

ECONOMIC  
RESEARCH  
FORUM



منتدى  
البحوث  
الاقتصادية

2016

# working paper series

THE IMPACT OF THE TURKISH EMPLOYMENT  
SUBSIDY PROGRAMS ON INCREASING  
THE LEVEL OF SOCIAL PROTECTION FOR WOMEN

Binnur Balkan, Seyit Mümin Cilasun  
and Belgi Turan

Working Paper No. 1022

**THE IMPACT OF THE TURKISH EMPLOYMENT SUBSIDY  
PROGRAMS ON INCREASING  
THE LEVEL OF SOCIAL PROTECTION FOR WOMEN**

Binnur Balkan, Seyit Mümin Cilasun and Belgi Turan

**Working Paper 1022**

**June 2016**

This research was supported by Economic Research Forum Grant. The views expressed here are those of authors and are not necessarily those of Economic Research Forum and/or CBRT. We thank İnsan Tunalı, Semih Tümen, Ragui Assaad and participants of ERF workshop on “Gender and Social Protection Policies in the MENA Region” for all the discussions and contributions.

**Send correspondence to:**

Belgi Turan

Atılım University

[belgi.turan@atilim.edu.tr](mailto:belgi.turan@atilim.edu.tr)

First published in 2016 by  
The Economic Research Forum (ERF)  
21 Al-Sad Al-Aaly Street  
Dokki, Giza  
Egypt  
[www.erf.org.eg](http://www.erf.org.eg)

Copyright © The Economic Research Forum, 2016

All rights reserved. No part of this publication may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without permission in writing from the publisher.

The findings, interpretations and conclusions expressed in this publication are entirely those of the author(s) and should not be attributed to the Economic Research Forum, members of its Board of Trustees, or its donors.

## Abstract

This paper investigates the impact of the employment subsidy program implemented in 2008 by Turkish government to generate new employment opportunities for women and young men. More precisely, using a nationally representative individual level data, we analyze the impact of the program on social protection of women by checking the transitions in the labor market states. Using difference-in-differences (DID) estimation technique; we assess the effectiveness of the policy by analyzing the switches from informal employment to formal employment, from unemployment to formal employment and from out of the labor force to formal employment. Our results indicate that the reform did not effectively increase the employment probabilities of women compared to men who are not eligible to benefit from the program but formality of women in the labor market increased significantly suggesting an expansion in the social security coverage women in Turkey.

**JEL Classification:** H24, J21, J32

**Keywords:** Employment subsidies, unemployment, informality

## ملخص

تبحث هذه الورقة تأثير برنامج دعم العمالة في عام 2008 من قبل الحكومة التركية لتوليد فرص عمل جديدة للمرأة والشباب. على نحو أدق، وذلك باستخدام البيانات تمثيلا وطنيا المستوى الفردي، نقوم بتحليل أثر البرنامج على الحماية الاجتماعية للمرأة عن طريق التحقق من التحولات في دول سوق العمل. عن طريق تقنية تقدير الفرق في الخلاقات (DID). نقوم بتقييم فعالية السياسة من خلال تحليل العمالة غير الرسمية إلى العمالة الرسمية، من البطالة إلى العمل الرسمي ومن خارج قوة العمل إلى العمل الرسمي. نتائجنا تشير إلى أن الإصلاح لا تؤدي زيادة فعالية احتمالات توظيف النساء مقارنة بالرجال الذين ليسوا مؤهلين للاستفادة من البرنامج ولكن شكلي للمرأة في سوق العمل زادت بشكل ملحوظ مما يشير إلى التوسع في تغطية النساء الضمان الاجتماعي في تركيا.

## 1. Introduction

One of the most fundamental problems in Turkish labor market is the low labor force participation rate of the women. Moreover, even if women decide to work, due to their low level of educational attainments, they mostly work in the informal sector that consists of small firms with lower non-pecuniary job amenities (such as health care or child care services). This labor market position of female in Turkey not only reduces the overall welfare but also creates an important problem for women: having no social protection.

To alleviate the effects of global recession, Turkish government spent approximately US\$45 Billion (6.8% of GDP) between 2008 and 2010, and implemented a series of fiscal stimulus measures, including tax reductions, increased public spending, and employment subsidy programs. (Ercan, Taymaz, Yeldan, 2010). Among this labor market reforms, The Turkish government started a employment program in July 2008 to subsidize the employers' social security contributions for the two target groups: young men (ages between 18 and 29) and all women above 18. The purpose of the program was to increase the formal employment of the relatively disadvantaged groups by reducing the employment costs in the labor market.

The aim of our paper is to investigate the impact of this program by analyzing its impact on social protection of women by checking the transitions in the labor market states. The subsidy program targeted only women and young men, thus enabling us to implement a quasi-experimental design by using older men (30 and above) as a control group in our difference-in-differences estimation strategy.

Although in theory, employment subsidy programs are effective in reducing the unemployment rates (Schweinberger, (1978), Orszag and Snower (2003)), there is no empirical consensus on the effect of these subsidy programs on employment outcomes. On the one hand, Kramarz and Philippon (2001) and Crepon and Desplatz (2002) find that the subsidy program has been effective in improving the employment outcomes of low-wage workers in France. Goos and Konings (2007) show that the program implemented in Belgium has increased full time employment by 5-8% and pre-tax wages by 1-3% without any displacement effect for the existing workers. On the other hand, Huttunen, Pirtilla, and Uusitalo (2013) find that the Finnish program had basically no effect on the employment outcomes of older, full-time, low-wage workers. Blundell, Costa Dias, Meghir, and van Reenen (2004) find that hiring subsidies have been effective in increasing the employment probabilities of the workers in the target group by 5%, but this positive effect has not been permanent. Boockmann, Zwick, Ammermuller, and Maier (2012) find that the hiring subsidy program implemented in Germany has been effective in improving labor market outcomes only in some certain regions of Germany but not in the entire country. Mühlau and Salverda (2000) studies the effect of a reduction in taxes and social security contributions paid by employers for minimum wage workers and finds that the program did not raise employment growth not even in minimum-wage intensive sectors, such as retail.

The effect of the Turkish subsidy program, recently, has been studied from various perspectives. Using aggregated labor market data, Uysal (2013) finds that the program was effective for the women in the age group 30-34. However, when the coverage of the program is extended to include all newly hired workers, the positive effect of the program on the employment disappeared. Moreover, during the economic crisis, an added worker effect has been shown to be present for women. Balkan et al. (2014) employ difference-in-differences (DID) techniques to investigate the impact of the program on the targeted disadvantaged groups. According to their results, while the most significant effect of the program is observed for older women, a weaker effect is found for young women and finally no effect is detected for younger men. To eliminate the confounding effect of 2008 global economic crisis which coincides with the policy period, Ayhan (2013) employs a triple difference strategy and finds

a positive effect of the program shortly after the announcement. Cilasun et al. (2015), employing transition analyses, finds that the policy measures, in general, helped in alleviating the adverse effects of the crisis on the Turkish labor market. They also find that, the policy particularly targeting youth and women was effective in promoting the employment of these disadvantaged groups, the beneficial effects being more pronounced for women.

