Hacettepe University Graduate School Of Social Sciences

Department of Economics

ESSAYS ON TURKISH LABOR MARKET

Altan ALDAN

Ph.D. Dissertation

Ankara, 2018

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ACCEPTANCE AND APPROVAL

The jury finds that Altan Aldan has on the date of 30.11.2018 successfully passed the defense examination and approves his Ph.D. thesis titled "Essays on Turkish Labor Market".

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30/11/2018

Altan ALDAN

ETİK BEYAN

Bu çalışmadaki bütün bilgi ve belgeleri akademik kurallar çerçevesinde elde ettiğimi, görsel, işitsel ve yazılı tüm bilgi ve sonuçları bilimsel ahlak kurallarına uygun olarak sunduğumu, kullandığım verilerde herhangi bir tahrifat yapmadığımı, yararlandığım kaynaklara bilimsel normlara uygun olarak atıfta bulunduğumu, tezimin kaynak gösterilen durumlar dışında özgün olduğunu, Doç. Dr. Selcen Öztürk danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

Altan ALDAN

ACKNOWLEDGEMENTS

This thesis was prepared with kind support of many people. First and foremost, I would like to express my gratitude to my supervisor, Dr. Selcen Öztürk for her excellent guidance and valuable suggestions in preparation of the thesis.

I would like to thank to my committee members Dr. Dilek Başar and Dr. Aytekin Güven for their precious comments and suggestions which improved the analysis in the thesis substantially.

I am grateful to my colleagues Sefa İdrisoğlu, Olcay Yücel Çulha and Ferya Öğünç for their assistance and feedback. Finally, I would like to express my gratitude to my wife, Derya for her patience and compassion.

ABSTRACT

ALDAN, Altan. *Essays on Turkish Labor Market,* Ph.D. Thesis, Ankara, 2018.

Turkish labor market has fundamental problems; labor force participation and employment rates are quite low especially among women and informality is prevalent. This thesis includes analysis on three issues in Turkish labor market. First, the factors behind the rise in the female labor force participation in recent years are analyzed. Cohort effects, which can be considered as a proxy for change in societal norms about women's employment, are found to be the main determinant in the rise. Improvement in educational attainment of women and decline in fertility rate are also found to have significant contributions. Second, the causal relation between public employment and private employment is investigated. Results suggest that rise in public employment generates additional employment in non-tradable private industries whereas it has no effect on tradable sector employment. Finally, the determinants of wage over reporting and the causal link between wage over reporting and minimum wage are investigated. The results show that wages of female, young and low educated workers have higher probability of being over reported to administrative bodies. In addition, the propensity of over reporting increases after minimum wage hike.

Key Words

Female Labor Force Participation, Cohort Effects, Employment Multiplier, Public Employment, Wage Over Reporting, Minimum Wage

ÖZET

ALDAN, Altan. *Türkiye İş Gücü Piyasası Üzerine Makaleler*, Doktora Tezi, Ankara, 2018.

Türkiye işgücü piyasasının özellikle kadınlarda düşük işgücüne katılım ve istihdam oranları ve yüksek kayıt dışılık gibi temel sorunları bulunmaktadır. Bu tez, Türk işgücü piyasasına yönelik üç farklı ampirik analizden oluşmaktadır. İlk olarak, son yıllarda kadın işgücü katılım oranında gözlenen artışın arkasında yatan faktörler incelenmiştir. Kadının çalışmasına yönelik toplumsal normlardaki değişimin bir göstergesi olarak değerlendirilebilecek olan kuşak etkisinin kadın işgücüne katılım oranındaki artışın ana belirleyicisi olduğu sonucuna ulaşılmıştır. Kadınların eğitim düzeyinin artmasının ve doğurganlığın azalmasının da önemli katkıları olduğu bulunmuştur. İkinci olarak, kamu istihdamı ile özel sektör istihdamı arasındaki nedensel ilişki incelenmiştir. Analiz sonuçları, kamu istihdamındaki artışların ticarete konu olmayan alanlarda ilave özel sektör istihdamı yarattığına, ticarete konu olan alanlarda ise özel sektör istihdamına etkisi olmadığına işaret etmektedir. Son olarak, maaşların yüksek gösterilmesinin belirleyicileri ve asgari ücret ile ilişkisi incelenmiştir. Sonuçlar genç, kadın ve düşük eğitimli çalışanların maaşlarının resmi birimlere yüksek gösterilme olasılığının daha yüksek olduğuna işaret etmektedir. Ayrıca, asgari ücret artışları sonrasında maaşların yüksek gösterilmesi eğiliminin arttığı bulunmuştur.

Anahtar Sözcükler

Kadın İşgücüne Katılım Oranı, Kuşak Etkileri, İstihdam Çarpanı, Kamu İstihdamı, Maaşların Yüksek Gösterilmesi, Asgari Ücret

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ABBREVIATIONS

GDP: Gross Domestic Product

İŞKUR: Turkish Employment Agency

LFS: Labor Force Survey

OECD: Organization of Economic Cooperation and Development

SGK: Social Security Institution

TDHS: Turkish Demographic and Health Survey

TURKSTAT: Turkish Statistical Institute

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CHAPTER 1:

INTRODUCTION

The ultimate aim of economic policy making is to improve the welfare of citizens. Per capita income is the most direct measure of welfare and hence all governments in the world are trying to achieve high and sustainable growth rates. However, high per capita income is not the only criteria of well-being of societies. In an ideal society, there are no barriers to citizens in supplying their labor in the market. Besides, everyone can find a job in the labor market. Finally, the quality of jobs in the ideal economy assures the welfare of citizens. For example, all jobs are formal and workers enjoy the benefits of the health and pension systems while working and after retirement. In addition, the wage level is high enough so that workers do not fall into poverty.

Turkey is one of the largest developing countries in the world. It has the advantage of young and growing population as opposed to developed countries, which deal with the problems of aging population. Therefore, Turkey has a great advantage in sustaining growth rates in the upcoming years and becoming a member of the club of developed countries. On the other hand, this demographic window creates some risks as well. If the young generations cannot be included in the labor market or cannot find jobs, non-employment and, hence, poverty may increase which may cause political unrest and tensions in the society. Similarly, if the quality of jobs does not improve, society's welfare will not increase and again political unrest may rise.

Turkey's labor market performed quite well in the last years, especially after the financial turmoil of 2008. Many people, especially women, entered into the labor market and the number of newly created jobs outperformed most of the largest economies. In addition, the degree of informality, which is measured as the share of unregistered workers to the social security system, declined drastically pointing out an improvement in the quality of jobs. However, Turkish labor market has still fundamental problems; unemployment rate is high, labor force participation and employment rates are quite low especially among women and informality is still prevalent.

This thesis will contribute to the existing literature on Turkish labor market in three aspects. First, the study will enlarge the literature on female labor force participation in

Turkey. Unlike earlier studies, the focus will be on the determinants of the rise in female labor force participation instead of its level. The emphasis of the chapter will be on identifying the cohort effects which may be consifered as a proxy for change in societal values. Second, it is the first study that analyzes the employment generation effect of public policies will be investigated for Turkey. More specifically, the direction and magnitude of the relation between public employment decisions and private employment will be estimated. Final aspect of Turkish labor market that will be studied in this thesis will be informality. However, unlike previous studies defining informality based on registry to social security system, this thesis will focus on informality on workers' incomes; i.e. wage misreporting.

The remainder of the thesis will proceed in four chapters. Following the introduction, Chapter 2 will summarize the recent developments in the Turkish labor market, in a comparative context. The focus of the chapter will be female labor force participation, job creation and improving the quality of jobs, in line with the remaining of the thesis. It will document that female labor force participation increased and will discuss policies behind the gratifying performance of Turkish labor market especially after the financial turmoil.

Chapter 3 investigates the female labor force participation in Turkey. Despite significant rise in recent years, it remains quite low in international standards. Recent studies show that societal values may inhibit female labor force participation in Turkey. The chapter contributes to the existing literature by estimating the contributions of different determinants on the rise of female labor force participation and identifying the cohort effects, which may be considered as a proxy changes in societal values. The chapter starts with the review of the literature on determinants of labor force participation in Turkey. Then it estimates the contribution of each determinant in the participation rise between 2004 and 2016. In doing so, discrete choice regressions models are used in line with the earlier literature. Besides, cohort effects are identified by using restrictions suggested in the international literature. Contributions of other effects, such as improvements in educational attainment, decline in fertility or reduced negative effects of child care are also investigated.

Chapter 4 contributes to the literature on the casual effect of public employment on private employment, which is dominated by evidence from developed countries, with

evidence from a developing country. More specifically, the chapter uncovers whether public employment crowds out or crowds in private employment in Turkey. Given that public sector is the biggest employer in Turkey, government's employment decisions may have important spillover effects. The chapter starts with the empirical literature regarding multiplier effect of public employment on private employment. Then the possible linkages between public and private employment are explained. Finally, the multiplier effect of public employment on private employment is estimated for the period between 2008 and 2016.. In order to obtain the causal relation instrumental variables technique is used in estimations.

Chapter 5 investigates wage over reporting in Turkey, i.e. being paid less than minimum wage although being a formal worker. Wage misreporting can be considered as a dimension of informality which attracted less academic attraction. There is a tiny literature on wage underreporting but, to the best of my knowledge, there is no study on wage over reporting. The chapter first estimates the determinants of over reporting. Then, it contributes to the literature on the effects of minimum wages using a difference-in-differences setting. For this purpose, the sharp increase in the minimum wage in Turkey in 2016 is used as a natural experiment.

Chapter 6 briefs the main conclusions of the thesis and provides policy recommendations and suggestions for further research.

CHAPTER 2

RECENT DEVELOPMENTS IN TURKISH LABOR MARKET

2.1. INTRODUCTION

Turkey is one of the largest developing countries in the world with a young and growing population. According to the World Bank classification, it is a member of upper middle income countries, one step behind being a developed country.[1] In order escape caught in the middle income trap, Turkey should grow rapidly in the upcoming years. For this purpose, effective and efficient use of all resources, including labor, is of vital importance. In that respect, severe problems in the Turkish labor market, such as low labor force participation and employment rates and high informality rate create barriers against growth. Hence, in order to fully mobilize population for higher growth, labor market in Turkey should be improved.

Labor supply is one of the main components of economic growth in the neoclassical model since Solow (1956). In order to sustain high growth rates in the long run, labor supply should continue to increase. Turkey's young and growing population will help labor supply continue to increase. On the other hand, labor force participation rate must also rise in order to fully enjoy this demographic window. Besides, new employment opportunities should be created in order to make use of this new labor supply and reduce unemployment rate in order to fight poverty. Finally, the quality of jobs should increase in order to reach shared prosperity. This chapter is dedicated to give an overall picture of the problems in Turkish labor market and recent developments.

Turkey has been implementing neoliberal policies since 1980s emphasizing exports of goods and services. As a result, the labor market transformed considerably; the share of agriculture in total employment declined from 60 percent in 1975 to 25.5 percent in 2011 (Çondur and Bölükbaş, 2014). Internal migration speeded up and urbanization

[1] List of upper middle income countries can be found at: https://data.worldbank.org/income-level/upper-middle-income

rate jumped from 43.8 percent in 1980 to 73.9 percent in 2016.[2] The newcomers in the cities were not qualified for non-agricultural jobs causing low labor force participation and employment rates. Women could not enter into labor market due to lack of skills for non-agricultural jobs, household chores or traditional beliefs against female employment whereas men had to accept informal jobs. The government implemented several policies to improve labor market indicators such as increasing enrollment in all levels of education, reducing labor costs or introducing active labor market programs (World Bank, 2014). However, serious problems remain in Turkish labor market, such as low participation and employment rates and high informality rate.

Labor force participation is quite low in Turkey compared to developed countries but is increasing. The main deficiency comes from females; labor force participation rate among women in Turkey is around half of the OECD average. In section 2, I will briefly discuss the recent developments in the labor force participation rate focusing on female labor force participation. I will discuss possible reasons of low participation and give brief information about the public policies aiming to increase female labor force participation.

Low level of employment rate is another problem in Turkish labor market. The rate of employment growth in Turkey in recent years, especially after the financial turmoil, was quite. However, employment rate is still very low in international standards; more than half of the working age population is not employed in Turkey. In section 3, I will look at the employment creation performance of Turkey in comparison with other countries; discuss the sources of employment growth and provide information on public policies aiming at increasing employment.

Quality of employment is also important in order to fully enjoy the benefits of growth. Employment should provide a minimum living standard for the employees. For this purpose, minimum wage schemes are implemented in many countries including Turkey. However, workers may not benefit from minimum wage due to informality, which also causes lack of access to medical services and pensions. Informality, defined as not being registered in the social security system is widespread in Turkey.

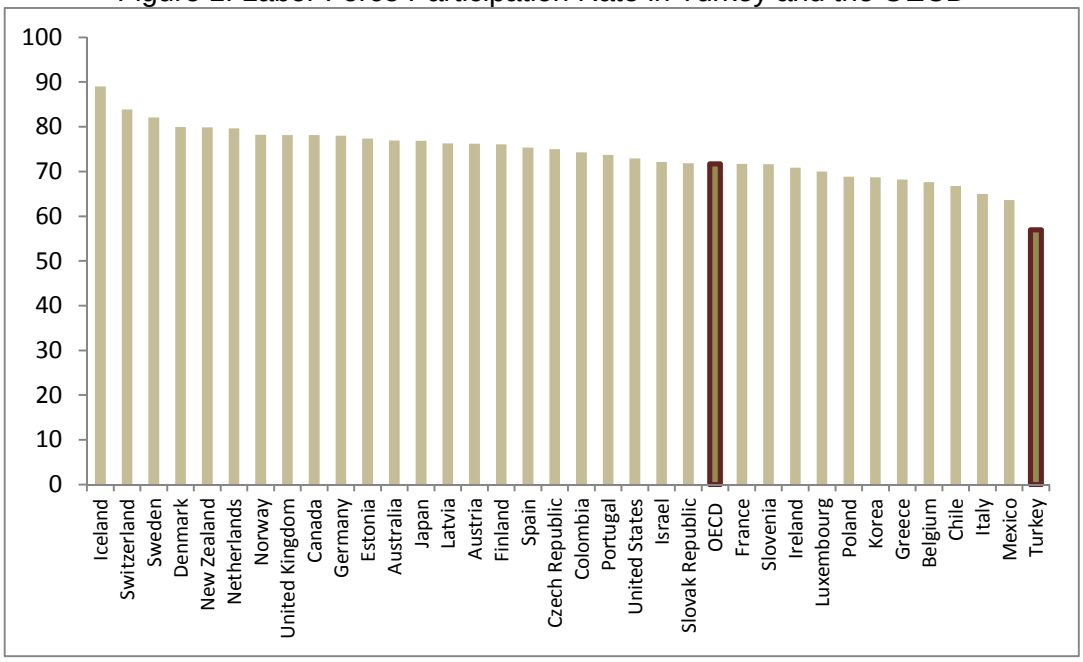
[2] Source: World Development Indicators (2018), http://databank.worldbank.org/data/reports.aspx?source=wdi-database-archives-%28beta%29, retrieved 7 August 2018.

Besides informality, wage misreporting may also prevent workers enjoy fully the benefits of employment, in terms of salary or pension payments. In section 4 I will discuss minimum wage, informality and misreporting in Turkey.

2.2. LABOR SUPPLY DEVELOPMENTS IN TURKEY

Low labor force participation rate is a fundamental problem in the Turkish labor market. According to most recent data, Turkey has the lowest labor force participation rate among the OECD countries (Figure 1). The gap in labor force participation rate between OECD average and Turkey is quite large, around 15 percentage points. The gap with the second worst country in terms of participation, Mexico is even quite large, almost 7 percentage points.

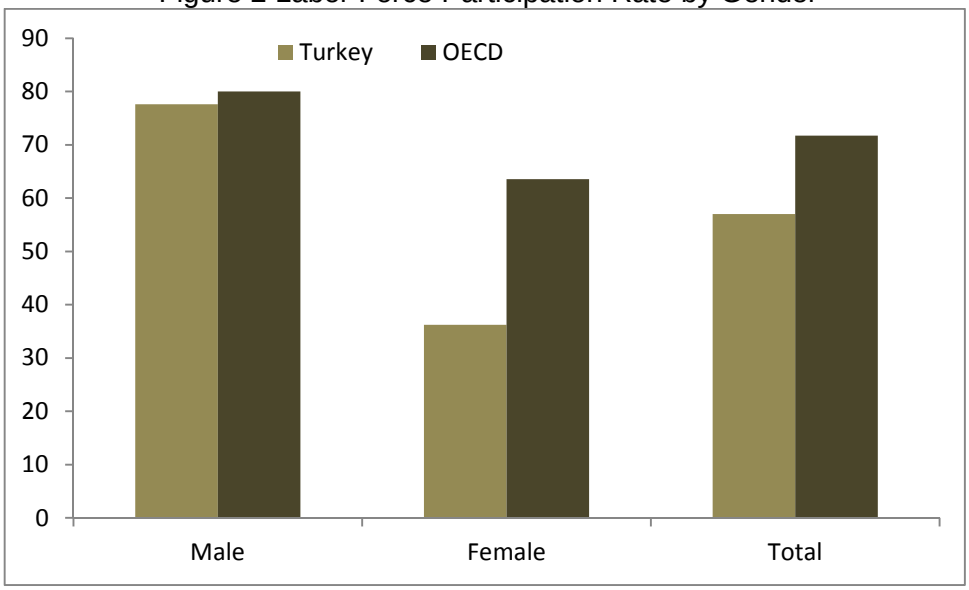
Figure 1: Labor Force Participation Rate in Turkey and the OECD



Source: OECD Employment Statistics, 2016.

The driver of the gap between Turkey and the OECD is low female labor force participation rate in Turkey. Figure 2 compares labor force participation rate in Turkey and the OECD average by gender. Male labor force participation rate in Turkey is lower than the OECD average but the difference is minimal. On the other hand, female labor force participation rate in Turkey is around half of the OECD average. Therefore, policies should focus on increasing labor force participation rate in order to increase labor supply in Turkey.

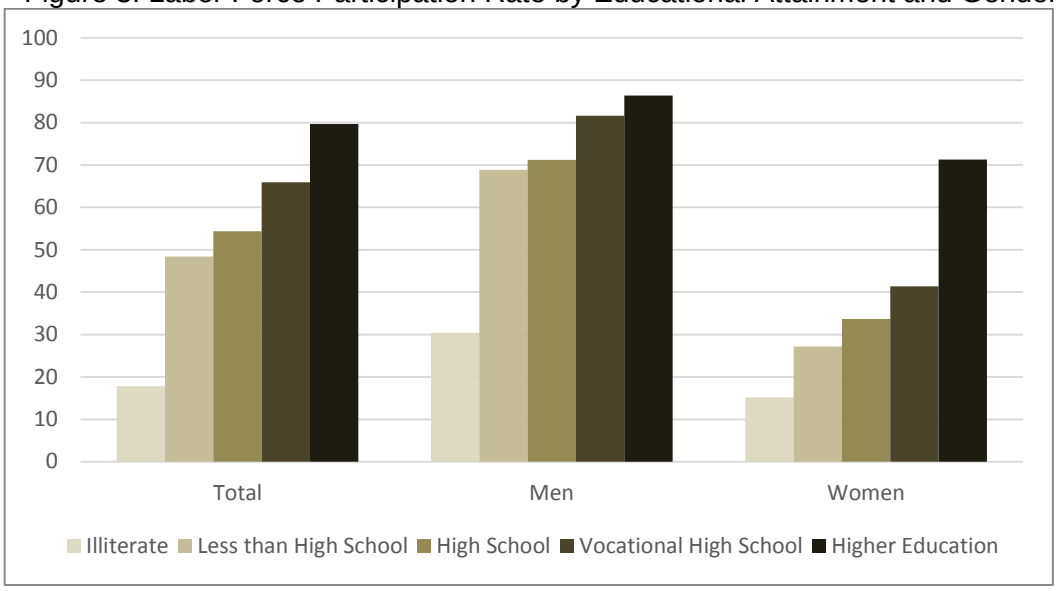
Figure 2 Labor Force Participation Rate by Gender



Source: OECD Employment Statistics, 2016.

Education is perceived as a key determinant of labor market status. Labor force participation increases with education both for men and women but the relative importance of education levels differ between genders (Figure 3). Being illiterate is the main obstacle for male labor force participation. Labor force participation rate increases steadily with the level of education for men, conditional on being literate. On the other hand, female labor force participation jumps with tertiary education whereas the effect of earlier stages of employment is small.

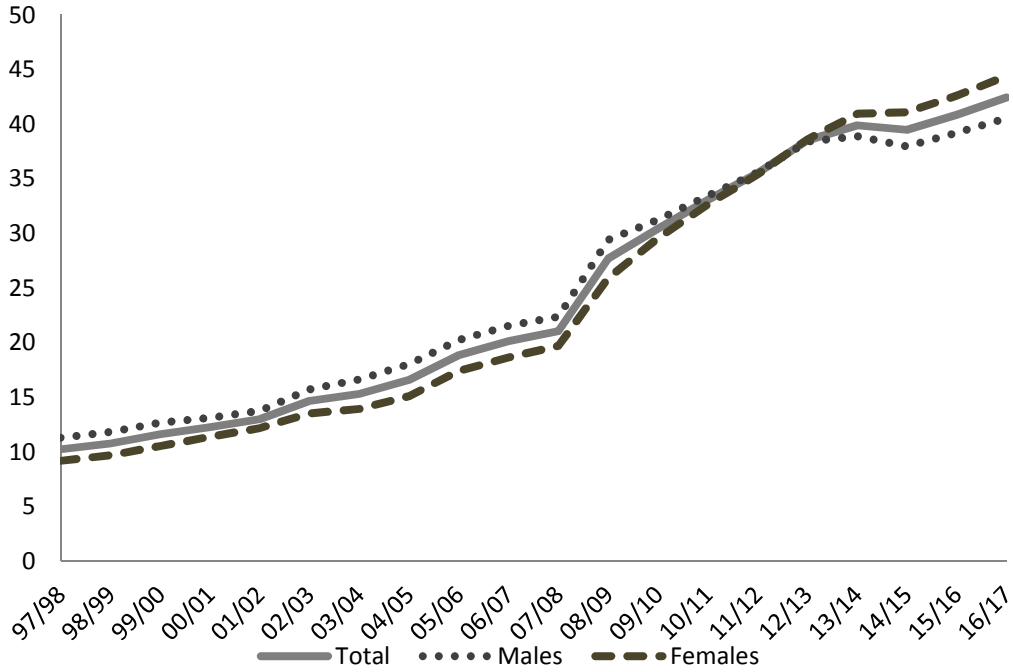
Figure 3: Labor Force Participation Rate by Educational Attainment and Gender



Source: TURKSTAT Labor Force Statistics, 2016.

Substantial amount of resources have been devoted to improve the educational outcomes. Compulsory education has been increased to 8 years in 1997 and further to 12 years in 2012. Moreover, several policies were implemented in order to increase the enrollment rate of pupils from disadvantaged households, such as provision of free textbooks, school meals, daily bussing and conditional cash transfers. As a result, almost full enrollment has been achieved in primary education and enrollment rates increased rapidly in all education levels (World Bank, 2014). Furthermore, the government and non-governmental organizations have implemented projects targeting increased female enrollment in education.[3] The improvements in enrollment have also been observed in tertiary education (Figure 4). In the last two decades, net enrollment rate increased almost 5 times for girls and 4 times for boys and the gender gap is reversed; tertiary enrollment rate is more than boys in recent years.

Figure 4:Tertiary Education Enrollment Rate, %



Source: Education Statistics, Ministry of National Education, 2017.

