-policy period. The low education level of women is also a reason why women can get a job in the low-skilled or informal sector.

We have used a DD estimation strategy to analyze the effect of subsidy programs on discrimination against women in the labor market. From both models, we have reached a conclusion that the DD estimates show significant effects of the subsidy programs on the discrimination faced by women. We have found that the incentives given by Law 4447 Provisional Articles 7 and 10 help to decrease discrimination faced by women especially in the low-skilled blue-collar and high-skilled white-collar jobs. We have found that these wage subsidies result on average a 1.2 percentage points increase and at most, a 3.3 percentage points increase in the share of women in newly hired workers. Our results seem to be parallel with the existing literature in Turkey. Similar to them, the formal job accessibility of women increased with the introduction of the employment subsidy programs.

Our results also suggest that implementing incentive programs to create a job for women and younger men is relatively costly. Besides, additional advantages such as less gender discrimination and more social welfare may support the implementation of such vulnerable group oriented incentives.

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A Unweighted Estimates

Table 7: Effect of Subsidy Policy on Gender of Last Hire: By Formality (DD Estimates)

	Young		Women		Men	
	1	**2**	**1**	**2**	**1**	**2**
subsidy	-0.027**	-0.025**	-0.022***	-0.026***	0.049***	0.051***
	(0.0082)	(0.0083)	(0.0046)	(0.0055)	(0.0075)	(0.0073)
formality	0.070***	0.094***	-0.054***	-0.073***	-0.016	-0.021
	(0.0096)	(0.0096)	(0.0056)	(0.0066)	(0.0089)	(0.0086)
subsidy × formality	0.004	-0.001	0.012**	0.014**	-0.016	-0.014
	(0.0068)	(0.0069)	(0.0040)	(0.0048)	(0.0063)	(0.0062)
R^2	0.114	0.069				

Notes: **(1)** Standard errors appear in parentheses. **(2)** The sample size is 229,587. **(3)** Omitted occupation is low-skilled blue-collar. **(4)** * significant at the .1 level, ** significant at the .05 level, *** significant at the .01 level or lower.

Table 8: Effect of Subsidy Policy on Gender of Last Hire: By Formality or Occupation

	Young		Women		Men	
	1	**2**	**1**	**2**	**1**	**2**
subsidy	-0.016	-0.012	-0.023***	-0.031***	0.039***	0.043***
	(0.0090)	(0.0091)	(0.0050)	(0.0059)	(0.0082)	(0.0079)
formality	0.073***	0.098***	-0.052***	-0.070***	-0.021	-0.028**
	(0.0097)	(0.0098)	(0.0057)	(0.0068)	(0.0090)	(0.0087)
subsidy × formality	0.002	-0.004	0.011*	0.011	-0.013	-0.008
	(0.0069)	(0.0070)	(0.0041)	(0.0048)	(0.0064)	(0.0062)
subsidy × occupation:						
high skilled white collar	0.002	0.007	0.005	0.015	-0.007	-0.023
	(0.0108)	(0.0109)	(0.0065)	(0.0082)	(0.0103)	(0.0099)
low skilled white collar	-0.006	-0.003	0.014*	0.028***	-0.008	-0.025**
	(0.0079)	(0.0079)	(0.0044)	(0.0054)	(0.0075)	(0.0072)
high skilled blue collar	-0.029***	-0.033***	-0.018***	-0.021***	0.047***	0.054***
	(0.0082)	(0.0083)	(0.0044)	(0.0054)	(0.0077)	(0.0075)
occupation:						
high skilled white collar	0.150***	0.191***	-0.075***	-0.089***	-0.075***	-0.103***
	(0.0092)	(0.0086)	(0.0034)	(0.0042)	(0.0088)	(0.0078)
low skilled white collar	0.206***	0.230***	-0.040***	-0.056***	-0.167***	-0.173***
	(0.0059)	(0.0056)	(0.0031)	(0.0034)	(0.0054)	(0.0050)
high skilled blue collar	0.075***	0.093***	-0.043***	-0.076***	-0.032***	-0.017**
	(0.0060)	(0.0060)	(0.0031)	(0.0032)	(0.0056)	(0.0054)
R^2	0.114	0.069				

Notes: **(1)** Standard errors appear in parentheses. **(2)** The sample size is 229,587. **(3)** The reference category is low-skilled blue-collar. **(4)** * significant at the .1 level, ** significant at the .05 level, *** significant at the .01 level or lower.