The contribution of our paper to this existing literature is multifold. First, we focus on the impact of this hiring subsidy program on improving the level of social protection for female workers, a significant fraction of whom are employed informally (i.e., without being registered to the social security system). Our paper will be the first paper to evaluate the effectiveness of the Turkish subsidy program in terms of transitions from informal to formal employment (particularly for women). It is important to evaluate the impact of employment programs on informality in emerging economies, as it is one of the major problems in developing countries, leaving the informal employees without the measure of protection in terms of job security, old-age pensions etc. Second, our analysis is first to use Turkish Survey of Income and Living Conditions, which has a panel structure, to evaluate the impact of this employment subsidy. Unlike previous work, we account for unobserved heterogeneity in individual characteristics, such as ability or motivation, and their possible correlation with labor market outcomes.

Using 2006-2012 waves of the Survey of Income and Living Conditions (SILC) panel, we first show that subsidy is successful in helping women into formal employment transition. Then using 2006 – 2010 waves of the same survey in a difference in differences set up, we show that subsidy creates formal job opportunities for women. Our results suggest that subsidy creates formal job opportunities for both unemployed and informally working women, resulting in a lower total employment creation. After the subsidy employment probabilities of women increased with an observed decrease of informality and unemployment probabilities. These results suggest that the employment subsidy program increased the social security coverage for women, both for unemployed and previously informally working individuals.

The paper proceeds as follows. Section 2 briefly summarizes Turkish labor market, policy environment and subsidy program. Section 3 describes the data. Section 4 lays out the empirical strategy and results. Section 5 concludes.

## **2. Institutional Background**

### ***2.1 Policy environment***

The Turkish labor market is characterized by high unemployment and low participation rates, which are much worse than the OECD averages and only slightly higher than the MENA averages. The unemployment rate, which was 8-9 percent in 90s, escalated to the range of 10-11 percent between 2002 and 2007 (in the post-2001 crisis era). With the global crisis in 2008, the unemployment rates hit an average of 14 percent between the last quarter of 2008 and 2010. After this period, with the improvements in regional and world economy, the unemployment rate in Turkey has decreased to an average of 9 percent between 2011 and 2014. Although the gender gap in unemployment rates has narrowed since 90s, there is still room for policy interventions to improve the existing gaps. In 2011, non-agricultural unemployment rates for women and men are 17.7 percent and 10.4 percent, respectively. Although participation rates both for men and women in Turkey are lower than the OECD averages, the participation rate for women is exceptionally low. The female labor force participation (FLFP) rate was 23.3 percent in 2004. It only increased to 23.6 percent in 2007, which is almost one third of OECD and EU-19 countries' averages—62 and 64 percent, respectively. By 2011, the FLFP rate increased to 28.8 percent, partly due to the added worker effects influenced by the 2008 financial crisis and the public policy measures to increase employment. The most recent figures suggest that the FLFP rate is still around 30 percent. (Tansel, 2012).

Other important features of the Turkish economy include the high taxes on labor and high level of informal economy. In Turkey, contributions by employee and employers to pension and disability insurance constitute around 40 percent of gross wages, which is the highest tax wedge among the OECD countries (World Bank, 2006). High taxes on labor exacerbate the informal economy problem, which is common to most developing economies. In Turkey, the share of informal employment was estimated as 43.5 percent as of 2008 and declined to 38.4 percent in 2012 with the reforms undertaken by the Turkish government. Although, the majority of the informal employment is in the agricultural sector, non-agricultural sectors also accounts for 29.8 percent and 25.8 percent of the informal labor force in 2008 and 2012, respectively. Tansel and Kan (2012) show that informal employment is particularly prevalent among youth and females, addressing the need for reforms to improve social protection among these disadvantaged groups.

## ***2.2 Turkish social security system***

The social security system in Turkey is predominantly similar to Bismarck model, where the premiums paid over the wages of employees according to their insurance status are collected in a joint pool. Premiums vary according to the level of risk involved in a job, however, on average, the employee contributes approximately 15 percent, which is deducted from their salary; and the employer contributes approximately 21.5 percent.

Turkish Social Security System has been struggling with financial problems since 1990s mainly due to early retirement implementations. According to the 2011 data, in Turkey worker to beneficiary ratio is 1.8, which is low compared to developed countries such as US and Germany, in which the ratio is 3.3 and 2.9, respectively. The ratio is even lower compared to BRIC countries China, Brazil and India, in which the ratio is 7.8, 8.6, 10.9. To secure financial sustainability, 1999 reform increased retirement age gradually, effective by 2002. Later, Turkish Social Security System went through a major transformation in 2007, centralizing the control of different social security funds in a single institution in order to ensure unity of standards and norms in terms of benefits. The three insurance funds, namely SSK, who previously was for private sector employees and workers in the public sector; Emekli Sandigi, previously for civil servants; and Bag-Kur, previously for self-employed, were merged under a sole body called the Social Security Institution (SSI) in 2007. The coverage was around 81% of the population as of 2008.

Turkish Social Security System provides a universal health insurance for all formally working citizens and their dependents. Men and women are eligible for old age pension at 60 and 58, respectively. System also offers unemployment insurance. Employees, employers and government make contribution to unemployment insurance plan at the rates 1%, 2% and 1%, respectively. Individuals must have at least 600 days of contributions in the 3 years before unemployment, including the last 120 days of employment to be eligible for unemployment insurance. Other than these work injury, maternity, and survivor pension are also available to citizens covered by the social security system.

## ***2.3 Employment subsidy program***

The aim of the employment subsidy program is (i) to encourage the employment of disadvantaged groups (females and youth) and (ii) to mitigate the adverse labor market effects of the 2008 crisis. The program was put into action on July 1st 2008 with Law 5763 and initially introduced with one year participation period, then extended to June 30, 2010 with Law 5838. This reform package has mainly targeted young men (ages between 18 and 29) and women above 18 who were not employed as a tax-registered worker in the preceding 6 months. The aim was to create new employment without replacing the existing workers; therefore, subsidies were only given to new employees hired in addition to the yearly average of the number of workers employed before the program. The program offered direct subsidy to employers by

reducing the employers' contribution to social security payment of new hires for five years. The Turkish government covered 100 percent of social security payments of new employees for the first year and reduced its participation by 20 percent each year for the following 4 years. The subsidy amount was fixed at social security payment that corresponds to minimum wage level; therefore, the program mostly targeted low-wage workers. The number of firms who benefitted from the program between 2008, 2009, 2010 is 9931, 19534 and 22082, respectively. More importantly, by March 2010, employment creation under the subsidy program was 30986 for women and 29945 for men (Topcu, 2011). Due to these encouraging numbers, government increased the coverage of subsidy program and extended the coverage period. By the enactment of Law 6111 in February 2011, a similar but more comprehensive employment subsidy package was announced for the period between March 2011 and December 2015. By this program government extended the coverage to both men and women of all ages, who were not employed as a tax-registered worker in the preceding 6 months. Moreover, subsidy limit that corresponds to minimum wage level was also relaxed and government started covering the total social security payment amount regardless of the wage level. Although, Law 6111 extended the coverage to all men, it still positively discriminated against women by offering longer coverage periods.

