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Understanding Recent Developments in the Turkish Labor Market: Empirical Essays with a Gender Focus

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Understanding Recent Developments in the Turkish Labor Market: Empirical Essays with a Gender Focus

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Abstract

This dissertation comprises three essays on the Turkish labor market. The first essay characterizes the distinctive characteristics of the Turkish labor market with the aim of understanding the factors lying behind its long-standing poor performance relative to its European counterparts. The analysis is based on a cross-country comparison among selected European Union countries. The study initially examines the role of the economic crises in explaining the stagnant structure of the Turkish labor market. Observing that labor market failures persist beyond business cycles, the analysis suggests that institutions can potentially explain the diversity of labor market performances, especially during downturns.

Among all the indicators of labor market flexibility, non-wage cost rigidities are regarded as one of the most important factors in slowing down employment creation in Turkey. The second essay focuses on an employment subsidy policy which introduces a reduction in non-wage costs through social security premium incentives granted to women and young men. Exploiting a difference-in-difference-in differences strategy, I evaluate the effectiveness of this policy in creating employment for the target group. The results, net of the recent crisis effect, suggest that the policy accounts for a 1.4% to 1.6% increase in the probability of being hired for women aged 30 to 34 above men of the same age group in the periods shortly after the announcement of the policy.

In the third essay of the dissertation, I analyze the labor supply response of married women to their husbands' job losses (AWE). I empirically test the hypothesis of added worker effect for the global economic crisis of 2008 by relying on the Turkey context. Identification is achieved by exploiting the exogenous variation in the output of male-dominated sectors hard-hit by the crisis and the gender-segmentation that characterizes the Turkish labor market. Findings based on the instrumental variable approach suggest that the added worker effect explains up to 64% of the observed increase in female labor force participation in Turkey. The size of the effect depends on how long it takes for wives to adjust their labor supply to their husbands' job losses.

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To my precious Kuzey, Simal and Ozgur Dunya...

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Chapter 1

What Makes the Turkish Labor Market Distinctive? A Comparison with the EU Countries

1.1 Introduction

The Turkish labor market has been performing rather poorly for the last two decades despite a relatively high economic growth rate. Among its main features are a downward trend in the labor force participation rate, despite an increasing working age population, and a low rate of employment particularly of urban women along with a large share of low skilled labor force and the great size of unregistered (informal) employment. These facts all place Turkey among the worst performing labor markets in Europe. What could be the reasons behind such a poor performance of the Turkish labor market that leaves it behind its European counterparts despite a higher growth rate?

The previous literature has widely addressed the importance of labor market institutions, more particularly of labor market flexibility in explaining the divergent performances of labor markets (Nickell, 1997; OECD, 1994; Sengenberger, 2006). Labor market flexibility has been suggested to many countries, including Turkey as a remedy to overcome the bottlenecks in their labor markets. The flexibility-oriented argument posits the flexible labor markets of the Anglo-Saxon countries as having better performance than the more rigid labor markets of Continental Europe (Onaran, 2004; Senses, 1994;

World Bank, 2006). It is still questionable whether flexibility is as important in a labor market with characteristics such as Turkey as it is in the richer but slower growing European countries.

The current global economic crisis, however, makes the critical role attached to the flexibility issue doubtful considering the incapability of the Anglo-Saxon countries to prevent unemployment rates from upsurging during the crisis. That the relatively more rigid German labor market has shown an outstanding performance during the crisis despite a substantial economic contraction lends credence to the doubts about the flexibility argument. In parallel, the institutional setting of the German labor market has recently attracted considerable attention in research (Burda and Hunt, 2011; Lehmann, 2010; Rinne and Zimmermann, 2012). In this respect, this study aims to discuss what types of institutions have been in place as an adjustment mechanism during the crisis and to what extent these institutions can explain the variation in labor market responses to the crisis. Although no country could escape from the crisis, the intensity and timing of the crisis and the speed of recovery substantially vary among countries. As the crisis hit most of the Europe much harder than Turkey, the relative position of the Turkish labor market has improved, most probably temporarily. This paper, therefore, discusses the relative performance of the Turkish labor market separately; before and during the crisis.

There is a relatively large literature on the Turkish labor market presenting the developments in main outcomes including employment, unemployment and wages[1]; the labor market effects of the economic crises, especially the domestically oriented crisis in 2001 and much less on the global crisis in 2008[2]; as well as the flexibility issue[3]. As a contribution to the current literature, this study intends to tell a more compact and up-to-date story about the Turkish labor market from an international perspective. It documents

[1]For further information about the structure of the Turkish labor market, see Bulutay (1995); Bagdadioglu and Ercan (1999); Ercan and Tunali (1997), Ilkkaracan and Yorukoglu (2004), Tunali (2003), World Bank (2006).

[2]For the effects of the 2001 crisis, see Koyuncu and Senses (2004), Senses (1994, 2002), and as for the 2008 crisis, see Ercan *et al.* (2010); Memis (2011).

[3]For the labor market flexibility in Turkey, see Ercan and Tansel (2006), Onaran (2004), TCEA (2004), Ozyildirim and Togan(1997).

how both labor market performances and institutional events have evolved in recent years. With a special focus on the global economic crisis of 2008, it characterizes the diversity of labor market responses to the crisis across a selected group of European countries, and relates the diversities to different labor market institutions. This study is of particular importance as it lays the groundwork for forthcoming chapters of the thesis in which more specific policy topics related to the Turkish labor market are examined.

The paper proceeds as follows: Section 1.2 presents the main developments in the labor market outcomes in Turkey in relation to the institutional events over the last two decades. Section 1.3 documents cross-country differences in the impacts of the global economic crisis, and Section 1.4 relates the labor market responses to the crisis to some labor market institutions. Section 1.5 concludes.

