

THE IMPACT OF TURKEY'S 2008 LABOR REFORM ON INFORMAL
EMPLOYMENT ACROSS SECTORS

A Master's Thesis

by
ZEYNEP YOLDAŞ

Department of
Economics
İhsan Doğramacı Bilkent University
Ankara
August 2017

To my family

THE IMPACT OF TURKEY'S 2008 LABOR REFORM ON INFORMAL
EMPLOYMENT ACROSS SECTORS

The Graduate School of Economics and Social Sciences
of
İhsan Doğramacı Bilkent University

by

ZEYNEP YOLDAŞ

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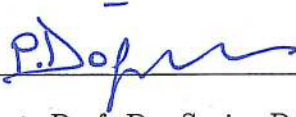
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Prof. Dr. Alp Erinç YELDAN

Supervisor

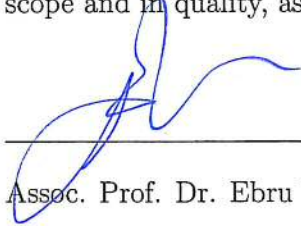
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Asst. Prof. Dr. Şaziye Pelin AKYOL

Examining Committee Member

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.



Assoc. Prof. Dr. Ebru VOYVODA

Examining Committee Member

Approval of the Graduate School of Economics and Social Sciences



Prof. Dr. Halime DEMİRKAN

Director

ABSTRACT

THE IMPACT OF TURKEY'S 2008 LABOR REFORM ON INFORMAL EMPLOYMENT ACROSS SECTORS

Yoldas, Zeynep
M.A., Department of Economics
Supervisor: Prof. Dr. Erinc Yeldan

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This thesis estimates the impact of 2008 Turkish Employment Subsidy Program which was enacted after the 2008 crisis to create formal employment opportunities in each main sector for females and young males who are regarded disadvantaged group. The design of the subsidy program is similar to a natural experiment in which women and young men are defined as treatment groups. The impact of the program is analyzed by using differences-in-difference method and utilizing the data of Turkish Household Labor Force Survey. Estimation results show that the program looks effective in decreasing informal employment in each sector. However, after excluding the certain age groups from the data due to heterogeneity problems; while it still remains effective in decreasing the informal employment for the industrial sector, it disappears for agricultural and services sectors.

Keywords: Differences-in-differences, employment subsidies, informal employment, Turkey' s labor markets

ÖZET

2008 İSTİHDAM REFORM PAKETİNİN SEKTÖRLERDEKİ ENFORMEL İSTİHDAMA ETKİSİ

Yoldaş, Zeynep
Yüksek Lisans, İktisat Bölümü
Tez Danışmanı: Prof. Dr. Erinç Yeldan

Ağustos 2017

Bu tez 2008 krizi sonrasında Türkiye’de yürürlüğe konulan istihdam teşvik yasasının tüm sektörlerdeki kadınlar ve genç erkekler için formel istihdam fırsatı yaratmasındaki etkiyi tahmin etmektedir. Teşvik programının yapısı kadın ve genç erkeklerin hedef grubu olduğu doğal deneylere benzemektedir. İstihdam programının etkisi farkların farkı metodu ve Türkiye Hanehalkı İşgücü Anketi veri seti kullanılarak analiz edilmektedir. Tahmin sonuçları teşvik programının enformel istihdamı azaltmada etkili olduğunu göstermektedir. Fakat heterojenlik problemini engellemek için; kullanılan veri setinden belli yaş grupları çıkarıldığında endüstri sektöründeki enformel istihdamı azaltıcı etki devam ederken tarım ve servis sektöründeki etki kaybolmaktadır.

Anahtar kelimeler: Enformel istihdam, farkların farkı, istihdam tesviki, Türkiye istihdam piyasası

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TABLE OF CONTENTS

ABSTRACT	vi
ÖZET	vii
ACKNOWLEDGEMENTS	viii
TABLE OF CONTENTS	ix
CHAPTER I: INTRODUCTION	1
CHAPTER II: LITERATURE REVIEW	3
CHAPTER III: BACKGROUND	7
3.1 Brief History of Informal Employment	7
3.2 The Subsidy Program in 2008	8
CHAPTER IV: EMPRICAL WORK	11
4.1 Data and the Methodology	11
4.2 Identification and the Model	13
CHAPTER V: RESULTS	16
5.1 Results for the Wider Age Group	16
5.2 Results for the Narrower Age Group	17
CHAPTER VI: CONSLUSION	19
BIBLIOGRAPHY	20
APPENDIX	23

LIST OF TABLES

1	Difference between employment rates of the EU countries average and Turkey (as a share of active population, aged 15 - 64), source: Eurostat for EU countries; Turkstat for Turkey.	1
2	Employment rates in aggregate level and in each sector, source: Turkstat	8
3	Employment rates in industrial and services sector, source: Turkstat .	9
4	Descriptive statistics for different treatment and control groups in the agricultural sector. The numbers are means of variables and standard errors in parenthesis, source: THLFS.	25
5	Descriptive statistics for different treatment and control groups in the industrial sector. The numbers are means of variables and standard errors in parenthesis, source: THLFS.	26
6	Descriptive statistics for different treatment and control groups in the services sector. The numbers are means of variables and standard errors in parenthesis, source: THLFS.	27
7	Relative Informal Employment Outcomes of Females and Young Males (of age 18 - 55) Before After the Subsidy for the Agricultural Sector.	28
8	Relative Informal Employment Outcomes of Females and Young Males (of age 18 - 55) Before After the Subsidy for the Industrial Sector.	29
9	Relative Informal Employment Outcomes of Females and Young Males (of age 18 - 55) Before After the Subsidy for the Services Sector.	30
10	Relative Informal Employment Outcomes of Females and Young Males (of age 25 - 35) Before After the Subsidy for the Agricultural Sector.	31
11	Relative Informal Employment Outcomes of Females and Young Males (of age 25 - 35) Before After the Subsidy for the Industrial Sector.	32

12	Relative Informal Employment Outcomes of Females and Young Males (of age 25 - 35) Before After the Subsidy for the Services Sector.	33
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LIST OF FIGURES

1	Informal employment rate in Turkey, source: Turkstat.	8
2	Informal employment rate in agricultural sector, source: Turkstat. . .	23
3	Informal employment rate in industrial sector, source: Turkstat. . . .	23
4	Informal employment rate in services sector, source: Turkstat.	24

CHAPTER I

INTRODUCTION

The low level of employment rate in Turkey which varies between 40% and 50% has always been a concern. The table shows the difference of the employment rate between European Union countries average and Turkey. The gap increases dramatically from 1997 for both females and males and it reaches a peak in 2007. The gap is striking especially for females because of their low level of participation to labor market.

	total	male	female
1997	0.171	0.049	0.290
1998	0.175	0.056	0.291
1999	0.185	0.054	0.295
2000	0.209	0.084	0.330
2001	0.221	0.108	0.330
2002	0.239	0.136	0.338
2003	0.256	0.148	0.361
2004	0.281	0.151	0.402
2005	0.284	0.149	0.410
2006	0.289	0.154	0.415
2007	0.293	0.158	0.421

Table 1: Difference between employment rates of the EU countries average and Turkey (as a share of active population, aged 15 - 64), source: Eurostat for EU countries; Turkstat for Turkey.