### **3. Data**

The data used in this analysis is drawn from the Turkish Income and Living Conditions Survey (SILC), which has been conducted by the Turkish Statistical Institute (TurkStat) since 2006. The survey has a panel nature and it is nationally representative. It provides detailed information on the income, demographic characteristics, wellbeing, living conditions, employment status, social security coverage, working hours, job characteristics and socioeconomic conditions of the individuals. Information obtained from the survey presented in two data sets: Household data and individual data set.

SILC is designed as a rotating panel in which the sample of households and corresponding individuals are traced annually for four consecutive years. A two-stage stratified sampling procedure is used to draw a representative non-institutionalized Turkish resident population, and survey weights are assigned accordingly. Each year the survey is conducted for four subsamples. One subsample is removed and replaced by a new subsample in each year. The interviews are administered once every year in April, May and June. The sample size is designed considering possible non-response, thereby no replacement is undertaken. Survey results are published annually in both cross-section and panel data set formats.

Our data covers the period 2006-2012. However, as mentioned above, the coverage of the program was extended to include qualified men older than 29 in 2011. Moreover, other policy interventions have alleviated the advantages of women in this period (Uysal, 2013). In this respect, we restricted our analyses to cover the period 2006-2010 in our difference-in-differences analyses. In line with the coverage of the policy, we exclude the individuals that are self-employed, unpaid family worker, working on their own account and individuals that are younger than 18, and individuals older than 64. Finally, we only keep the individuals who are present in at least two consecutive years of the survey.

The frequencies and shares of each labor market state (Formal, Informal, Employed and Unemployed) for 2006-2012 are reported in Table 1 and Table 2 for women and men, respectively.

According to the tables, the share of formal employment in the labor market exhibits a decreasing trend throughout the time for both genders. However, the share for men is still three times that of women. On the other hand, while the share of informal employment of women also displays an increasing trend, informality is decreasing for men in terms of labor market shares. Although the share of informality seems to be more pronounced for men, when we



consider the working individuals, informality is significantly higher for women. In terms of unemployment, women seem to be better off relative to men; however, this low ratio is a consequence of low labor force participation of women. While the share of inactive men is around 25%, this share is around 80% for women and it exhibits a decreasing trend.

Turkish labor market displays two striking features regarding women; low labor force participation rate and concentration in the informal sector. These make women unprotected in terms of social protection and underline the need for policy action. In order to see whether the policy reforms applied in July 2008 made the women better off by providing them social security coverage through making them to work in formal sector, we first employ Markov Transition Analyses<sup>1</sup>. We define four labor market states, employment in formal sector (f), employment in informal sector (i), unemployment (u) and inactive (n). For these four states, we estimate transition probabilities for 2006-2007, 2007-2008, 2008-2009 2009-2010, 2010-2011 and 2011-2012 flows by gender. Table 3 and Table 4 report the transition probabilities for women and men, respectively.

According to the tables, mobility of formal sector is quite low in Turkey (above 90% of the men and around 90% of the women who are initially employed in formal sector, remain in their state). However, these ratios fell to 86.87% for men and 84.04% for women in 2008-2009 transition, which could be a mere reflection of 2008 global crises. Moreover, as expected, another mitigating effect of the crises in the 2008-2009 transitions is the increase in the transition probability of moving from formal and informal state to unemployment state. For instance, during the crises, the transition probability of a formal male worker and female worker being unemployed increased to 5.23% and 6%, respectively. The same probability increased to 12.57% for informal male worker and 7.36 for informal female worker.

When we compare formal and informal states we see that the probability of getting unemployed is higher if the individual is working in the informal sector as seen from the number above. Moreover, women working in the informal sector have significantly higher probability of leaving the labor market compared to men<sup>2</sup>. While transition from formal to informal state is very limited for both groups, the probability of moving from informal to formal state is very common, particularly for men.

While the unemployed men become employed more intensively in the informal sector, unemployed women mostly find job in formal sector. However, it should be noted that, the probability of unemployed men finding a job in both sectors is higher than that of women. Individuals that were out of the labor force remains to be at the same state in the next year. This fact is more pronounced for women. Finally, during the crises (2008-2009 transition) we do not observe any significant movement from inactive state to either type of employment. However, compared to pre-crisis period, a slight increase is observed from inactive to unemployment states, which might somewhat reflect an added worker effect for both genders.

As mentioned above, a reform package was put into effect in July 2008 with the aim of increasing formal employment among the young (18-29 age group) and women. In order to see whether the package had its intended effects, we first compare the women and men by focusing on the movements from unemployment to formal employment. According to Table 3 and Table 4, transition from unemployment to formal employment does not exhibit any significant differences between the crises and non-crisis periods among men and women. On the other hand, transition to formal employment could also occur from informal employment. This

---

<sup>1</sup> The survey is applied on the April, May and June of the related survey year. Therefore, while 2008 survey covers the pre-policy period, 2009 survey covers the post-policy period. This pattern makes us to use the Markov Analysis to identify the effect of the policy.

<sup>2</sup> The probability of a worker leaving the labor market for informal female is more than three times than that of informal male worker.

transition exhibits a significant decrease for male workers compared to the pre-crisis period (from 17.97% to 9.12%) while the decrease was limited for females (from 10.37% to 9.12%). This can indicate that the reform package targeting female workers achieved its intended goals to some extent. Moreover, as mentioned above, in February 2011, the policy was reorganized to cover all new workers regardless of age and gender. The effect of this revision is visible in the 2010-2011 and 2011-2012 transitions for men. Prior to 2010-2011 transition, while the probability of finding a job for the unemployed male worker is higher in the informal sector compared to formal sector, by the 2010-2011 transition, this pattern is reversed; unemployed males begin to find jobs mostly in the formal sector.

Since the young males (18-29 age group) were also covered by the reform package, above analysis could be misleading considering the possibility that some men were also benefited from the package. To account for this concern, we tailor the Markov analyses for the men and women that are older than 30 in order to better identify the policy effect (Table 5 and Table 6).

According to the tables, while the probability of moving from unemployment to employment for men exhibits a decline in the 2007-2008 period, the same probability increases for women. In other words, the probability of women finding a formal job increased following the policy. Moreover, the probability of finding a formal job for the informal female workers increased in 2007-2008 period (from 5.56% in 2007-2008 to 6.31% in 2008-2009). However, this probability decreased for informal male workers (from 14.47% in 2007-2008 to 7.91% in 2008-2009). In this sense, the reform package targeting female workers seems to achieve its intended goals. Moreover, the probability of unemployed men finding a job in the formal sector increased significantly in the post policy period which could once again reflect the extended coverage of the policy to include men above 29 in February 2011. As this finding could blur the identification of the impact of the 2008 policy, we narrow the time span of difference-in-differences analysis to 2006-2010 period.