Table 9: Effect of Subsidy Policy on Gender of Last Hire: By Formality and Occupation

	Young		Women		Men	
	1	**2**	**1**	**2**	**1**	**2**
subsidy	0.003	0.005	-0.032***	-0.041***	0.029**	0.036***
	(0.0095)	(0.0096)	(0.0053)	(0.0062)	(0.0087)	(0.0084)
formality	0.098***	0.133***	-0.059***	-0.080***	-0.039**	-0.053***
	(0.0123)	(0.0123)	(0.0070)	(0.0083)	(0.0114)	(0.0110)
subsidy × formality	-0.037***	-0.041***	0.030***	0.038***	0.007	0.004
	(0.0101)	(0.0102)	(0.0060)	(0.0071)	(0.0091)	(0.0088)
subsidy × occupation:						
high skilled white collar	-0.014	-0.011	-0.004	0.007	0.018	0.004
	(0.0193)	(0.0196)	(0.0113)	(0.0147)	(0.0184)	(0.0176)
low skilled white collar	-0.037***	-0.034**	0.027***	0.047***	0.010	-0.013
	(0.0105)	(0.0104)	(0.0058)	(0.0071)	(0.0101)	(0.0095)
high skilled blue collar	-0.057***	-0.056***	-0.001	-0.001	0.059***	0.056***
	(0.0106)	(0.0106)	(0.0058)	(0.0069)	(0.0099)	(0.0095)
occupation:						
high skilled white collar	0.161***	0.201***	-0.077***	-0.092***	-0.083***	-0.109***
	(0.0109)	(0.0104)	(0.0042)	(0.0053)	(0.0105)	(0.0094)
low skilled white collar	0.215***	0.243***	-0.040***	-0.060***	-0.175***	-0.183***
	(0.0067)	(0.0064)	(0.0035)	(0.0038)	(0.0061)	(0.0057)
high skilled blue collar	0.074***	0.096***	-0.038***	-0.075***	-0.036***	-0.020**
	(0.0072)	(0.0071)	(0.0035)	(0.0036)	(0.0066)	(0.0064)
formality × occupation:						
high skilled white collar	-0.233***	-0.196**	0.231**	0.161	0.002	0.035
	(0.0581)	(0.0570)	(0.0709)	(0.0651)	(0.0560)	(0.0570)
low skilled white collar	-0.130***	-0.159***	0.068	0.038	0.062	0.121**
	(0.0348)	(0.0344)	(0.0268)	(0.0268)	(0.0348)	(0.0360)
high skilled blue collar	0.011	0.000	-0.023*	-0.004	0.011	0.003
	(0.0143)	(0.0149)	(0.0080)	(0.0115)	(0.0134)	(0.0129)
formality ×subsidy × occupation:						
high skilled white collar	0.035	0.043	0.007	-0.002	-0.042	-0.041
	(0.0226)	(0.0230)	(0.0147)	(0.0167)	(0.0203)	(0.0200)
low skilled white collar	0.073***	0.076***	-0.027***	-0.040***	-0.045**	-0.036
	(0.0149)	(0.0152)	(0.0068)	(0.0079)	(0.0142)	(0.0142)
high skilled blue collar	0.065***	0.057***	-0.043***	-0.055***	-0.022	-0.001
	(0.0155)	(0.0162)	(0.0075)	(0.0090)	(0.0144)	(0.0146)
R^2	0.115	0.070				

Notes: **(1)** Standard errors appear in parentheses. **(2)** The sample size is 229,587. **(3)** The reference category is low-skilled blue-collar. **(4)** * significant at the .1 level, ** significant at the .05 level, *** significant at the .01 level or lower.

B Wage Elasticities of Labor Supply in Pre- and Post-Policy Period

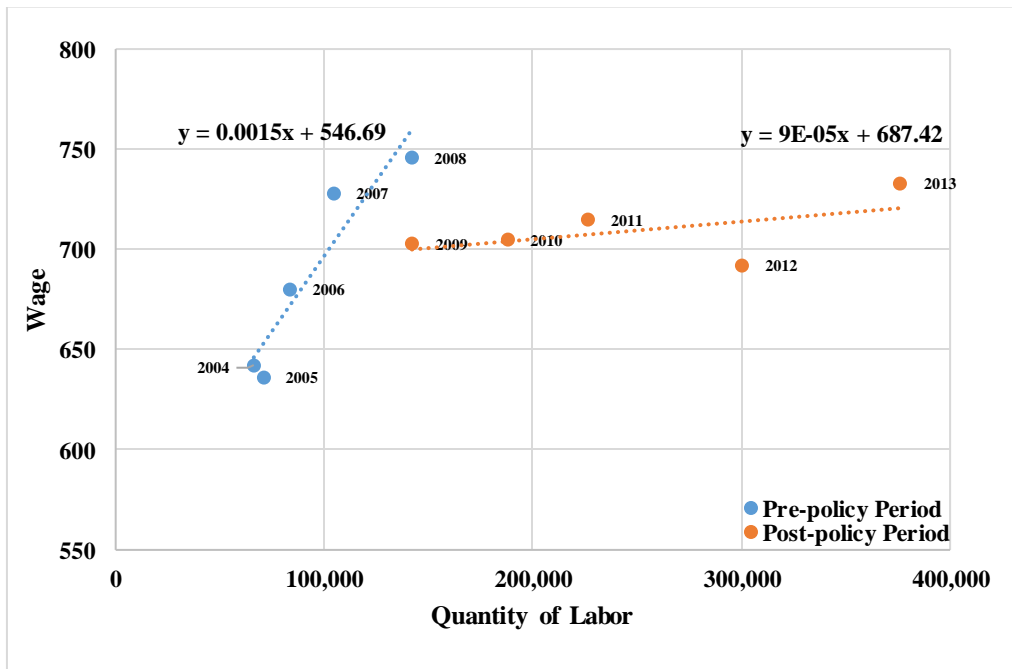*Figure 1: Wage elasticity of labor supply, Registered Women Workers*