In 2008 after the global crisis, the government implemented a new labor reform package to mitigate the incidence of this crisis on employment rate which had already been an important concern. The aim of this new labor reform package was

to subsidize the employers' social security contributions so that cost of employing new workers would be cheaper which would maintain employment to the extent possible. The target was females and young males of age younger than 30 who are also called disadvantaged group because of the low demand of employers. The employment subsidy did not differentiate any sector of workers; the only requirement to benefit from the subsidy was being unregistered to Social Security Institute for the preceding 6 months. Even though it was not a clearly stated policy objective initially, the basic institutional design of the program enabled a rise in formal type of employment this was because of institutional rules of participation necessitated that the employers shouldn't have any social security debt and all their employees have to be registered in order to access to the program. This as a by product enabled the share of registered workers to increase while employment was subsidized. That is instead of only increasing number of workers, the government aimed to decrease the number of informal workers in each sector. In this thesis I conduct an econometric analysis to show whether the new policy favoring the young men and women is successful in lowering informal employment in each main sectors for both gender, to the best of my knowledge, has not been done yet. My results show that there is a considerable variation across age groups, gender and sectors. That is, while the subsidy program is not effective in agricultural and services sectors; in the industrial sector, the program decreased the informal employment.

The organization of the rest of this thesis is as follows. In the next chapter existing literature will be summarized. Chapter 3 gives a background of informality in Turkey and describes the design of the subsidy program. Chapter 4 explains the data and provides the empirical analysis. Chapter 5 discusses the results and the last chapter concludes.

CHAPTER II

LITERATURE REVIEW

Employment subsidy programs have been very popular in many countries to fight against problems in labor markets such as unemployment, informality, low level of participation rates, etc. In 2002, German government announced Hartz Plan with many series of reforms in the labor market. Boockmann et al. (2012) implement a differences-in-differences method to evaluate whether hiring subsidies as a part of Hartz Reform have an impact on older workers. They find that the subsidy generated employment opportunity only for women in East Germany and they evaluate these subsidies as deadweight effects for other employees groups. Bernhard et al. (2008) use the propensity score matching technique to estimate the average effect of wage subsidy on job seekers who are not eligible for unemployment benefits. Their results show that after the wage subsidy the treated group remained in regular employment longer than the untreated group which proves the effectiveness of the policy. Thirdly, Caliendo and Künn (2015) shows that the impact of the program, which was intended to increase motivation of unemployed population through lowering taxes, is positive only for single men. Jacobi and Kluge (2006) suggest that the labor market in Germany started to recover after an overall evaluation of Hartz Reform.

Caliendo and Künn (2015) examine the effect of start-up subsidies on promoting self employment among unemployed women and find that they became successful. Braakmann and Vogel (2010) focus on impact of European Union Enlargement

on service enterprises in eastern German. Their result shows a negative and small effect on treatment group. Petrick and Zier (2011) study the employment effect of European Unions Common Agricultural Policy in the labor market for agriculture and find no marginal impact on job creation.

Similar to Germany, French government also enacted many employment subsidies in 1990s. The most important one is payroll tax subsidies for low-wage workers. Crépon and Desplatz (2002) find that this labor cost reduction created many jobs and positive wage effect for low-wage workers. Also Chéron et al. (2008) show that payroll tax subsidies increased the welfare and the transition from unemployment to employment more than the cut in minimum wages. Cahuc et al. (2014) examine the impact of the hiring credits during 2008 recession on low wage workers employed in small-sized firms and find that this policy is very effective in creating jobs. Behaghel et al. (2008) show that after the tax reform which exempts firms paying tax if they lay off old workers, the probability of hiring older workers declines contrary to expectations.

One of papers including employment effects belongs to Huttunen et al. (2013). They work on the impact of payroll tax subsidies in Finland on old and low-wage workers and find zero employment effect. Blundell et al. (2004) focus on a policy with wage subsidies and job assistance for young people in UK and find only short lived positive effect on employment probabilities. Bishop (1981) shows that New Jobs Tax Credit in USA 1970s increases the employment probabilities in construction and distribution industries; also, decreases price level differences between retail and wholesale prices of commodities.

Lehmann and Pignatti (2007) analyze transitions between labor market segmentation in Ukraine between 2003 and 2004. However, instead of 4 traditional classification of market states, they focus on flows between formal salaried, voluntary informal salaried, involuntary informal salaried, self-employed formal, self-employed informal, unemployed and not in labor force. They find that workers try to enter formal employment at any age and if they cannot, they are pushed to infor-

mal salaried jobs in involuntary manner. Then they use difference-in-differences method to see if these transitions create any wage gap between states with a target group if an individual moves to other state. They find moving to a voluntary informal salaried employment creates a larger return so transition probabilities show positive attitude towards formal employment while wage gap is larger for informal one.

There exists a limited number of papers estimating the effects of Turkish employment subsidies on labor market states. Ayhan (2013) examines the impact of 2008 employment subsidy on female targeted group applying triple DID method to eliminate the potential effect of 2008 crisis and her result suggests a positive effect on women employment. Also she estimates the policy effect across sectors in case of a heterogeneity problem and finds a positive impact only in the service sector. Balkan et al. (2014) show that 2008 employment subsidy program has a positive effect only on old women employment probability using difference-in-differences method. Kan and Tansel (2014) show transitions between labor market states (unemployed, inactive, employed) after the subsidy implementation in 2008 using Markov transition probabilities and suggest the policy became partially successful.

Uysal (2013) analyzes the effectiveness of this hiring subsidy in 2008 on formal employment for females of age between 30 and 44 using DID approach and indicates a positive effect on formal employment of old women. Lastly, Balkan et al. (2016) estimate the effect of the 2008 employment subsidy on employment, formality, informality, unemployment and not in labor force status of old females only. They use 5 different regressions for each labor market state and their results indicate after the policy only formality of old female workers increased. Both of these studies on formal employment show the effect of the new policy on females only. These few papers about Turkey's employment subsidy are effective on creating jobs for old females. Following previous studies, I evaluate the impact of the employment subsidy on informal employment in Turkey but the analysis in my thesis focuses on all individuals who are eligible to benefit from the subsidy that are both females between 18 and 55 and young males of age younger than 30. Moreover, I

take into account heterogeneity problems across sectors; therefore, I apply three different estimation processes for each sector: agricultural, industrial and services sectors.