1.2 Peculiar Characteristics of the Turkish Labor Market

This section evaluates the labor market performance of Turkey in comparison with the European Union (EU) countries considering her candidate membership status. The countries which have similar development level (GDP per capita) to Turkey are selected for the comparative analysis. These are the new member states (NMS) including Bulgaria, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia[4]. They are also in common with some labor market characteristics such as the sectoral distribution of employment. Furthermore, two old member states, namely Germany and Spain are included in the comparison group as they are the representatives of the best and worst performances in the EU-15 during the global crisis.

One should be cautious in assessing the statistical findings since there could be an inconsistency in data from different sources or from the same source but at different points in time. To minimize the data inconsistency

[4]Croatia has not been included in the comparison group as its membership of the EU has become effective on 1 July 2013.

problem, international (e.g. Eurostat and OECD) and national (e.g. Turkstat) data sources are relied on for cross-country and country-specific evaluations, respectively. While the data used for cross-country analysis date back to 1995, the earliest date of national data analysis is 1988. This section with the intent of evaluating the relative performance of the Turkish labor market focuses on the period up to 2008, and the period after 2008 is analyzed in the following section while discussing the impacts of the global economic crisis across the selected countries.

As presented in Table 1.1, Turkey is the only country in the comparison group experiencing an approximately 10 percentage-point decline in the rates of labor force participation and employment between 1995 and 2007. The comparison countries (except for Romania), on the other hand, saw a positive growth in these indicators. As of 2007 Turkey has the lowest rates of participation (49.1%) and employment (44.6%) which are around 20 percentage points below the EU average. Figure 1.1 makes clear that the divergence between Turkey and the comparison countries is mainly because of the dramatically low rate of female participation in Turkey at 23.6% in 2007, which is around one third of the EU average. On the other hand, there is not such a difference in the male participation rate between Turkey and the comparison group. A similar pattern is observed for the employment rate across genders (see Table 1.3).

Many researchers from Turkey point out the significant role of cultural factors in explaining the lower rate of labor force participation of women relative to that of men (Aran *et al.*, 2010; Dayioglu and Kirdar, 2009; Gunduz-Hosgor and Smith, 2006). It is widely argued that the dominance of patriarchal relations in the society and accordingly the common perception against women for doing market work brings about a sharp distinction in duties fulfilled by men and women. While men are regarded as primary bread-winners, women are considered to be mainly responsible for household chores and child care activities. The influence of the traditional division of labor in households is clearly seen in the rates of labor force participation among married people. While only one out of five married women participate in the labor force, the participation rate is almost seven percentage points higher for their single

counterparts. The increasing responsibilities of women related to household chores after marriage make them, particularly the urban females, withdraw from the labor market. As reported by Aran *et al.* (2010), only one fifth of poorly educated urban women continue working after having the first child. Although they have a higher educational attainment, the participation rate of urban women decreases by 15 percentage points upon the first baby's birth, and does not reach its earlier level. On the other hand, men who were not working before the marriage enter the labor force in order to fulfill their roles as bread winners. This could be the reason for the higher rate of labor force participation among the married men relative to their single counterparts.[5]

The rise in educational attainment alleviates the disadvantageous position of women in the labor market. As Table 1.2 displays, the female labor force participation rate in 2007 is almost 70% among university graduates, whereas the rate drops to 20% for those who are educated less than high school level and below 13% for the same group of women who live in the urban areas. The male labor force participation rate, however, does not exhibit such a variation depending on the educational attainment provided they are literate. An important issue worthy of note is the substantial improvement in the educational profile of employment over the last two decades. According to the Turkstat (2013) records, the share of illiterate workers in total employment decreased from 17.6% in 1988 to 4.8% in 2007, and university graduates have obtained a larger share in employment with an increase from 4.9% to 18.2% between 1988 and 2007. Nevertheless, the largest proportion of employment is still held by workers with less than high school education (51.5%). Turkey is one of the few OECD countries where the number of individuals with less than secondary education available to the labor market increased between 1998 and 2008 (OECD, 2010). This points to one of the main problems of the Turkish labor market that the bulk of low educated and low skilled labor force is still dominant in the labor market.

On the other hand, higher educational attainment does not prevent young

[5]The descriptive statistics concerning the difference in labor supply behaviors of married people are not presented here in order to avoid replication as it is discussed in the third chapter of the thesis.

people from the hazard of becoming unemployed. University graduates aged 20-24 have a staggering unemployment rate of 25.2% in 2007, compared to a 5.9% rate for those aged 25-64 and a 9.7% rate for university graduates overall (Turkstat, 2013). This implies that there is a high probability for a young person to become unemployed just after graduation from university. The unemployment rate in Turkey is the highest for the age group 15-24, that is 20% in 2007, and decreases proportionately for those above 25 years-old (*ibid*). As Table 1.5 displays, the young suffer from the unemployment problem more severely than the other age groups in all the comparison countries.

The large share of low educated people in the labor market along with the limited capacity of the formal sector to absorb the excess supply produces an informalization problem that is another worrisome issue for the Turkish labor market. Informal employment, defined as not being registered with any social security institution, constitutes 45.4% of total employment which amounts to 9.4 million employed people as of 2007 (see Table 1.3). One might interpret the large size of the informal sector as a silent consensus between employers and the government given that unemployment would have been a much more dramatic problem in the absence of an informal sector, more particularly in the urban area.