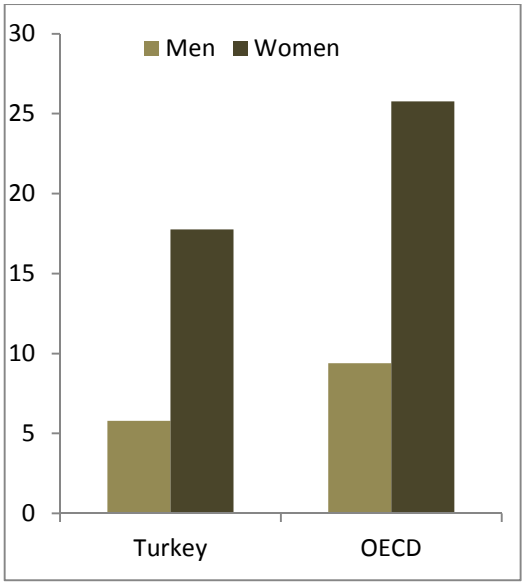
Household chores and especially childcare is considered as a major barrier against female labor force participation and employment. In the Household Labor Survey of

[3] Examples include, Girls' Education Project (Kız Çocuklarının Eğitimi Projesi) of Ministry of National Education, "Let Girls Go to School" (Haydi Kızlar Okula) Project of UNICEF. Besides, conditional cash transfer program of Ministry of Family and Social Policies positively discriminates girls.

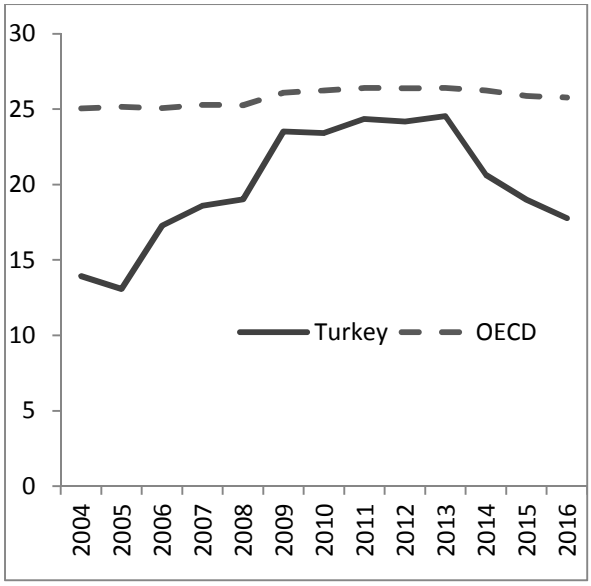
2016, around two thirds of women that do not enter into the labor force state that household chores is the main reason of not searching for a job. In the 10th development plan regarding the period 2014-2018, one of the core issues is to increase female labor force participation through obtaining balance between domestic and employment responsibilities of women. In this fashion, labor code was amended by Law 6715 in 2016 in order to facilitate flexible work arrangements such as distance work, temporary work arrangements through employment agencies and part-time employment opportunities after maternity. The left panel of figure 5 shows that the share of part-time employment is much higher among women compared to men, both in Turkey and the OECD, suggesting that women may prefer part-time employment. On the other hand, the share of part-time workers is lower in Turkey compared to the OECD average (Figure 5, left panel). The share of part time employment increased rapidly after the financial turmoil possibly due to deterioration of economic conditions of the household but it fell in recent years. Reasons for the low share of part time employment in Turkey should be identified both in demand and supply sides and policies should be launched for convergence to OECD average in order to increase female employment and labor force participation rates.

Figure 5: Share of part-time employment in Turkey and the OECD

a. Share by Gender in 2016



b. Trends in female part-time employment share



Source: OECD Employment Statistics Database.

In addition to flexible work arrangements, extending childcare and early childhood education services is considered to have positive effect on labor force participation of

mothers, besides its main goal of cognitive and non-cognitive development of their children. Enrollment in early childhood education is increasing in Turkey but is very low in international standards. In 2015, pre-primary school enrollment rate was only 26 percent in Turkey, much less than the OECD average of 78 percent.[4] Hence, more resources should be devoted for extending early childhood education facilities. In addition, financial support to working women for childcare and crèche services should be implemented at large scale.[5]

Institutional and legal framework may also create a barrier against female labor force participation. The new Turkish labor code which became effective in 2003 forbids discrimination against women and the state is responsible for gender equality according to constitution after the amendment in 2004 (Gökşen et al 2015, World Bank 2014). On the other hand, there are still some legal barriers against women's employment. For example, women cannot work in dangerous occupation, such as mining (Süral, 2007). Furthermore, firms that have more than 100 women employees must have childcare facilities within the firm, which incurs additional cost to firms and might inhibit firms' female labor demand. Policies that reduce the cost of female employment may trigger female labor demand of firms and increase labor force participation of women. For example, Turkish Employment Agency's (İŞKUR) active labor market program, which was implemented after 2008 financial turmoil for five years and subsidized firms' social security contributions for female employees, had a positive impact on female employment (Balkan et al, 2016). Finally, early retirement age may be another reason for low participation rate especially for women (Dayıoğlu and Kırdar, 2010). In 1990s, women who paid social security contributions for at least 20 years were eligible to retire at the age of 38.[6] The early retirement age scheme was not financially sustainable and the social security system was reformed in 1999 and 2008. As a result, retirement age has been increasing gradually and will reach the age of 65 by 2048 (Alcan and Can, 2018).

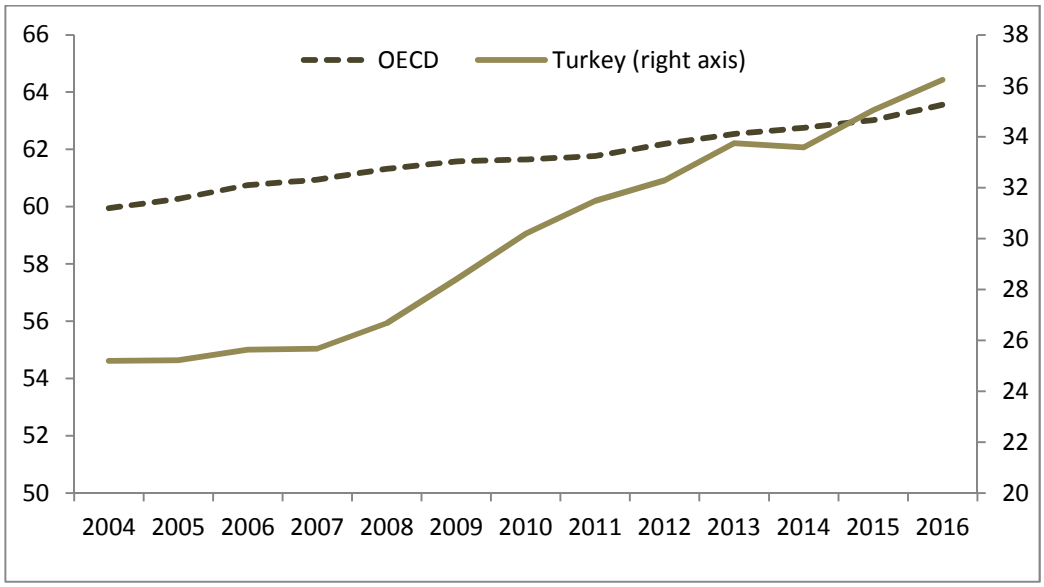
[4] Source: World Development Indicators (2018). http://databank.worldbank.org/data/source/world-development-indicators#, retrieved 7 December 2018.

[5] There is a pilot Project of Ministry of Labor and Social Security which started in 2017, where financial support is provided to grandparents who are taking care of their grandchildren if their daughter/daughter in law is working.

[6] Men were also eligible to retire early at age 43 conditional on social security contributions of 25 years before 1999 reform.

In summary, there are significant barriers against women's labor market activity in Turkey and female labor force participation is almost only half of the OECD average. On the other hand, there is a significant rising trend in participation rate in recent years (Figure 6). In chapter 3, I will discuss the findings of earlier literature on possible barriers against women's labor force participation. Then, I will decompose the determinants of the rise in participation observed in recent years. More specifically, I will try to filter out the effects of changes in observed characteristics of women and will estimate the effects of changes in socio-economic environment.

Figure 6: Trends in Female Labor Force Participation in Turkey and the OECD



Source: OECD Employment Statistics Database.

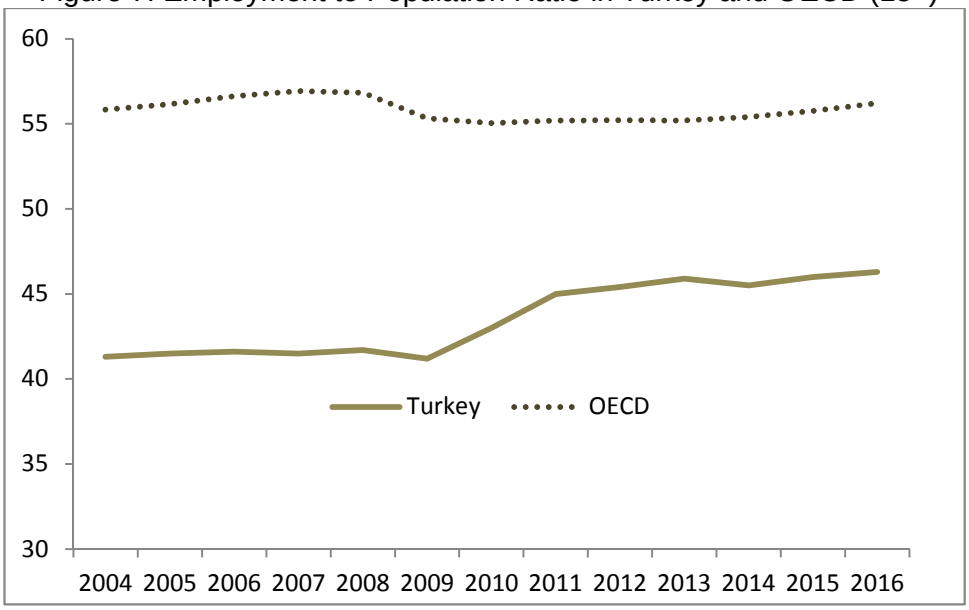
2.3. JOB CREATION IN TURKEY

Increasing participation rate will help achieving sustainable growth only if the increase in the labor supply is utilized. If not accompanied with employment growth, increased labor supply may even be destructive as unemployment rate will climb up causing unrest in the society. Therefore, employment creation is of critical importance for achieving development goals.

Turkey lags behind the OECD average in employment rate, similar to labor force participation rate (Figure 7). Employment to population ratio was stable in Turkey before the financial turmoil. It declined in 2009 by 0.5 percentage points, but the decline was modest compared to the OECD average (1.5 percentage points).

Moreover, recovery was much faster in Turkey compared to the OECD average, especially in the first two years after the turmoil. As a result, employment rate in Turkey in the post-crisis period is quite high compared to pre-crisis levels whereas OECD countries could not reach the pre-crisis levels as of 2016.

Figure 7: Employment to Population Ratio in Turkey and OECD (15+)



Source: World Development Indicators Database.

Comparison of employment rate does not fully show the employment generation success of Turkey after the financial turmoil. Turkey created 5.9 million jobs after the turmoil (on average 847 thousand annually), even more than the total of European Union countries (Table 1). Employment growth rate in Turkey (27.9 percent) is much more higher compared to European countries, OECD average or the US. On the other hand, labor force also increased quite fast (13.6 percent) thanks to rise in working age population growth (13.6 percent) and participation rate. Therefore, the rise in employment rate from 41.2 in 2009 to 46.3 in 2016 was not as dramatic as employment growth, although it is much higher than the developed countries.

Turkey's success in employment growth was not fully transmitted in unemployment figures due to population and participation growth. Although unemployment rate declined by 2.1 percent from 14 percent in 2009 to 10.9 percent in 2016, it is quite higher than the OECD average, 6.3 percent. In addition, the number of unemployed remains stable. Therefore, employment creation must continue and even accelerate in

order to curb unemployment rate, given that both working age population and labor force participation rate are rising.

Several government policies may spur employment growth. First, policies supporting investment and economic growth will also trigger employment creation. There is a bidirectional relation between growth and employment. On the one hand, employment growth is a main component of potential GDP growth. On the other hand, GDP growth creates employment through induced demand. One factor behind the Turkey's employment success after the crisis is the fast recovery of economy activity (Figure 8).

Table 1: Labor Market Developments in Turkey and Major Economies (2009-2016)

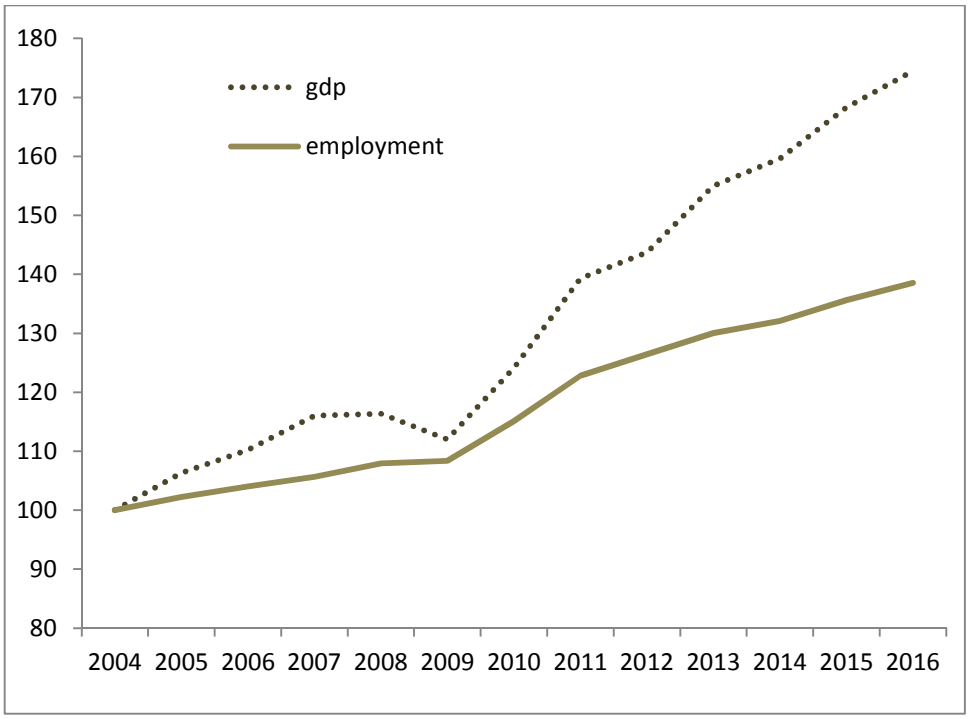
	Turkey		US		EU 28		OECD	
	2009	2016	2009	2016	2009	2016	2009	2016
Employment	21.3	27.2	139.9	151.4	218.9	223.7	542.2	581.4
Job Creation		5.9		11.6		4.8		39.2
Employment Growth (2009-2016, %)		27.9		8.3		2.2		7.2
Average Annual Job Creation		0.8		1.7		0.7		5.6
Employment to Population Ratio (%)	41.2	46.3	59.3	59.7	52.6	53.2	55.4	56.4
Working Age Population (15+)	51.7	58.7	235.8	253.5	415.8	420.1	978.7	1031.4
Growth (2009-2016, %)		13.6		7.5		1.0		5.4
Labor Force	24.7	30.5	154.1	159.2	240.3	244.3	590.5	620.5
Growth (2009-2016, %)		23.4		3.3		1.7		5.1
Participation Rate	47.9	52.0	65.4	62.8	57.8	58.2	60.3	60.2
Unemployment								
Number of Unemployed	3.5	3.3	14.3	7.8	21.4	20.7	48.4	39.1
Unemployment Rate (%)	14.0	10.9	9.3	4.9	8.9	8.5	8.2	6.3

Source: OECD Employment Statistics. All levels are in millions.

In the period after the 2009 financial turmoil, not only the growth accelerated but also the GDP elasticity of employment growth rose. In the pre-crisis period, the elasticity, which is calculated as the ratio of percentage change of employment to percentage change in GDP was 0.35, i.e. 1 percent GDP growth caused 0.35 percent growth in employment. In the first two years after the crisis, when GDP grew very fast, the elasticity increased to 0.55 and remained around 0.5 afterwards. Although the elasticity increased significantly, it may not be enough to create employment that will reduce

unemployment in Turkey, even if high growth rates are sustained. Therefore, it is crucial to analyze the policies that contributed to the rise in elasticity after the financial turmoil and design new policies and instruments to increase the elasticity further.

Figure 8: GDP and Employment in Turkey (2004=100)



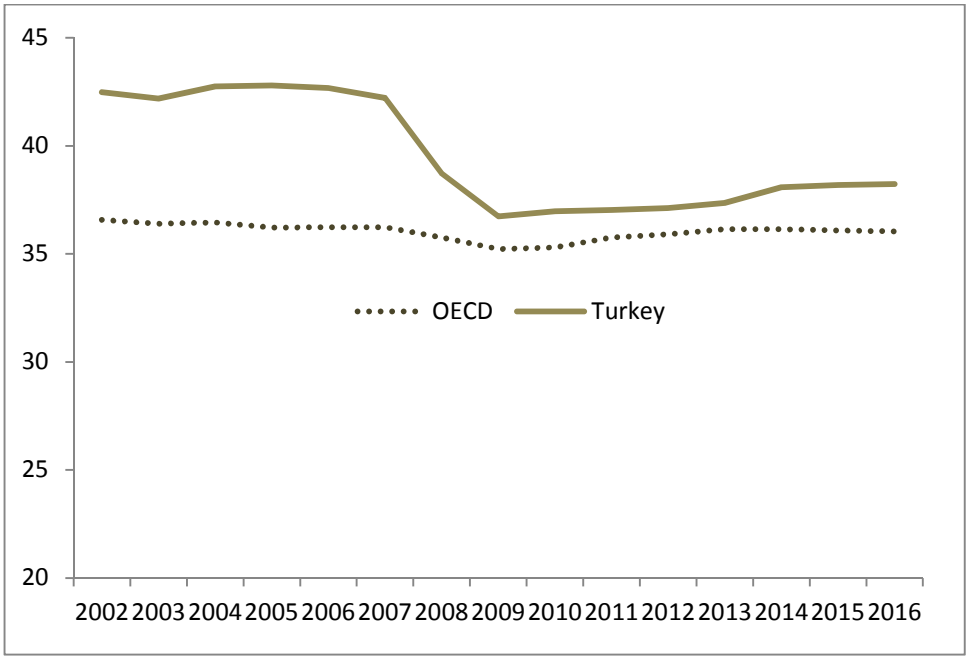
Source: TURKSTAT Employment and National Account Database.

High labor cost is one of the main barriers against generating employment. Estimates suggest that employment in Turkey is responsive to labor cost (Betcherman and Pagés, 2007). The government took several measures to reduce labor costs around the financial turmoil. In 2008, a minimum living allowance for personal income tax was introduced which reduced the tax wedge by 2.5-6 percentage points. In addition, social security contributions for employers were reduced by 5 percentage points (World Bank, 2010). As a result tax wedge, in percent of the labor cost, converged to OECD average (Figure 9).The reductions in tax wedge on labor are found to be effective in the fast recovery of employment after the turmoil (World Bank, 2014).

In addition to across to board measures, reductions in labor costs have been implemented for targeted groups since 2008. An incentive scheme was enacted in 2008 such that social security contributions of employers for young workers younger than 29 and women workers irrespective of age who are newly hired were reimbursed by unemployment insurance fund for five years (Law No. 5763). The employment effect

of this intervention is found to be positive (Balkan et al, 2014). In 2017, a subsidy scheme for employers who increase their employment was introduced so that the social security contribution of the workers (up to contribution amount of minimum wage) who are newly hired is paid by the Turkish Employment Agency (İŞKUR) for 1 year (Statutory Decree No. 687). New legislation is being prepared that will extend the amount and duration of government subsidies on employers' labor costs, especially for certain industries (manufacturing and information technologies) and young and women workers.[7] One potential worry about these incentives is that subsidized employment generation programs may crowd out job creation that would occur in the absence of these incentives.

Figure 9: Tax Wedge in Percent of Labor Cost



Source: OECD Tax Statistics Database.
Note: The figure shows the tax wedge of an unmarried person with average earning.

The skills mismatch between labor supply and demand is another barrier against employment creation. According to 2017 wave of Labor Market Report prepared by İŞKUR, 18.5 percent of all firms stated that they had difficulty in filling vacancies for around half a million jobs.[8] Lack of occupational skills and experience are stated as the main reasons for difficulty in filling vacancies. In order to reduce mismatches in the

[7] See http://www.iskur.gov.tr/tr-tr/isveren/tesvikler.aspx for details.

[8] Full report can be found in http://www.iskur.gov.tr/tr-tr/kurumsalbilgi/raporlar.aspx#dltop

labor market and improve employability of unemployed, İŞKUR expanded its active labor market programs after the financial turmoil. The number of participants in İŞKUR's active labor market programs increased dramatically from roughly 32 thousand in 2008 to 421 thousand in 2016. Most of the participants in İŞKUR's programs attend either on-the-job learning programs (around 238 thousand) or vocational courses (around 119 thousand).[9] Employers enjoy the benefit of free labor in the duration of on-the-job training whereas participants gain job specific skills and experience. Furthermore, social security contributions of employers who employ graduates of either vocational courses or on-the-job learning programs are subsidized by İŞKUR.

Labor market rigidity may be another factor restraining employment generation. Turkish legal framework on labor market is quite strict in international standards (World Bank, 2014). The high share of informal employment makes the labor market deregulated whereas workers in formal employment suffer from rigid regulations (Duman, 2014). The government acknowledges the fact that Turkish labor market is rigid in several areas. In the 10th development plan, reform areas for easing labor market were determined as improving severance pay and labor outsourcing systems and extending flexible work arrangements. Although some amendments on flexible work arrangement are introduced, problems still remain about Turkey's labor market flexibility.[10]

Social safety net may also inhibit employment growth. Beneficiaries of social safety programs or unemployment benefit will lose some amount of income if they find a job. Therefore, social benefits may work like income tax on employment.[11] In order to reduce disincentive effects of social benefits, several measures, which became effective as of 2018, were introduced by Law No 6704. First, social security contributions of employers, who employ a beneficiary of social safety programs, are reimbursed by the Ministry of Family and Social Policies in order to induce labor demand for beneficiaries. Second, beneficiaries are oriented to İŞKUR by Ministry of Family and Social Policies and İŞKUR offers these beneficiaries either jobs or

[9] Source: ISKUR Statistics Annals 2008 and 2016, http://www.iskur.gov.tr/tr-tr/kurumsalbilgi/istatistikler.aspx#dltop

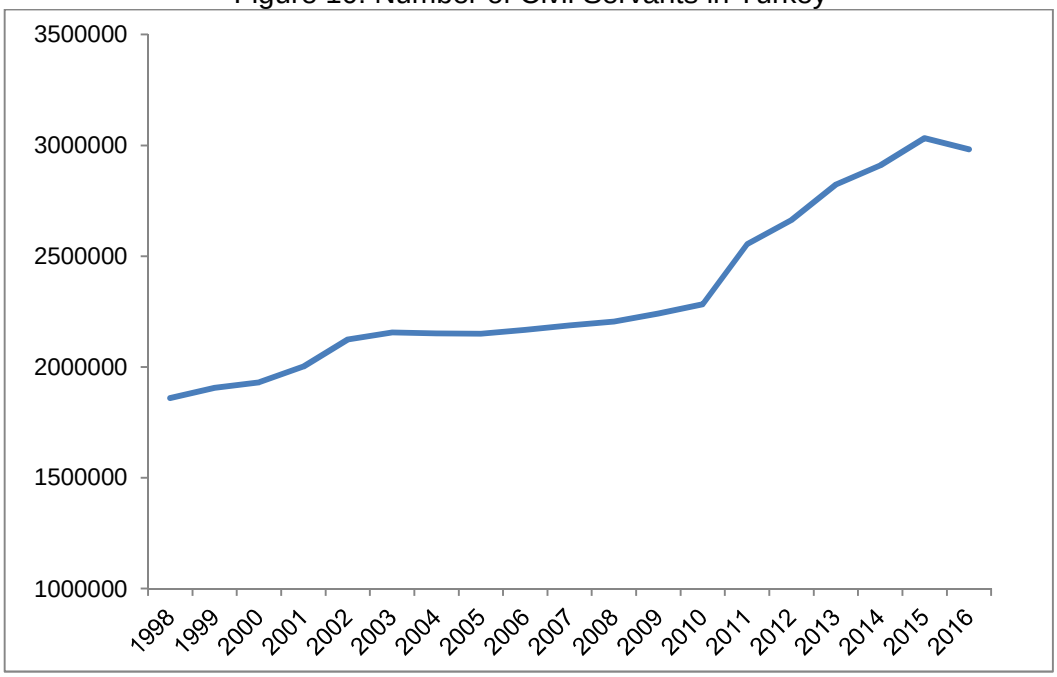
[10] Law no 6715 effective since 2016 extended flexible work arrangements.