CHAPTER III

BACKGROUND

3.1 Brief History of Informal Employment

ILO' s definition of informal employment consists of own-account workers, contributing family workers and employees holding informal jobs. There exists many alternative definitions of informal employment; such as sum of workers with jobs offering less than minimum wage or working in small-sized firms. However, Kan and Tansel (2014) find that for Turkey' s labor market, the most optimal definition of informal employment comprises workers who are not registered to social security institute which is called social security definition. It is optimal because of its ability that can capture the key relationships between several individual and employment characteristics and the likelihood of informality. Figure 1 illustrates informal employment rate between 2000 and 2010 in Turkey. It is seen that there is a decreasing trend in the aggregate level after 2001.

Moreover, one should not confuse employment in the informal sector and informal employment. First one depends on characteristics of the enterprises while second one is about individuals (Husmanns, 2004). In my thesis I use the second definition; that is the social security definition.

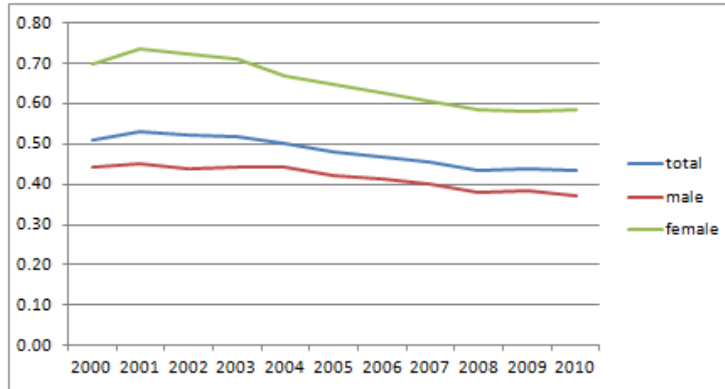


Figure 1: Informal employment rate in Turkey, source: Turkstat.

Table 2 and 3 show the employment rate in aggregate level and across sectors for periods between 2000 and 2010. They show the population of workers employed in each sector and gender, as a ratio to the number of active population in that gender. It is seen that in agriculture, there is a declining trend in both male and female employment rates. These workers that left agricultural sector skipped to services sector because there is an increasing trend in services but in the industrial sector there is not a stable trend. However the total employment rate did not experience a clear upward trend since 2004 for both males and females, also as I mentioned before it is still very far away from the benchmark countries.

	Total Employment				Agricultural Sector		
	total	male	female		total	male	female
2000	0.467	0.689	0.249	2000	0.395	0.304	0.651
2001	0.456	0.665	0.251	2001	0.420	0.315	0.683
2002	0.444	0.639	0.253	2002	0.367	0.272	0.623
2003	0.432	0.629	0.239	2003	0.360	0.270	0.605
2004	0.413	0.627	0.208	2004	0.376	0.277	0.633
2005	0.415	0.632	0.207	2005	0.349	0.248	0.600
2006	0.415	0.629	0.21	2006	0.339	0.244	0.585
2007	0.415	0.627	0.21	2007	0.291	0.216	0.508
2008	0.417	0.626	0.216	2008	0.257	0.186	0.463
2009	0.412	0.607	0.223	2009	0.240	0.172	0.436
2010	0.43	0.627	0.24	2010	0.235	0.168	0.427

Table 2: Employment rates in aggregate level and in each sector, source: Turkstat

	Industrial Sector				Services sector		
	total	male	female		total	male	female
2000	0.254	0.297	0.132	2000	0.351	0.398	0.218
2001	0.228	0.276	0.108	2001	0.352	0.409	0.209
2002	0.253	0.297	0.137	2002	0.380	0.431	0.241
2003	0.240	0.280	0.132	2003	0.400	0.450	0.264
2004	0.227	0.267	0.121	2004	0.397	0.456	0.245
2005	0.230	0.267	0.137	2005	0.417	0.484	0.262
2006	0.228	0.216	0.134	2006	0.434	0.493	0.281
2007	0.249	0.279	0.161	2007	0.460	0.505	0.331
2008	0.263	0.296	0.166	2008	0.480	0.517	0.370
2009	0.268	0.304	0.164	2009	0.492	0.524	0.400
2010	0.267	0.304	0.161	2010	0.498	0.528	0.412

Table 3: Employment rates in industrial and services sector, source: Turkstat

3.2 The Subsidy Program in 2008

After the global crisis in 2008, the Turkish government had to take many measures to avoid from the impact of the crisis, especially the government wanted to stop the chronic high level of unemployment rate so it enacted some employer-side subsidies. The first employment subsidy is Law #5763 enacted in July 2008. The aim of this subsidy is that instead of imposing the tax burden to employers, the tax would be paid by Unemployment Insurance Fund for limited periods so that it would be cheaper to hire new workers. The total remission of social security premium paid by employers was eligible only for newly hired female and young male in the 18-29 age group workers who are called disadvantaged groups, while there is only 5 percentage point decrease in premium of all workers. Also the remission was 100% for the first year, 80% for the second, 60% for the third, 40% for the fourth and 20% for the fifth year. Other conditions in order to benefit from the subsidy is that these newly hired workers should not be paying tax as a registered worker for the last 6 months. Also, the beneficiaries should be hired additional to existing workers in firms so the subsidy targets creating new formal jobs for unemployed and informally employed disadvantaged group. In February 2009, Law #5838 was enacted, it had same content with Law #5763 but the duration of the benefits was extended. In February 2011, by the enactment of Law #6111, the privileges remained valid until 2015 and not only female and young male workers, old males became eligible to benefit from the incentive as long as they satisfy certain conditions. Therefore the coverage of the periods after 2010 will be excluded in this study to specify the true impact of subsidy on the disadvantaged group. Moreover,

these subsidies was available to those who were not employed as a tax-registered worker in the preceding 6 months and new employees would be hired in addition to the existing workers in the workplace so that the new employment opportunities were supposed target the disadvantaged groups instead of subsidizing the already filled positions.

Yeldan (2010) states that employment related measures cost 73 million TL in 2008, 4,303 million TL in 2009 and 5,000 million TL in 2010 and when these numbers are calculated as ratio to the GDP, they are 0.99% in 2008, 3.41% in 2009 and 2.23% in 2010. Moreover, in a study of applied general equilibrium modeling, he estimates the return of the subsidy program on employment rate and finds 0.4% in 2009 and 0.9% in 2013 which is quite meager. .