The informalization problem in the urban area is mainly an outcome of the sectoral transition process through which Turkey has been passing over the last two decades. This process points out a marked decline in agricultural employment due to mechanization and removal of the subsidies in the sector associated with a rural exodus. While agriculture was the largest employing sector in 1988, accounting for 46.5% of total employment, its share decreased to 23.7% in 2007, amounting to a 3.4 million employment loss. The fall in agricultural employment was replaced by the services sector which produced a growth in employment of around 5 million in the same period (Turkstat, 2013). Despite the marked decline in agricultural employment in Turkey, it is still more than five times the EU-15 average and four times the EU-27 average (see Table 1.4). Turkey, following Romania, ranks the highest in terms of agricultural employment share while the incidence of services employment is the lowest as of 2007. The productivity in the agricultural sector is, however,

substantially low relative to the other sectors as can be seen in the figures of gross value added in Table 1.4. This contributes to the low-skill profile of the labor force in Turkey.

There is a remarkable decline in agricultural employment also in the NMS along with a proportional increase in services employment. A comparison with the EU-15 countries shows that while the incidence of agricultural employment in the NMS is relatively higher (but comparable in Estonia and Slovakia), the incidence of services employment is roughly comparable, except for Bulgaria, Lithuania, Poland and Romania. This implies that these four countries are still in the early stages of a structural transition process, and so is Turkey.

The dissolution of agriculture in Turkey was triggered by an institutional change in 2000 called "Agricultural Reform Implementation Program"[6]. The program basically replaced price supports on agricultural products and input subsidies with direct income support for farmers dependent on the size of cultivated area. In addition to a change in support composition, the amount of governmental support was reduced (Cakmak and Dudu, 2010; World Bank, 2004). Whether the decline in the share of agricultural employment after 2000 is due to this institutional change is hard to say without exploring the causal effect; it is clear, though, that this institutional change gave an impetus to the process of structural change which is in line with the downward trend in the incidence of agricultural employment versus the upward trend in the services.

As a result of this sectoral transition process, plenty of the low-skilled labor force dropping out of agriculture have migrated towards cities with the hope of finding a job. The urban economy is rather selective and requires higher qualifications in contrast to agricultural activities where half of the employment is composed of unpaid family workers, the majority of whom are female (78.3%). Women coming out of agriculture are less likely to upgrade their skills and to acquire skill-required jobs relative to their male

[6]This program was regulated under an agreement signed with the World Bank which was grounded on the IMF standby agreement in 1999 and the letters of intent dated 9 December 1999 and 10 March 2000 (Gunaydin, 2009).

counterparts given their responsibilities related to housework and child care. Therefore, women have been much more adversely affected by this transition process (Bulutay, 1995; Ozyildirim and Togan, 1997). Women with lower educational attainment generally quit job searching because they do not have any hope of finding a job with their present qualifications. The fact known as "discouraged worker effect" may clearly be seen in the labor force participation rate of women in the urban area, which is approximately 4 percentage points less than the overall female participation rate (see Table 1.2).

It is also important to consider the role of business cycles while discussing the poor performance of a labor market, most particularly in a country like Turkey where economic crises occur so frequently. As illustrated in Figure 1.2, Turkey's economy exhibits an unstable growth trend including expansionary and recessionary episodes throughout the 1990s[7]. The slumps in the GDP growth rate observed in 1999 and 2009 correspond to the Russian financial crisis of 1998 and the current global economic crisis, respectively. While the latter will be discussed in the following section, the former one is not covered in this study as there is no discernible effect of that crisis on the Turkish labor market. On the other hand, the other two points in time in which an outcome fall is recorded, namely 1994 and 2001, refer to the domestically originated economic crises[8]. The 2001 crisis hit the labor market particularly hard compared to the crisis in 1994, despite similar levels of output losses. The employment rate with a 5 percentage-point decline between 2000 and 2002 fell to 41.7%. In parallel, the unemployment rate showed a marked increase from 6.5% in 2000 to 10.3% in 2002, and remained above 10% since then despite a rapid recovery in output, that was on average 6.8% growth in GDP between 2002 and 2007. The crisis negatively impacted the

[7]The factors behind this precarious performance are mainly associated with the radical change in the economic policy arena in the 1980s; namely a shift from import substitution to export orientation. This economic transition accompanied structural adjustment reforms, one of which was the liberalization of capital movements in 1989. Henceforth the growth performance of the country became dependent on unstable capital movements (Senses, 2002).

[8]These crises erupted due to rapid outflow of foreign capital and initially spread throughout the financial market and then influenced the rest of the economy including the real sector. The basic outcomes of these crises might be summarized as economic contraction, galloping inflation as well as a rise in unemployment and wage reductions.

non-agricultural area even more, where the unemployment rate jumped from 9.3% in 2000 to 16% in 2002.

The downward rigidity of the unemployment rate over the last decade irrespective of economic growth has introduced a new phenomenon to Turkey called "jobless growth"[9]. In fact, the NMS in the comparison group also suffered from jobless growth before 2004, albeit for different reasons. After 2004, however, output and employment growth went hand in hand (Lehman, 2010)[10]. The rise in the employment rate in the NMS by 2004 improved the relative position of the countries against Turkey. With the outburst of the current economic crisis, their relative positions have deteriorated. The discussion now turns to the evaluation of the impacts of the recent crisis on the selected labor markets.