[11] OECD tax and benefit model takes into account social benefits in calculating incentives and disincentives to work. For details, http://www.oecd.org/els/benefits-and-wages-statistics.htm

vocational training. Beneficiaries who do not accept the offers by İŞKUR more than 3 times lose eligibility for social safety programs. These measures are expected to increase labor force participation and employment rates in the upcoming years.

Finally, government's public employment policy can also be effective on total employment growth, whether the aim is to create employment or not. The number of civil servants in Turkey stayed stagnant in 2000s as a result of stabilization program implemented after the financial crisis in 2001, which required tight fiscal policy to reduce public debt (Figure 10). However, public employment started to rise in recent years, after 2010. Public employment growth has a direct effect on total employment; total employment increases one-to-one with the increase of public employment in the short run. Furthermore, rise in public employment may have positive spillover effects on private employment because new public employment means extra demand for private sector. For example, a newly hired civil servant, like all other workers, will go to local restaurants which will increase the demand for these restaurants. On the other hand, private employment may be crowded out by public employment growth due to distortions in macroeconomic framework, labor market or behavior of labor force. In chapter 4, I will discuss the mechanisms behind possible positive and negative multiplier effects of public employment on private employment in depth, review the literature and empirically analyze the multiplier effect in Turkey.

Figure 10: Number of Civil Servants in Turkey



Source:Social Security Institution (SGK)

2.4. IMPROVING THE QUALITY OF JOBS TO FIGHT POVERTY

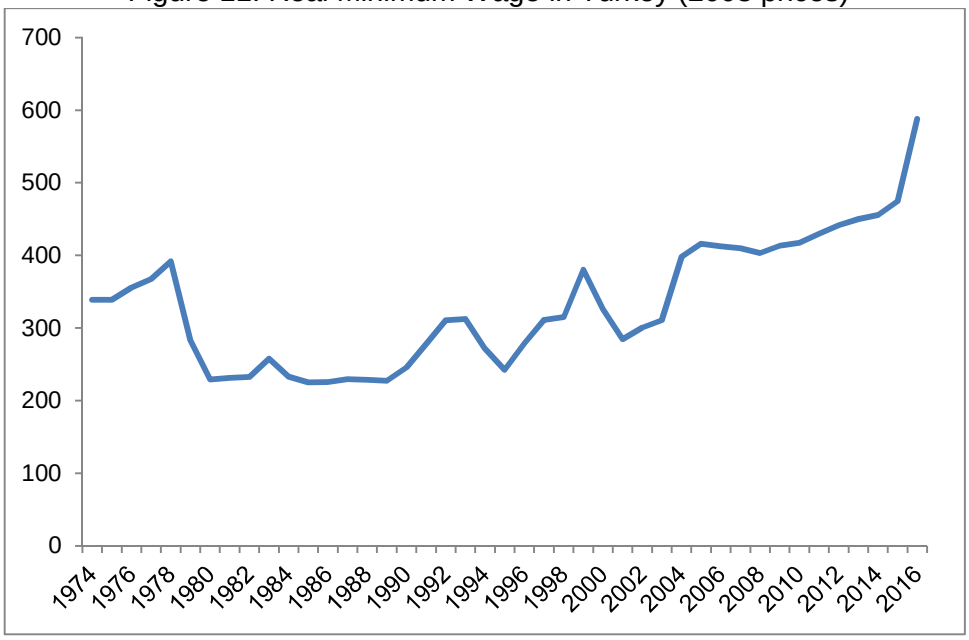
In order to fully enjoy the benefits of employment, the quality of jobs should be high enough so that workers do not fall into poverty when working and after retirement, have social rights such as access to health or enough time to spend at leisure. One and maybe the most important dimension of quality of jobs is paying fair wages to employees for their effort. In this respect, minimum wage law is being implemented in Turkey as well as many other countries in the world.

The implementation of minimum wage in Turkey goes back to 1806, when wage floors were set for some specific occupations (Güven et al, 2011). In 1921, minimum wage for miners was introduced. In 1936, a general minimum wage law was accepted in the parliament but became effective only after 1951. The first implementations were not effective because a general minimum wage level for all occupations could not be determined, there was no rule for the frequency of updating the level of the minimum wages and minimum wages were determined by regional commissions. As a result, several amendments were done starting 1967. First, the same minimum wage level became effective for all occupations and a national commission became the authority for determination, instead of regional commissions after 1968 (Korkmaz, 2003). After 1971, minimum wage commissions were required to meet at least biannually but they actually meet every year since 1987 because of high inflation (Güven et al, 2011). In the first years of implementation of new minimum wage scheme, the level of minimum wage was differentiated between regions but a nationwide level of minimum wage is being set since 1974 (Gürcihan-Yüncüler and Yüncüler, 2016).

The minimum wage also has its roots in the constitutions of 1961 and 1982 (Güven et al, 2011). According to 1961 constitution, the government is obliged to implement wage policies so that workers earn wages that warrant a life without deprivation and that are proportional with their work and that are in line with achieving the goal of reduced inequality. Liberal views were incorporated in the 1982 constitution and it is stated that the government takes into account the economic conditions in determining the level of the minimum wage. Thus, the level of minimum wage followed different patterns since 1974 (Figure 11). Real minimum wage declined drastically in 1979 due to rise in inflation and remained flat in 1980s (Gürcihan-Yüncüler and Yüncüler, 2016). An increasing trend started in 1990s which was disturbed by economic crisis of 1994 and

2001. After a major increase in 2004, which compensates the effects of 2001 crisis, minimum wage continued to increase slightly until 2016. Another sharp rise took place in 2016; minimum wage increased by 30 percent in nominal terms and around 20 percent in real terms.

Figure 11: Real Minimum Wage in Turkey (2003 prices)

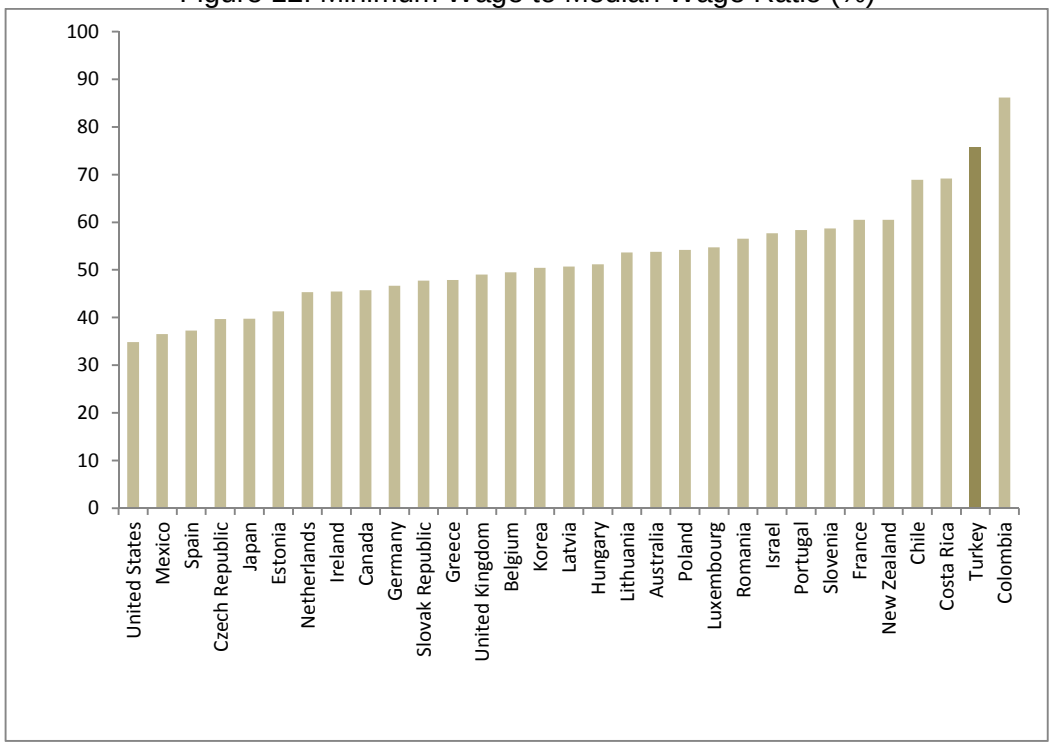


Source: Ministry of Labor and Social Security.
Note: Consumer Price Index is used to deflate minimum wage.

Although minimum wage helps poverty reduction among low wage earners, it may reduce the chance of being employed for the most vulnerable groups in the economy. If minimum wage is set too high, firms may reduce labor demand due to increased costs. In this respect, the level of minimum wage can be considered as a measure of strictness of the labor market. In absolute terms, the level of minimum wage in Turkey is quite low compared to European countries (Güven et al, 2011). However, the level of minimum wage as a percentage of the median wage is quite high in Turkey compared to OECD countries suggesting that it is binding (Figure 12). In order to reduce the sharp increase in the labor costs due to new minimum wage, a subsidy program was introduced for firms' social security contribution for minimum wage earners.[12]

[12] Government reimbursed 100 TL of employers' social security contribution for minimum wage earners in 2016. The subsidy scheme continues as of 2018.

Figure 12: Minimum Wage to Median Wage Ratio (%)

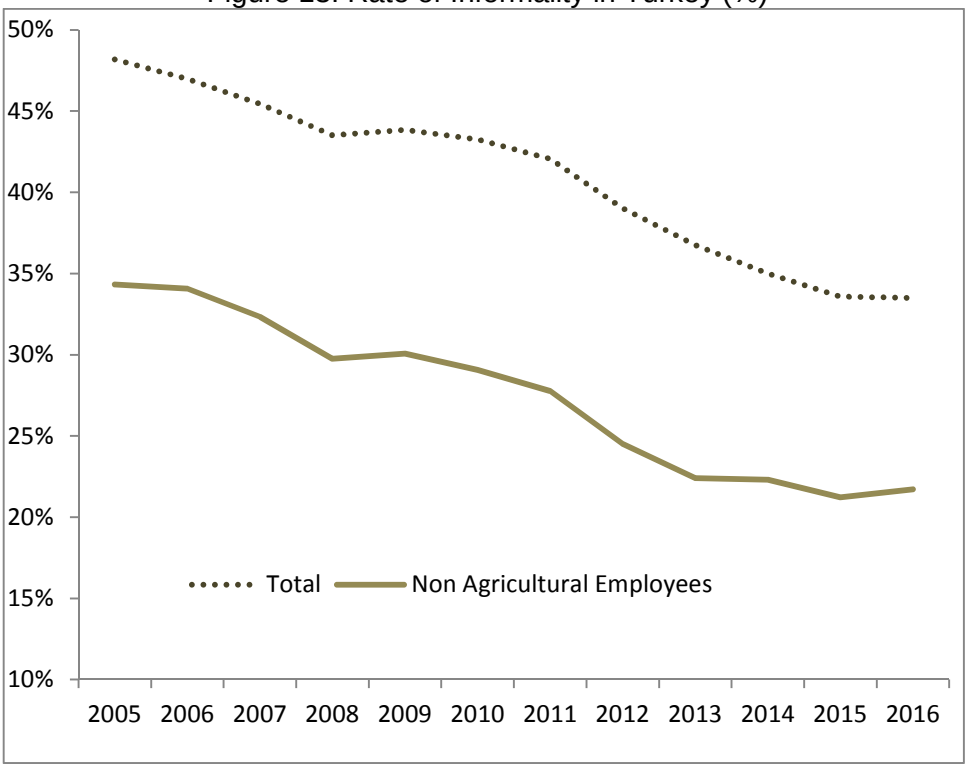


Source: OECD Earnings Data Base. Latest data for each country is used.

A good job should not only provide income to escape poverty while working but also should provide access to health and pension systems, i.e. it should be formal. High level of minimum wages and other labor market strictness measures may increase informality as firms will choose to hire workers informally to escape the regulatory burden (World Bank, 2014). Low retirement age may also induce informality besides reducing labor force participation. Around two million pensioners were estimated to work informally in 2008 (World Bank, 2010).

The level of informality is quite high in Turkey despite significant reductions in recent years (Figure 2.13). The share of informal workers is much higher in agriculture due to (mostly female) unpaid family workers (World Bank, 2014). The declining trend was interrupted in 2009 and informality in non-agricultural sectors increased, as a response to financial turmoil. Government took several measures against informality after 2009 crisis, including strengthening the capacity of tax and social security audits, sharing databases among agencies and moving towards a risk based inspection system (World Bank, 2014). As a result, informality rate continued to decline until 2016, when there is a slight increase in non-agricultural informality rate, which may be due to dramatic rise in the minimum wage.

Figure 13: Rate of Informality in Turkey (%)



Source: TURKSTAT Labor Force Survey Results.

Even formally employed workers may not enjoy their official salaries in the case of misreporting. Misreporting may be in two forms. First, wages may be underreported when officially reported wages are lower than the actual wages. In this case, workers do not fully enjoy the pensions corresponding to their actual income after retirement. Besides, tax and social security administrations lose income. Second, wages may be over reported when officially declared wages are higher than the actual wages. Then, workers do not fully enjoy their official wages. The government acknowledged the presence of misreporting and took several precautions. First, the Law 5754 which became effective in 2008 obliges firms to pay salaries and all other type of workers' incomes through banks. In the first years, the regulation was implemented to firms with more than 10 employees. The threshold was reduced to 5 employees in 2016. Second, SGK started to collect occupation data since 2010 and declaring occupation became compulsory in 2018. SGK inspectors will be able to see abnormally low earnings compared to occupational standards with this practice.[13] Wage misreporting is heavily fined in tax and social security codes in Turkey.[14] I will discuss the mechanisms behind

[13] https://www.muhasebenet.net/haber.php?haber_id=21630

[14] Misreporting is considered as fraud and may even be sentenced with imprisonment; http://www.hurriyet.com.tr/yazarlar/sukru-kizilot/bordroda-ucreti-dusuk-gosteren-patrona-hapis-26486021

misreporting and review the related literature in Chapter 5. Then, I will estimate the determinants of wage over reporting in Turkey and analyze the effects of minimum wage hike in 2016 on wage over reporting.

CHAPTER 3

RISE IN FEMALE LABOR PARTICIPATION IN TURKEY: IDENTIFYING COHORT EFFECTS

3.1. INTRODUCTION

Inclusion of women into labor force is crucial for achieving the goal of shared prosperity in various aspects. First, inactive women in the society means unused factor of production and restricts economic growth. Hence, high sustained growth rates can only be achieved via increasing labor supply of women. Aşık (2013) analyze different scenarios for Turkey and suggests that increase in female labor participation will considerably increase potential growth. Second, labor market is a key area for transforming the society into more egalitarian and equitable one with respect to gender and integrating women into formal production (Euwals et al, 2011). Significant difference between male and female labor market attachment can be considered as a sign of gender discrimination (Kılıç and Öztürk, 2014). Third, increasing employment rate of women will decrease the dependency ratios and help sustainability of pension and social security systems, which bring a significant burden to public finance especially in aging societies (Apps, 1991). As a result, reducing barriers against women and increasing labor force participation is a key policy priority all around the world.

Female labor force participation increased rapidly in 1900s in developed countries and the gender gap in participation declined significantly. Increased demand in office jobs which were considered to be “nice job” for women and rising female labor supply due to improvements in college enrollment triggered rise in female involvement in labor force in the beginning of the twentieth century (Goldin, 2006). Second World War caused a further jump in female labor force participation as a result of labor shortage in many developed countries (Kılıç and Öztürk, 2014). Women did not leave the labor market after the World War and labor force participation among women increased steadily. After 1970s, the perception of women about the labor market changed considerably from job oriented view to career oriented view (Goldin, 2006). Young women who were grown up in 1960s saw high labor force participation rate among both parents and anticipated long-run participation in the labor market as opposed to their mothers.

Hence, they invested in human capital, earned more and worked at jobs that were previously perceived to be suitable for men only. As a result, gender discrimination in the labor markets of developed countries declined considerably. For example, the gap between male and female labor force participation declined from 31 percentage points in 1980 to 16 percentage points in 2016.[15]

The increase of female labor force participation in the twentieth century in developed countries was not observed in most of the developing countries, including Turkey. Female labor force participation rate is quite low in Turkey and is almost half of the OECD average (Figure 2, Chapter 2).

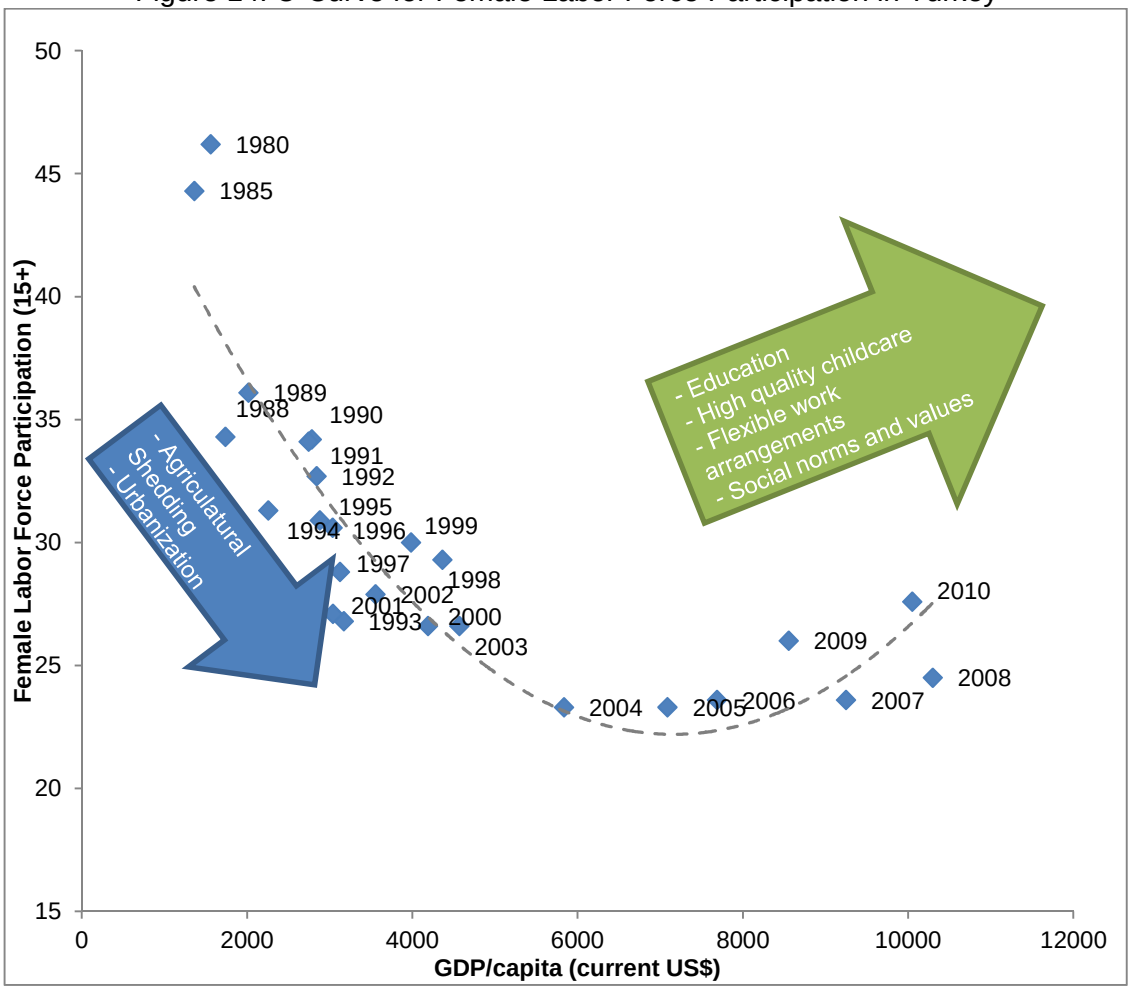
One possible explanation is the U-shaped relation between female labor force participation and economic development, hypothesized by several authors in the literature such as Sinha (1967), Goldin (1994), Mammen and Paxson (2000) and Tam (2011). According to U-shape hypothesis, female labor force participation is very high in undeveloped agricultural societies where all adults in the households, including women, work in their farms as unpaid family workers. At this stage of development, there are no barriers for women's employment because working in the farm is an integrated part of domestic duties. As the countries start to develop, more jobs are created in service and industry sectors in urban areas and families migrate to city centers. At this stage, women cannot (or prefer not to) enter into labor force because their education and skills are not adequate for jobs in industry or services. Besides, they cannot simultaneously work and fulfill their domestic duties, such as child care and there are social or institutional barriers against working women. Hence, female labor force participation declines in the early stages of development. On the other hand, as the countries develop further, female labor force participation start to increase as a result of reduced barriers such as improvements in education level, changing social norms against working women or improved child care facilities. Therefore, the U-shape hypothesis suggests first negative and then positive relationship between the level of development and female labor force participation.

Labor force participation among women followed a declining pattern until mid-2000s in line with the prediction of U-shape hypothesis (World Bank 2014, Atasoy 2017).

[15] Source: OECD Employment Statistics (2018), https://stats.oecd.org/Index.aspx?QueryId=64197#, retrieved 7 December 2018.

Agricultural shedding and urbanization are found to be important determinants of the decline in the female labor force participation rate since 1980s (Dayıoğlu and Kırdar, 2010). Tansel (2001) finds evidence supporting the U-shape hypothesis in Turkey. World Bank (2014) suggests that the first phase of U-shape came to an end and hence increase in female labor force participation is expected as Turkey continues to grow (Figure 14). However, the U shape hypothesis is silent about the speed of this increase and the final level that female labor force participation rate will reach. They will be determined by how fast and how much the barriers against female activity in the labor force, will be abolished.

Figure 14: U-Curve for Female Labor Force Participation in Turkey



Source:World Bank (2014)

According to World Development Report of 2012 focusing on gender, barriers on female employment are multi-dimensional and refer to barriers in markets, law and institutions and social norms (World Bank 2012). Lack of adequate education and skills for the jobs offered in the labor market is an important barrier for women's activity.

Turkey can be considered to be successful in increasing enrollment rates and declining gender gap in all levels of education (Figure 4, Chapter 2). Legal framework of Turkish labor market started to be women friendly since 1995 (Kılıç and Öztürk, 2014). On the other hand, there are still institutional and social barriers against female employment such as inadequate child care and elder care services and negative beliefs on working women. As a result, female labor force participation is quite low compared to OECD countries. However, there is a significant rise of female labor force participation rate in the last years (Figure 6, Chapter 2).

This chapter will decompose the drivers of the rise in the female labor force participation rate in Turkey between 2004 and 2016. More specifically, the cohort effect on the rise of participation rate, after filtering out the effects of changes in observable characteristics of women such as education or having children, will be identified. In doing so, a binary outcome regression will be estimated with additional assumptions on year and cohort effects in order to avoid multicollinearity. Cohort effect, obtained after controlling for observed characteristics, can be attributed to unobserved changes in the societal values as well as institutional settings (Euwals et al 2011). To the best of my knowledge, there is no study on estimating the unobserved cohort effects in Turkey.[16] The results suggest that cohort effect was the dominant factor of rise in the labor force participation of women in Turkey, followed by improvement in educational attainment. On the other hand, the positive cohort effect is coming to an end for the young generations. New policies should be implemented for further increasing the cohort effect and accelerating the rise of participation rate.

The chapter will proceed as follows. In the next section, empirical literature on the determinants of female labor force participation will be discussed with a special focus on Turkey. Section 3 will introduce the estimation methodology in order to identify cohort effect and decompose the factors behind the increase in female labor force participation between 2004 and 2016. Data and descriptive statistics will be discussed in section 4 and results will be presented in section 5. Finally, section 6 will discuss the findings.

[16] Dayıoğlu and Kırdar (2010) find that cohort effects are important in female labor force participation in Turkey but they do not consider the changes in observed characteristics such as education.

3.2. DETERMINANTS OF FEMALE LABOR FORCE PARTICIPATION: EMPIRICAL LITERATURE

Education is a primary determinant of labor market outcomes of both males and females. Years of schooling has a positive impact on wages in a standard Mincerian equation, which aims to determine the determinants of earnings. Therefore, the opportunity cost of being inactive is higher for educated people and labor force participation rises with education. Besides this direct impact, education might increase women's labor force participation through increased empowerment of women in the society and bargaining power in the household and reduced fertility (Cameron et al, 2001).