CHAPTER IV

EMPRICAL WORK

4.1 Data and the Methodology

The data I use in this thesis is taken from the Turkish Household Labor Force Survey data which is published annually by the Turkish Statistical Institute. Although it is a micro level dataset, each individual in the survey is given weights to reach the aggregate macro-level data. The design of the THLFS makes it pooled section data because it is constructed in a way that each consecutive year, half of the individuals in the data is eliminated and replaced with the new one; therefore, an individual stays in the sample for 18 months. The questionnaire contains very detailed information about each household in the sample, especially information about the main economic activities of workers and social security registration status is the main interest of this thesis.

The sample used in this study includes individuals older than 17 and younger than 56 and covers years between 2006 and 2010. Before the estimation, I divide sample into 3 subsamples with respect to the sectors of workers because I implement 3 different estimations. The data set includes information about individuals' previous job characteristics even they are out of employed status currently. Although, it is not very detailed, still provides sufficient information for the classification of agricultural, industrial and services sectors. However the data limitation is that

number of workers in the construction sector in Turkey is very limited especially for women so workers in this sector are included in the industrial sector.

Table 4, 5 and 6 provide summary statistics for the data used in econometric analyses after eliminating households younger than 18 and older than 55 between 2006 and 2010. The rates are mean numbers of dummy variables. Also marital status refers to married individuals. Education is 4 different dummy variables for no degree, primary education, secondary education and college education and above, respectively.

The design of the subsidy program resembles to a natural experiment because it is an unexpected and exogenous intervention enacted by the government. In this experiment females and young males are placed in the experimental group and old men of age 30 and above are in the control group who are not affected from the policy change. To analyze the effect of the employment subsidy on the probability of informality on the experimental group the difference-in-differences model and probit estimation are used.

Nonlinear difference-in-differences model where it shows the conditional probability that $y=1$ follows as:

$$E(y = 1|x) = \varphi(X\beta_0 + \beta_1Post + \beta_2Treatment + \beta_3Post * Treatment)$$

$$E(y = 1|X, Treatment = 1, Post = 1) = \varphi(X\beta_0 + \beta_1 + \beta_2 + \beta_3)$$

$$E(y = 1|X, Treatment = 1, Post = 0) = \varphi(X\beta_0 + \beta_2)$$

$$E(y = 1|X, Treatment = 0, Post = 1) = \varphi(X\beta_0 + \beta_1)$$

$$E(y = 1|X, Treatment = 0, Post = 0) = \varphi(X\beta_0)$$

Treatment shows the experimental group who is the main target of the experiment and Post refers to the period after the experiment is enacted. In the model the parameter of interest is β_3 that shows the differential impact of the experiment on target group.

Also, the marginal effect of the interaction term between the post period and treatment follows as (Ai and Norton, 2003)

$$\frac{\partial \varphi(\cdot)}{\partial (Post * Treatment)} = \beta_3 \varphi'(\cdot)$$

where $\varphi(X\beta_0 + \beta_1 Post + \beta_2 Treatment + \beta_3 Post * Treatment) = \varphi(\cdot)$

The treatment consists of the group who are affected from the policy change that is the targeted group. The post consists the period after the changes implemented.

4.2 Identification and the Model

Identification is achieved by the employment subsidy which targets females and young males who are observed before and after the policy change under the Law 5763. This enables using the differences-in-difference method to evaluate the effectiveness of the employment subsidy on the target in each main sector. The main sectors are the agricultural, industrial and services sectors. Moreover, while the treatment group consists females and young males between 18 and 29 who are not preferred as a formal worker by employers due to low level of education, skills or patriarchal structure of Turkish families; the control group consist males older than 29 who are not targeted by the government. The time period before the treatment which is 2008 employment subsidy will refer to years of 2006 and 2007, while the post subsidy period will include 2008-2010 period.

The key assumption in differences-in-difference method is before the treatment effect which is the employment subsidy in this thesis, the targeted and control group should follow a common informality rate trend. The informality rates for control and treatment groups in each sector are seen in Figure 2, 3 and 4. The ratios are annual because only annual data was available and calculated from the aggregate level data. In each sector and for each group until 2008 trends in informality rate are almost parallel. Although informal employment rate in the agricultural sector stays roughly same for each group in pre-policy period, in other sectors there is a downward trend. Moreover, during the post-subsidy period unlike the agricultural sector, in services and industrial sectors movement in informal employment rates diverge.

Given the description of treated and control groups, to estimate the effects of the employment subsidy on the informal employment, I use the following model:

$$\begin{aligned}
\text{Informality}_{i,t,r} = & \beta_0 + \beta_1 \text{youngmale}_i + \beta_2 \text{youngfemale}_i + \beta_3 \text{oldfemale}_i \\
& + \beta_4 \text{Post} - \text{Subsidy}_t + \alpha_1 \text{youngmale}_i * \text{Post} - \text{Subsidy}_t \\
& + \alpha_2 \text{youngfemale}_i * \text{Post} - \text{Subsidy}_t + \alpha_3 \text{oldfemale}_i * \text{Post} - \text{Subsidy}_t \\
& + \psi_1 Z_{i,t} + \phi_1 \text{youngmale}_i * UR_{r,t} + \phi_2 \text{youngfemale}_i * UR_{r,t} \\
& + \phi_3 \text{oldfemale}_i * UR_{r,t} + \rho_1 \text{youngmale}_i * \text{trend} + \rho_2 \text{youngfemale}_i * \text{trend} \\
& + \rho_3 \text{oldfemale}_i * \text{trend} + U_{i,t} + \text{oldfemale}_i * \text{Treatment}_i * \text{Post} - \text{Subsidy}_t \alpha_t \\
& + Q_r + Q_t + Q_t * Q_r + u_{i,r,t}
\end{aligned}$$

In the econometric model the dependent variable is a binary variable INF which takes value of 1 if the individual is not employed as a social security registered worker and 0 if he is formally employed, unemployed or not in labor force. Post-subsidy takes value of 1 for 2008-2010 periods and 0 for 2006 and 2007. Also instead of defining only 1 variable for the target group, I use 3 different independent variables for young males, females and old females.

Moreover, young male is a binary variable and takes 1 if the individual is a male

younger than 30 and 0 otherwise. Young female refers to females younger than 30 and takes 1, 0 otherwise. Older female is a binary variable equal to 1 for females older than 29. Moreover, their coefficients show the differential change of being eligible for the employment subsidy on informal employment rate compared to the base category which is control group in this model.