1.3 Labor Market Responses to the Global Economic Crisis

Recently Turkey has been passing through another crisis era which originated in the United States (U.S.) financial markets. The U.S. financial crisis that rapidly spread into a global economic crisis has had a devastating effect on incomes, government finances, and not the least, labor markets. With the outburst of the crisis in Europe, the employment rate fell by on average two percentage points in the EU-27 between the first quarters of 2008 and 2010 along with a proportional increase in the unemployment rate (Eurostat,

[9]The term "jobless growth" was first introduced by the International Labor Organization (ILO) and United Nations Conference on Trade and Development (UNCTAD) to represent the evidence of economic growth not translating into employment creation in many countries (ILO, 2006; UNCTAD, 2006). Although there were previously some other periods in Turkey where un/employment was not elastic to output growth, this phenomenon has lately been pronounced for Turkey.

[10]Lehman (2010) with reference to Rutrowski (2007) tells the story of jobless growth in the NMS in relation to the restructuring process of the economies. After the central planning period lasting until the mid 1990s, firms started to eliminate labor hoarding and restructure their production processes to be more competitive in world markets. At the end of this process, there occurred a rise in their employment rates thanks to the upturn in the world economy associated with their accession to the EU. See Figure 1.3 for the trend in the rates of employment, unemployment and output growth in the NMS.

2013).

Interestingly Turkey has experienced an increase in the employment rate over the crisis. As Table 1.3 displays, the increase in the employment rate is entirely attributable to the improvement in female employment outcomes which is elaborated in the third chapter of the dissertation. Furthermore, this increase has taken place in the formal sector. With a simple algebra based on Table 1.3, we can calculate the in/formal employment rate (as a share of working age population) which reveals the source of the employment increase. In particular, the product of the share of formal employment in total employment and the overall employment rate yields us the formal employment rate, which rose to 27.7% in 2012 from 22.7% in 2007. On the other hand, the informal employment rate decreased from 18.8% in 2007 to 17.7% in 2012. This implies that it is the informal sector that bore the burden of the crisis. It is needless to say that the share of informal employment in total employment decreased accordingly over the period, as presented in Table 1.3.

Despite an improvement in the employment rate, the unemployment rate recorded an increase due to the crisis. Table 1.5 indicates that the unemployment rate rose to 12.5% in 2009 from 8.8% in 2007 and then decreased to 10.7% in 2010 with the recovery from the crisis. The non-agricultural unemployment rate, showing a parallel but more severe trend, jumped to 17.4% in 2009 with a 5 percentage-point increase, as shown in Table 1.3. A relatively moderate rise in the unemployment rate categorizes Turkey as a medium level-affected country alongside Bulgaria and Slovakia. As the crisis hit most of the EU countries much more severely, Turkey's ranking has become better than the period prior to the crisis. In the current situation, the unemployment rate in Turkey is lower than that in one third of the EU countries. However, it was the highest in 2007 following Slovakia (11.2%) and Poland (9.6%).

Spain and the Baltic countries saw the highest employment losses during the crisis. More concretely, the unemployment rate more than doubled in Spain and more than tripled in the NMS including Estonia, Latvia and Lithuania between 2007 and 2010. Spain with an unemployment rate of 25%

in 2012 currently ranks the highest among the EU-27. Poland and Romania, on the other hand, are the countries with the lowest increases in unemployment rates of less than 3 percentage points since the crisis burst into sight. Germany is the only country where the unemployment rate did not increase, even decreased by a 3 percentage points over the period (see Table 1.5).

Not only the severity of the crisis but also the timing of the outburst and the speed of the recovery vary across countries. In Europe, the crisis first hit labor markets such as the United Kingdom and Ireland where the financial sector has a relatively high share of employment. Among the comparison countries, however, Spain is the first one to experience an unemployment increase by the third quarter of 2007 (Eurostat, 2013). Spain was followed by Latvia and Lithuania in the first quarter of 2008, and Estonia and Turkey in the third quarter of 2008. Turkey, despite its late reaction to the crisis, is the earliest to start to recover by the third quarter of 2009. Even the employment rate in Turkey outstripped its pre-crisis level by the first quarter of 2010. Following Turkey, Estonia started to see an upward trend in employment rate by the second quarter of 2010. Latvia, Lithuania and Slovakia are the others having very recently begun to recover; whereas the rest have still been suffering from unemployment increases even in 2012 (see Table 1.5).

The adverse effects of the crisis are not evenly distributed over the population within a country. In particular, youth unemployment (of the age group less than 25 years old) has increased at a faster pace than for all other age groups. Table 1.5 indicates that the average unemployment rate in the EU-27 was 7.1% in 2007 and rose to 10.6% in 2012, while the youth unemployment rate reached 22.3% in 2012 with a seven-percentage point increase from 2007. The highest jump was observed in Estonia, Latvia and Lithuania where youth unemployment rate more than tripled. Currently the incidence of youth unemployment is at least double the total rate of unemployment in all member states with the notable exception of Germany. Turkey, with a youth unemployment rate of 15.7% in 2012, ranks the lowest among the selected countries following Germany.

Considering gender differentiation, the economic crisis has generally affected men more than women given that traditionally male-dominated sectors

(e.g. manufacturing and construction) were particularly hard hit, especially in the first phase of the crisis (Leschke and Watt, 2010; Ercan *et al.*, 2010). In all comparison countries experiencing a rise in unemployment during the crisis, except for Poland and Romania, the increase in unemployment rate is due to a higher growth of male rather than female unemployment, as inspection of Figure 1.4 makes clear. As a result, the unemployment rate is currently slightly higher among men than among women in a large number of the EU countries in contrast to the situation before the crisis. Turkey exhibits an exceptional case. Women in Turkey have had higher unemployment rates than their male counterparts in the periods both before and after the crisis; however, the gender gap against women has narrowed between 2007 and 2009. After the economic recovery has started, by the end of 2009, male unemployment rate has declined much faster, and the gender gap in 2010 has become even wider than it was in 2007.