Empirical literature mostly confirms that there is a positive correlation between educational attainment and labor force participation of women all around the world. Psacharopoulos and Tzannatos (1989) reviews early empirical studies on the relation between education and female labor force participation and concludes that education has a positive effect on female labor force participation in most of the countries. Glick and Sahn (1997) finds that having a university degree is crucial for women for being a wage earner whereas level of education does not have a significant effect in their study for Guinea. Ejaz (2007) finds that female labor force participation is positively correlated with years of schooling in India.

Literature on Turkey also suggests a positive relation between education and female labor force participation. Kasnakoğlu and Dayıoğlu (1997) find that female labor force participation increases with education and that schooling exerts the highest impact on participation compared to other characteristics. Tansel (2001) finds that education is an important determinant of female labor force participation and that having a high school and especially university diploma increases the probability of women's entry into labor force drastically. Recent studies such as Dayıoğlu and Kırdar (2010), Kızılgöl (2012), Kılıç and Öztürk (2014) and Alcan and Can (2018) confirm the finding that female labor force participation increases with schooling and that tertiary education has the highest impact.

Marital status is another determinant of female labor force participation. At the time of marriage, women should decide on the optimal allocation of their time between market

and non-market uses, such as household chores, child care or leisure (Becker, 1965). Therefore, there might be differences in the labor market decisions of single and married women. Moreover, the traditional views on emphasizing the role of women in household chores may be stronger among married women. Literature regarding Turkey, such as Kasnakoğu and Dayıoğlu (1997), Dayıoğlu and Kırdar (2010) and Kılıç and Öztürk (2014), suggests a negative correlation between being married and labor force participation of women in Turkey, even after controlling for having children.

Fertility plays a significant role on female labor participation. Women have to decide on allocation of their time between market and non-market activities after having a child, like the decision after marriage. Literature finds negative correlation between fertility and female labor force participation all around the world. Bussmann (2009) conducts a cross-country analysis and shows that countries with higher fertility rate (total number of births per women) have lower female labor force participation rates. Studies regarding Turkey also find such a negative correlation. Age of children may also alter the magnitude of the negative effect of having child on labor force participation. Children below primary age need the most extensive child-care and hence mothers need to allocate much more time. Children at high school do not need extensive child-care and may even help their mothers in household chores. Kasnakoğlu and Dayıoğlu (1997) find that having children below primary school age has a more negative effect on labor force participation of married women compared to children at primary school age. Dayıoğlu and Kırdar (2010) and Kızılgöl (2012) use number of children as the explanatory variable and find a negative relation between fertility and labor force participation. Kılıç and Öztürk (2014) consider only children below primary age school and confirm the negative relation.

The negative impact of children reduces significantly if child care services are widespread and are at affordable prices. Female labor force participation is higher in countries with extensive child care system, such as France and Sweden (World Bank, 2014). Del Boca et al. (2008) shows that differences in child care provisions explain a significant portion of labor force participation differences among European countries. Berlinski and Galiani (2007) show that, large-scale construction of pre-primary education facilities in Argentina had a positive causal impact on maternal employment. Flexible work arrangements such as part-time employment opportunities, may also

weaken the negative tradeoff between childcare (and domestic duties in general) and activity in the labor market (Schmid, 2010).

Significant portion of households in Turkey are in the form of extensive families, as opposed to developed countries. Family decision making may differ in these households compared to nuclear families (Schultz, 1990). Living in an extensive family might support female activity in the labor market as other household members may share the domestic responsibilities of women. On the other hand, living in an extensive family may be a sign of traditionalist beliefs against women's work. Kızılgöl (2012) finds that living in extensive family increases labor force participation of women in rural areas but decreases it in urban areas. Extensive family may also mean increased domestic responsibility of married women, as they may have to care elder as well as children. Kılıç and Öztürk (2014) shows that existence of elder people in the household reduces female labor force participation in urban areas whereas increases it in rural areas.

Household's income, other than the own labor income, is generally found to be negatively correlated with women's labor force participation (Hotz and Miller, 1988). Dedeoğlu (2000) argues that economic difficulties are an important determinant of female labor participation in urban areas. Kılıç and Öztürk (2014) shows that female labor force participation is negatively correlated with household income in urban areas in Turkey.

A related concern for female labor supply decision is the employment status of their husband or labor market conditions in general. Married women may enter into labor market in case their husband become unemployed, which is referred as added worker effect and has been analyzed by labor economists empirically since 1930s (Ashenfelter, 1980). Previous studies regarding Turkey suggest that added worker effect has a significant role in female labor supply decisions especially in crisis years. Başlevent and Onaran (2003) analyze the relation between labor force participation decision of married women and employment status of their husbands for the period bertween 1988 and 1994. They find that married women whose husbands are unemployed are more likely to enter into labor force. However, they assert that this correlation only significant in 1994, when Turkey witnessed one of its most severe economic crisis. Karaoğlan and Ökten (2015), in their analysis for the period 2005-2010, find that women enter into labor force after their husband become unemployed

and argue that added worker hypothesis is valid in Turkey. Tight labor market conditions may also lead women (and also men) to leave the labor market because they believe that there are no jobs suitable for them, known as the discouraged worker effect. If discouraged (added) worker effect is dominant, labor force participation is expected to fall (rise) in economic downturns. Karaoğlan and Ökten (2015) shows that, discouraged worker effect also works for Turkish married women after controlling for transition of their husbands from employment to unemployment. However, the magnitude of discouraged worker effect is quite small and added worker effect dominates, even in the crisis year of 2009. Başkaya and Şengül (2012) shows that female labor force participation increases in economic downturns, supporting the previous findings on added worker effect.

Another barrier against female labor force participation is culture and social norms. Recent studies show that culture has a fundamental role in low female labor force participation in developing countries. Antecol (2000) compares the home country female labor force participation rates of immigrant women in the US and shows that differences in home countries are transmitted to immigrants as well, pointing out the effect of culture. Fernandez and Fogli (2009) show that culture is an important determinant for female labor force participation in the US. They proxy culture with past female labor force participation and total fertility rates from the woman's country of ancestry. Contreras and Gonzalo (2010) include women's beliefs on cultural values in labor force participation equation in addition to classic determinants such as education, age and marital status in their study for Chile. They find that, women who internalize machismo and conservative cultural values have less labor force participation. An Alesina et al (2013) show that differences in labor force participation today is affected by historical changes in the means of production. They show that, descendants of societies that used plough in agriculture, have less female labor force participation since utilization of plough changed the division of labor within household members.

Studies regarding Turkey also find that traditionalism has a significant negative role on female labor supply. Gündüz-Hoşgör and Smits (2008) use 1998 wave of Turkish Demographic and Health Survey (TDHS) and analyze the effect of traditionalism using information on marriage type (for example blood relationship with husband or bride price paid at the wedding) and responds to gender role attitudes questions (for example, "important decisions should be made by man"). They conclude that

patriarchal ideology inhibits female labor force participation. Güner and Uysal (2014) use 2008 wave of TDHS which shows the internal migration history of women. They show that female employment rates in 1970 in a female migrant's province of origin affects her labor supply behavior in 2008, suggesting that culture plays an important role in female labor force participation. Using the same data set, Dildar (2015) includes opinion questions on patriarchy and religiosity in a standard female labor force participation equation and argues that patriarchal norms is a barrier against female labor force attachment. Atasoy (2017) uses 2013 wave of TDHS and finds that women who were raised under a traditional culture have a lower probability to participate to labour force and find jobs.

The negative effects of traditional values against working women may weaken with having higher levels of education. Knudsen and Warness (2001) finds that employment of mothers is approved by younger and well educated people. Moreover, increase in labor force participation and employment of women may deteriorate the beliefs supporting traditional gender role in the society (O'Sullivan, 2012). Peer effects may also work; observing working women locally and the benefits of female employment may undermine the negative attitudes towards employment among women (Fogli and Veldkamp, 2011; Fernandez, 2013).

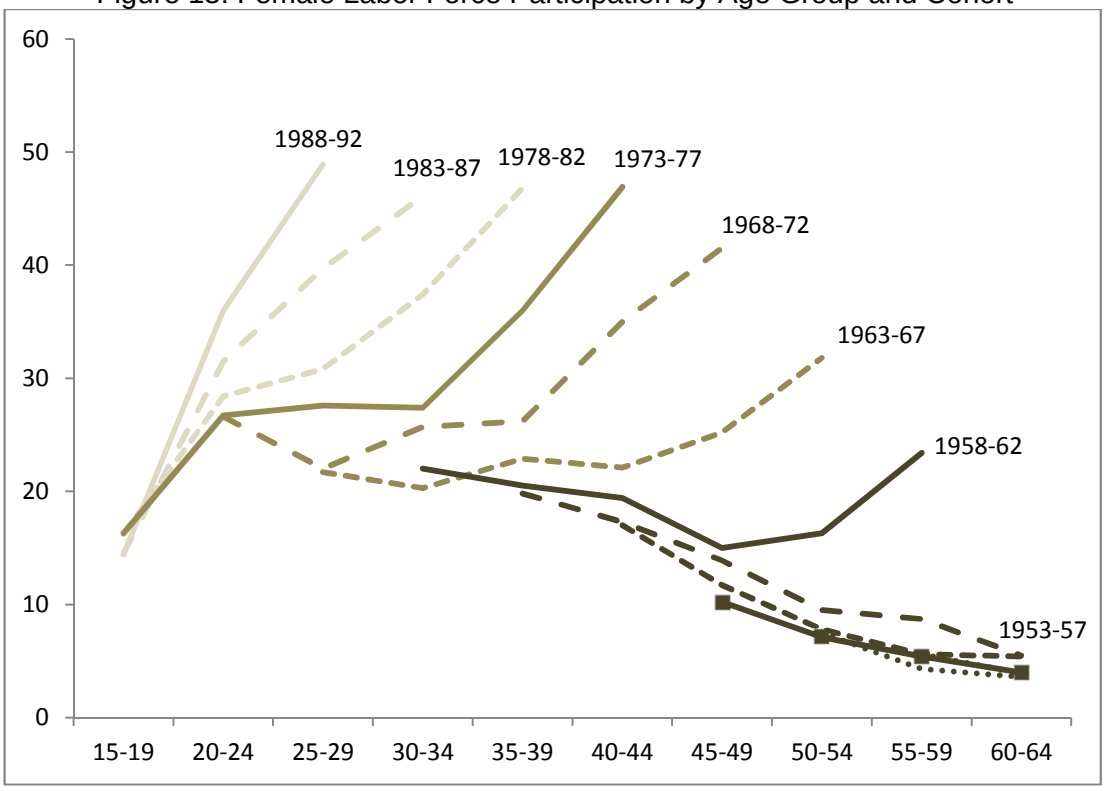
This chapter focuses on extend the existing literature by focusing on the determinants of rise in female labor force participation between 2004 and 2016, not the determinants of the level of participation. Emphasis is given to the contribution of cohort effects which may be considered as a sign change in cultural values. In addition, I analyze whether the negative effect of child care reduces within time and with the rise in educational attainment of women.

3.3. IDENTIFYING THE COHORT EFFECT: EMPIRICAL METHODOLOGY

Cohort effect refers to the fact that younger generations have different labor supply decisions compared to older ones. This effect may be a result of differences in observational characteristics such as educational attainment or may reflect the change in societal values or institutional setting in a country.

One way of visually inspecting the importance of cohort effects is to compare the labor force participation rate of different cohorts. However, this comparison also includes age effects as well. Age itself is an important determinant of labor force participation because of life cycle decisions, such as education or marriage (Euwals et al, 2011). One possible solution is to compare labor force participation of different cohort at the same age intervals. Figure 15 shows that younger cohorts have higher attachment to labor market in the same age groups in Turkey. For example, labor force participation rate of women at the age group 25-29 increases steadily in younger cohorts; it is 48.9 percent for women born between 1988 and 1992, more than twice of women born between 1968 and 1972 (21.7 percent). Therefore, visual inspection suggests that cohort effect is an important determinant of female increase in the female participation rate in Turkey. However, it ignores the year effects; women's entry into labor force may depend on the economic conditions in a specific year. Besides, these observed cohort effects also include the change in individual characteristics, such as education.

Figure 15: Female Labor Force Participation by Age Group and Cohort



Source: TURKSTAT LFS Results; 1992, 1997, 2002,2007,2012 and 2017.

Regression based analysis is required to identify the cohort effects from age and time effects and filter out the effects of changes in characteristics of the population. Most of the studies in the literature use cohort based models, where synthetic panels of cohorts are produced for each year of birth and panel regressions are run. Early studies using this method find significant cohort effects in developed countries, such as UK (Joshi et al, 1985) and US (Coleman and Pencavel, 1993). Recent studies also find significant cohort effects for Europe (Balleer et al, 2014) and for the US (Fallick and Pingle, 2007) and for high-skilled women in Germany (Fitzenberger et al, 2004). Regarding Turkey, Dayıoğlu and Kırdar (2010) estimate a simple cohort based model and show that younger cohorts are more likely to enter into labor force, after controlling for year and age effects.

Euwals et al. (2011) analyze individual level instead of cohort level data to disentangle the cohort, age and time effects in order to uncover the factors leading female labor force participation increase in the Netherlands. The model uses a discrete choice model of propensity to participate into the labor market. More specifically, the logit model is estimated as follows;

$$Pr_{it} = \beta_0 + F_a(a_{it}) + F_c(c_i) + F_t(t) + \beta X_{it} + \varepsilon_{it} \quad (1)$$

where Pr_{it} is the labor force participation choice of individual *i* at time *t*, which takes the value of 1 in the case of being active in the labor market. X_{it} denotes the individual characteristics, such as education, marital status or having children and a_{it} denotes age of individual at time t, c_i is the birth year of individual *i*, t is the year of observation and F_a , F_c and F_t are functional forms for the effects of age, cohort and time, respectively. Since, the summation of age and birth year of an individual equals to the year of observation, estimation of all parameters in equation (1) with linear functional forms for all F_a , F_c and F_t is impossible due to perfect multicollinearity.

One possible solution is to assume that time effects are related with the macroeconomic and labor market conditions in a specific year. Euwals et al (2011) use unemployment rate as a proxy for time effects, namely use the functional form;

$$F_t(t) = \delta_t UR_t \quad (2)$$

and estimate equation (1) with no functional restrictions on age and cohort effects, i.e. full set of age and cohort dummies are included in the regressions. Positive (negative) sign of the coefficient of unemployment points out the dominance of added (discouraged) worker effect.

An alternative approach is assuming that the cohort effect is positive but is concave (Fitzenberger, 2004). In practice, a logarithmic form for cohort effect is assumed;

$$F_c(c_i) = \delta_c \ln(c_i) \quad (3)$$

where time and cohort effects are estimated by a full set of dummy variables. Euwals et al (2011) shows that these two approaches yield similar results for the Netherlands. In this study, I estimate both specifications. After estimating equation (1), the change in labor force participation between two periods can be decomposed, where the contribution of a covariate x_j is approximated by

$$contribution_j = \overline{LFP_t}(1 - \overline{LFP_t})\hat{\beta}_j \Delta \bar{x}_j \quad (4)$$

where $\overline{LFP_t}$ is the average labor force participation rate at the initial year, $\hat{\beta}_j$ is the coefficient of covariate x_j in equation (1) and $\Delta \bar{x}_j$ is the difference of average values of covariate x_j between the end and the beginning years.

3.4. DATA AND DESCRIPTIVE STATISTICS

In this study, I use the micro data from the household budget surveys (HBS) produced by TURKSTAT for the period between 2004 and 2016. I prefer to use HBS since it includes information on household income. Besides, the data includes information on individual characteristics and labor force status. HBS is nationally representative and population weights are provided by TURKSTAT. I restrict the data to women aged between 19 and 65. I exclude individuals aged between 15 and 18, who are most

probably in the secondary education.[17] As a result, there are 144.354 observations in the sample.

Besides age and cohort, I include several individual characteristics regarding marital status, household type, possible responsibility of childcare and elder care, educational attainment, household income and enrollment in education as determinants of labor force participation. I define marital status in three categories; single, married and divorced/widow. 4 household types are included in the analysis; patriarchal or extended family where several generations live in the same household, nuclear family where parents and possibly children live in the same household, single household heads and others. Possibility of child care duties is included in the analysis by three dummy variables of having a child (i) younger than primary education age interval (0-5 years old), (ii) attending primary education (6-11 years old) and (iii) attending secondary education (12-18 years old). A dummy variable for the existence of an elder person (aged more than 64) in the household approximates the possibility of elder care.

The regressions include educational attainment with 5 groups; no diploma, primary, lower secondary, secondary (high school) and tertiary education. In order to account for the effects of economic difficulties, all income components of the household excluding the female individual herself is summed and then divided by the household size.[18] Consumer price index is used to deflate household income. A dummy variable that takes the value of 1 in case of enrollment in education is also added.

Descriptive statistics for the years 2004 and 2016 are given in Table 2. Labor force participation increased significantly within the analysis period and the increase was dramatic in non-agricultural labor force participation; total labor force participation increased by 7.1 percent whereas the increase was 14.2 percent in non-agricultural participation.[19] Important transformations have occurred in family structure during the

[17] Compulsory education was extended to 12 years in 2012. Besides, enrollment rate in secondary education among females was almost 70 percent even before the compulsory education reform (World Bank, 2014)

[18] OECD equivalent scale is used as the measure of household size. OECD scale gives a weight of 1,0 to the first adult, 0,5 to the second and each subsequent person aged 14 and over, and 0,3 to each child aged less than 14 in the household.

[19] Unemployment rate was assumed to be zero in agriculture sector when calculating the non-agricultural labor force participation rate.

period; the share of divorced/widow women increased at the expense of married, the share of patriarchal households decreased and nuclear and single head households increased, fertility has declined but the probability of having an elder person in the household increased. Educational attainment of women improved drastically; the share of tertiary graduates almost tripled and the share of women with no diploma or primary education declined sharply. Average age increased by 1.7 years and there is a significant increase in per capita household income.

Table 2: Descriptive Statistics for 2004 and 2016

	2004		2016	
	Mean	No of Obs.	Mean	No of Obs.
Labor Force Participation Rate (%)				
Total	31.5	10515	38.6	12610
Non-Agricultural	18.3	9010	32.5	10996
Marital Status (%)		10515		12610
Single	16.9	10515	16.8	12610
Married	76.3	10515	75.0	12610
Divorced/Widow	6.8	10515	8.2	12610
Household Type (%)		10515		12610
Nuclear	66.8	10515	68.8	12610
Patriarchal/extended	26.7	10515	23.7	12610
Single Household Head	5.8	10515	6.6	12610
Other	0.7	10515	0.8	12610
Child/Elder in the House (%)		10515		12610
Aged 0-5	32.7	10515	30.0	12610
Aged 6-11	37.0	10515	28.5	12610
Aged 12-18	39.8	10515	33.5	12610
Elder	10.8	10515	12.1	12610
Educational Attainment (%)		10515		12610
No Diploma	20.9	10515	18.1	12610
Primary	50.7	10515	32.8	12610
Secondary School	6.3	10515	15.3	12610
High School	16.1	10515	17.1	12610
Tertiary Education	6.0	10515	16.7	12610
Age	37.4	10515	39.1	12610
Cohort	1966.6	10515	1976.9	12610
Per Capita Household Income	3898.4	10515	5464.6	12610
Enrollment in Education (%)	2.7	10515	7.8	12610
Unemployment Rate (%)	9.7	10515	10.4	12610

Notes: Household income is in 2003 prices.

3.5. ESTIMATION RESULTS

This section starts with discussion of the estimation results of equation (1), using two alternative specifications defined in (2) and (3). Instead of overall unemployment,

education specific unemployment rates are used following Euwals et al (2011). The estimations are done for non-agricultural labor force participation since non-agricultural sector is the main driver of labor force participation increase as is shown Table 2.

Estimation results are presented in Table 3.[20] Individual characteristics have similar coefficients in both specifications. The coefficient of being married is negative, as expected. Living in a patriarchal or extended household increases the probability of participating in the labor market in line with Kızılgöl (2012); probably because of sharing household duties and child care. On the other hand, if elder people live in the patriarchal/extended household, the probability declines in line with Kılıç and Öztürk (2014). Women who are enrolled in education are less likely to enter into labor force, as expected. The coefficient of household income is negative suggesting that economic difficulties encourage women to enter into labor force, in line with previous findings (Kılıç and Öztürk, 2014). Having children aged less than 12 years is negatively correlated with labor force participation whereas having children in secondary education age group (12-18) does not have any negative impact. This finding suggests mothers do not need to devote significant time for taking care of their children who are enrolled in secondary education. Moreover, the coefficient of having a child below age of 6 is much higher compared to the coefficient of having a child whose age is between 6 and 11, in line with Kasnakoğlu and Dayıoğlu (1997).[21] Therefore, the burden of child care is most extensive for children below primary school age. When the children attend primary school, the burden of child care reduces and the negative impact of having a child on the probability of labor force participation of mothers decreases.

The coefficient of unemployment rate is positive in specification 1 in line the added worker hypothesis similar to previous findings (Başlevent and Onaran, 2003; Karaoglan and Okten, 2015) but it is not statistically significant. Therefore, specification 1 suggests that year effects do not explain the rise in labor force participation between 2004 and 2016. Results of specification 2 show that there is not a systematic time effect for female labor force participation and the coefficient of 2016 is insignificant. This suggests that time effects do not have any explanatory power on explaining labor

[20] Note that the regressions also include interaction terms of educational attainment and year with having child or elder in the household results of which will be discussed separately.

[21] Marginal effects also differ significantly. Having a child at age group 0-5 and age group 6-11 reduces the probability of labor force participation by 10,7 and 3.6 percent, respectively.

force participation growth between 2004 and 2016 and the assumption that time effects resemble macroeconomic conditions is plausible. Finally, cohort effects are found to be positive in specification 2; i.e. younger cohorts are more likely active in the labor market compared to older cohorts after controlling for changes in observable determinants of participation. Therefore, the results of specification 2 suggest that social and cultural barriers against working women were relaxed for younger cohorts.

Table 3: Estimation Results

	Specification 1		Specification 2	
	Coefficient	Std. Error	Coefficient	Std. Error
Marital Status				
Married	-0.843***	(0.0310)	-0.861***	(0.0311)
Divorced/Widow	-0.00398	(0.0455)	-0.0168	(0.0454)
Household Type				
Patriarchal/extended	0.177***	(0.0266)	0.179***	(0.0266)
Single Parent	0.00258	(0.0394)	-0.00823	(0.0395)
Other	0.0243	(0.0652)	-0.0331	(0.0654)
Child/Elder in the House (%)				
Aged 0-5	-0.832***	(0.103)	-0.857***	(0.107)
Aged 6-11	-0.309***	(0.0980)	-0.378***	(0.0987)
Aged 12-18	-0.0209	(0.0882)	-0.112	(0.0936)
Elder	-0.652***	(0.152)	-0.694***	(0.156)
Educational Attainment (%)				
Primary	0.538***	(0.0562)	0.556***	(0.0558)
Secondary School	0.945***	(0.0782)	0.966***	(0.0646)
High School	1.262***	(0.0716)	1.301***	(0.0578)
Tertiary Education	2.685***	(0.0663)	2.698***	(0.0617)
Per capita Household Income	-3.21***	(0.59)	-3.18***	(0.257)
Enrollment in Education	-0.196***	(0.0380)	-0.232***	(0.0382)
Unemployment Rate	0.703	(0.938)	-	
Cohort Dummies	X		-	
Log (cohort)	-		1.393***	(0.255)
Age Dummies	X		X	
Year Dummies	-			
2005			-0.0987	(0.0841)
2006			-0.258***	(0.0860)
2007			-0.106	(0.0860)
2008			-0.0306	(0.0873)
2009			0.288***	(0.0877)
2010			0.202**	(0.0900)
2011			0.162*	(0.0950)
2012			0.240**	(0.100)
2013			0.172	(0.107)
2014			0.191*	(0.114)
2015			0.143	(0.119)
2016			0.0292	(0.126)

Notes: Robust standard errors in parenthesis. ***, ** and * denote significance at 1, 5 and 10 %, respectively. Base categories for categorical variables are being single, nuclear family, having no diploma and year 2004. Interaction terms of educational attainment and year with having child/elder are included in both regressions. Log cohort is the natural logarithm of cohort subtracted by 1939.