Z consists of personnel characteristics such as marital status, educational attainment, age and their interactions with treatment groups. Also, I include the interaction term of regional unemployment rates and treatment groups to control for differences in females and males reaction to economic crisis which implies added worker effect. The time trend and its interaction with target groups are put into model to eliminate from the probability that instead of the subsidy, the change in the informality rate might result from a linear time trend. Due to the design of the Turkish Household Labor Force Survey, individual fixed effect cannot be included in the model, instead, the region, year fixed effect and their interaction are used to control for possible differences of macroeconomic cycles and interventions such as regional subsidies between provinces on the result. Therefore I construct 3 different equations for agricultural, industrial and services sectors in which parameters of interest will be α_1 , α_2 and α_3 which measure the differential change in the informal employment probability after the subsidy on the targeted group.

CHAPTER V

RESULTS

First of all, because the data comes from a survey, the weight of each individual is included in the estimation process. Before the estimation, the code `svyset` is used with a primary sampling unit, sampling weights and strata. These are questions of no of household, factor and gender, respectively from the survey questionnaire.

5.1 Results for the Wider Age Group

In the first part of the estimation, the sample covers people of age between 18 and 55 years old. The probit estimation is used in this study; therefore, instead of simple coefficients, marginal effects with a stata code of `mf` will be examined. In the tables, instead of whole estimation results, the ones with primary interest are shown.

In agricultural sector, Table 7 shows that interaction terms between regional unemployment rates and young, old females are negative and significant. This implies added worker effect because if there is a sudden rise in unemployment rate, women whose husband or any men from her family becomes unemployed try to find a formal job as a result of precautionary motive. Also, the interaction between old females and being married is positive and significant. The reason behind it is that

married female workers are more prone to find informal jobs because they can benefit from their husbands' social security benefits (Başlevent and Acar, 2015). The parameters of interest which show the differential effect of the subsidy on the probability of informal employment for disadvantaged group is insignificant for young males and females. However, it is negative and significant for old females. Therefore, it seems that in agricultural sector, the subsidy led to 5.4 percentage point decline among old female workers.

Secondly, in industrial sector, Table 8 shows that similar to agricultural sectors, there exists added worker effect and positive differential impact of being married on informality for old females. Moreover, it seems each treatment group enjoyed the decline in informal employment probabilities which are 2.9 for young males, 3 for young females and 4.5 points for old females.

Finally, in services sector as seen in Table 9 added worker effect is valid for young and old females similar to other sectors. Although the differential impact of being married and female is positive on old females, it is not significant. The effects of the employment subsidy on disadvantaged groups are negative for young males and positive for old females which are 1.3 and 3.8 respectively.

5.2 Results for the Narrower Age Group

Instead of a wide age group, due to a heterogeneity problem focusing on a narrower age group gives more robust results. Firstly, in agricultural sector, the results in Table 10 are almost similar to previous ones, except the marginal effect of being old female and benefiting from the employment subsidy. The significant parameter of interest became insignificant for narrower age group. Therefore we can conclude that the subsidy is not effective in decreasing informal employment for each targeted group.

Also in services sector, Table 12 shows that added worker effect is still valid for female of aged 25-29 and 30-35. However, the negative and significant parameter that shows the effect of subsidy on treatment group turned insignificant. Instead of decreasing the informal employment probability, the result suggests that informal employment outcome of older female worsened.

Finally, unlike other sectors, results in Table 11 show that employment subsidy achieved its aim of declining the informal employment among each 3 treatment group. After excluding individuals younger than 25 and older than 35, the estimation results did not change. The parameters are still negative and significant and 2.5 percentage points for young males, 3.5 for young females and 3 for old females. Therefore the sector which experienced positive effect of employment subsidy in 2008 is only industrial sector.

The results are not surprising. Employment conditions in agricultural sector are not suitable for formal employment because of large number of temporary workers, own account workers and unpaid family workers employed in this sector. Moreover, instead of hiring permanent workers who benefit from the subsidy program, employers demand low-wage seasonal workers during the harvest periods. Moreover, the important concern about the program is its strict conditions and eligibility criteria which makes it difficult to benefit. Also results show that in services sector where number of female workers is largest, after the employment subsidy the probability of informal employment increased by 3.9 percentage point, this is probably as I mentioned before old females' willingness to work in formal jobs because they can benefit from men's social security benefits in their families (Başlevent and Acar, 2015). Finally, industrial sector is the only one in which each individual in the targeted group benefited from the subsidy program. The difference is the extra subsidy enacted in manufacturing industry which includes reduction in Special Consumption Tax Taymaz (2010) shows that after the tax reduction large-size firms' production in manufacturing industry increased. Therefore the decline in the informal employment might come from increase in demand for formal workers.

CHAPTER VI

CONSLUSION

In this thesis I have analyzed the impact of the 2008-Employment subsidy, which reduces the cost of employers when hiring new workers, on informal employment among the target group which consists females and young males compared to men older than 30. However; I employed 3 different estimations for each sector: agricultural, industrial and services sectors. As an estimation method, I use differences-in-difference model to examine the effect of the subsidy program. In the first part of the study I use individuals older than 18 and younger than 55 and found that the program decreased the informal employment only in industrial sector for each group. Although in other sectors there seems that the subsidy program is effective, after concentrating on narrower age group, the positive effect disappeared except industrial sector. However, it is observed that in services sector, the new policy increased the informal employment among old females with ages between 30 and 35. To sum up, the effect of the employment subsidy program implemented in 2008 is not similar across sectors and target groups. Although the evidence shows that it is effective in industrial sector, huge cost of the subsidy program makes this impact meager.

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APPENDIX

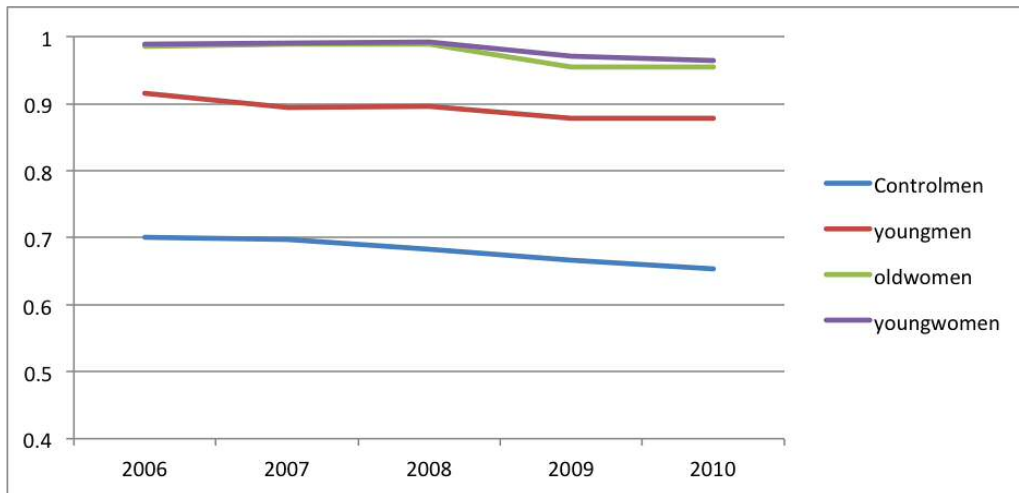


Figure 2: Informal employment rate in agricultural sector, source: Turkstat.