Moreover, people with low educational attainment have been more adversely affected. The average unemployment rate in the EU-27 among those educated at no higher than secondary level was 10.9% in 2007, and jumped to 16.2% in 2010, whereas the unemployment rate among those educated at the upper secondary school level increased only by 2.1 percentage points in the same period. The university graduates saw even less increase in unemployment, around 1.4 percentage points. The situation is somewhat different in Turkey in the sense that those with low and medium levels of education saw the same rise in unemployment of around 4.1 percentage points. Nevertheless, the least affected group is the university graduates as can be figured out in Figure 1.5.

Nonstandard employment has played a significant role during the crisis as it provides more freedom for employers in controlling the size of the workforce according to the firms' needs so as to respond to demand changes more quickly (Monastiriotis, 2003). As Table 1.6 displays, part-time employment has increased during the crisis in all comparison countries but Poland. The largest growth in part-time employment took place in countries such as Estonia, Latvia and Slovakia with relatively low initial levels of part-time employment, fluctuating less than 10%. In contrast to the upward trend in

part-time employment during the crisis, the incidence of temporary employment such as fixed-term and temporary agency workers decreased, especially in the initial phase of the crisis. This immediate decline could have been caused by less job security of temporary workers relative to their permanent counterparts, making them more likely to be the first to lose their jobs (Leschke and Watt, 2010). However, by mid-2009 temporary employment has increased in a number of countries, possibly because employers preferred short-time contracts during the crisis which can easily be terminated (*ibid*). Spain with a decrease of 7 percentage points in the share of temporary employment between 2007 and 2010 has largely utilized nonstandard employment in adjusting the labor force to output losses given the rigid rules on dismissal of permanent workers. This is consistent with the huge increase (of 23.4 percentage points) in the unemployment rate among the young who are likely to hold temporary contracts. On the other hand, nonstandard employment is not common in Turkey similar to the NMS, and neither exhibits a considerable fluctuation during the crisis.

What could be the reasons behind the divergences in labor market responses during the crisis? As shown in Figure 1.3, all the selected countries but Poland have suffered from a decline in output during the crisis; however, the labor markets have not responded to output losses proportionally. The NMS saw large output losses, which are combined with large declines in employment and a substantial hike in unemployment. Spain despite its below average output loss exhibited a large labor market contraction. Germany, on the other hand, exhibited almost stable rates of employment and unemployment despite a considerable output loss. Many researchers point at labor market institutions in explaining the divergent performances of labor markets even among similar economies (Burda and Hunt, 2011; Rinne and Zimmermann, 2012). In the next section these institutions are elaborated with a question in mind: to what extent could labor market institutions explain the diversity in labor market responses to the crisis?

1.4 The Role of Labor Market Institutions During the Global Economic Crisis

Since the 1990s, labor market institutions, particularly of labor market flexibility have been central to the literature examining the reasons behind the divergence in labor market performances, in an attempt to establish a causal relation between labor market performances and institutional structures (Eichhorst *et al.*, 2010). The current crisis makes this topic more interesting given the fact that labor market institutions might be responsible for the diversities in labor market responses to the economic downturn even among similar economies. This section will focus on institutions related to labor market flexibility having actively played a role in alleviating the effects of the crisis.

Labor market flexibility is commonly defined as the degree and speed of adjustment of labor markets to changes in economic conditions. According to this narrow definition, labor market flexibility is a part of employers' strategies within the aim of cost reduction or productivity increase (Brodsky, 1994; Monastiriotis, 2003; Ozaki, 1999). A broader definition of labor market flexibility also comprises the ability of workers to adapt themselves to new economic conditions, especially through upgrading their skills as well as to adjust their working lives and working hours to their own preferences, especially through the use of working time flexibility (Chung, 2006; Jepsen and Klammer, 2004). This broad definition involves five types of flexibility according to a widely used classification developed by Atkinson (1984):

1. *External numerical flexibility*: Firms' ability to adjust the number of employees to the changes in economic conditions, e.g. employment protection legislation.

2. *Internal numerical flexibility*: Firms' ability to adjust working hours of employees already employed by the firm, e.g. working time reductions, short-time work schemes.

3. *External functional flexibility*: Employees' ability to adapt themselves to structural changes through upgrading their skills, e.g. active labor

market policies.

4. *Internal functional flexibility*: Firms' ability in adjusting to demand changes through a flexible work organization, e.g. multi-skilling, task rotation and team working

5. *Labor cost flexibility* is composed of two components. The first is *wage cost flexibility* which refers to the responsiveness of real wages to changing economic conditions. This is related to wage-setting mechanisms such as collective bargaining agreements. The second is *non-wage cost flexibility* which refers to the adjustability of labor cost that is not directly related to actual working hours, including income tax on wages, employers' and employees' contributions to the social security and unemployment insurance fund (Monastiriotis, 2003).

In this analysis wage cost flexibility will be excluded from the discussion since it requires a comprehensive and a separate analysis including the influence of productivity, inflation lags in the collective bargaining and so forth. Neither will non-wage cost flexibility be discussed as it is evaluated in the second chapter of the thesis. Considering their key roles during the recent crisis in accommodating adverse shocks, the focus will rather be on four types of institutions which are employment protection legislation, flexible working time arrangements, active labor market policies and unemployment insurance benefits.

1.4.1 Employment Protection Legislation

External numerical flexibility, defined as the adjustability of the size of employment, is roughly achieved by removing regulations on job security, easing dismissal rules and extending use of nonstandard employment. The main determinant of external numerical flexibility is employment protection legislation (EPL) that regulates the initiation and termination of the employment relationship by setting hiring and firing rules which make the labor force more costly to the employer.