Interaction terms of education and year with having children for specification 1 are provided in Table 4.[22] The upper panel shows that, the negative effect of having children in preschool age group declines with educational attainment suggesting that more educated women use early childhood education facilities or may afford care takers. Similarly, the negative effect of having children in primary school age group (age 6-11) is significantly reduced for university graduates. Interestingly, having children above 11 years old increases the probability of labor force participation for women with primary or secondary school diploma. This may be due to sharing household chores with grown up children in families with low educated mothers so that these women can find opportunity to enter into labor force. The lower panel shows no decline trend in the negative effect of having child on female labor force participation. These results suggest that the availability and/or affordability of child care services in Turkey did not improve between 2004 and 2016 and hence fertility is still an important barrier against female labor force participation.

Table 4: Effect of Having Child by Education and Year (Specification 1)

	Child Aged 0-5		Child Aged 6-11		Child Aged 12-18	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
Education						
Primary	-0.0121	(0.0765)	-0.0191	(0.0704)	0.163**	(0.0667)
Secondary	-0.0826	(0.0869)	-0.00582	(0.0823)	0.158**	(0.0788)
High School	0.185**	(0.0790)	-0.0294	(0.0741)	-0.0777	(0.0701)
Tertiary	0.414***	(0.0856)	0.352***	(0.0863)	-0.0125	(0.0828)
Year						
2005	-0.0326	(0.108)	0.0453	(0.102)	-0.0971	(0.0864)
2006	-0.140	(0.105)	-0.0831	(0.103)	-0.0721	(0.0873)
2007	-0.177*	(0.106)	0.0274	(0.105)	-0.128	(0.0889)
2008	0.135	(0.102)	0.0388	(0.101)	-0.0210	(0.0871)
2009	0.143	(0.0994)	0.177*	(0.0978)	0.0340	(0.0872)
2010	0.0328	(0.0961)	0.156*	(0.0939)	0.0229	(0.0819)
2011	0.0727	(0.0966)	0.155*	(0.0929)	-0.0484	(0.0813)
2012	0.0932	(0.0976)	-0.0193	(0.0949)	0.00920	(0.0826)
2013	0.0538	(0.0991)	-0.0159	(0.0965)	-0.0270	(0.0839)
2014	-0.0528	(0.103)	-0.0594	(0.0991)	-0.0665	(0.0862)
2015	-0.0368	(0.102)	-0.0368	(0.0969)	-0.0285	(0.0863)
2016	-0.198*	(0.104)	-0.0232	(0.0982)	-0.0880	(0.0878)

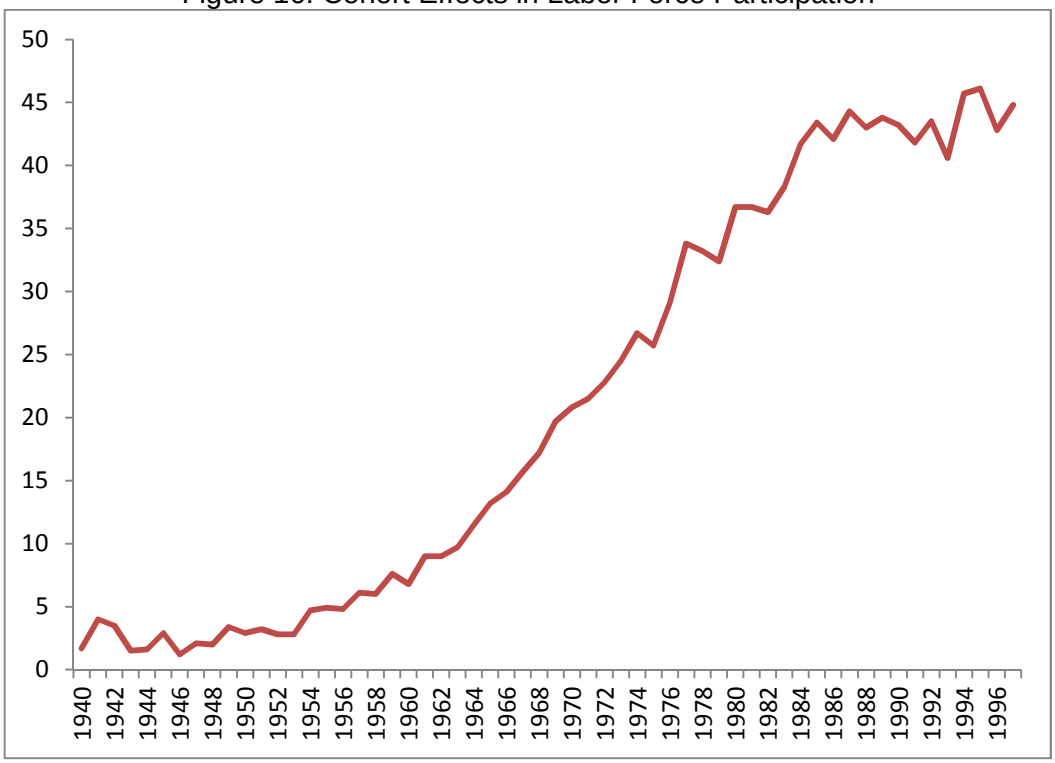
Notes: Robust standard errors in parenthesis. *, ** and *** denote significance at 1, 5 and 10 %, respectively. No diploma and 2004 are base categories for education and year, respectively.

Estimates of cohort effects in specification 1 are provided in Figure 3.3. The figure shows the estimated probabilities to participate for each cohort where all other

[22] Specification 2 yields similar results which are available upon request.

determinants of participation are fixed to their mean values. Cohort effects show that younger cohorts are more likely to participate into labor force, even after controlling for changes in observable determinants such as education. Hence, the results suggest that societal values against working women deteriorated for younger cohorts. The positive cohort effect accelerated with the cohorts born around 1960s but it is steady for cohorts born after 1985. Interestingly, the acceleration in cohort effects cohort effects took place in 1980s when Turkish economy started to transform into a more liberal one. The cohorts of 1960s and 70s entered into labor force more intensively compared to older generations in 1980s when the transformation started. Positive cohort effects also continued to rise for the cohorts of 1980s who were born in a transforming economy. However, the cohort effect is steady for the cohorts who were born after 1985. Therefore, there is still room for changing societal values in order to increase female labor force participation. Finally, visual inspection of Figure 16 suggests that logarithmic transformation is not a plausible assumption to analyze cohort effects in Turkey.

Figure 16: Cohort Effects in Labor Force Participation



Next, I decompose the rise in non-agricultural female labor force participation into contribution of determinants using equation (4). I use specification (1) since the assumption of logarithmic transformation does not seem to be plausible. The

decomposition results are provided in Table 5. Cohort effects explain almost two thirds of 14.2 percent increase in participation rate between 2004 and 2016. Labor force participation among women would increase by around 9 percent even in the absence of any change in other determinants. Improvement in educational attainment has the second largest impact explaining around a quarter or 3.57 points of increase in the participation rate. Besides its direct effect, education also reduces the negative impact of having child but the effect is limited (0.18 percentage points). Decreasing fertility and change in age profile are other factors largely contributing to the rise in participation rate. The rise of the share of elder population has a negative contribution on labor force participation growth but the magnitude of the contribution is very limited.

Table 5: Determinants of Participation Growth, 2004-2016.

	Contribution	Share		Contribution	Share
Marital Status	0.14	1.0	Education*Elder	0.02	0.2
Household Type	-0.06	-0.4	Year*Elder	0.00	0.0
Children	0.61	4.3	Household Income	0.00	0.0
Elder	-0.11	-0.7	Enrolled in Education	-0.12	-0.8
Education	3.57	25.1	Unemployment Rate	0.06	0.4
Education*Children	0.18	1.3	Age Effects	0.95	6.7
Year*Children	0.00	0.0	Cohort Effects	8.98	63.1
TOTAL	14.2	100		14.2	100

Notes: Decomposition is based on specification 1 in Table 3.

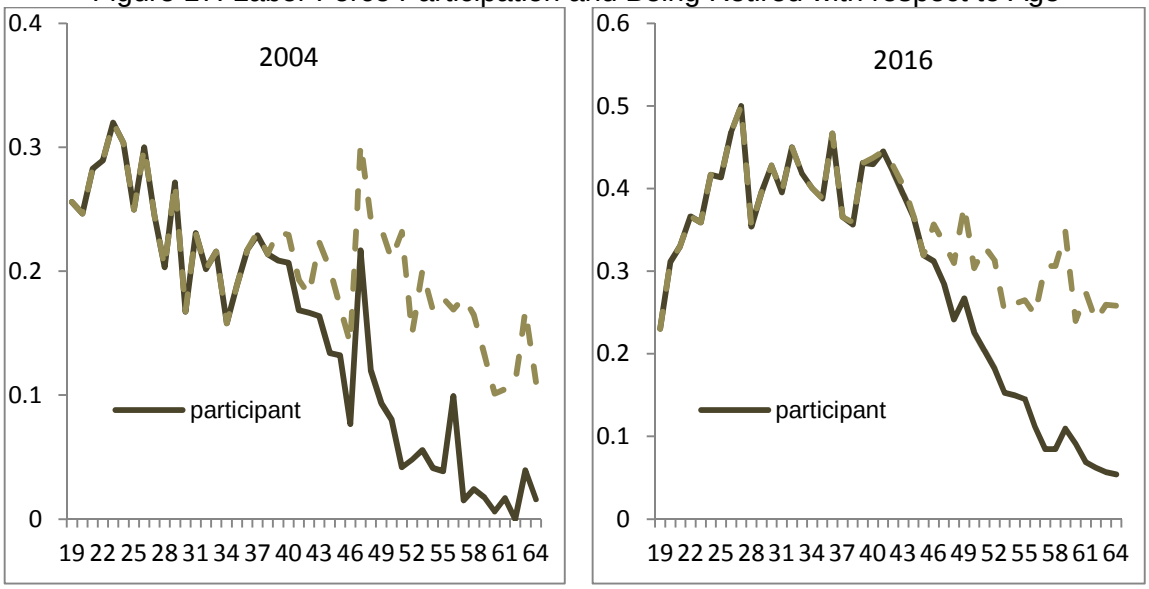
The large contribution of cohort effects suggests that the change in societal values and weakening of beliefs against working woman is the driver of female labor force participation rate. On the other hand, cohort effects may also include the impacts of omitted variables and changes in institutional setting which may be effective only on younger cohorts. One natural candidate of such a change is the reforms in retirement regime which gradually increases retirement age for younger cohorts.[23]

In order to have a rough estimate of the impact of increasing retirement age, I define an alternative measure of labor market attachment which takes the value of 1 in the case

[23] See chapter 2 for details.

of being participant or retired. In young age groups, these two indicators are the same because there is no chance of being retired but they tend to diverge as the individuals get older. Figure 17 shows the age profiles of these two indicators for the years 2004 and 2016. The series named “participant” is actually the labor force participation rate whereas the series named “participant or retired” gives the population share of women who are either participants in the labor force or retired. In 2004, the two series become to diverge at the age of 38 as a result of early retirement scheme of 1990s. On the other hand, the age of divergence between these two series increases to 45 in 2016 due to social security reforms after 1999.

Figure 17: Labor Force Participation and Being Retired with respect to Age



In order to have a rough estimate of the effect of retirement age, a simple calculation is done. First, it is assumed that labor force participation would be equal to the population share of participants and retirees between ages 38 and 45 in 2004 as if actual earliest retirement age was 45 as in 2016. Second, labor force participation line in 2004 is shifted upwards by the difference of share of participants and participants or retirees after the age of 45 in 2004. Then the difference between this newly created counterfactual labor force participation rate for 2004 and the actual labor force participation rate in 2004 is calculated using share of each cohort in 2004.The calculation yields an estimate of 1.6 percent increase in the labor force participation in 2004. In other words, the contribution of cohort effects would be around 7.4 percent and the cohort effects would explain more than half of the participation increase in the absence of retirement age reforms. In summary, cohort effects, which is a proxy for

changes in societal norms, remains the main driver of labor force participation in Turkey.

3.6. DISCUSSION

Female labor force participation is quite low in Turkey compared to OECD average, which is considered to be a fundamental barrier against economic growth. Besides, weak attachment to labor market also inhibits women's empowerment and gender equity in the society. On the other hand, the characteristics of the population are changing and there are significant efforts to promote female employment. As a result, there is a dramatic increase in the female labor force participation rate especially in non-agricultural sectors. In this chapter, first I analyze the determinants of female labor force participation in Turkey. Then, I decompose the increase in the labor force participation into contribution of the changes in the determinants.

The focus of the study is to estimate the magnitude of cohort effects and its importance in the rise of labor force participation. Cohort effects measure whether younger cohorts' labor force participation decision is different than the older ones. Cohort effects can be considered as a proxy for changing social norms about female employment in the absence of any change in the institutional setting. Estimation results suggest that younger cohorts are more likely to enter into labor force, even after controlling for improvements in observable characteristics, such as educational attainment. Decomposition results suggest that cohort effects explain almost two thirds of non-agricultural female labor force participation growth in Turkey.

Social security reforms, which were effective only on younger cohorts, explain some portion of the cohort effects. However, even after controlling for retirement reforms, cohort effects still explain more than half of the participation increase. These effects may still include some other unobserved determinants of female labor force participation. However such a big share of cohort effects suggests that change in cultural norms is the main driver of female labor force participation in Turkey.

Estimation results suggest that cohort effects accelerated in 1980s where major structural reforms took place in Turkey towards a liberal economy. Cohorts of 1960s and 1970s, who were at the beginning of working ages, entered more intensively

compared to their predecessors. In addition, women who were born in 1980s, in the midst of structural transformation, are more likely to enter into labor force. Therefore, structural changes in the economy in 1980s may have also affected the culture and society. Identifying the causal impact of structural change in the economy on societal values is beyond the scope of this chapter. Further studies may focus on identifying the relation between economic environment and societal values with a special focus on beliefs regarding women.

The results suggest that female labor force participation will continue to rise since younger cohorts are more likely to participate. Besides, retirement age will continue to rise until 2048. However, estimates suggest that cohort effects are relatively stable in the youngest cohorts born after 1985. This is in line resistance in beliefs against working women. According to 2016 wave of family structure survey conducted by TURKSTAT, 21.9 percent of males believe that women should not work whereas this ratio is 8.5 percent among females. Besides, the improvement in social norms among men is minimal in 10 years; in the 2006 wave of the same survey, 23 percent of males and 10 percent of females responded that women should not work. Therefore, campaigns to change men's idea against working women are crucial in order to accelerate the rise in female labor force participation rate.

Improvement in educational attainment is the second largest factor behind participation growth among women. The gender gap in enrollment rates in all levels of education disappeared in Turkey. Hence, further attempts should consider improving the quality of education such that skills needed in the labor market are provided by formal education.

Declining fertility also contributed to participation growth but there is no declining trend in the negative impact of having children. In other words, women are more likely to enter into labor force in 2016 compared to 2004 because they have fewer children on average. However, there is no decline in the negative effect of having a child on participation and hence child care remains as a major barrier. According to 2016 wave of family structure survey, care of children aged between 0 and 5 are mostly done by mothers (86 percent) whereas the share of crèches and preprimary schools is only 2.8 percent. Extending the enrollment rate in early childhood education is crucial for further increasing female labor force participation, especially for less educated women from

disadvantaged families. Enrollment in early childhood education will also improve the educational outcomes of children in the future. Previous studies show that, lack of affordable child care services is the main reason of low enrollment in child care services, rather than low demand (World Bank, 2015). Hence, subsidized prices for child care services or income support to women who work and whose child attends a preschool facility may increase labor force participation.

Flexible work arrangements may also inhibit the negative impact of fertility on labor force participation. Public preschool facilities generally do not operate full time (World Bank, 2015). Hence, child care is still a problem for women who work full time. Unfortunately, the share of part time employment among women in Turkey is lower than the OECD average and is declining in recent years (Figure 5, Chapter 2). Policies favoring part-time employment and other types of flexible employment, such as flexitime or teleworking are necessary to foster female labor force participation growth.[24]

Finally, elder care might be a barrier against female labor force participation rate in the upcoming years. According to TURKSTAT demographic indicators, the share of elder people in Turkish population increased slightly from 6.7 percent in 2004 to 8.3 percent in 2016; a 1.6 percent rise in 12 years.[25] Hence, the effect of an elder living in the household was rather limited in decomposition analysis. However, it is expected that the share of elder people in the society will increase by 2.7 percent in only 9 years and reach 11 percent in 2025. Moreover, the share will reach 16.3 percent in 2040. Therefore, capacity of elder care services should be improved in order to limit the negative consequences of this increase on female labor force participation in the future.

[24] A more detailed discussion is provided in Chapter 2.

[25] Source: http://tuik.gov.tr/PreTablo.do?alt_id=1027, retrieved June 15, 2018.

CHAPTER 4

LOCAL MULTIPLIERS: THE IMPACT OF PUBLIC EMPLOYMENT ON LOCAL EMPLOYMENT IN TURKEY

4.1. INTRODUCTION

Job creation is a fundamental objective of governments all over the world. Rising unemployment rates made job creation even more important after the financial turmoil. As a result, countries devote considerable resources to boost job creation in different ways. Governments have many alternative combinations of policies to support job creation. For example they use investment incentive packages such as tax reductions, free or subsidized provision of land or infrastructure to attract new firms. One goal of these investment incentives is to increase employment via increased growth. In addition, direct incentives for employment generation can also be used. Reductions in tax burden of labor across the board or subsidies in social security contributions for employment growth in targeted groups, such as young or women who constitute the most disadvantaged group in the labor market can be given as examples of such incentives. Besides, active labor market policies can be used to improve employability of unemployed or inactive people. Vocational courses or on the job training programs provided or financed by employment agencies can be given as examples of active labor market programs. Governments can also spend considerable time and effort for legal amendments against labor market rigidities which are assumed to inhibit employment growth, for example reducing hiring and firing costs. Finally, governments may choose to foster employment growth directly instead of incentives to private sector by increasing public employment.

Turkey is not an exception and also has difficulties in job creation. In fact, Turkey faces the need of job creation much more heavily compared to developed countries due to its young and growing population. In the years after the financial turmoil, although almost one million jobs were created each year, unemployment rate remains high due to increasing labor supply as a result of rising working age population and labor force participation rate (Chapter 2, Table 1). Besides, as it was noted in Chapter 3, female labor force participation is quite low but is increasing. Hence, labor supply will likely continue to rise in the next years. Therefore, creating more jobs is a core issue in

political discussions. In addition, significant regional disparities remain in Turkey, in terms of both income and labor market indicators. Creating jobs in least developed areas where employment rate is low is another obstacle for Turkey to achieve sustainable growth rates and shared prosperity. As a result, the government took several measures to boost employment growth especially after the financial turmoil (Chapter 2).

In this chapter, I analyze the effects of public job creation on employment growth. Public employment generation has a one-to-one effect on total employment generation. Besides, it has an indirect impact on total employment through multiplier effects on private employment. This chapter focuses on the job multiplier effects of public employment on private employment in local labor markets.

Public employment can induce new employment in the private sector, especially in non-tradable services sector, due to increased demand to local services similar to multiplier mechanism as in Moretti (2010), who analyze the multiplier effect of tradable employment on local non-tradable employment. In Moretti's framework, new workers in tradable industry increase demand of local services such as restaurants, legal services or medical services causing increase in local non-tradable employment. Similarly, a shock to public employment may increase demand for local services and crowd in non-tradable employment. On the other hand, public employment can crowd out private employment via different channels (Behar and Mok, 2013). For example, rise in public employment means higher taxes which disturb employment growth of private firms. In addition, higher wages and job guarantee in public sector reduce individuals' efforts to find new jobs in private sector. Alesina et al (2001) documents that on the job search intensity and entrepreneurial activity is less in southern regions compared to northern regions in Italy and argues that the high share of public employment in south is driving this difference.

In summary, the net effect of public employment on private employment is ambiguous. If positive spillover effects dominate, public employment crowds in private employment. In this case, one extra job in public sector results with more than one job creation in total. On the other hand, if crowding out effect is dominant, one extra job in public sector results with less than one job in total. The degree of crowding out can be classified into three categories. If an extra job in public sector crowds out less than one

job in private sector, i.e. the net effect on employment is positive but smaller than 1, partial crowding out happens. In the case of full crowding out, a new job in public sector is created at the expense of a loss of exactly one job in private sector and hence there is no effect of public employment policy on total employment. Finally, public employment can crowd out private employment more than fully if the loss in private employment due to one extra public employment is more than one. Estimating the net effect of public employment is important for policy makers who allocate public resources in alternative job creation schemes.

The empirical literature on the multiplier effect of public employment on private employment is limited. Most of the studies in the literature rely on time series methods. For example, Malley and Moutos (1996) use Johansen cointegration technique and find that public employment more than fully crowds out private employment in the long run using Swedish data. Demekas and Kontomelis (2000) develop a simple model of labor market where government and employers in the private sector compete for workers but make employment and wage decisions on the basis of different objective functions. They test their model with Johansen cointegration analysis for Greece and find that increase in public wages causes unemployment to rise due to spillovers to private wages. On the other hand, they do not find any significant impact of public employment decisions on unemployment. Linneman (2009) finds that public employment has positive impact on private employment in the short run I using a VAR analysis for the US. Craigwell and Jackman (2014) use a two-step Markov-switching error correction model and find that public employment partially crowds out private employment in Barbados.

Another strand of empirical literature uses cross country variation in public employment share. Algan et al (2002) use fixed effect panel data regressions for a sample of OECD countries and find that public employment more than fully crowds out private employment. Behar and Mok (2013) uses a similar framework for Middle East and North African (MENA) countries and find that public employment fully crowds out private employment. In a similar fashion, Feldmann (2009) and Feldmann (2010) find that government size is positively correlated with unemployment in developing countries.

Recent studies analyze the public employment-private employment relation at the local labor market level. Faggio and Overman (2014) use the local job multiplier framework introduced by Moretti (2010) in order to analyze the effect of public employment on local level private employment. Using regional data for the UK and the instrumental variable (IV) technique based on the shift share method introduced by Bartik (1991) and developed by Moretti (2010) in job multiplier analysis, they find that public employment crowds out manufacturing employment whereas it crowds in services employment and that the net effect on total private employment is negligible. Senftleben-König (2014) applies the same method for Germany and finds that public employment partially crowds out private employment. She also shows that the crowding out effect works through employment in tradable industries whereas there is no effect on non-tradable sector employment. Auricchio et al (2017) finds similar results in their analysis for Italian municipalities. In a recent paper, Ranzani and Tuccio (2017) reach opposite conclusions for some African countries. They show that, public employment crowds in private employment in tradable and non-tradable industries although it crowds out the agricultural employment in the long run. The reason of their opposing results can partially be attributed to the period they considered is around 30 years, much longer compared to previous studies. However, the main factor may be that the net effect of public employment on private employment may depend on the development level of the country. Monseny et al (2016) use a different instrument and find that public employment positively affects private employment in Spanish regions.[26] In summary, the findings of empirical literature suggest that the direction and the magnitude of public employment depend on the country context.

Finally, some local level studies use a difference in differences approach to evaluate the impact of public sector relocation programs in specific cities or regions. For example, Faggio et al (2016) finds that public employment relocation in Germany due to change of capital from Bonn to Berlin had positive impact on private employment in Berlin. Faggio (2016) finds similar results for the UK public employment relocation program. Schlüter (2014) finds that public employment increase in Berlin due to change of capital caused increases in private employment in the neighborhoods of Berlin which are closer to new ministerial buildings. Becker et al (2018) uses differences in differences and synthetic control methods to analyze the effect of Bonn's

[26] Their instrument is the capital status of cities for regions in Spain.

being the capital city of West Germany after second world war and find that public employment had positive but small impact on private employment.