#### 4. Empirical Analysis

The setup of 2008 employment subsidy allows us to employ a difference-in-differences (dind) strategy for assessing the effects of the subsidy on women's social security coverage. As a result of 2008 employment subsidy, hiring previously non-working women became cheaper compared to hiring men above 29 years of age. Given the law define "working" as being registered with the social security institution; this cost advantage is applicable to informally employed women together with the women who are classified as unemployed and not in labor force (NILF). Therefore, the possible social security coverage effect of subsidy might work through informal to formal employment transitions as well as not having a job to formal employment transitions.

To identify these channels, we construct a set of five difference-in differences equations as shown below where dependent variables are constructed as binary variables. For example,  $Employment_{it}$  takes the value of 1 for time  $t$  and individual  $i$  if individual is employed as a wage earner at time  $t$ , and 0 otherwise. Other four dependent variables are constructed in a similar manner where formality takes 1 for formally employed individuals; informality takes 1 for informally employed individuals and so on and so forth. Here,  $I$  denotes target variable and  $T$  stands for treatment effect, which is 1 after 2008 and 0 otherwise. We control for time trends and gender specific time trends via  $Trend$  and  $Trend * I_{it}$  variables. Finally,  $I_{it} * T_{it}$  captures treatment - target interaction, meaning that  $\beta_1$  is our main parameter of interest in a difference-in-differences regression.

$$Employment_{it} = \alpha_1 + \beta_1 * (I_{it} * T_{it}) + \beta_2 * T_{it}$$

$$Formality_{it} = \alpha_1 + \beta_1 * (I_{it} * T_{it}) + \beta_2 * T_{it}$$

$$Informality_{it} = \alpha_1 + \beta_1 * (I_{it} * T_{it}) + \beta_2 * T_{it}$$

$$Unemployment_{it} = \alpha_1 + \beta_1 * (I_{it} * T_{it}) + \beta_2 * T_{it}$$

$$NILF_{it} = \alpha_1 + \beta_1 * (I_{it} * T_{it}) + \beta_2 * T_{it}$$

The panel nature of our dataset allows us to use fixed effects estimation for above system. Fixed effects estimation has two main advantages over cross section difference-in-differences analysis. First, it eliminates the need for controlling other covariates, which might be correlated with labor market outcomes but static in nature, like gender. Second, and more importantly, fixed effects capture unobserved heterogeneity – ability, being hardworking - embedded in individual characteristics, which might affect labor market outcomes.

We estimate alternative specifications. First of all, we construct our regression for the whole sample, 18 – 64 years old women being the treatment group and 30-64 years old men as the control group. Then, we restrict our analysis to above 29 years old women in order to achieve a better comparison between control and treatment groups, as once again the control group is the men older than 29. Finally, we narrate both our control and treatment observations to 30 - 35 years old interval to make sure that we are comparing very similar individuals in the labor market.

Table 7 reports fixed effects estimation<sup>3</sup> results for overall sample where the treatment group is all women between 18 – 64 years old and the control group is the men aged 30-64. In the first column, we estimate whether policy is effective in increasing employment probabilities of women before going into the details of social security coverage expansion. The first coefficient of first row suggests post-2008 employment subsidy program is not effective in increasing employment probabilities of women compared to the control group. Other columns in this table help us understand how the composition of labor market states of women changes during this period. At the last column, we do not observe a statistically and economically significant coefficient, meaning that there is no difference between men and women in the not in labor force group before and after the subsidy. We can infer from the last coefficient, policy was not effective in pulling inactive women into the labor force. On the other hand, we observe a significant coefficient in the fourth column, suggesting an average switch in the labor market status of women compare to men in the control group, based on the unemployment to employment transition. However, consistent with the employment coefficient, unemployment coefficient is economically small and so policy is not strikingly effective in helping unemployed women to find work.

After understanding the overall effects of subsidy, it is also possible to identify social security coverage effects. Column 2 and 3 represent how formality and informality probabilities of the target group changed compared to the control group after the subsidy. Clearly, there is a significant increase in formality probability of women after the subsidy together with a smaller but significant probability of leaving informality. In other words, subsidy successfully results in women leaving unemployment and informal labor market and joining formality. Those results are in line with the transition probability matrices and reveal a similar working mechanism of the subsidy. Therefore, we can claim that post-2008 subsidy was successful in increasing the social security coverage for women, both for unemployed and informally working individuals.

Then we narrow our treatment group to achieve more homogeneous control and treatment groups. In the overall sample regression, relatively dissimilar workers are pooled into one regression. For example, labor market movements and incentives of an 18-year-old woman might be very different from the labor market movements of a 50 years old man. To overcome this drawback, we drop women below 30 years old from our sample for the second set of

---

<sup>3</sup> We first construct a random and a fixed effect regression for all outcomes of interest and apply a Hausman test. It reveals that fixed effects are more appropriate in our case so we carry on reporting FE estimates.

results. Hence, control and treatment groups are constructed on more similar workers, all of whom are above 29 years old. Table 8 displays our regression results for women of this new subsample.

In addition to a weakly significant employment effect for this subgroup, formality effect seems slightly stronger for older women. The employment probability goes up about 1 percent and formality probability goes up about 4.2 percent after the subsidy for women above 29 years old compared to the control group. However, there is no striking difference between the overall sample and older subsample results.

Finally, we further refine our sample to individuals between 30 and 35 years old. This smaller sample let us compare very similar individuals in the labor market where treatment group includes women aged 30 – 35 years old and control group includes men from the same age interval. As Table 9 reveals the coefficients are very similar to our original results in all columns, only getting stronger for social security coverage results, indicating a switch from informality and unemployment to formality for women. In this regression set, we compare relatively similar individuals and hence reduce the probability of incomparable treatment and control groups.

With both wider and narrower age samples, we show that post-2008 subsidy program is successful in expanding social security coverage of women in Turkey. We also discuss there are two sides to this expansion story. First, subsidy creates new formal job opportunities for women who are previously unemployed. Therefore, it increases the coverage for women who have no job prior to the subsidy program. More importantly, subsidy enhances the social security coverage of women who are working but not covered prior to subsidy.

#### **4.1 Robustness exercise**

First, we try to identify whether effects of subsidy survived after the enactment of new law, enlarging the subsidy coverage to all men. Given the new law still treat women favorably compare to our control group, we expect that effects of subsidy will survive albeit at a smaller magnitude. In order to achieve such a comparison, we extend our dataset to 2006 – 2012 and assign 2009 – 2012 as the new subsidy period. Then, we carry out our original regressions on the whole sample and compare the coefficients of all five outcomes between two different subsidy periods. Table 10 summarizes difference in differences coefficients for all five labor market outcomes. It is clear from the table that, social security implications of new policy design works as we expected, with a smaller probability of leaving informal employment and a smaller probability of entering the formal employment. Although expanding sample creates a significant employment coefficient for women, that coefficient is not robust to refining sample to older women.