A widely used indicator measuring the strictness of EPL has been developed by the OECD (OECD, 2004). The so-called "EPL index" is composed of three separate indices; (*i*) hiring and firing rules for permanent workers, (*ii*) regulations on nonstandard employment contracts such as part-time, fixed-term and temporary employment, (*iii*) regulations on collective dismissals. The index runs potentially from 0 to 6, where a larger number implies more rigidity and thus a higher labor cost to employers. There is a considerable variation in the level of stringency of EPL among the EU countries as well as across the types of EPL. Turkey with an index of 3.5 is overall the strictest country, and many NMS are more flexible than Germany and Spain (OECD, 2013). A comparison of the permanent component of the index makes the differences among countries less marked. As Figure 1.6 displays[11], the indices in the comparison group fluctuate around the OECD average, except for Germany and Latvia which are the strictest countries, and Estonia which is the most flexible. Regarding the requirements for collective dismissal, the selected countries are generally above the OECD average. Germany and Spain with an index of 3.8 rank the highest, Turkey with relatively lenient requirements ranks in the middle, and Estonia and Poland scaling at the OECD average are the most flexible countries in the comparison group.

Much of the cross-country variation in the EPL index is due to the differences in the level of regulations on nonstandard employment contracts, particularly because temporary employment is much less regulated in the NMS than in the old member states (Lehman, 2010). Correspondingly, the EPL indices in the NMS are quite low whilst the index is by far the highest in Turkey, followed by Spain (see Figure 1.6). Turkey has recently regulated many types of flexible work arrangements which have not a widespread usage yet, as can be seen in Table 1.6 (Law No. 4857, 2003). It is still the only country in the OECD which has not legally introduced temporary work agencies. This could be the reason why Turkey is the most rigid country in terms of the temporary component of the EPL index (World Bank, 2006).

One should be cautious in evaluating the strictness of the Turkish labor

[11]Figure 1.6, relying on the EPL index developed by the OECD, does not include non-OECD member EU countries such as Bulgaria, Latvia, Lithuania and Romania.

market given the large size of the informal sector (45.4% as of 2007), which makes the market overall much more flexible than what is recorded (Ercan *et al.*, 2010). In consistency with this argument, despite no considerable change in the share of temporary employment during the crisis (as displayed in Table 1.6), a remarkable decline was observed in informal employment (as displayed in Table 1.3) which is mostly composed of vulnerable groups and more likely to be temporarily employed without a legal contract.

Statistical evidence shows that countries with stronger EPL, like Germany, have suffered fewer employment losses than those with weak EPL such as Anglo-Saxon countries. On the other hand, Spain which is also an example of a strict EPL-country experienced a vast number of job losses during the crisis. These contradictory cases suggest an ambiguous relation between EPL and labor market outcomes. The design of EPL as well as the interaction with other labor market institutions could be relevant in explaining the diversity of the outcomes. Rovelli and Bruno (2008), for instance, document an ambiguous and non-monotonous relation between EPL and employment rate, however, the correlation becomes negative for countries with more generous labor market policies. It seems that the issue is more complicated than simply being a question of more or less strict EPL. Nevertheless, the rigidity of regulations could have explanatory power for the variation of labor market performances especially in the event of an adverse demand shock.

1.4.2 Working-time Flexibility

Working-time flexibility, also known as internal numerical flexibility, has attracted considerable attention during the current crisis. In particular, all the countries in the comparison group have experienced marked falls in average weekly working hours per worker with the onset of the crisis (see Table 1.8). In line with this change, the share of part-time employment in total employment has increased during the crisis (see Table 1.6). What is more worthy of attention about working-time flexibility is "short-time working (STW)" schemes that had a significant impact on preserving jobs during the crisis, with the largest effect in Germany. STW programs are designed as short-term

public support provided for employers under unavoidable financial difficulties due to external demand shocks so as to refrain from layoffs through reducing working hours, while also providing income-support for workers whose working hours are reduced due to a shortened workweek or temporary lay-offs (Burda and Hunt, 2011; Hijzen and Venn, 2011).

Many EU countries as well as Turkey have shown a strong interest in STW during the crisis. Twenty-two EU countries reported either setting up new measures or adjusting existing measures in response to the economic downturn (European Commission, 2010). The glaring case is the German system (Kurzarbeit) which has undergone many modifications during the crisis. In particular, the eligibility requirements of the STW scheme were changed to facilitate the access to subsidies by a broader group of workers (including fixed term and temporary agency workers), to reduce the required minimum number of affected workers, to extend the maximum duration (which was 6 months before the crisis) to 24 months and to increase the level of compensation (Burda and Hunt, 2011). These modifications were embodied in large increases in the number of beneficiaries. To illustrate, the average number of beneficiaries in 2009 was recorded at more than one million, which is ten times the 2008 average (Leshke and Watt, 2010).

In Germany, as in many old member states, employees do not need to fulfill any specific requirement to be eligible for STW benefits and can have access to the scheme simply because they rely on an employment contract linking them to their employer (European Commission, 2010). On the other hand, in Spain, support for STW is provided for those who fulfill the eligibility requirements of unemployment insurance. As indicated in Table 1.7, almost no change was made in the existing scheme in Spain during the crisis to facilitate the access to the subsidies. As a result, the STW scheme in Spain was not utilized effectively during the crisis.