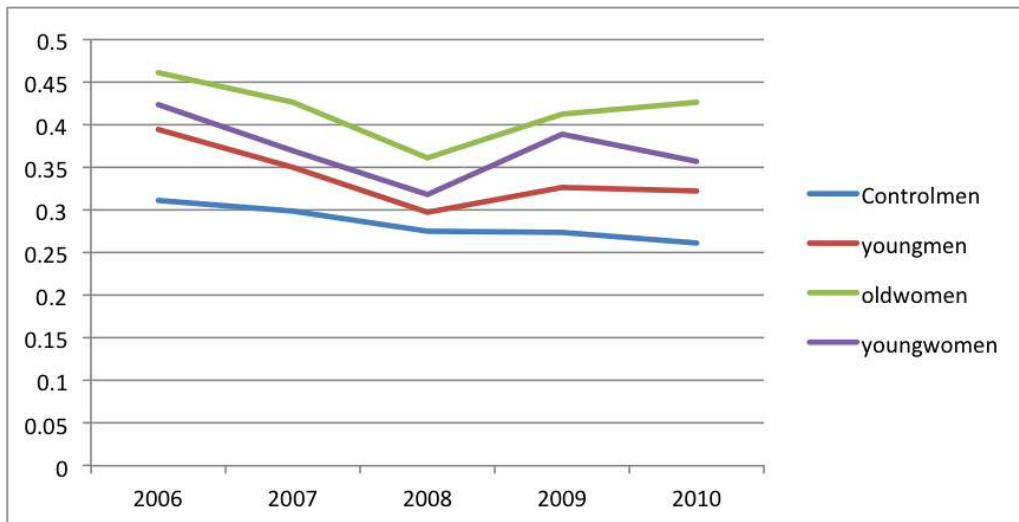


Figure 3: Informal employment rate in industrial sector, source: Turkstat.

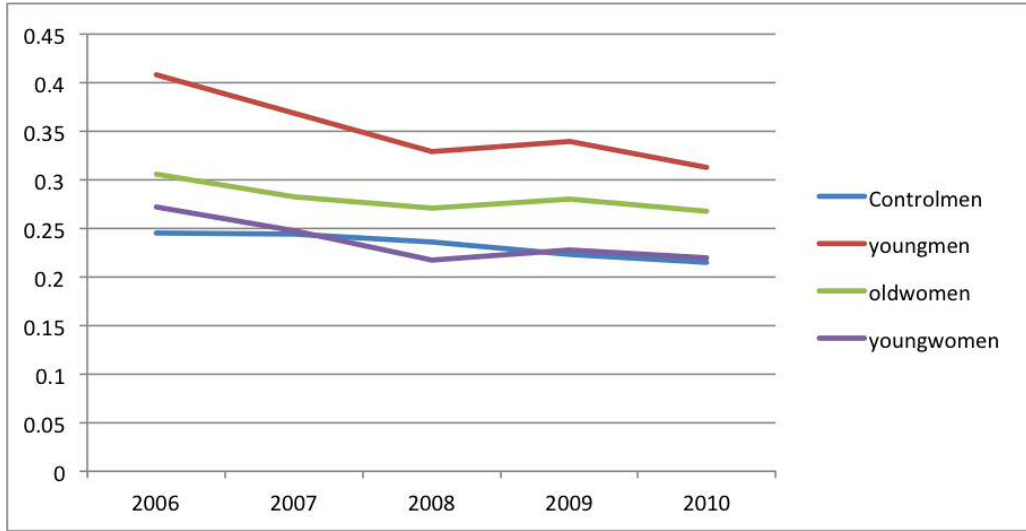


Figure 4: Informal employment rate in services sector, source: Turkstat.

Variables	2006				2007			
	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29
Informality	0.615 (0.487)	0.706 (0.456)	0.600 (0.490)	0.582 (0.493)	0.613 (0.487)	0.694 (0.461)	0.583 (0.493)	0.564 (0.496)
Marital status	0.949 (0.219)	0.402 (0.490)	0.604 (0.489)	0.914 (0.280)	0.952 (0.215)	0.399 (0.490)	0.602 (0.490)	0.913 (0.282)
education1	0.0575 (0.233)	0.0626 (0.242)	0.0832 (0.276)	0.0994 (0.299)	0.0563 (0.231)	0.0716 (0.258)	0.120 (0.325)	0.0951 (0.293)
education2	0.805 (0.396)	0.643 (0.479)	0.718 (0.450)	0.623 (0.485)	0.810 (0.392)	0.630 (0.483)	0.665 (0.472)	0.637 (0.481)
education3	0.0644 (0.246)	0.238 (0.426)	0.0755 (0.264)	0.0108 (0.103)	0.0637 (0.244)	0.245 (0.430)	0.0841 (0.278)	0.0128 (0.112)
education4	0.0119 (0.109)	0.0269 (0.162)	0.00708 (0.0839)	0.00144 (0.0380)	0.0113 (0.106)	0.0239 (0.153)	0.00878 (0.0933)	0.00168 (0.0410)
Observations	12,835	4,602	6,637	18,001	11,631	3,899	5,921	17,241

Variables	2008				2009				2010			
	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29
Informality	0.597 (0.491)	0.692 (0.462)	0.542 (0.498)	0.533 (0.499)	0.590 (0.492)	0.648 (0.478)	0.498 (0.500)	0.608 (0.488)	0.600 (0.490)	0.671 (0.470)	0.530 (0.499)	0.620 (0.485)
Marital status	0.950 (0.219)	0.387 (0.487)	0.606 (0.489)	0.913 (0.283)	0.940 (0.237)	0.334 (0.472)	0.578 (0.494)	0.907 (0.290)	0.939 (0.239)	0.314 (0.464)	0.612 (0.487)	0.911 (0.285)
education1	0.0528 (0.224)	0.0866 (0.281)	0.159 (0.366)	0.0974 (0.296)	0.108 (0.311)	0.133 (0.340)	0.296 (0.456)	0.341 (0.474)	0.0967 (0.296)	0.117 (0.321)	0.268 (0.443)	0.316 (0.465)
education2	0.809 (0.393)	0.597 (0.491)	0.636 (0.481)	0.634 (0.482)	0.802 (0.398)	0.587 (0.492)	0.616 (0.486)	0.638 (0.481)	0.807 (0.395)	0.592 (0.492)	0.635 (0.481)	0.660 (0.474)
education3	0.0704 (0.256)	0.259 (0.438)	0.0723 (0.259)	0.0154 (0.123)	0.0756 (0.264)	0.244 (0.429)	0.0808 (0.273)	0.0193 (0.138)	0.0819 (0.274)	0.249 (0.432)	0.0844 (0.278)	0.0213 (0.144)
education4	0.0121 (0.109)	0.0291 (0.168)	0.00670 (0.0816)	0.00142 (0.0377)	0.0136 (0.116)	0.0361 (0.186)	0.00723 (0.0847)	0.00194 (0.0440)	0.0145 (0.120)	0.0426 (0.202)	0.0125 (0.111)	0.00295 (0.0543)
Observations	11,533	3,751	6,417	18,300	12,521	4,491	6,920	17,030	13,091	4,503	6,874	18,967

Table 4: Descriptive statistics for different treatment and control groups in the agricultural sector. The numbers are means of variables and standard errors in parenthesis, source: THLFS.