As an additional robustness check, we carry out a pseudo treatment experiment on policy timing. In pseudo treatment, we define pre-2008 as pre-policy and 2008 as the post-policy period. In the original policy analysis regressions, 2008 is included in the pre-policy period. Hence, the coefficients of pseudo regression should be insignificant if we correctly identify the policy effects at hand.

Similar to our policy analysis regressions, women between ages 18 to 64 constitute the treatment group in first pseudo analysis. Men above age 30 and below 65 constitute our control group, given that they did not benefit from employment subsidies. Therefore,  $I$  takes the value of 1 for treatment group and 0 for the control group. Then, unlike the policy analysis regressions,  $T$  takes the value of 1 for years 2006 and 2007; and 0 for 2008. Our parameter of interest  $I*T$  is constructed as the multiplication of two above defined variables. Finally, we control for group specific time trends in pseudo regression.

Table 11 summarizes our findings for first pseudo regression. In line with our expectations, difference in differences coefficient  $I*T$  is small and insignificant. Therefore, we identify no difference between men's and women's labor market outcomes around 2008, a year prior to the policy. Group specific time trends are significant for some of the outcomes reflecting the differential trends for women and men in the labor market.

As second and third robustness exercises, we repeat our pseudo regression for smaller subgroups. In these pseudo regressions, control groups are created as in the initial subgroup analysis so that we are focusing on more similar groups. Table 12 and 13 strengthen our initial conclusion such that no effect observed for women older than 30 years old and also for women between 30 and 35 years old. Difference in differences coefficient  $I*T$  is small and insignificant in both regressions, suggesting that no difference between labor market outcomes observed in the pre policy period. In conclusion, we have a strong evidence to believe that the coefficients for policy effects we capture in the original regressions are due to the policy and not the other confounding effects.

## **5. Conclusion**

Employment subsidy program implemented in 2008 in Turkey provides an opportunity to assess the effectiveness of such policies in decreasing unemployment and informality in developing countries. Moreover, as this reform originally targeted relatively disadvantaged groups, women and young men, it is a unique opportunity to see if such programs are beneficial in terms of increasing social protection of women.

We use Turkish Income and Living Conditions Survey (SILC), which has a panel nature that enables us to account for unobserved heterogeneity at the individual level. We examine whether the policy increases employment probabilities of women. But more importantly, we examine whether the policy affects the probability of formality in the labor market.

We first employ a basic Markov Transition Analysis and then a difference-in-differences framework. Since the subsidy program targeted only women and young men, it enables us to implement a quasi-experimental design by using older men (30 and above) as a control group in our difference-in-differences estimation strategy.

Our results indicate that after the subsidy program women's employment probability increased more than that of men who are not eligible to benefit from the policy change. Moreover, we show that women's formality probability increased in the labor market suggesting a significant expansion in the social security coverage of women. Our robustness analysis shows that our results are not driven by the underlying differences between our treatment and control group. As the results of the study confirms that the policies targeting women are effective in promoting the formal employment, these sorts of policies could be useful to increase social security coverage of women.

## References

- Ayhan, S. H. (2013). "Do Non-Wage Cost Rigidities Slow Down Employment? Evidence from Turkey", *IZA Journal of Labor Policy*, 2: 20.
- Balkan, B., Y. S. Baskaya and S. Tumen (2014). "Evaluating the Impact of the Post-2008 Employment Subsidy Program in Turkey", The Central Bank of the Republic of Turkey Working Paper No. 14/14.
- Betcherman, G., N. M. Daysal, C. Pages (2010). "Do Employment Subsidies Work? Evidence from regionally targeted subsidies in Turkey", *Labour Economics*, 17(4): 710-722.
- Blundell, R., M. Costa Dias, C. Meghir, and J. van Reenen (2004). "Evaluating the Employment Impact of a Mandatory Job Search Program", *Journal of the European Economic Association*, 2: 569-606.
- Boockmann, B., T. Zwick, A. Ammermuller, and M. Maier (2012). "Do Hiring Subsidies Reduce Unemployment among the Elderly? Evidence from Two Natural Experiments", *Journal of the European Economic Association*, 10: 735-764.
- Cilasun, S. M., E. Ö. Acar and B. Günalp (2015). "The Effects of Labor Market Reforms on the Labor Market Dynamics in Turkey", MPRA Working Paper No: 64767
- Crepon, B. and R. Desplatz (2002). "Evaluating the Effects of Payroll Tax Subsidies for Low Wage Workers", Unpublished Manuscript, CREST-INSEE.
- Ercan, H. E. Taymaz, E. Yeldan (2010). *Crisis and Turkey: Impact Analysis Of Crisis Response Measures*, ILO.
- Goos, M. and J. Konings (2007). "The Impact of Payroll Tax Reductions on Employment and Wages: A Natural Experiment Using Firm Level Data", LICOS Discussion Papers #17807.
- Huttunen, K., J. Pirtilla, and R. Uusitalo (2013). "The Employment Effects of Low-Wage Subsidies", *Journal of Public Economics*, 97: 49-60.
- ILO (2013). "Women and men in the informal economy: a statistical picture."
- Koitz, David, "Social Security: Brief Facts and Statistics," Congressional Service Report, Washington D.C., 1997, pg. 10
- Kramarz, F. and T. Philippon (2001). "The Impact Of Differential Payroll Tax Subsidies On Minimum Wage Employment", *Journal of Public Economics*, 82(1): 115–146.
- Orszag, M. J. and J. Snower (2003). "Designing Employment Subsidies", *Labour Economics*, 84: 54-58.
- Schweinberger, A.G., (1978). Employment Subsidies and the Theory of Minimum Wage Rates In General Equilibrium, *Quarterly Journal of Economics*, 78(3): 361-374.
- Tansel, Aysit, (2012). 2050'ye Doğru Nüfusbilim ve Yönetim: İşgücü Piyasına Bakış
- Tansel, Aysit and E. O. Kan (2012). "The Formal/informal Employment Earnings Gap: Evidence from Turkey".
- Topcu, U. (2011). 6111 Sayılı Kanun ile Getirilen Sigorta Prim Teşviki Uygulama Esasları, *Mali Çözüm Dergisi*.
- Uysal, G. (2013). Kadın İstihdamında Verilen Teşvikler İşe Yarıyor, Bahcesehir University Center for Economic and Social Research (Betam), Research Brief No. 13/151.

World Bank (2006). "Country Economic Memorandum: Promoting Sustained Growth and Convergence with the European Union".