This chapter contributes to the existing literature on multiplier effects of public employment on local private employment in a large developing country context, Turkey. The methodology in this paper is closely related to Faggio and Overman (2014). I estimate the multiplier impact of public employment on private employment for the period of 2008-2016 using province level employment data from social security records. Unlike Faggio and Overman (2014) and other studies on developed countries, I find that public employment crowds in private non-agricultural employment similar to Ranzani and Tuccio (2017), who analyze public employment multipliers in developing countries. Unlike Ranzani and Tuccio (2017), this positive spillover impact comes only from non-tradable sector whereas there is no effect on tradable sector employment. I also show that positive public employment effect is only significant in provinces with more elastic labor supply where the share of agriculture in total employment and labor force participation rate are used as proxies for labor supply elasticity. Finally, the results suggest that multiplier effect is only significant and quite large in provinces with high non-agricultural unemployment rate.

The chapter is organized as follows. In the next section, I summarize the conceptual framework and introduce the empirical methodology. In section 3, I discuss data and present descriptive statistics. Section 4 discusses the empirical results and finally section 5 concludes.

4.2. CONCEPTUAL FRAMEWORK AND EMPIRICAL METHODOLOGY

In this study, I use theoretical local job multiplier framework based on the models of Moretti (2010) and Moretti (2011). The model assumes that each region within a country is a competitive economy producing tradable and non-tradable goods. Tradable goods are the goods that are produced for the use of whole nation or for export and non-tradable goods are produced only for the demand of local residents. Firms that are producing tradable goods can freely choose location whereas non-tradable goods must be produced locally. Prices of tradable goods are set totally by national market whereas local factors have also impact on the prices of non-tradable goods. In practice, manufacturing is considered as tradable industry and services

(excluding government) and construction industries are considered to be non-tradable. It should be noted that products of agriculture and mining are also tradable. However, firms in these industries cannot choose location freely. Therefore, these industries are considered to be neither tradable nor non-tradable.

Labor markets in each region are assumed to be competitive and labor is perfectly mobile between sectors within a region. Capital is assumed to be fully mobile and firms' location decision is an element of their profit maximization process. Similarly, labor mobility between regions are assumed and workers migrate freely taking wages, cost of living (for example housing) and individual preferences into account.

In this framework, the multiplier measures the impact of an exogenous increase in employment in tradable industries (for example due to establishment of a new firm) on employment in local non-tradable industries due to increase in demand to locally produced services induced by new workers in tradable industries. The magnitude of the multiplier depends on the elasticity of labor supply in the local labor market since all of extra demand will create new employment. If the labor supply is elastic, the increased demand will cause higher multipliers. In the case of perfect elastic labor supply, all of extra demand created by new workers in tradable industries will be provided new workers instead of rising wages. On the other hand, inelastic labor supply will translate additional demand due to new tradable sector employees into higher wages and hence prices, with limited multiplier effect on employment. Hence, factors that increase the elasticity of labor supply will also increase the magnitude of the multiplier. Hence, higher geographical mobility of workers or higher responsiveness of housing market to local demand will have positive effect on multipliers. In addition, abundance of possible labor supply locally will increase multiplier. For example, multiplier effect might be larger in regions with higher unemployment rate.

In the framework of Moretti, public sector cannot be considered as either tradable or non-tradable. On the one hand, some part of public employment is due to increased local demand to public services, such as education, health, municipal services. In this respect, public sector can be considered as non-tradable. On the other hand, some part of public services is provided for the whole nation and can be considered as tradable in local setting. In addition, the national government has discretionary power on the geographical distribution of public employment. The government may choose

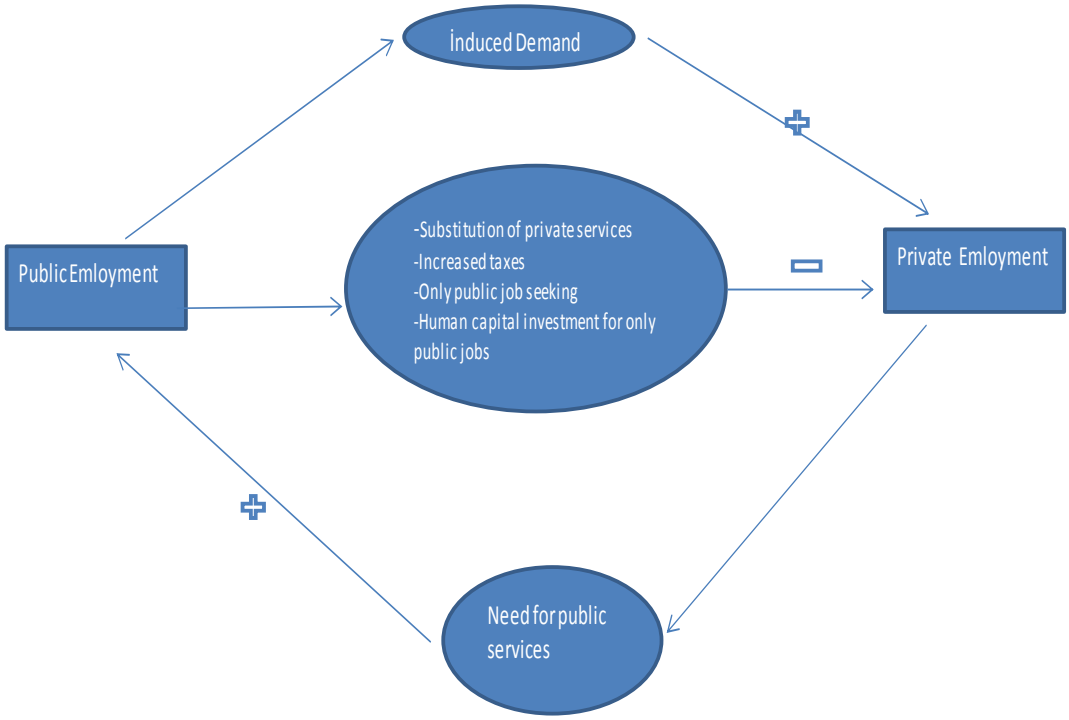
some cities for regional hub for some national public services for several reasons. For example, the cities where military bases are established are determined based on geostrategic rather than economic reasons. Or the government may choose to establish a public university in a city where there is no demand for a university in the local labor market.

Faggio and Overnam (2016) use the local multiplier framework of Moretti to analyze the effect of public employment on private employment. It is assumed that public employment is funded by national taxation instead of local. Besides, public sector wages are determined at the national level as opposed to tradable and non-tradable sectors and a public wage premium is assumed.

In this framework, the effect of public employment on private employment is similar to tradable employment multiplier. If the government permanently increases public employment in a region, the increased demand by new public employees will cause increasing private employment, especially in non-tradable industries.[27] Besides, the non-tradable sector may directly supply goods and services to public sector, which directly induces employment. On the other hand, public employment might have negative impacts on private employment as well. First, some private services are almost perfect substitutes to public services, such as health and education (Faggio and Overman, 2014). In the case of improvement in the local supply of these public services, private employment in these services will fall. Second, general equilibrium effects, i.e. increased taxes or interest rates might have negative impact on private investment and employment (Behar and Mok, 2013). Third, public wage premium and job security may cause individuals to wait for public jobs instead of searching for private jobs (Feldmann, 2009, 2010). Similarly, if the public share in labor market is high, students in secondary or tertiary education may invest in skills needed in public sector but not in private sector causing a mismatch problem in private labor market (Salehi-Isfahani and Dhillon, 2008). Figure 18 summarizes possible channels of interaction between public and private employment.

[27] Increase in public employment in a region may also positively affect local tradable employment. However, this effect can be expected to be much smaller compared to non-tradable employment since the market for a firm in a tradable industry is the whole country and the demand of the region where the firm is located will be a small portion of its total market.

Figure 18: Interaction between public and private employment



Source: Own Ilustration

In summary, the direction and the magnitude of the effect of public employment on local private employment is ambiguous. If positive spillover effects dominate, the net multiplier impact is positive. On the other hand, if negative spillover effects are dominant, public employment crowds out private employment. Depending on the strength of negative spillover effects, public job creation may even cause net employment loss in total. The relative magnitude of multiplier effect on tradable and non-tradable employment is less ambiguous. Negative spillover effects have similar effects on tradable and non-tradable employment. On the other hand, non-tradable sector mostly enjoy the benefits of extra demand from new public sector employees since they depend on local demand whereas nationwide or global demand is relevant for tradable sector. Therefore, it is most likely that public employment affects non-tradable sector more positively compared to tradable sector.

In order to test the direction and magnitude of public employment multiplier, the contribution of private employment to total local employment growth is regressed on the contribution of public employment. Let E denote total employment, R denote private

employment and P denote public employment. Then, the employment growth between year *t* and *t-s* in a region *i* is decomposed into public and private sector contribution as,

$$\left(\frac{E_t - E_{t-s}}{E_{t-s}}\right)_i = \left(\frac{R_t - R_{t-s}}{E_{t-s}}\right)_i + \left(\frac{P_t - P_{t-s}}{E_{t-s}}\right)_i \quad (5)$$

where the first term in the right hand side of identity (1) is the contribution of private employment and the second term is the contribution of public employment to total local employment growth, respectively. Then, the magnitude of the multiplier is estimated by the regression;

$$\left(\frac{R_t - R_{t-s}}{E_{t-s}}\right)_i = \beta \left(\frac{P_t - P_{t-s}}{E_{t-s}}\right)_i + \delta X_{i,t} + \alpha_i + \phi_t + \varepsilon_{it} \quad (6)$$

where $X_{i,t}$ is the vector of time varying local level control variables, α_i is region fixed effect, ϕ_t is time fixed effect to absorb the effect of national shocks and ε_{it} is the error term. The coefficient β gives the estimate of public employment multiplier on private employment. A positive β means that positive spillover effects dominate and public employment has positive effect on private sector employment. On the other hand, if negative spillover effects are dominant and public employment crowds out private employment, then the estimate of β is negative.

The ordinary least squares (OLS) estimate of β may be subject to endogeneity bias since public employment contribution might be correlated with the unobserved local characteristics which are included in the error term. If public employment increases due to rising demand to public services driven by forces which also increase private employment, then the estimate of β is upward biased. For example, refugee influx in a region will increase both private and public employment but the OLS estimate will misleadingly interpret the increase in private employment as a result of public employment. If the government increases public employment as a response to negative shocks in local private employment, then the estimate of β is downward biased. Similarly, in the case of reverse causality where local public employment increases due to rising demand for public services as a result of rising private employment, then the OLS estimate will be upward biased. In order to solve the possible endogeneity problem in the OLS regression, I employ the IV strategy introduced by Faggio and Overman (2014) who modify the shift share analysis of Bartik

(1991). The instrument measures the predicted public employment contribution to local employment growth if the government increased public employment proportionally all over the country, without any area specific disturbance. Algebraically, the instrument is constructed as,

$$\left(\frac{P_{t-s}}{E_{t-s}}\right)_i \times \left(\frac{P_t^{TUR} - P_{t-s}^{TUR}}{P_{t-s}^{TUR}}\right) \quad (7)$$

where the first term measures the initial share of public employment in region *i* and the second term measures the nationwide growth rate public employment between periods *t* and *t-s*. When calculating the national growth rate is calculated, own region is excluded for the sake of exogeneity.

4.3. DATA AND DESCRIPTIVE STATISTICS

The main data source in this paper is the annual statistics of Social Security Institution (SGK). The data covers only formal employees and is available 2008 onwards. Since multiplier is defined over the long term, I only use the data for 2008, 2012 and 2016 and hence the time unit is 4 years in line with earlier studies. The smallest geographic unit in SGK statistics is province. Hence, I construct a panel data set with time dimension 3 and geographical dimension 81.

Turkish social security system classifies workers into three groups; wage earners who work according to labor law (Class 4-1-a in SGK terminology), self-employed or employer (Class 4-1-b in SGK terminology) and civil servants (Class 4-1-c in SGK terminology). Since SGK does not provide the ownership status of the firms, I use civil servants as a proxy for public employment.[28] SGK provides two digit NACE Rev2 codes of industries for employees working under labor law. Therefore, I can compute number of employees in tradable and non-tradable services. I define tradable sector as manufacturing and non-tradable sector as services (excluding government and military services) and construction, in line with the literature. SGK data does not provide

[28] According to Ministry of Finance data, 80 percent of all public employees work as civil servant (SGK class 4-1-c) according to SGK classification. Moreover, more than half of public employees who work under labor law (SGK class 4-1-a) work in state owned enterprises and municipalities, which do not fit the public employee definition in the paper's framework. Furthermore, only 4.4 percent of employees in civil servant scheme work for municipalities or state owned enterprises. Source: http://www.bumko.gov.tr/TR,908/kadro-istatistikleri.html, retrieved November 22, 2017.

industry breakdown of self-employed and I keep all self-employed in a separate category.

Several variables are included in the analysis in order to control for the effects of developments in the regions. The control variables include logarithm of population and its growth rate, per capita real GDP and its growth rate and the share of college graduates in the population. All control variables are taken from the TUIK regional indicators data base. Table 6 presents the descriptive statistics for the average of the analysis period.

Table 6: Descriptive Statistics

	Mean	Std. Dev.	Min	Max
Number of Employees				
Total Employment	197201	496044	11442	4166979
Public Employment	33372	53560	4296	379255
Private Employment	163829	452086	7058	3868200
Tradable Employment	39257	107806	398	900623
Nontradable Employment	99299	293761	4899	2510927
Self-Employment	23673	53488	1526	452448
Share in Total Employment				
Public Employment	0.25	0.09	0.07	0.55
Private Employment	0.75	0.09	0.45	0.93
Tradable Employment	0.16	0.10	0.02	0.46
Nontradable Employment	0.44	0.06	0.31	0.63
Self-Employment	0.13	0.03	0.08	0.19
Contribution to Employment Growth				
Public Employment	0.04	0.12	-0.28	0.77
Private Employment	0.17	0.11	-0.05	0.59
Tradable Employment	0.03	0.04	-0.04	0.23
Nontradable Employment	0.14	0.10	-0.05	0.56
Self-Employment	0.00	0.02	-0.07	0.12
Regional Control Variables				
Population (Level)	933989	1661071	80542	13785340
Population (Growth Rate)	0.04	0.04	-0.08	0.24
Real Per Capita GDP(Level)	12580	4522	5277	27717
Real Per Capita GDP (Growth Rate)	0.14	0.07	0.00	0.38
Share of College Graduates	9.20	2.15	5.04	17.90

Source: SGK and TURKSTAT. Real GDP figures are in 2009 prices.
Notes: Sample average of all periods are presented.

Government is the biggest employer in Turkey. Public employment accounts for around a quarter of total non-agricultural employment in provinces on average. The relative importance of public employment varies considerably around provinces. Labor markets in some provinces heavily rely on public employment, where more than half of employees work in the public sector. Non-tradable employment accounts for more than half of private employment; 44 percent of total non-agricultural employees work as wage earners in non-tradable industries. Private sector was the main driver of employment growth throughout the period whereas public sector had a limited contribution. Non-tradable sector employment was the main driver of employment as a result of shift towards service industries whereas the contribution of manufacturing was limited. Self-employment still has a considerable share (around 13) but is stagnant as a result of structural transformation of the economy.

4.4. ESTIMATION RESULTS

I start with presenting the OLS results of equation 6. In all regressions, observations are weighted according to initial total employment. The results are presented in Table 7. The first four specifications in the upper panel of Table 7 present the results of regressions without any controls other than time and province fixed effects, for private employment, non-tradable employment, tradable employment and self-employment, respectively. The results suggest a significant and important positive multiplier effect of public employment on private employment; a 1 percent rise in public employment's contribution to employment growth is correlated with a 0.68 percent increase in private employment's contribution. Specifications 2-4 show that only non-tradable local employment is positively associated with public employment growth. The coefficients for tradable and self-employment are not significant.

Specifications 5-8 in the lower panel of Table 7 present the results of regressions with additional controls. The results are qualitatively unchanged but the coefficient of public employment contribution declines considerably; a 1 percent rise in public employment's contribution to employment growth is correlated with a 0.39 percent increase in private employment's contribution. Again, only non-tradable employment's contribution is positively correlated with public employment's contribution to total employment growth in local level.

Table 7: Impact of Public Employment on Private Employment (OLS Results)

	-1	-2	-3	-4
	private emp	Non-trad emp	Tradable Emp	Self -Emp
Public Emp.	0.68061931***	0.54503680***	0.11763905	0.03545464
	[0.189]	[0.169]	[0.090]	[0.053]
Observations	162	162	162	162
R-squared	0.8403127	0.76562876	0.74696806	0.5369808
	-5	-6	-7	-8
	private emp	Non-trad emp	Tradable Emp	Self -Emp
Public Emp.	0.38948673***	0.27836139*	0.09430154	0.0292328
	[0.145]	[0.154]	[0.106]	[0.049]
Population (Log)	-1.13630265**	-0.94243678	-0.18498737	-0.04857632
	[0.538]	[0.589]	[0.346]	[0.165]
Growth of Population	0.65733923	0.29247775	0.22580377	0.15597956
	[0.688]	[0.529]	[0.273]	[0.191]
Real GDP per capita	0.00000893	0.00003273*	-0.00001479*	-0.00000978
	[0.000]	[0.000]	[0.000]	[0.000]
Growth of per capita GDP	0.35539267	0.72627297***	-0.26262719*	-0.13171304
	[0.253]	[0.250]	[0.148]	[0.083]
College share	0.05369226	0.00958445	0.03815151	0.00510118
	[0.043]	[0.027]	[0.026]	[0.007]
Observations	162	162	162	162
R-squared	0.87809903	0.8363259	0.81716681	0.65920286

Notes: All regressions include time and province fixed effects. Standard errors clustered at province level in parenthesis. *,** and *** denote significance at 1, 5 and 10 percent, respectively. Lagged values of logarithm of population, real GDP per capita and college share among all workers are used.

The results in Table 7 reveal that public employment crowds in private employment. Moreover, the results suggest that this positive impact comes through non-tradable employment. However, the results do not necessarily point out a causal relation. In order to have causal interpretation I now present the IV estimation results in Table 8. The specifications 1-4 in the upper panel of Table 8 show the regression results without additional control variables, similar to Table 7. The specifications 5-8 include additional control variables. At the bottom of each specification, I present the results of first stage regressions. The instrument is significant and passes the weak instrument F-test in all specifications. The coefficient of the instrument is negative, suggesting that, after

controlling for local characteristics; public employment grew less in provinces where the share of public employment is initially high.

Table 8: Impact of Public Employment on Private Employment (IV Results)

	-1	-2	-3	-4
VARIABLES	private emp	Non-trad emp	Tradable Emp	Self -Emp
Public Emp.	0.53382092***	0.54244985***	0.0237465	-0.0227785
	[0.125]	[0.120]	[0.055]	[0.042]
Observations	162	162	162	162
R-squared	0.83704265	0.76562696	0.73976814	0.5184365
	First Stage Statistics			
Instrument	-13.589***	-13.589***	-13.589***	-13.589***
	[0.971]	[0.971]	[0.971]	[0.971]
F-Test	106.338	106.338	106.338	106.338
Prob >F	[0.000]	[0.000]	[0.000]	[0.000]
	-5	-6	-7	-8
	private emp	Non-trad emp	Tradable Emp	Self -Emp
Public Emp.	0.27885651**	0.20123728*	0.08091598	0.0105294
	[0.114]	[0.116]	[0.076]	[0.040]
Population (Log)	-1.2606078***	-1.02909413**	-0.20002751	-0.06959163
	[0.379]	[0.402]	[0.235]	[0.120]
Growth of Population	0.71981884	0.33603442	0.2333634	0.16654251
	[0.457]	[0.361]	[0.184]	[0.129]
Real GDP per capita	0.00001054	0.00003385***	-0.0000146***	-0.0000095**
	[0.000]	[0.000]	[0.000]	[0.000]
Growth of per capita GDP	0.40933696**	0.76387937***	-0.25610027**	-0.1225931**
	[0.181]	[0.175]	[0.105]	[0.058]
College share	0.05573912*	0.01101138	0.03839916**	0.00544723
	[0.029]	[0.019]	[0.017]	[0.005]
Observations	162	162	162	162
R-squared	0.87678457	0.83519314	0.81706324	0.65784893
	First Stage Statistics			
Instrument	-14.132***	-14.132***	-14.132***	-14.132***
	[0.808]	[0.808]	[0.808]	[0.808]
F-Test	166.43	166.43	166.43	166.43
Prob >F	[0.000]	[0.000]	[0.000]	[0.000]

Notes: All regressions include time and province fixed effects. Standard errors clustered at province level in parenthesis. *,** and *** denote significance at 1, 5 and 10 percent, respectively. Lagged values of logarithm of population, real GDP per capita and college share among all workers are used.

The results of instrumental variable regressions without any additional control variables in the upper panel of Table 8 (specifications 1-4) are quite similar to OLS results in Table 7. There is a decline in the coefficient of total private employment compared to OLS estimate but the effect on non-tradable employment is almost the same. On the other hand, in specifications 5-8 with additional controls, there is a decline in the magnitude of coefficients, both for total and non-tradable private employment. This decline suggests that public employment reacts to local demand as a result of private employment growth and hence OLS estimates are upward bias. However, the multiplier is still positive and significant and the driver of positive multiplier is again non-tradable employment.

The instrumental variable strategy relies on the assumption that provinces are small and that they do not affect the behavior of national government. Two provinces in Turkey, namely Istanbul and Ankara, may not fit into this definition. As of 2016, these two provinces account for 37.6 percent of total private employment (29.1 percent of private employment is in İstanbul and 8.5 percent in Ankara) and 24.5 percent of public employment (12.5 percent of public employment is in Ankara and 11.9 percent in Istanbul). In order to see the robustness of the IV strategy, I estimate the IV regressions excluding these two provinces. The results presented in Table 9 are similar to those in Table 8 with full sample. In fact, the coefficient of public employment is even larger in all specifications. Therefore, the results in Table 9 confirm the validity of the instrument.

In summary, I find in this chapter that public employment crowds in private employment in Turkey, mainly through non-tradable sector. These results are opposed to previous results which use similar methodology for developed countries (for example, Faggio and Overman, 2014 and Senftleben-König, 2014) but similar to results for developing African countries (Razzani and Tuccio, 2017). On the other hand, unlike Razzani and Tuccio (2017), the positive multiplier effect works only through non-tradable employment. Hence, it can be concluded that the direction and magnitude of public employment multiplier on private employment depends on the country context and the evidence from developed countries that public employment crowds out private employment is not universally valid.

Table 9: Impact of Public Employment on Private Employment (IV, excluding Istanbul and Ankara)

	-1	-2	-3	-4
VARIABLES	private emp	Non-trad emp	Tradable Emp	Self -Emp
Public Emp.	0.63063559***	0.69405734***	-0.03872484	-0.0256589
	[0.145]	[0.152]	[0.058]	[0.046]
Observations	158	158	158	158
R-squared	0.80008412	0.71466313	0.67952212	0.59664376
	-5	-6	-7	-8
	private emp	Non-trad emp	Tradable Emp	Self -Emp
Public Emp.	0.37362911***	0.29749060**	0.07069247	0.01934906
	[0.124]	[0.116]	[0.082]	[0.039]
Population (Log)	-1.1735095***	-0.9672311***	-0.20406124	-0.04043603
	[0.322]	[0.302]	[0.227]	[0.107]
Growth of Population	0.16279395	0.11126971	0.17752649	-0.12552716
	[0.455]	[0.340]	[0.184]	[0.099]
Real GDP per capita	0.00005640***	0.00007085***	-0.0000142	0.00000021
	[0.000]	[0.000]	[0.000]	[0.000]
Growth of per capita GDP	0.44044674**	0.73084101***	-0.2386180**	-0.0734446
	[0.199]	[0.175]	[0.120]	[0.050]
College share	0.03037605	-0.02303784	0.04170436**	0.01034027**
	[0.027]	[0.015]	[0.018]	[0.005]
Observations	158	158	158	158
R-squared	0.85811031	0.82585326	0.77268068	0.65659224

Notes: All regressions include time and province fixed effects. Standard errors clustered at province level in parenthesis. *,** and *** denote significance at 1, 5 and 10 percent, respectively. Lagged values of logarithm of population, real GDP per capita and college share among all workers are used.