Variables	2006				2007			
	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29
Informality	0.227 (0.419)	0.301 (0.459)	0.192 (0.394)	0.165 (0.371)	0.217 (0.412)	0.267 (0.442)	0.164 (0.371)	0.146 (0.353)
Marital status	0.947 (0.224)	0.443 (0.497)	0.534 (0.499)	0.842 (0.365)	0.945 (0.227)	0.445 (0.497)	0.546 (0.498)	0.832 (0.374)
education1	0.0277 (0.164)	0.0366 (0.188)	0.0401 (0.196)	0.0464 (0.210)	0.0308 (0.173)	0.0438 (0.205)	0.0545 (0.227)	0.0343 (0.182)
education2	0.720 (0.449)	0.580 (0.494)	0.611 (0.488)	0.678 (0.467)	0.717 (0.450)	0.561 (0.496)	0.569 (0.495)	0.680 (0.466)
education3	0.180 (0.384)	0.307 (0.461)	0.251 (0.434)	0.173 (0.378)	0.179 (0.384)	0.312 (0.463)	0.264 (0.441)	0.189 (0.392)
education4	0.0530 (0.224)	0.0645 (0.246)	0.0810 (0.273)	0.0484 (0.215)	0.0545 (0.227)	0.0730 (0.260)	0.0951 (0.293)	0.0541 (0.226)
Observations	24,771	12,530	5,516	7,604	24,941	12,048	5,319	7,577

Variables	2008				2009				2010			
	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29
Informality	0.201 (0.401)	0.227 (0.419)	0.138 (0.345)	0.125 (0.331)	0.201 (0.401)	0.226 (0.418)	0.161 (0.368)	0.212 (0.409)	0.204 (0.403)	0.244 (0.429)	0.170 (0.376)	0.221 (0.415)
Marital status	0.944 (0.231)	0.449 (0.497)	0.569 (0.495)	0.836 (0.370)	0.938 (0.241)	0.424 (0.494)	0.558 (0.497)	0.817 (0.387)	0.934 (0.248)	0.395 (0.489)	0.565 (0.496)	0.828 (0.377)
education1	0.0307 (0.173)	0.0443 (0.206)	0.0615 (0.240)	0.0375 (0.190)	0.0473 (0.212)	0.0648 (0.246)	0.105 (0.306)	0.0860 (0.280)	0.0457 (0.209)	0.0750 (0.263)	0.108 (0.310)	0.0833 (0.276)
education2	0.707 (0.455)	0.546 (0.498)	0.554 (0.497)	0.679 (0.467)	0.700 (0.458)	0.539 (0.498)	0.547 (0.498)	0.665 (0.472)	0.696 (0.460)	0.545 (0.498)	0.532 (0.499)	0.683 (0.465)
education3	0.184 (0.388)	0.322 (0.467)	0.268 (0.443)	0.186 (0.389)	0.190 (0.392)	0.315 (0.465)	0.249 (0.432)	0.175 (0.380)	0.193 (0.394)	0.295 (0.456)	0.248 (0.432)	0.164 (0.370)
education4	0.0581 (0.234)	0.0790 (0.270)	0.0982 (0.298)	0.0597 (0.237)	0.0625 (0.242)	0.0806 (0.272)	0.0988 (0.298)	0.0739 (0.262)	0.0661 (0.248)	0.0849 (0.279)	0.113 (0.316)	0.0698 (0.255)
Observations	25,439	12,575	5,598	8,462	25,361	12,699	5,710	6,846	26,763	12,987	5,753	8,141

Table 5: Descriptive statistics for different treatment and control groups in the industrial sector. The numbers are means of variables and standard errors in parenthesis, source: THLFS.

Variables	2006				2007			
	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29
Informality	0.208 (0.406)	0.350 (0.477)	0.176 (0.380)	0.173 (0.378)	0.207 (0.405)	0.317 (0.465)	0.155 (0.362)	0.165 (0.371)
Marital status	0.944 (0.231)	0.398 (0.490)	0.413 (0.492)	0.784 (0.412)	0.937 (0.243)	0.392 (0.488)	0.415 (0.493)	0.775 (0.417)
education1	0.0208 (0.143)	0.0202 (0.141)	0.0117 (0.108)	0.0237 (0.152)	0.0184 (0.134)	0.0249 (0.156)	0.0140 (0.117)	0.0222 (0.147)
education2	0.552 (0.497)	0.430 (0.495)	0.239 (0.426)	0.361 (0.480)	0.544 (0.498)	0.420 (0.494)	0.229 (0.420)	0.357 (0.479)
education3	0.234 (0.423)	0.397 (0.489)	0.451 (0.498)	0.269 (0.443)	0.238 (0.426)	0.390 (0.488)	0.449 (0.497)	0.272 (0.445)
education4	0.182 (0.386)	0.146 (0.353)	0.292 (0.455)	0.312 (0.464)	0.188 (0.390)	0.158 (0.365)	0.303 (0.460)	0.318 (0.466)
Observations	42,199	17,195	9,313	13,942	41,991	16,731	9,522	14,174