**Table 1: Distribution of Labor Market States (Women)**

State	2006		2007		2008		2009	
	N	%	N	%	N	%	N	%
Formal	236	8.3	567	10.49	909	11	1,223	11.09
Informal	146	5.13	283	5.23	398	4.81	487	4.42
Unemployed	64	2.25	100	1.85	235	2.84	423	3.84
Inactive	2,399	84.32	4,457	82.43	6,724	81.35	8,891	80.65
Total	2,845	100	5,407	100	8,266	100	11,024	100
State	2010		2011		2012			
	N	%	N	%	N	%		
Formal	1,333	11.88	1,721	12.42	1,463	13.39		
Informal	589	5.25	674	4.86	607	5.55		
Unemployed	355	3.16	449	3.24	282	2.58		
Inactive	8,942	79.7	11,018	79.48	8,576	78.48		
Total	11,219	100	13,862	100	10,928	100		

**Table 2: Distribution of Labor Market States (Men)**

State	2006		2007		2008		2009	
	N	%	N	%	N	%	N	%
Formal	916	40.95	1,900	43.14	3,193	47.55	4,095	44.98
Informal	578	25.84	1,040	23.61	1,341	19.97	1,762	19.35
Unemployed	208	9.30	334	7.58	551	8.21	986	10.83
Inactive	535	23.92	1,130	25.66	1,630	24.27	2,262	24.84
Total	2,237	100	4,404	100	6,715	100	11,453	100
State	2010		2011		2012			
	N	%	N	%	N	%		
Formal	4,401	47.29	5,826	49.77	4,812	51.51		
Informal	1,702	18.29	2,057	17.57	1,544	16.53		
Unemployed	836	8.98	966	8.25	613	6.56		
Inactive	2,367	25.44	2,857	24.41	2,372	25.39		
Total	9,306	100	11,706	100	11,804	100		



**Table 3: Transition Probabilities for Women, 2006-2012**

LMS 2006	LMS 2007					LMS 2007	LMS 2008				
	F	I	U	N	Total		F	I	U	N	Total
F	177	2	4	15	198	F	442	5	7	30	484
	89.39	1.01	2.02	7.58	100		91.32	1.03	1.45	6.2	100
I	18	67	8	31	124	I	25	132	12	72	241
	14.52	54.03	6.45	25	100		10.37	54.77	4.98	29.88	100
U	10	7	4	32	53	U	18	8	13	50	89
	18.87	13.21	7.55	60.38	100		20.22	8.99	14.61	56.18	100
N	36	50	26	1,943	2,055	N	48	83	79	3,699	3,909
	1.75	2.43	1.27	94.55	100		1.23	2.12	2.02	94.63	100
Total	241	126	42	2,021	2,430	Total	533	228	111	3,851	4,723
	9.92	5.19	1.73	83.17	100		11.29	4.83	2.35	81.54	100
LMS 2008	LMS 2009					LMS 2009	LMS 2010				
	F	I	U	N	Total		F	I	U	N	Total
F	658	16	47	62	783	F	742	10	28	65	845
	84.04	2.04	6	7.92	100		87.81	1.18	3.31	7.69	100
I	26	168	24	108	326	I	20	204	25	84	333
	7.98	51.53	7.36	33.13	100		6.01	61.26	7.51	25.23	100
U	33	22	44	95	194	U	40	33	78	121	272
	17.01	11.34	22.68	48.97	100		14.71	12.13	28.68	44.49	100
N	62	99	132	5,507	5,800	N	66	137	88	5,538	5,829
	1.07	1.71	2.28	94.95	100		1.13	2.35	1.51	95.01	100
Total	779	305	247	5,772	7,103	Total	868	384	219	5,808	7,279
	10.97	4.29	3.48	81.26	100		11.92	5.28	3.01	79.79	100
LMS 2010	LMS 2011					LMS 2011	LMS 2012				
	F	I	U	N	Total		F	I	U	N	Total
F	761	10	20	62	853	F	1,087	13	33	94	1,227
	89.21	1.17	2.34	7.27	100		88.59	1.06	2.69	7.66	100
I	38	221	19	124	402	I	44	304	12	139	499
	9.45	54.98	4.73	30.85	100		8.82	60.92	2.4	27.86	100
U	47	18	48	106	219	U	57	30	58	153	298
	21.46	8.22	21.92	48.4	100		19.13	10.07	19.46	51.34	100
N	88	98	124	5,687	5,997	N	131	191	123	7,232	7,677
	1.47	1.63	2.07	94.83	100		1.71	2.49	1.6	94.2	100
Total	934	347	211	5,979	7,471	Total	1,319	538	226	7,618	9,701
	12.5	4.64	2.82	80.03	100		13.6	5.55	2.33	78.53	100

Notes: Numbers in each cell refer to number of observations and transition probabilities (%), respectively. I: Informal, F: Formal, U: Unemployed, N: Not in Labor Force (Inactive)

**Table 4: Transition Probabilities for Men, 2006-2012**

		LMS 2007							LMS 2008				
LMS 2006		F	I	U	N	Total	LMS 2007		F	I	U	N	Total
F		729	33	18	23	803	F		1,570	42	46	47	1,705
		90.78	4.11	2.24	2.86	100			92.08	2.46	2.7	2.76	100
I		75	305	34	37	451	I		149	544	78	58	829
		16.63	67.63	7.54	8.2	100			17.97	65.62	9.41	7	100
U		29	67	32	28	156	U		47	77	66	51	241
		18.59	42.95	20.51	17.95	100			19.5	31.95	27.39	21.16	100
N		17	50	25	334	426	N		35	78	49	718	880
		3.99	11.74	5.87	78.4	100			3.98	8.86	5.57	81.59	100
Total		850	455	109	422	1,836	Total		1,801	741	239	874	3,655
		46.3	24.78	5.94	22.98	100			49.27	20.27	6.54	23.91	100
		LMS 2009							LMS 2010				
LMS 2008		F	I	U	N	Total	LMS 2009		F	I	U	N	Total
F		2,408	152	145	67	2,772	F		2,574	66	82	66	2,788
		86.87	5.48	5.23	2.42	100			92.32	2.37	2.94	2.37	100
I		95	717	131	99	1,042	I		123	737	113	91	1,064
		9.12	68.81	12.57	9.5	100			11.56	69.27	10.62	8.55	100
U		71	98	148	92	409	U		116	158	167	139	580
		17.36	23.96	36.19	22.49	100			20	27.24	28.79	23.97	100
N		45	89	110	1,028	1,272	N		56	73	99	1,123	1,351
		3.54	7	8.65	80.82	100			4.15	5.4	7.33	83.12	100
Total		2,619	1,056	534	1,286	5,495	Total		2,869	1,034	461	1,419	5,783
		47.66	19.22	9.72	23.4	100			49.61	17.88	7.97	24.54	100
		LMS 2011							LMS 2012				
LMS 2010		F	I	U	N	Total	LMS 2011		F	I	U	N	Total
F		2,799	52	83	69	3,003	F		3,806	98	106	108	4,118
		93.21	1.73	2.76	2.3	100			92.42	2.38	2.57	2.62	100
I		138	748	85	67	1,038	I		224	936	93	105	1,358
		13.29	72.06	8.19	6.45	100			16.49	68.92	6.85	7.73	100
U		124	111	164	111	510	U		158	130	152	148	588
		24.31	21.76	32.16	21.76	100			26.87	22.11	25.85	25.17	100
N		63	71	90	1,177	1,401	N		96	108	95	1,522	1,821
		4.5	5.07	6.42	84.01	100			5.27	5.93	5.22	83.58	100
Total		3,124	982	422	1,424	5,952	Total		4,284	1,272	446	1,883	7,885
		52.49	16.5	7.09	23.92	100			54.33	16.13	5.66	23.88	100