As I discussed in section 4.2, the sign of the multiplier depends on the relative magnitude of forces that work in opposite directions. In the case of Turkey, the positive spillover effects through extra demand of new public employees dominates the forces that crowds out private employment. These results are in line with Aldan et al (2017) who find that the multiplier effect of manufacturing employment on local non-tradable employment is much larger in Turkey compared to previous results for developed countries. Several factors might be behind these results. First, saving rates are quite low in Turkey. Hence, new employees in public sector might consume a large

proportion of their income and increase demand for local services. Second, the elasticity of labor supply in Turkey might be higher for several reasons. Low social expenditures and unemployment benefits and low labor force participation may increase the labor supply elasticity.[29] Besides, agriculture still has a considerable employment share in Turkey and people move from rural to urban areas for non-agricultural jobs, increasing the amount of labor supply in non-agricultural sectors.

In order to test whether labor supply elasticity affects the magnitude of the multiplier, I divide provinces into two groups based on the share of agriculture share in total employment. I also form two groups based on non-agricultural labor force participation rate. Then I re-estimate the regressions in the group of provinces with high and low share of agriculture in employment and labor force participation rate.[30] Besides, multiplier effect may increase with unemployment rate as unemployed people will be more inclined to accept job offers in the case of low unemployment benefits as in Turkey. Unfortunately, province level labor market indicators are not available in Turkish Labor Force Survey. Hence, I use the results of 2011 Population and Housing Census conducted by TURKSTAT in order to obtain labor market indicators. For each indicator (agriculture share in employment, non-agricultural labor force and unemployment rates) I calculate the median for 2011 and then divide the sample into two parts using the median as the cut-off point.

The results of OLS and IV regressions are presented in Table 10. In both OLS and IV regressions, the multiplier effect of public employment is significantly positive in provinces with high agriculture share in employment, low labor force participation and high unemployment rate. On the other hand, there is no significant impact of public employment on private employment in provinces with low share of agriculture in employment, high labor force participation rate and low unemployment rate. Besides, the difference between multiplier coefficients is quite large between provinces with high and low non-agricultural unemployment rates. These results suggest that public sector

[29] The amount of total social expenditures and unemployment benefits as percent of GDP is quite low compared to OECD average. Source: OECD Social Expenditure database, https://stats.oecd.org/Index.aspx?DataSetCode=SOCX_AGG#, retrieved Novemnber 29 2017.

[30] It can be argued that inactive people will not supply labor anyway and hence low labor force participation cannot be a proxy for elastic labor supply. However, Aldan and Gürcihan-Yüncüler (2014) shows that extra generated employment causes non-participants to employ suggesting that inactive population, at least partially, is ready to supply labor in case of labor demand growth.

employment has higher crowding in effect on private sector employment in more elastic local labor markets.

Table 10: Public Employment Multiplier and Local Labor Market Characteristics

		OLS	IV
Agriculture Share in Total Employment	High	0.42707684**	0.30128980**
		[0.194]	[0.148]
	Low	0.36926340	0.27414777
		[0.230]	[0.173]
Labor Force Participation Rate (non-agriculture)	High	0.31914534	0.23146157
		[0.217]	[0.160]
	Low	0.41506052*	0.26943021*
		[0.211]	[0.160]
Unemployment Rate (non-agriculture)	High	0.57614621**	0.43638806**
		[0.255]	[0.204]
	Low	0.14643293	0.08939606
		[0.208]	[0.155]

Notes: All regressions include time and province fixed effect, lagged population, growth rate of population, log of real GDP per capita, growth of GDP per capita and share of college graduates in working age population. Standard errors clustered at province level in parenthesis. *, ** and *** denote significance at 1, 5 and 10 percent, respectively.

4.5. DISCUSSION

Turkey has a young and growing population and employment creation is particularly important to turn this demographic chance into an advantage. Governments have several options to support employment growth such as transforming labor market regulations towards a more flexible labor market, decreasing labor costs to employers, for example via declining tax wedge or providing financial incentives to firms for employment generation. Increasing public employment is one of these policy tools. Public sector is the biggest employer in labor market and hence government can increase total employment via creating public employment directly. On the other hand, public employment decisions may have significant effects on private employment as well. There are various channels that cause public employment to crowd in or crowd out private employment. While increased demand to local services due to new public workers crowds in private employment, rising taxes in order to finance public employment, public provision of previously privately provided services, increase in reservation wage due to public wage premium and job security may cause crowding out of private employment as a result of public employment growth.

Identifying the net effect of public employment on total employment will increase our understanding of the labor market and will guide policy makers who try to foster employment generation. In this paper, I estimate the causal impact of public employment on private employment using the most recent technique based on Faggio and Overmann (2014). The technique uses regional variation in public employment intensity and uses an instrumental variable methodology which uses nationwide employment decision of the government as an exogenous shock to local labor markets.

Unlike previous studies on developed countries and similar to results for developing countries, I find that public employment crowds in private employment. Therefore, the results in this chapter suggest that, the sign and magnitude of the effect of public employment on private employment depends on country characteristics. One possible explanation of differences in the magnitude of multipliers between countries may be differences in elasticity of labor supply. The crowding in channel may be stronger in economies with an elastic labor supply. I test this possibility by conducting the analysis separately for provinces with high and low agriculture share in employment, labor force participation rate and non-agricultural unemployment rate. High agricultural share in employment and non-agricultural unemployment rate and low non-agricultural labor force participation rate can be considered indicators of elastic labor supply. I find that the positive public employment multiplier effect comes from regions where labor supply elasticity can be regarded as relatively more elastic.

Further research may analyze the effects of institutional settings and other labor market characteristics on the magnitude of public employment multiplier, both in a cross country and within country setting. Besides, identifying alternative channels where public employment crowds in or out private employment is of particular importance in order to fully understand local labor market dynamics and policy design. In that respect, provision of regional data should be improved. Data for smaller local units with more details on individual characteristics are necessary to improve the quality of further research. Finally, the analysis of this study focuses on only formal employment due to data availability. Given that informality is widespread in Turkish labor market, data on informal workers at province level will improve the understanding of multiplier effects in Turkey.

The finding that public employment does not crowd out public employment in Turkey suggests that public employment generation cannot be seen as harmful for total employment generation automatically. On the other hand, the positive multiplier effect of public employment does not mean that increasing public employment is the best option for employment generation. Best policy option for increasing employment should be decided by comparing the costs and benefits of different employment generation schemes. Finally, the finding that public employment multiplier is large and significant in provinces with high non-agricultural unemployment rate suggests that any increase in public employment should favor regions with higher unemployment rates if the objective of this increase is to generate employment in private sector.

CHAPTER 5

IMPACT OF MINIMUM WAGE ON WAGE MISREPORTING IN TURKEY: EVIDENCE FROM MINIMUM WAGE HIKE IN 2016

5.1. INTRODUCTION

Minimum wage is at the hearth discussions among politicians and policy makers as well as researchers. Around a century after its introduction in Australia and New Zealand in late 19th century, minimum wage became common in most of the countries (Neumark and Wascher, 2008). Nationwide minimum wage is implemented in Turkey since 1968 although legislations for wage floor for specific occupations started even as early as the beginning of 1800s (Güven et al, 2011).[31] The aim of minimum wage is to assure workers to get a fair salary for their work and not to fall into poverty. Determining the level of minimum wages has always became a hard topic in Turkey as different interest groups are effected in opposite directions. Trade unions complain about the low level of minimum wage and ask for significant hikes. On the other hand, employers emphasize the role of labor costs on competitiveness and try to curb minimum wage increases.

Although the aim of minimum wage scheme is to fight poverty for low income workers, it may have negative impact on employment and make workers even worse. This possible side effect triggered both theoretic and empirical research on the employment effects of minimum wages. Different theories predict alternating employment responses to minimum wages.[32] In the basic neoclassical model, minimum wage will reduce employment if it is set above the equilibrium wages due to decline in production as a result of increased prices (scale effect) and substitution of labor with capital (substitution effect). If the neoclassical assumptions of full coverage of minimum wage (for example no informality) or homogenous worker are relaxed, the effect on total employment is ambiguous; employment in effected groups (less skilled and covered by minimum wage legislation) declines whereas employment in non-effected group can

[31] The history of minimum wage implementation in Turkey is discussed in more detail in Chapter 2, section 2.4.

[32] Brown (1999) and Neumark and Wascher (2008) provide a comprehensive discussion on employment effects of minimum wage in alternative theories.

increase. On the other hand, monopsony models or models those assume some degree of market power of firms in labor markets predict positive impact of minimum wage on employment. Hence, estimating the employment effect of minimum wages has been also considered as tests of validity of alternative models. As a result, there is an extensive empirical literature which tries to identify the causal effect of minimum wage on employment.

Several techniques have been used to analyze the employment effects of minimum wages.[33] Although the earliest studies used a quasi-experimental framework and compared employment of effected and non-effected groups after the minimum wage hike, time series studies dominated the empirical literature before 90s (Kennan, 1995). In 90s, literature on minimum wage effects started to use different techniques. Neumark and Wascher (1992) triggered the empirical literature using panel data techniques which augment the time series analysis by including geographical variation.

Another strand of the literature compares the labor market outcomes of regions that are affected by minimum wage hike with the outcomes of regions where there is no minimum wage increase, after seminal paper by Card (1992a) in a differences-in-differences setting. Card (1992a) analyzes the employment effect of minimum wage rise in California and argues that minimum wage increase did not have a detrimental effect on employment in California compared to other states with no minimum wage hike. This type of analysis is mostly done in the US where minimum wages are determined in state level, in addition to federal minimum wages. However, in most of the countries, and in Turkey, minimum wage applies nationwide and region specific case studies cannot be done. On the other hand, as Card (1992b) shows, regions within a country are affected differently by a national minimum wage increase and this variation can be exploited in analyzing the effect of an increase in national minimum wages.

Besides employment, empirical literature studied different impact of minimum wage on different outcomes. One straightforward extension is the analysis of the effect on working hours firms may also adjust working hours in addition to employment. Couch and Wittenburg (2001) find that minimum wage negatively effects teen working hours and this effect is higher compared to effect on teen employment. Another interesting

[33] For a detailed discussion, see Neumark and Wascher (2007).

question is that whether minimum wage reduces poverty. Neumark and Wascher (2002) find that minimum wages help poor families escape poverty but also cause some non-poor families to fall into poverty due to job losses and the second effect is larger. They also find that minimum wages increase the income of families that remain poor. Autor et al (2016) find that minimum wage has a positive contribution in reducing income inequality.

Another interesting area of research is the linkage between minimum wages and employment-enrollment choice of teenagers. Neumark and Wascher (1995) find that rises in minimum wage reduces the school enrollment rates as teens prefer to search jobs with higher minimum wages instead of education. Employers on the other hand substitute low skilled employees with high skilled ones who leave school. Rise of minimum wage also change the individuals' preferences by increasing the reservation wages permanently (Falk et al, 2006).

There is also empirical research on the effects of minimum wages in different firm outcomes. Lemos (2008) reviews the literature on price effects of minimum wages and conclude that increase in minimum wage has a limited inflationary effect. Draca et al. (2011) find that profitability declines after minimum wage hike in firms with higher intensity of minimum wage earners. Riley and Bondibene (2017) find that firms respond to minimum wage hike by raising labor productivity. Haepp and Lin (2017) find that increase in the minimum wage reduce firms' human capital investment in the form of worker training whereas it has no effect on physical capital investments. Gan et al (2016) argues that rise in minimum wage reduces both probability of exporting and the volume of export (conditional on exporting) in Chinese firms, due to reduced competitiveness in the international market.

One possible channel for firms to overcome detrimental consequences of minimum wage hike is wage misreporting, which did not attract much academic interest. Wage misreporting can be in two forms; under or over reporting. Firms or employees may choose underreporting in order to evade tax wedge (including social security premium) on labor income. Underreporting is common in developing countries and Turkey is no exception (World Bank, 2010).On the other hand, firms may over report if they have to employ some amount of workers formally to comply with regulations or to obtain contributions from the government but actually pay less than minimum wage. Although

there is no study on wage over reporting, anecdotal evidence suggests that there might be some degree of over reporting in Turkish labor market.[34] Increase in minimum wage may have opposite effects on over and under reporting. The degree and intensity of underreporting may decline if the actual wages do not rise in the same amount as minimum wage. On the other hand, over reporting may increase if firms do not increase the actual wages of their employees who initially earn around the minimum wage in the same amount of minimum wage hike.

There is a thin literature on estimating the degree of misreporting using household data, pioneered by Pissarides and Weber (1989) who aims to estimate the amount of tax evasion due to underreporting. Merikull and Staehr (2010) estimate the prevalence and analyze the determinants of wage underreporting in three Baltic countries, using data from face-to-face interviews with around 900 employees. Williams and Padmore (2013) conducts a similar research for the European Union using a survey of around 27000 face-to-face interviews. Using the same survey results, Williams (2012) compares the underreporting rates among South Eastern European countries and argues that underreporting is less prevalent in countries with more state intervention. Regarding Turkey, Pelek and Uysal (2018) compares the results of Labor Force Survey (LFS) conducted to individuals and Structure of Earnings Survey (SES) conducted to firms in order to estimate the prevalence of underreporting. More specifically, they run a Mincerian wage equation in LFS and input the predicted wages from this regression in SES and then compare the wages reported by firms. Their findings suggest that underreporting causes a 20 percent loss in payroll tax loss in the formal sector. To the best of my knowledge, there is no literature analyzing prevalence and determinants of wage over reporting.

Recent studies analyze the effects of regulation changes, such as minimum wage increase or changes in the social security system, on underreporting behavior in a difference in differences setting. Tonin (2011) finds that minimum wage hike in Hungary reduced underreporting and caused a decline in disposable income of workers, by using a consumption panel of households. Kumler et al (2013) compare group averages of incomes for young and old workers using two datasets; household survey

[34] Even the Minister of Labor and Social Security accepts the possibility of over reporting, see https://www.yeniasir.com.tr/ekonomi/2017/05/17/uyanik-isverenin-asgari-ucret-oyunu-bozuldu (retrieved, January 17, 2018).

where income is reported by employees and administrative data where firms report wage bills. They analyze the effect of a pension reform in Mexico which effectively tied pension payments to reported wages. They show that, after the reform, underreporting declined among younger workers who were affected by the reform. Bergolo and Cruces (2014) use the responses to a direct question on misreporting in a household survey in Uruguay and find that a considerable share of workers' wages are underreported. They also analyze the effects of a health reform which increased contribution for dependent children in a differences-in-differences setting. They find that the health reform caused a rise in underreporting of wages of workers with children.

In the last years, minimum wage has generally been determined in line with inflation and productivity growth and hence real minimum wages did not increase sharply, except for 2004 and 2016 (Figure 11, Chapter 2). The rise in 2004 was used to analyze the effects of minimum wages by several papers in a differences-in-differences setting. Gürcihan-Yüncüler and Yüncüler (2016) find that minimum wage hike in 2004 caused informality and working hours to rise but did not have significant effect on employment level. They also find that minimum wage hike effects wages in the informal sector as well, which is referred as "lighthouse effect" and found in other developing countries. Papps (2012) uses administrative data and finds a negative impact of minimum wage increase in 2004 on workers' probability of remaining employed formally. Bakış etal (2015) find that secondary education enrollment rate in regions with higher minimum wage intensity increased. They argue that minimum wage hike relaxed financial constraints of low income countries and they could afford their children's schooling. The effect of the minimum wage hike in 2016 was analyzed by Çapar-Diriöz and Ercan (2017). They find that minimum wage increase in 2016 had no effect on overall employment but negative effect on formal employment, in line with the findings of Gürcihan-Yüncüler and Yüncüler (2016).

Last but not least, there are also studies using time series and panel data techniques in order to analyze the relation between minimum wage and Turkish labor market. Güven et al (2011) use cointegration analysis and cannot find any long run relation between minimum wage and employment. Pelek (2015) conduct a regional panel data analysis and finds that minimum wage has no effect on employment but increases informality among young people.

In this chapter, I contribute to literature on the effects of minimum wage in Turkey using the hike in 2016. I aim to analyze the effect of minimum wages on wage over reporting, which was never studied in Turkey or in any other country context, to the best of my knowledge. I use differences in differences methodology exploiting variation in responsiveness to minimum wage increase among regions and industries. In addition, I analyze the determinants of wage over reporting. The results suggest that minimum wage increase in 2016 caused increase in over reporting. The chapter proceeds as follows. In the next section, I discuss the empirical strategy and in section 5.3 I provide data and descriptive statistics. In section 5.4, I provide estimation results and finally section 5.5 concludes.

5.2 EMPIRICAL METHODOLOGY

In this chapter, I use the variation in the bite of minimum wage among groups in Turkey. Minimum wage in Turkey is applied nationwide for all type of workers and hence it is impossible to have a natural experiment where affected and non-affected groups in the society are compared in a quasi-experimental setting. On the other hand, the effect of minimum wage rise on different segments in the economy varies due to differences in the share of workers affected by minimum wage. Following the seminal paper by Card (1992.b), many studies use this variation to analyze the effect of minimum wage increase.

Card (1992.b) makes use of the geographical variation in minimum wage intensity in the US. He uses the share of workers who are affected by federal minimum wage in each state to estimate the effect of federal minimum wage increase in 1989. Several papers use different partitions such as geography, industry, occupation, age and education (Stewart, 2002). In studies regarding Turkey, Gürcihan-Yüncüler (2016) uses industry-occupation and Çapar-Diriöz and Ercan (2017) uses education group-age group partitions. In this study, I use the variation in the fraction of workers affected by minimum wage in industry-region groups to analyze the effect of minimum wage increase on wage over reporting.

In summary, I estimate the equation below, using ordinary least squares method for the period of 2015-2016;

$$O_{ijt} = \alpha + \delta Year_t + \phi Fr_j + \beta\left(Year_t * Fr_j\right) + \gamma X + \varepsilon_{ijt} \quad (8)$$

where O_{ijt} is a dummy variable which takes the value of 1 if the individual *i* in region-industry group *j* at year *t* has over reported wage. $Year_t$ denotes year dummy and takes the value of 0 for 2015 and 1 for 2016. Fr_j is the fraction of workers affected by minimum wage in group *j*.

The variable of interest in equation (8) is the interaction term $\left(Year_t * Fr_j\right)$ and the coefficient β measures the impact of minimum wage increase on over reporting. Positive β means that over reporting in group *j* increased more if the fraction of workers affected by minimum wage hike was larger in that group. Finally, X is a vector including other variables that may be determinant of over reporting behavior. Individual level variables such as age, gender, education, and firm size are included in X. In addition, industry level value added, region level unemployment rate and region, industry and occupation fixed effects. In all regressions, standard errors are clustered at region-industry level and population weights provided by TURKSTAT are used.

5.3. DATA AND DESCRIPTIVE STATISTICS

In this study, I use the data from 2015 and 2016 waves of household labor force survey (LFS) conducted by Turkish Statistical Institute (TURKSTAT). I restrict the data to wage earners who have a permanent and full time job and are covered by social security and exclude the public sector. According to labor law in Turkey, a formal worker who worked full time in a month should be paid at least the minimum wage. Hence, I construct the dependent variable by comparing the self-reported wages of workers with the minimum wage.

In constructing the under reporting variable, I drop observations with income less than the half of the minimum wage of 2015, inflated by consumer price index in 2016. The reason for not using separate thresholds for each year is that dramatic rise in minimum wage in 2016 will also affect the threshold and will cause over trimming of under reported observations. The dependent variable is a binary variable which takes the value of 1 if the reported wage is above the threshold and below 90 percent of the minimum wage and is zero if the reported wage is more than 90 percent of the minimum wage. I also define another dependent variable which takes the value of 1 if

the reported wage is above the threshold and below 90 percent of the minimum wage and zero if the wage of the worker is around the minimum wage (within 10 percent neighborhood). In this case, I focus on the low wage earners who are presumably the target group for over reporting.

The variable of interest is constructed by the fraction of workers who are affected by the minimum wage increase. In line with Card (1992.b), I construct the dependent variable as the share of workers who earn between the minimum wages of 2015 and 2016 with a 10 percent of error margin. That is, a worker is considered to be affected by the minimum wage increase if his/her wage in 2015 lies between 90 percent of minimum wage in 2015 and 110 percent of minimum wage in 2016. Alternatively, I also use the share of workers who earn around the minimum wage of 2015 (between 90 percent and 110 percent of the minimum wage) in 2015 as a measure of the fraction of effected workers. I construct the share for each group based on industry and region. There are 19 industries and 26 regions in the survey. Besides continuous version of the variable, I also provide results with binary treatment variable where the treatment dummy takes the value of 1 for industry-region groups if the fraction of effected workers above the median.

In the regressions I include worker characteristics such as age, gender and years of education as determinants of under reporting. In the LFS, education is defined as schooling levels. I use the following method to convert levels into years of education. Illiterate workers are assumed to have zero years of education, literature workers who did not finish any kind of school are assumed to have 3 years education. Primary education, secondary and high school graduates are assumed to have 5, 8 and 11 years of education, respectively. Workers who have higher level diploma then high school are assumed to have 15 years of education. Firm size categories are also included in the regressions where 4 categories represent the firms that have 1-10, 10-24, 25-49 and 50+ employees, respectively. All regressions include region, industry and occupation dummies as well.

Table 11 presents the descriptive statistics for dependent, independent and main control variables for 2015 and 2016. The variable over reporting (1) takes the value of 1 in the case of over reporting and 0 for all other formal workers. The variable over reporting (2) takes only low wage earners, whose income is less than 110 percent of

the minimum wage. In 2015, 1.9 percent of all formal workers and 5.7 percent of formal low wage earners reported that their wages were lower than the minimum wage. In 2016, these ratios went up significantly; over reporting more than doubled among all workers and almost doubled among low wage earners.

Table 11: Descriptive Statistics for 2015 and 2016

	2015				2016			
	Mean	Min	Max	Obs.	Mean	Min	Max	Obs.
Over reporting (1)	1.90%	0	1	62581	4.00%	0	1	62638
Over reporting (2)	5.70%	0	1	23292	11.10%	0	1	25733
Fraction effected (1)	33.90%	0	1	23292				
Fraction effected (2)	60.70%	0	1	23292				
Low Wage Earners								
Female	34.30%	0	1	23292	32.70%	0	1	25733
Age	33.4	17	89	23292	33.8	17	90	25733
Education	8.5	3	15	23039	8.6	3	15	25501
Size				23292				25733
1	36.90%	0	1	23292	35.90%	0	1	25733
2	8.10%	0	1	23292	9.20%	0	1	25733
3	22.40%	0	1	23292	21.50%	0	1	25733
4	32.60%	0	1	23292	33.50%	0	1	25733
All Wage Earners								
Female	27.30%	0	1	62581	27.80%	0	1	62638
Age	34.9	17	89	62581	35.2	17	100	62638
Education	10.1	3	15	62277	10.2	3	15	62358
Size								
1	28.20%	0	1	62581	27.30%	0	1	62638
2	8.10%	0	1	62581	8.60%	0	1	62638
3	22.70%	0	1	62581	21.40%	0	1	62638
4	41.00%	0	1	62581	42.60%	0	1	62638

Notes: Over reporting (1) represents the share of over reporting over all workers and over reporting (2) represents the share of over reporting among low wage earners. Fraction effected(1) represents the ratio of workers who earned around the minimum wage of 2015 in 2015. Fraction effected(2) represents the ratio of workers who earned between minimum wages of 2015 and 2016 in 2015.

In terms of absolute figures, there were around 227 thousand workers whose wages were over reported in 2015 and this number rose to 505 thousand people in 2016. This suggests that, first, the under report variable does not just represent any measurement error in wage data as there is no reason to have a change in measurement error between two years. Second, almost doubling of under reporting ratio gives suggestive evidence on the effect of minimum wage on misreporting. Turning to main independent

variables, we see that on average, 34 percent of workers earned around minimum wage of 2015 (variable fraction effected 1) and 61 percent of workers earned between minimum wages of 2015 and 2016 (variable fraction effected 2) in industry-region groups, in 2015.

Descriptive statistics of control variables suggest that there is not a dramatic change between worker characteristics between 2015 and 2016, both for the sample of all wage earners and for the sample of low wage workers. In both samples, average age and years of education increased slightly and the share of smallest firms (size 1) declined in 2016. On the other hand, the share of female workers in low paid jobs declined whereas the female share in all jobs went up. In both years, low wage earners are less educated and younger and work more in smaller firms. Besides, the share of women in low paid jobs is higher than the national average. Finally, number of observations in low wage earners increased by more than 10 percent whereas total number of observations increased only slightly.[35] This means that, the dramatic rise in the minimum wage caused the share of low wage earners to increase. Hence, the rise in the share of over reported wages among low wage earners would be even higher if there would be no such composition change.