Variables	2008				2009				2010			
	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29	Control Group	Male<30	Female<30	Female>29
Informality	0.200 (0.400)	0.282 (0.450)	0.134 (0.340)	0.159 (0.366)	0.184 (0.388)	0.273 (0.445)	0.122 (0.327)	0.106 (0.308)	0.176 (0.381)	0.252 (0.434)	0.115 (0.319)	0.0995 (0.299)
Marital status	0.927 (0.260)	0.388 (0.487)	0.427 (0.495)	0.779 (0.415)	0.921 (0.270)	0.352 (0.478)	0.469 (0.499)	0.814 (0.389)	0.914 (0.280)	0.325 (0.468)	0.464 (0.499)	0.824 (0.381)
education1	0.0176 (0.132)	0.0251 (0.157)	0.0160 (0.125)	0.0228 (0.149)	0.0324 (0.177)	0.0393 (0.194)	0.0359 (0.186)	0.105 (0.307)	0.0297 (0.170)	0.0384 (0.192)	0.0379 (0.191)	0.105 (0.306)
education2	0.540 (0.498)	0.398 (0.489)	0.217 (0.412)	0.365 (0.481)	0.533 (0.499)	0.391 (0.488)	0.267 (0.442)	0.475 (0.499)	0.514 (0.500)	0.389 (0.487)	0.276 (0.447)	0.491 (0.500)
education3	0.236 (0.425)	0.395 (0.489)	0.446 (0.497)	0.267 (0.442)	0.235 (0.424)	0.394 (0.489)	0.406 (0.491)	0.201 (0.401)	0.238 (0.426)	0.380 (0.485)	0.393 (0.488)	0.194 (0.395)
education4	0.194 (0.396)	0.176 (0.381)	0.315 (0.465)	0.318 (0.466)	0.199 (0.399)	0.176 (0.380)	0.291 (0.454)	0.218 (0.413)	0.218 (0.413)	0.193 (0.394)	0.293 (0.455)	0.210 (0.407)
Observations	41,865	16,792	10,256	15,510	45,025	18,478	12,626	26,769	47,815	18,987	13,409	31,558

Table 6: Descriptive statistics for different treatment and control groups in the services sector. The numbers are means of variables and standard errors in parenthesis, source: THLFS.

Variables	Dependent Variable = 1 if informally employed, = 0 otherwise
male1829	0.0697* (0.0364)
female1829	0.0443* (0.0244)
female3055	-0.139*** (0.0204)
subsidy	0.0608* (0.0343)
male1829*subsidy	0.0303 (0.0202)
female1829*subsidy	-0.0210 (0.0172)
female3055*subsidy	-0.0547*** (0.0128)
maritals*female1829	-0.0677*** (0.0131)
maritals*female3055	0.0993*** (0.0124)
male1829*Unemp.R.	-0.00988*** (0.00124)
female1829*Unemp.R.	-0.0184*** (0.00112)
female3055*Unemp.R.	-0.0103*** (0.000829)
Observations	205,165

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 7: Relative Informal Employment Outcomes of Females and Young Males (of age 18 - 55) Before After the Subsidy for the Agricultural Sector.

Variables	Dependent Variable = 1 if informally employed, = 0 otherwise
male1829	0.0642** (0.0268)
female1829	0.214*** (0.0384)
female3055	-0.0933*** (0.0157)
subsidy	0.0133 (0.0213)
male1829*subsidy	-0.0290*** (0.00837)
female1829*subsidy	-0.0296** (0.0124)
female3055*subsidy	-0.0457*** (0.00945)
maritals*female1829	-0.101*** (0.00537)
maritals*female3055	0.0219** (0.00885)
male1829*Unemp.R.	0.00218*** (0.000637)
female1829*Unemp.R.	-0.000587 (0.00105)
female3055*Unemp.R.	-0.00200** (0.000895)
Observations	256,640

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8: Relative Informal Employment Outcomes of Females and Young Males (of age 18 - 55) Before After the Subsidy for the Industrial Sector.

Variables	Dependent Variable = 1 if informally employed, = 0 otherwise
male1829	0.107*** (0.0265)
female1829	0.115*** (0.0396)
female3055	0.0933*** (0.0180)
subsidy	-0.0435*** (0.0128)
male1829*subsidy	-0.0134** (0.00606)
female1829*subsidy	-2.88e-05 (0.00870)
female3055*subsidy	0.0382*** (0.00806)
maritals*female1829	-0.0886*** (0.00337)
maritals*female3055	0.000941 (0.00505)
male1829*Unemp.R.	-5.14e-05 (0.000445)
female1829*Unemp.R.	-0.00377*** (0.000620)
female3055*Unemp.R.	-0.00456*** (0.000493)
Observations	464,157

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 9: Relative Informal Employment Outcomes of Females and Young Males (of age 18 - 55) Before After the Subsidy for the Services Sector.

Variables	Dependent Variable = 1 if informally employed, = 0 otherwise
male2529	0.0720 (0.0655)
female2529	-0.0724 (0.0545)
female3035	-0.0859 (0.0535)
subsidy	-0.0523 (0.0572)
male2529*subsidy	0.0300 (0.0333)
female2529*subsidy	-0.0420 (0.0307)
female3035*subsidy	-0.0357 (0.0289)
maritals*female2529	-0.00503 (0.0215)
maritals*female3035	0.0489** (0.0227)
male2529*Unemp.R.	-0.0101*** (0.00208)
female2529*Unemp.R.	-0.0160*** (0.00197)
female3035*Unemp.R.	-0.0166*** (0.00185)
Observations	52,770

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 10: Relative Informal Employment Outcomes of Females and Young Males (of age 25 - 35) Before After the Subsidy for the Agricultural Sector.

Variables	Dependent Variable = 1 if informally employed, = 0 otherwise
Male2529	-0.0136 (0.0356)
female2529	-0.0272 (0.0423)
female3035	0.00800 (0.0432)
subsidy	0.0204 (0.0295)
male2529*subsidy	-0.0252** (0.0122)
female2529*subsidy	-0.0352** (0.0166)
female3035*subsidy	-0.0296* (0.0159)
maritals*female2529	-0.0265** (0.0106)
maritals*female3035	0.0210 (0.0131)
male2529*Unemp.R.	0.000751 (0.000914)
female2529*Unemp.R.	-0.00268* (0.00148)
female3035*Unemp.R.	-0.00687*** (0.00143)
Observations	97,119

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 11: Relative Informal Employment Outcomes of Females and Young Males (of age 25 - 35) Before After the Subsidy for the Industrial Sector.

Variables	Dependent Variable = 1 if informally employed, = 0 otherwise
male2529	0.0141 (0.0312)
female2529	0.00640 (0.0419)
female3035	0.116*** (0.0428)
subsidy	-0.0573*** (0.0176)
male2529*subsidy	0.00456 (0.00919)
female2529*subsidy	-0.000546 (0.0125)
female3035*subsidy	0.0393*** (0.0140)
maritals*female2529	-0.0362*** (0.00593)
maritals*female3035	-0.0127* (0.00710)
male2529*Unemp.R.	-0.000407 (0.000622)
female2529*Unemp.R.	-0.00447*** (0.000862)
female3035*Unemp.R.	-0.00607*** (0.000823)
Observations	161,556

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 12: Relative Informal Employment Outcomes of Females and Young Males (of age 25 - 35) Before After the Subsidy for the Services Sector.