Notes: Numbers in each cell refer to number of observations and transition probabilities (%), respectively. I: Informal, F: Formal, U: Unemployed, N: Not in Labor Force (Inactive)

**Table 5: Transition Probabilities for Women above 30, 2006-2012**

		LMS 2007							LMS 2008				
LMS 2006		F	I	U	N	Total	LMS 2007		F	I	U	N	Total
F		104	1	2	6	113	F		245	2	3	15	265
		92.04	0.88	1.77	5.31	100			92.45	0.75	1.13	5.66	100
I		6	48	4	22	80	I		8	86	6	44	144
		7.5	60	5	27.5	100			5.56	59.72	4.17	30.56	100
U		3	2	1	14	20	U		3	3	5	23	34
		15	10	5	70	100			8.82	8.82	14.71	67.65	100
N		10	25	11	1,709	1,755	N		19	53	29	3,406	3,507
		0.57	1.42	0.63	97.38	100			0.54	1.51	0.83	97.12	100
Total		123	76	18	1,751	1,968	Total		275	144	43	3,488	3,950
		6.25	3.86	0.91	88.97	100			6.96	3.65	1.09	88.3	100
		LMS 2009							LMS 2010				
LMS 2008		F	I	U	N	Total	LMS 2009		F	I	U	N	Total
F		382	8	13	28	431	F		453	6	13	28	500
		88.63	1.86	3.02	6.5	100			90.6	1.2	2.6	5.6	100
I		13	106	13	74	206	I		7	138	12	65	222
		6.31	51.46	6.31	35.92	100			3.15	62.16	5.41	29.28	100
U		10	10	16	47	83	U		17	19	29	62	127
		12.05	12.05	19.28	56.63	100			13.39	14.96	22.83	48.82	100
N		18	60	62	5,150	5,290	N		17	96	39	5,318	5,470
		0.34	1.13	1.17	97.35	100			0.31	1.76	0.71	97.22	100
Total		423	184	104	5,299	6,010	Total		494	259	93	5,473	6,319
		7.04	3.06	1.73	88.17	100			7.82	4.1	1.47	86.61	100
		LMS 2011							LMS 2012				
LMS 2010		F	I	U	N	Total	LMS 2011		F	I	U	N	Total
F		483	7	10	31	531	F		709	7	18	47	781
		90.96	1.32	1.88	5.84	100			90.78	0.9	2.3	6.02	100
I		27	175	11	90	303	I		24	253	7	110	394
		8.91	57.76	3.63	29.7	100			6.09	64.21	1.78	27.92	100
U		17	11	15	56	99	U		26	12	28	75	141
		17.17	11.11	15.15	56.57	100			18.44	8.51	19.86	53.19	100
N		31	71	64	5,580	5,746	N		65	155	64	7,236	7,520
		0.54	1.24	1.11	97.11	100			0.86	2.06	0.85	96.22	100
Total		558	264	100	5,757	6,679	Total		824	427	117	7,468	8,836
		8.35	3.95	1.5	86.2	100			9.33	4.83	1.32	84.52	100

Notes: Numbers in each cell refer to number of observations and transition probabilities (%), respectively. I: Informal, F: Formal, U: Unemployed, N: Not in Labor Force (Inactive)

**Table 6: Transition Probabilities for Men above 30, 2006-2012**

		LMS 2007							LMS 2008				
LMS 2006		F	I	U	N	Total	LMS 2007		F	I	U	N	Total
F		525	24	10	17	576	F		1,159	34	30	34	1,257
		91.15	4.17	1.74	2.95	100			92.2	2.7	2.39	2.7	100
I		36	201	25	26	288	I		80	382	50	41	553
		12.5	69.79	8.68	9.03	100			14.47	69.08	9.04	7.41	100
U		16	35	20	20	91	U		19	54	39	33	145
		17.58	38.46	21.98	21.98	100			13.1	37.24	26.9	22.76	100
N		4	36	12	250	302	N		6	47	22	547	622
		1.32	11.92	3.97	82.78	100			0.96	7.56	3.54	87.94	100
Total		581	296	67	313	1,257	Total		1,264	517	141	655	2,577
		46.22	23.55	5.33	24.9	100			49.05	20.06	5.47	25.42	100
		LMS 2009							LMS 2010				
LMS 2008		F	I	U	N	Total	LMS 2009		F	I	U	N	Total
F		1,748	101	92	47	1,988	F		1,908	45	52	49	2,054
		87.93	5.08	4.63	2.36	100			92.89	2.19	2.53	2.39	100
I		57	499	89	76	721	I		62	516	69	70	717
		7.91	69.21	12.34	10.54	100			8.65	71.97	9.62	9.76	100
U		28	54	102	60	244	U		60	106	99	90	355
		11.48	22.13	41.8	24.59	100			16.9	29.86	27.89	25.35	100
N		16	56	51	793	916	N		20	53	51	872	996
		1.75	6.11	5.57	86.57	100			2.01	5.32	5.12	87.55	100
Total		1,849	710	334	976	3,869	Total		2,050	720	271	1,081	4,122
		47.79	18.35	8.63	25.23	100			49.73	17.47	6.57	26.23	100
		LMS 2011							LMS 2012				
LMS 2010		F	I	U	N	Total	LMS 2011		F	I	U	N	Total
F		2,114	37	57	48	2,256	F		2,926	71	66	80	3,143
		93.71	1.64	2.53	2.13	100			93.1	2.26	2.1	2.55	100
I		79	558	53	50	740	I		142	681	61	75	959
		10.68	75.41	7.16	6.76	100			14.81	71.01	6.36	7.82	100
U		52	62	97	76	287	U		83	91	89	100	363
		18.12	21.6	33.8	26.48	100			22.87	25.07	24.52	27.55	100
N		18	53	54	891	1,016	N		29	67	44	1,156	1,296
		1.77	5.22	5.31	87.7	100			2.24	5.17	3.4	89.2	100
Total		2,263	710	261	1,065	4,299	Total		3,180	910	260	1,411	5,761
		52.64	16.52	6.07	24.77	100			55.2	15.8	4.51	24.49	100

Notes: Numbers in each cell refer to number of observations and transition probabilities (%), respectively. I: Informal, F: Formal, U: Unemployed, N: Not in Labor Force (Inactive)

**Table 7: Fixed Effects Regression for Overall Sample**

Variables	(1) employment	(2) formality	(3) informality	(4) unemp	(5) NILF
I*T	0.00803 (0.00767)	0.0367*** (0.00647)	-0.0287*** (0.00792)	-0.0142*** (0.00551)	0.00621 (0.00737)
T	-0.0249*** (0.00592)	-0.0508*** (0.00500)	0.0259*** (0.00611)	0.0203*** (0.00425)	0.00467 (0.00569)
Trend	0.00159 (0.00269)	0.0107*** (0.00227)	-0.00916*** (0.00278)	-0.00669*** (0.00193)	0.00510** (0.00258)
Gender*Trend	0.0231*** (0.00349)	-0.000707 (0.00294)	0.0238*** (0.00360)	0.00695*** (0.00250)	-0.0301*** (0.00335)
Constant	0.485*** (0.00438)	0.230*** (0.00370)	0.255*** (0.00452)	0.0364*** (0.00315)	0.479*** (0.00421)
Observations	56,359	56,359	56,359	56,359	56,359
R-squared	0.007	0.005	0.003	0.001	0.009
# of Panel Obs.	19,063	19,063	19,063	19,063	19,063