Most of the NMS including Bulgaria, Latvia, Lithuania, Poland and Slovakia, where such schemes did not exist before the crisis, have recently introduced STW schemes. Estonia, the only exemption in this sample, still has no scheme. Table 1.7 displays that the compensation and maximum duration of the schemes substantially vary among the NMS. The schemes generally

cover all types of employment contracts and have a clear link with training provisions in common. More specifically, there are financial incentives for both employers and employees associated with undertaking training during the STW period, however, the actual take-up is recorded as fairly low since taking part in training is made optional. The STW schemes in the NMS were, overall, not as efficient as in Germany. While the coverage of STW schemes in 2009 was 0.1% in Poland, 0.4% in Bulgaria and 1.6% in Slovakia, it was approximately 3% in Germany (Leshke and Watt, 2010).

Although STW was legislated in Turkey relatively early, in 2003, the scheme was not utilized effectively until the onset of the current crisis given the rigidity in eligibility requirements. STW in Turkey is a unilateral decision taken by employers which requires an approval of the related Ministry. Workers are paid by the unemployment insurance fund for the period they are temporarily out of employment. The eligibility of the STW support is dependent on workers' qualifications concerning the service duration and number of premium days of the unemployment insurance. The level of compensation is set to the amount of unemployment benefits which is 40% of the daily earning of the corresponding worker and cannot exceed 80% of the minimum wage (Law No. 4857, 2003). During the crisis, some new provisions have been introduced only for the period between 2008 and 2010. According to these provisions, STW compensation has been raised by 50%, and the maximum duration of the STW scheme which was 3 months before the crisis has been extended to 6 months (Law No. 5763, 2008; Directive, 2009).

With the modifications of the STW scheme in Turkey, the number of beneficiary employees increased from 650 in 2008 to over 190,000 in 2009, and the number of beneficiary firms rose from 181 to 3,250 over the same period[12]. In parallel to the economic recovery from the crisis, as of 2010 the number of workers and firms benefiting from the scheme fell to 27,000 and 266, respectively (ISKUR, 2010). The number of beneficiaries, despite the remarkable increase during the crisis, is still well below the Germany average. Even if an empirical analysis is needed to evaluate the effectiveness of the

[12]According to the calculations of Kostekli (2011), saving 190,000 jobs corresponds to the prevention of an additional 0.8 percent increase in the unemployment rate in 2009.

STW schemes, the figures roughly show that Germany has been by far the most successful implementation area of the STW scheme in comparison to the rest of Europe.

1.4.3 Active Labor Market Policies

Another labor market measure widely in place during the crisis is active labor market policies (ALMP) which intend to avoid unemployment increases given the existing scale of job losses. These policies mainly aim at enhancing labor supply through training activities, increasing labor demand through public works, wage and employment subsidies, and improving functioning of the labor market through employment services (Betcherman et. al., 2004). Whether ALMP are efficient in struggling against the unemployment problem is still an open question given the ambiguity in the findings of the previous studies[13]. In this subsection, it is not the intention to evaluate the effectiveness of ALMP, but to understand whether policy generosity may be related to more favorable labor market outcomes, especially during the current crisis.

While the old member states have a long and extensive experience with ALMP, many NMS have recently introduced these programs in response to a growing number of unemployment problems. The participation to ALMP greatly varies by type of programs across countries. As Table 1.9 shows, while most of the participation takes place in training activities in Germany, employment incentives constitute the major body of ALMP in Spain and incentives for direct job creation and starting-up a job are the main measures in the NMS. The expenditures on ALMP vary by type of programs accordingly, as displayed in Table 1.10.

Also the policy generosity varies across countries. Figure 1.7 demonstrates that expenditures on ALMP as a share of GDP range from 0.05% in Estonia to 0.73% in Germany in 2007. An inspection of Figure 1.7 alongside Table 1.1 makes clear that there is not a clear-cut relation between the policy generosity and employment outcomes. The least and the most generous

[13]For a detailed summary of the related literature, see Betcherman *et al.* (2004), Lehman and Kluve (2008) and Card *et al.* (2009).

countries, Estonia and Germany, for instance, had very similar employment rates in 2007. Likewise, policy generosity does not vary in direct proportion to unemployment rates. The most prominent increase in the share of active measures was seen in Poland, followed by Germany, which are the two countries having not been affected by the crisis in terms of employment losses. On the other hand, the spending on ALMP is substantially lower in the NMS where unemployment rates are often higher than the old member states. Even after the unemployment rates upsurged due to the crisis, only a few countries among the NMS increased spending on active measures, and the increase remained quite modest relative to the changes in the unemployment rates. In parallel, the countries which experienced unemployment increases during the crisis (except for Estonia and Latvia) recorded a bare increase or even sometimes a decrease in the number of ALMP participants, as can be seen in Figure 1.8.

One explanation for the modest increase in spending on active measures during the crisis could be the fiscal problems of the transition economies, and accordingly limited funds for labor market policies (Lehman and Kluve, 2009). Another explanation could be the priority of policy makers between passive and active measures. Since they are both financed from the same pot in most of the countries, when unemployment increases sharply during recessionary periods, expenditures on passive labor market policies (including unemployment insurance benefits) substantially increase at the expense of crowding out active measures (Leschke and Watt, 2010). Consistent with this argument, active spending saw a moderate increase during the current crisis relative to the substantial increases in the expenditure rate of unemployment benefits. As shown in Figure 1.7, in all the countries in the comparison group, the spending on passive policies has increased much more than the spending on active measures with the notable exceptions of Germany and Poland. Nevertheless, a higher proportion of total spending is still on passive measures in Germany. Poland, however, in every respect is an exceptional case in that active spending has increased during the crisis despite a decrease in the share of expenditures on passive measures.