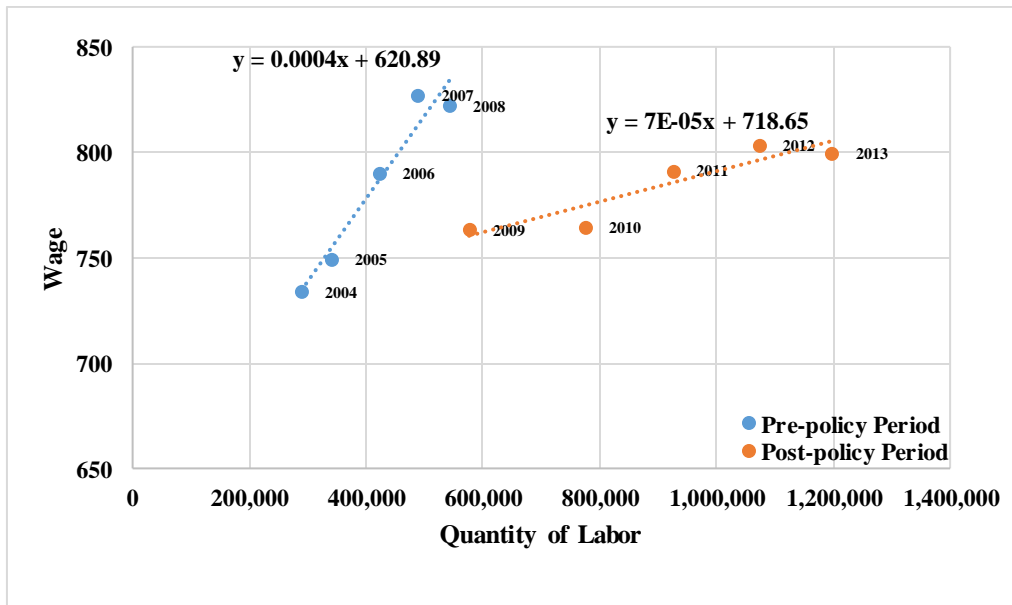*Figure 2: Wage elasticity of labor supply, Registered Men Workers*

Figure 3: Wage elasticity of labor supply, Unregistered Women Workers
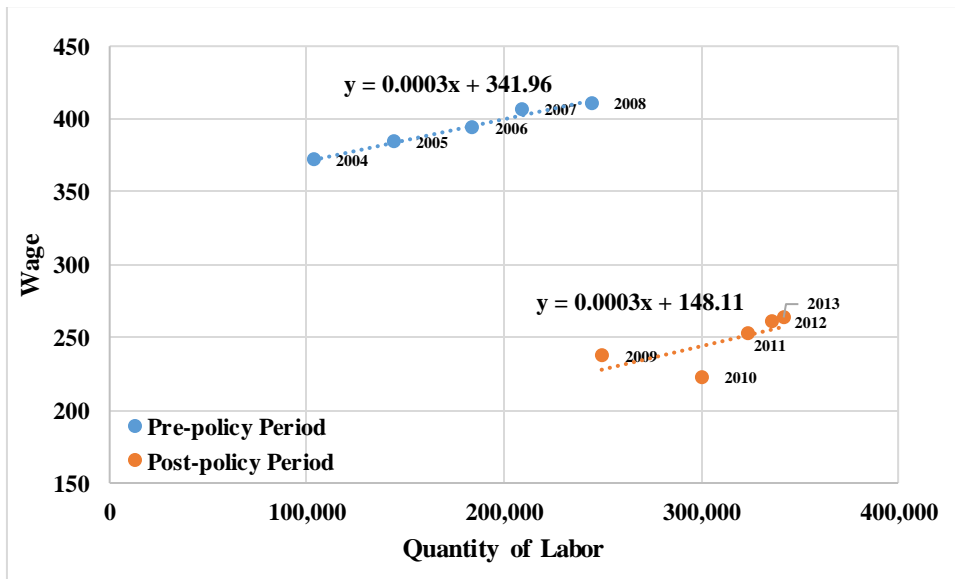

y = 0.0003x + 341.96

y = 0.0003x + 148.11

Figure 4: Wage elasticity of labor supply, Unregistered Men Workers

y = 0.0002x + 438.5

y = 0.0001x + 316