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 8: Fixed Effects Regression for Above 29 Years Old Women**

Variables	(1) employment	(2) Formality	(3) informality	(4) unemp	(5) NILF
I*T	0.0136* (0.00798)	0.0428*** (0.00704)	-0.0293*** (0.00876)	-0.0170*** (0.00575)	0.00341 (0.00735)
T	-0.0249*** (0.00562)	-0.0508*** (0.00495)	0.0259*** (0.00617)	0.0203*** (0.00405)	0.00467 (0.00517)
Trend	0.00159 (0.00255)	0.0107*** (0.00225)	-0.00916*** (0.00280)	-0.00669*** (0.00184)	0.00510** (0.00235)
Gender*Trend	0.0177*** (0.00363)	-0.00726** (0.00320)	0.0250*** (0.00398)	0.00670** (0.00261)	-0.0244*** (0.00334)
Constant	0.552*** (0.00465)	0.269*** (0.00410)	0.283*** (0.00511)	0.0363*** (0.00335)	0.412*** (0.00428)
Observations	44,785	44,785	44,785	44,785	44,785
R-squared	0.005	0.005	0.003	0.001	0.006
# of Panel Obs.	14,877	14,877	14,877	14,877	14,877

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 9: Fixed Effects Regression for Women Aged 30-35**

Variables	(1) employment	(2) Formality	(3) informality	(4) unemp	(5) NILF
I*T	0.0127 (0.0180)	0.0555*** (0.0172)	-0.0428** (0.0194)	-0.0372** (0.0147)	0.0245 (0.0157)
T	-0.0396*** (0.0129)	-0.0698*** (0.0123)	0.0302** (0.0139)	0.0355*** (0.0106)	0.00404 (0.0113)
Trend	0.0179*** (0.00611)	0.0337*** (0.00584)	-0.0158** (0.00658)	-0.0152*** (0.00500)	-0.00268 (0.00534)
Gender*Trend	0.0185** (0.00854)	-0.0262*** (0.00815)	0.0447*** (0.00919)	0.0174** (0.00698)	-0.0359*** (0.00746)
Constant	0.561*** (0.0111)	0.325*** (0.0106)	0.237*** (0.0120)	0.0561*** (0.00911)	0.383*** (0.00973)
Observations	10,248	10,248	10,248	10,248	10,248
R-squared	0.012	0.007	0.008	0.002	0.015
# of Panel Obs.	4,513	4,513	4,513	4,513	4,513

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 10: Fixed Effects Regressions for Short and Long Samples**

Variables	(1)	(2)
	2006 – 2010	2006 – 2012
Employment	0.00803 (0.00767)	0.0148** (0.00714)
Formality	0.0367*** (0.00647)	0.0314*** (0.00605)
Informality	-0.0287*** (0.00792)	-0.0166** (0.00733)
Unemployment	-0.0142*** (0.00551)	-0.0142*** (0.00513)
NILF	0.00621 (0.00737)	-0.000548 (0.00686)

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 11: Fixed Effect Regression for Pseudo Treatment**

Variables	(1) employment	(2) formality	(3) informality	(4) unemp	(5) NILF
I*T	-0.00293 (0.0123)	-0.0111 (0.0102)	0.00813 (0.0132)	-7.09e-05 (0.00840)	0.00300 (0.0119)
T	-0.0150 (0.00954)	0.00341 (0.00794)	-0.0184* (0.0103)	0.00950 (0.00653)	0.00554 (0.00923)
Trend	0.0112* (0.00658)	0.0114** (0.00547)	-0.000246 (0.00707)	-0.00999** (0.00450)	-0.00120 (0.00636)
Gender*Trend	0.0307*** (0.00845)	0.00549 (0.00703)	0.0252*** (0.00908)	0.00488 (0.00579)	-0.0356*** (0.00818)
Constant	0.459*** (0.00726)	0.211*** (0.00605)	0.248*** (0.00781)	0.0404*** (0.00497)	0.501*** (0.00703)
Observations	30,914	30,914	30,914	30,914	30,914
R-squared	0.011	0.004	0.004	0.001	0.011
# of Panel Obs.	17,085	17,085	17,085	17,085	17,085

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 12: Fixed Effect Regression for Pseudo Treatment (Women Age Above 30)**

Variables	(1) employment	(2) formality	(3) informality	(4) unemp	(5) NILF
I*T	0.00623 (0.0130)	-0.00787 (0.0113)	0.0141 (0.0146)	-0.00481 (0.00883)	-0.00142 (0.0120)
T	-0.0150 (0.00917)	0.00341 (0.00797)	-0.0184* (0.0104)	0.00950 (0.00625)	0.00554 (0.00846)
Trend	0.0112* (0.00632)	0.0114** (0.00550)	-0.000246 (0.00715)	-0.00999** (0.00431)	-0.00120 (0.00583)
Gender*Trend	0.0184** (0.00893)	-0.00445 (0.00777)	0.0229** (0.0101)	0.00785 (0.00609)	-0.0263*** (0.00824)
Constant	0.531*** (0.00786)	0.251*** (0.00683)	0.280*** (0.00888)	0.0370*** (0.00536)	0.432*** (0.00725)
Observations	24,365	24,365	24,365	24,365	24,365
R-squared	0.006	0.003	0.004	0.001	0.007
# of Panel Obs.	13,342	13,342	13,342	13,342	13,342

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 13: Fixed Effect Regression for Pseudo Treatment (Women Aged 30 - 35)**

Variables	(1) employment	(2) formality	(3) informality	(4) unemp	(5) NILF
I*T	0.0122 (0.0289)	-0.00937 (0.0282)	0.0216 (0.0334)	-0.0191 (0.0224)	0.00689 (0.0260)
T	-0.0249 (0.0206)	-0.000302 (0.0201)	-0.0246 (0.0238)	0.0243 (0.0160)	0.000620 (0.0186)
Trend	0.0328** (0.0144)	0.0366*** (0.0140)	-0.00384 (0.0166)	-0.0305*** (0.0112)	-0.00229 (0.0129)
Gender*Trend	0.0172 (0.0202)	-0.0181 (0.0197)	0.0353 (0.0234)	0.0316** (0.0157)	-0.0488*** (0.0182)
Constant	0.544*** (0.0178)	0.298*** (0.0174)	0.246*** (0.0206)	0.0632*** (0.0139)	0.392*** (0.0161)
Observations	5,617	5,617	5,617	5,617	5,617
R-squared	0.019	0.013	0.009	0.005	0.024
# of Panel Obs.	3,472	3,472	3,472	3,472	3,472

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.