5.4. EMPIRICAL RESULTS

The section starts with analyzing the determinants of over reporting before I present the results of equation 8 for two reasons. First, it will be informative to see which segments of population is under the risk of over reporting since this issue has not been analyzed before. It should be noted that the coefficients of these determinants do not necessarily point out a causal relation. Second, if the probability of over reporting is correlated with worker characteristics, it means that the over reporting figures that were presented in Table 11 do not merely come from reporting errors.

In order to investigate the determinants of over reporting, I regress over reporting in 2016 to worker characteristics (age, gender, and education), firm size and the set of industry, region and occupation dummies. Table 12 presents the regression results

[35] This difference is not an artifact due to sampling design but is also valid in the weighted population figures. In 2016, the number formal wage earners who earn at most 110 percent of the minimum wage increased by 14.3 percent compared to 2015 whereas the rise in total number of wage earners was only 2.7 percent.

both for the whole sample and for the sample of low wage earners. Over reporting is more prominent among young, women and less educated workers. In that respect, over reporting is another problem among disadvantaged groups in the labor market who have low employment rate, high informality and low income (World Bank 2014). The results for education and age are in line with Williams Padmore (2013), who find that underreporting is more prevalent among young and less educated workers. On the other hand, they find that men are more likely to have underreported wages whereas our results suggest the opposite for over reporting. Over reporting is higher in smaller firms, in line with the earlier studies who find underreporting is more common in small firms, such as Kumler et al (2013) and Bergolo and Cruces (2014).

Table 12: Determinants of Over Reporting

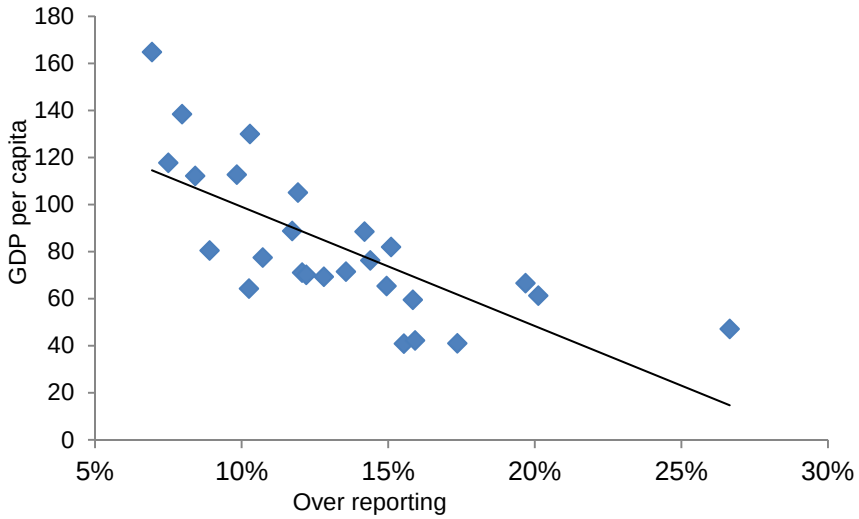
		Whole Sample		Low Wage Earners	
		Effect	Std. Error	Effect	Std. Error
Years of Education		-0.004	0.000	-0.004	0.001
Age		-0.001	0.000	-0.002	0.000
Female		0.032	0.002	0.041	0.005
Size					
	2	-0.027	0.004	-0.044	0.008
	3	-0.032	0.003	-0.054	0.006
	4	-0.041	0.003	-0.072	0.006

Notes: All coefficients are significanat at 1 percent. Regressions include region, industry and occupation dummies. Robust standard errors are used.

Next, I show that the geographical and sectorial distribution of over reporting is not random. Figure 19 presents the scatter plot of regional over reporting rate among low wage earners with per capita GDP. There is a clear negative correlation between regional income and over reporting, again suggesting that over reporting variable is not merely a measurement error Workers in underdeveloped regions may have to accept having actual wages below the minimum wage due to lack of enough jobs. On the other hand, workers in these regions may accept over reported wages because price level is lower in these regions and wages below the minimum are enough for living. In fact, the correlation between regional purchasing power parity and over reporting is very similar to the correlation in figure 19.[36]

[36] The figure is available upon request.

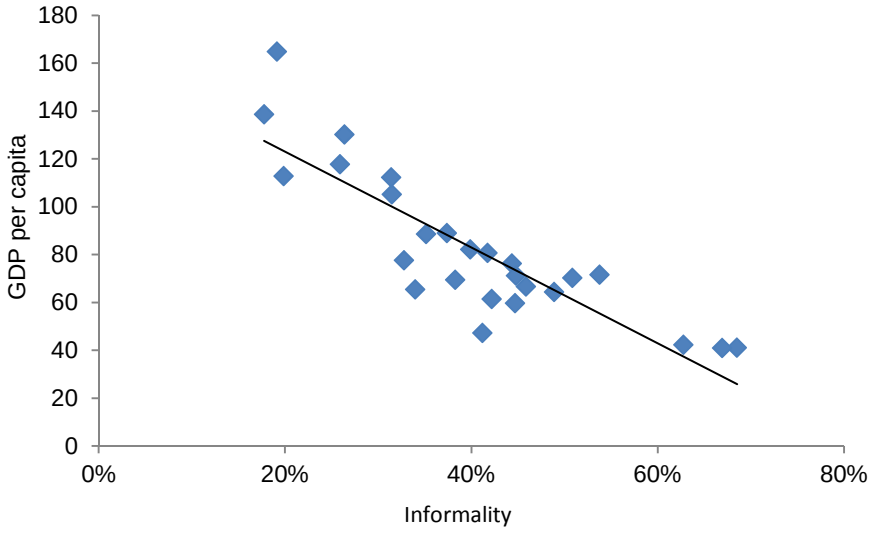
Figure 19: Regional Over Reporting Rate and per capita GDP



Notes: Data for 2014 is used for per capita GDP and the data points show relative income to national average.

The correlation between over reporting and per capita GDP is very similar to the correlation between informality rate and per capita GDP, as is shown in Figure 20. Hence, workers in the underdeveloped regions are less likely to find formal job and they cannot enjoy the benefits of minimum wage legislation even if they find a job. Therefore, regional policies to combat with informality should include wage misreporting as well. Audits should not consider only informality but should also take wage misreporting into account. In addition, regional minimum wage might reduce both informality and misreporting.

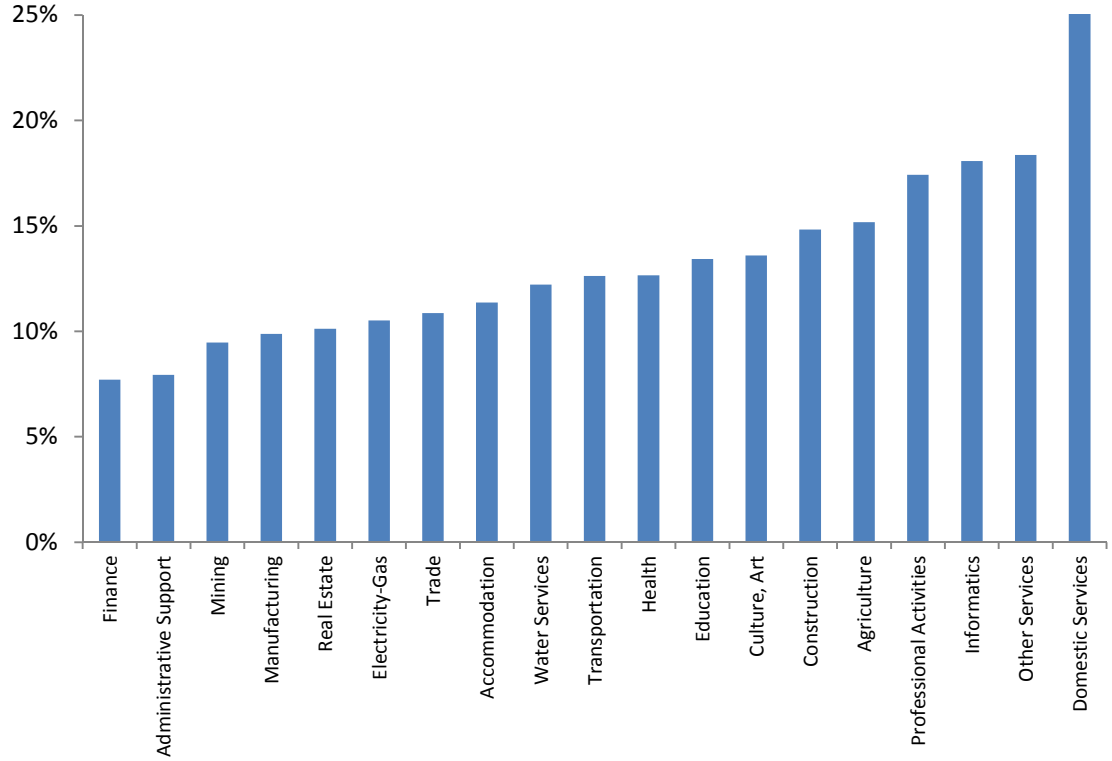
Figure 20: Regional Informality Rate and per capita GDP



Notes: Data for 2014 is used for per capita GDP and the data points show relative income to national average.

In figure 21, I show the over reporting rate by industries in 2016. The figure is in ascending order with respect to over reporting among low wage earners. There is a significant variation in over reporting ratio among industries with smallest rates in finance and administrative support (around 8 percent) and highest rate in domestic services (34 percent) followed by other services and informatics (around 18 percent).[37] This variation also suggests that over reporting variable is not a measurement error which is distributed randomly among industries.

Figure 21: Over reporting among industries



Having shown that the over reporting variable I have created does not only come from measurement error and varies with individual characteristics, regions and industries, I turn to estimating the effect of minimum wage on over reporting. Table 13 presents the regression results of equation 8. In the upper left panel, I present the estimation results for the full sample. In the first four columns, the results for the full sample of formal workers are presented. Regardless of the measure of fraction of effected workers, the results show that the effect of minimum wage increase in 2016 is significantly positive;

[37] For visual reasons, vertical axis in figure 21 is limited to 25 percent.

the rise in over reporting rate in industry-region groups is positively correlated with the intensity of workers earning around minimum wage of 2015 (fraction effected 1) or earning between the minimum wages of 2015 and 2016 (fraction effected 2). This positive effect is robust to inclusion of individual characteristics; namely age, gender and years of education and firm size as control variables. In columns 5-8, I repeat the same exercise for the sample of low wage earners and obtain similar results.

Table 13: Effect of Minimum Wage Rise on Over Reporting

Continuous Dependent Variable								
	Full sample				Low Wage Earners			
	Fraction Effected 1		Fraction Effected 2		Fraction Effected 1		Fraction Effected 2	
	-1	-2	-3	-4	-5	-6	-7	-8
Effect	0.096***	0.097***	0.056***	0.056***	0.085***	0.083***	0.041**	0.040*
	[0.010]	[0.010]	[0.006]	[0.006]	[0.030]	[0.030]	[0.021]	[0.021]
Control Variables	No	Yes	No	Yes	No	Yes	No	Yes
Binary Dependent Variable								
	Full Sample				Low Wage Earners			
	Fraction Effected 1		Fraction Effected 2		Fraction Effected 1		Fraction Effected 2	
	-1	-2	-3	-4	-5	-6	-7	-8
Effect	0.013***	0.014***	0.013***	0.013***	0.013*	0.013*	0.001	0.001
	[0.003]	[0.003]	[0.003]	[0.003]	[0.008]	[0.008]	[0.008]	[0.008]
Control Variables	No	Yes	No	Yes	No	Yes	No	Yes

Notes: Fraction effected 1 represents the ratio of workers who earned around the minimum wage of 2015 in 2015. Fraction effected 2 represents the ratio of workers who earned between minimum wages of 2015 and 2016 in 2015. *, ** and *** represents significance at 1%, 5% and 10%, respectively. Cluster robust standard errors with respect to industry-region groups in brackets. All regressions include region, occupation and industry dummies. Control variables include age, education, gender and firm size.

Bottom panel of Table 13 presents the regression results where binary dependent variables are used. The coefficients can be interpreted as the difference between changes in over reporting in minimum wage intensive region-industry groups (lower than the median) compared to less intensive groups. The positive and significant coefficients in the first four columns reveal that, over reporting in industry-region groups with high share of workers earning around minimum wage of 2015 or between minimum wages of 2015 and 2016 increased more compared to regions with low share of workers earning around minimum wage. Positive results are obtained for the sample of low wage earners in columns 5-8 although the coefficients are not significant if the

share of workers earning between two minimum wages are used to create treatment and control groups.

In summary, estimation results suggest that over reporting is a problem among low wage earners. Low educated, young and female workers are more likely to suffer over reporting and the degree of over reporting increased after the minimum wage hike in 2016. On the other hand, minimum wage hike might have changed underreporting behavior of firms as well. Table 14 presents suggestive evidence on under reporting.

The first column of Table 14 gives the share of workers who earn within 10 percent neighborhood of minimum wage according to labor force survey. Second column gives the over reporting measure used in this paper and the third column is the summation of first two columns. The fourth column gives the share of minimum wage earners according to administrative data of Social Security Institution (SGK). If there were no under reporting, we should expect this ratio and the share of workers who earn around or below in the LFS data should be the same. Thus, I calculate the difference of these two ratios from administrative data and survey data as a broad measure of under reporting. The last column, which is the difference between columns 4 and 3, suggests that there is a considerable share of workers whose wages are underreported. In 2015, 7.1 percent of workers earned more than the minimum wage but their earnings were recorded as minimum wage by the firms. It should also be noted that this underreport measure does not take into account the workers whose wages are underreported but not reported at the minimum wage. Thus, the degree of underreporting might be even higher.

Table 14: Share of minimum wage earners, over reporting and under reporting (%)

	(1)	(2)	(3)	(4)	(5)
	around minimum wage	Over report	around or below minimum wage	minimum wage	under report
Source:	LFS	LFS	(1)+(2)	SGK	(4)-(3)
2015	29.6	1.9	31.5	38.6	7.1
2016	31.2	4	35.1	40.9	5.8
Difference	1.6	2.1	3.6	2.4	-1.3

Source: Labor Force Survey, Social Security Institution (SGK) Annual Statistics

The difference between 2015 and 2016 suggest that firms reacted to minimum wage hike by increasing the share of minimum wage earners (1.6 percentage points) suggesting that some of the workers who earned between two minimum wages in 2015 earned minimum wage in 2015. The rate of over reporting increased by 2.1 percent and as a result, the share of formal workers earning around or below minimum wage increased by 3.6 percentage points. On the other hand, the share of minimum wage earners in social security records increased by 2.4 percentage points. The under reporting proxy decreased by 1.3 percentage points from 7.1 percent in 2015 to 5.8 percent in 2016. This decline in under reporting as a result of minimum wage hike is in line with earlier literature such as Tonin (2011).

5.5. DISCUSSION:

Turkey is characterized by high degree of informality like many other developing countries. Although informality in the sense of not registering to social security is widely recognized in Turkey and studied in the literature, informality also comes from wage misreporting. Firms may underreport their employees' wages in order to escape tax burden. On the other hand, firms may over report if they have to employ a minimum number of workers formally, for example to comply with regulations, but pay less than the minimum wage. Both types of misreporting reduce the benefits of jobs to wage earners. In the case of underreporting, workers gain less pension payment in retirement. On the other hand, workers do not enjoy the benefit of the minimum wage legislation if their wages are over reported. There is a tiny literature on wage under reporting but over reporting has not been analyzed yet.

This chapter is the first attempt to analyze the determinants of wage over reporting. First, I show that, probability of over reporting is correlated with worker characteristics and that disadvantaged groups in the labor market (young, female, less educated) have higher risk of over reporting. Besides, the intensity of over reporting varies among industries and regions and over reporting is a more severe problem in regions with lower per capita income and lower price levels. In that respect, over reporting resembles informality very much. Finally, the likelihood of over reporting is higher in small firms.

Second, the chapter contributes to the vast literature on consequences of minimum wage on several economic outcomes such as employment, working hours or informality. I analyze the effect of minimum wage increase on over reporting behavior in a difference in differences setting using the minimum wage increase in 2016 in Turkey as a natural experiment. The fraction of workers with over reported wages almost doubled between 2015 and 2016. Estimation results suggest that minimum wage hike in 2016 has a significant role on this rise.

The results of this study suggest that workers at the lower quantiles of the wage distribution could not fully enjoy the rise in the minimum wage in 2016 due to increase in over reporting. On the other hand, over reporting might have helped firms to get rid of destructive effects of minimum wage hike and curbed employment losses. Therefore, the net effect of over reporting on the welfare of low income earners is ambiguous. Further research should analyze the total effect of minimum wages on labor market indicators such as employment, wages and over reporting in a structural model.

Another channel that firms might have used to deal with minimum wage increase is underreporting. There is suggestive evidence that a considerable fraction of workers wages' are underreported in Turkey, in line with earlier findings of Pelek and Uysal (2018). In addition, the intensity of underreporting seems to have declined after minimum wage increase due to the rise in the share of workers earning around the minimum wage. It should be noted that the definition of underreporting used in this paper only considers the workers who earn more than minimum wage but whose wages are recorded at the minimum wage. Further research should also analyze the causal effect of minimum wage increases on under reporting.

The results of this chapter suggest that policy makers should consider informality in the form of wage misreporting in addition to informality in the form of non-registered employment to social security system. An obvious policy implication is that, auditing capacity of social security institution should be improved in order to reduce wage misreporting. Audits should focus on groups with higher risk of wage misreporting, such as small firms or under developed regions.

In addition, the results suggest that policy makers should think the effect of misreporting on policy effectiveness in designing wage policies. For example, the results suggest that workers in less developed regions cannot find formal jobs easily and even if they can find a formal job, they cannot earn the minimum wage. Higher level of both informality and over reporting in less developed regions suggests that regional minimum wages instead of a nationwide one may be considered.[38] Or, the rise in over reporting in 2016 after the minimum wage hike suggests that low wage earners could not fully enjoy the rise in minimum wage and other policies could be considered to fight poverty. Finally it should be noted that, policy makers should consider all effects on the economy and society through various channels in designing wage policies including minimum wage.

[38] Introducing a regional minimum wage system may have impacts on several social and economic outcomes other than misreporting. These impacts should be investigated carefully before any change in the minimum wage system.

CHAPTER 6

CONCLUSION

Turkey has a young and growing population, which brings a chance for sustainable growth in the future. In order to make use of this demographic window, labor force participation and employment rates must increase. Furthermore, employment creation should be through decent jobs, which are formal and which pay fair wages to employees so that they do not all into poverty. This thesis focused on these challenges in the Turkish labor market.

Female labor force participation is extremely low in Turkey compared to OECD average. However, significant improvement was achieved in the last decade. The government implemented several policies for this aim; enrollment rates increased in all levels of education thanks to physical and human capital investments, gender discrimination in the legal codes were abolished, positive discrimination to women were implemented to women in ISKUR's active labor market programs, enrollment rate in early childhood education although it is still very low in international standards. Gradual increase in retirement rate also supports the increase in labor force participation rate of both men and women.

Chapter 3 analyzed the determinants of the increase in female labor force participation rate in recent years. The emphasis was on identifying the contribution of cohort effects, which measure whether younger cohorts' labor force participation decision is different than the older ones and which can be considered as a proxy for changing societal values about women's employment. The results suggest that younger cohorts are more likely to enter into labor force, even after controlling for improvements in observable characteristics and that these cohort effects are the main driver of labor force participation rate rise in recent year. Cohort effects accelerated in 1980s where major structural reforms took place in Turkey towards a liberal economy. Identifying the causal impact of structural change in the economy on societal values is beyond the scope of this chapter. Further studies may focus on analyzing the relation between economic environment and societal values with a special focus on beliefs regarding women. Finally, it should be noted that cohort effects may also include change in characteristics which cannot be observed in the data and which are not related to

societal values. Hence, the results should be considered as an upper bound for change in social belief against working women. However, since the contribution of cohort effects is very large, it can be concluded that change in social values played a significant role in the rise of female labor force participation.

Improvement in educational attainment and increase in the retirement age are other factors behind in the surge of female labor force participation rate. Declining fertility also contributed to participation growth but there is no declining trend in the negative impact of having children.

The results suggest that female labor force participation will continue to rise since younger cohorts are more likely to participate. However, the pace of cohort effects lost momentum in the youngest cohorts. Therefore, campaigns to change social norms, and especially men's beliefs, against working women are needed in order to foster participation growth. Although the negative effects of child care reduced due to decline in fertility, the tradeoff between motherhood and employment is still prevalent in Turkey. Extending the enrollment rate in early childhood education is crucial for further increasing female labor force participation, especially for less educated women from disadvantaged families. Subsidized prices for child care services or income support to women who work and whose child attends a preschool facility may increase labor force participation. Flexible work arrangements should also be extended in order to curb the negative impact of child care. Finally, elder care will be an obstacle for female labor force participation in the upcoming decades as the share of elder in the population will increase and hence the capacity of elder care services should also be extended.

Turkish labor market outperformed most of the largest economies in the world in terms of job creation, especially after the financial turmoil in 2008. Several policy measures were taken to boost employment growth after the turmoil. Tax wedge on labor income was cut for all workers. Additional incentives for disadvantaged groups in the labor market, such as young and women, have also been implemented. In addition, İŞKUR implemented several active labor market policies such as vocational training or on- the job training in order to improve the employability of non-employed people. Finally, government supported employment growth directly by increasing the number of public employees.

In addition to its direct effect, public employment may indirectly contribute to employment growth by crowding in private employment as new public employees in a region will increase the demand for locally produced services or goods. On the other hand, public employment may crowd out private employment due to several reasons. Estimates in Chapter 4 suggest that public employment positively effects local private employment in the provinces of Turkey similar to results for developing countries but unlike developed countries. One possible explanation of differences in the magnitude of multipliers between countries may be differences in elasticity of labor supply. The crowding in channel may be stronger in economies with an elastic labor supply. Larger positive effects in the analysis for provinces with possible indicators of local labor supply elasticity e.g. higher unemployment rate, higher share of agriculture in employment and lower labor force participation rate supports this idea.

The results suggest that increasing public employment cannot be harmful for labor market. On the other hand, the positive multiplier effect of public employment does not mean that increasing public employment is the best option for employment generation. Best policy option for increasing employment should be decided by comparing the costs and benefits of different employment generation schemes. Finally, the finding that public employment multiplier is large and significant in provinces with high non-agricultural unemployment rate suggests that any increase in public employment should favor regions with higher unemployment rates if the objective of this increase is to generate employment in private sector.

Turkey was not only successful in job creation but also could improve the quality of jobs. Low wage earners benefited the rise in the minimum wage in real terms. The share of informality, defined as non-registered jobs to social security system, declined substantially. However, other types of informality must also be considered for a full assessment of quality of jobs. Chapter 5 analyzed one particular type of informality; formal workers with salaries below the minimum wage namely wage over reporting.

The analysis suggest that over reporting is more prevalent among young, female and low educated workers who work in small firms. Therefore, policy makers should consider informality in the form of wage misreporting in addition to informality in the form of non-registered employment to social security system. An obvious policy implication is that, auditing capacity of social security institution should be improved in order to reduce wage misreporting. Besides, the intensity of over reporting varies among industries and regions and over reporting is a more severe problem in regions

with lower per capita income and lower price levels. Higher level of both informality and over reporting in less developed regions suggests that regional minimum wages instead of a nationwide one may be considered. Of course, introducing a regional minimum wage scheme may have several social and economic results, other than informality or wage over reporting. Further studies should investigate the total effect of introducing a regional minimum wage system.

The analysis also finds that the prevalence of over reporting increased significantly after the minimum wage hike in 2016. In other words, low wage earners could not fully enjoy the rise in minimum wage. Therefore, other policies might be considered to fight poverty instead of raising the minimum wage. On the other hand, over reporting might have helped firms to get rid of destructive effects of minimum wage hike and curbed employment losses. Therefore, the analysis is silent about the net welfare effect of minimum wage and the possibility of over reporting. Further studies should identify all positive and negative effects of sharp minimum wage increases for low wage earners. In summary, policy makers should consider all effects on the economy and society through various channels in designing wage policies including minimum wage.

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