Turkey is not included in the preceding tables and graphs given the lack of

data according to the EU classification of labor market programs. Compared to the overall Europe, Turkey has a very limited experience and capacity in the area of ALMP. The most significant initiative regarding the ALMP is the establishment of the national employment agency (ISKUR) in 2000. ISKUR's responsibilities include both the tasks related to ALMP such as matching between job seekers and vacancies, providing employment services and training, regulating private employment agencies, improving employment prospects for the disabled and ex-convicts as well as some tasks related to passive labor market policies such as administering the unemployment insurance scheme (ISKUR, 2010).

Considering the size of unemployment in Turkey (10.3% of unemployment rate in 2007, amounting to around 2.5 million unemployed), the number of beneficiaries from ALMP remains quite limited (111,000 placements and 23,000 trainees in 2007). With an upsurge in the unemployment rate during the current crisis, the number of beneficiaries increased approximately ten times as presented in Table 1.11. However, the number of participants covered by training programs is still quite modest compared to one million people who became unemployed over the crisis. Taken together, it could be argued that ALMP have not played an efficient role during the crisis either in Turkey or in the NMS, nor are these programs institutionalized enough to avoid unemployment increases in the event of an economic downturn or to fulfill the other objectives.

1.4.4 Unemployment Insurance Benefits

The main objective of the unemployment insurance benefits (UIB) scheme is to reduce the cost of unemployment by compensating the financial loss of the individuals who become unemployed involuntarily due to causes not stemming from themselves. This compensation mechanism intends to encourage the unemployed to engage in longer job searches. The decision on the optimum level and duration of unemployment benefits is crucial given that the high level and long duration of benefits could make people reluctant to search for a job. In order not to fall into the so-called "unemployment trap", a way

commonly followed by policy makers is to introduce an incremental reduction in the amount of benefits (Gruber, 2004). As Table 1.12 presents, the initial level of payments in the comparison group fluctuates between 50% and 70% of the earning base, and reduces incrementally throughout the entitlement period in some countries including Estonia, Latvia, Lithuania and Spain. Turkey, with a replacement rate set at a maximum 50% of the average daily wage calculated on the basis of the net wages earned during the last four months before becoming unemployed, ranks among the lowest.

UIB schemes have been introduced to the NMS after 1990s, mostly in the second half of the decade. Likewise, the UIB scheme in Turkey was legislated in 1999, and the first payments were made in 2002. The Social Security Institution is the only responsible body for collecting the premiums and the remainder of the activities are carried out by ISKUR. The UIB scheme covers all workers who are registered to the Social Security Institution, apart from civil servants and the self employed. The scheme is funded by the contributions of workers (of 1%), employers (of 2%) and the government (of 1%), calculated based on the worker's monthly gross earning basic to premium (Law No. 4447, 1999). As in the case of comparison countries, contribution to the insurance fund is compulsory for each sector.

There is a considerable variation in the duration of UIB across the comparison group, ranging from 6 months in Latvia, Lithuania and Slovakia to 2 years in Spain, as presented in Table 1.12. The duration of payments generally depends on the length of service and accordingly the accumulated premiums, as it does in Turkey. Workers who have held continuous employment for at least 120 days before becoming unemployed and for at least 600 days in the last 3 years are qualified to receive benefits. If this requirement is met, workers can receive benefits for 6, 8 or 10 months depending on accumulated premiums (Law No. 4447, 1999)[14]. The contribution requirement, namely the minimum number of days required for contribution in one year is 200 days in Turkey, which is substantially high relative to the comparison

[14]Workers who have paid premiums for 600 days in the previous 3 years receive benefits for 6 months; those who have paid premiums for 900 days in the previous 3 years receive benefits for 8 months and those who have paid premiums for 1080 days in the previous 3 years receive benefits for 10 months (Law No. 4447, 1999).

group, except for Bulgaria and Poland where insurance installments have to be paid more than 7 months in a year. In addition to these numerical conditions, an unemployed person in Turkey must be involuntarily separated from her/his job and actively seek a job in order to be eligible for UIB. Similarly, in all the comparison group but Lithuania and Slovakia, involuntary separation is required for becoming eligible. However, in none of the comparison countries, except for Estonia and Romania, do the unemployed lose their entitlement because they do not actively seek work or they are not available for job (Venn, 2012).

As mentioned in the previous subsection, the majority of spending on labor market policies belongs to passive measures including UIB, which increased remarkably during the current crisis in all countries where there is an upsurge in unemployment rate. The number of beneficiaries also saw a noticeable increase in these countries, as shown in Figure 1.8. Nonetheless, the usage of the UIB schemes has remained quite limited in the NMS considering the huge jump in unemployment rate during the crisis. As noted by Eichhorst *et al.* (2010), the stringency of the eligibility criteria might be responsible for the low access to the schemes. The situation is similar in Turkey. As Figure 1.9 depicts, the number of UIB applicants in Turkey which started to rise by the third quarter of 2008, when the unemployment rate saw a jump due to the crisis, peaked in April 2009 and began to decline thanks to the economic recovery. More concretely, the number of beneficiaries increased from 120,000 in June 2008 to 320,000 in April 2009. Despite such an increase, the efficiency of the scheme is still regarded as quite modest given the 1.3 million-increase in the number of unemployed in the same period.

Given the under-utilization of the unemployment insurance fund due to the stringency in the eligibility requirements, a large amount of surplus amounting to 61 billion Turkish Liras (almost 25 billion Euros) has been accumulated in the fund by the end of 2012 (ISKUR, 2013). This surplus has been used in some employment supporting activities. A recent one, introduced in May 2008, aims to decrease hiring cost of employers. The fund was allocated to pay out the share of employers' social security contributions

during a five-year period. The evaluation of the effectiveness of this regulation in creating employment constitutes the main interest of the second chapter of the thesis.

1.5 Conclusion

This paper has documented the poor performance of the Turkish labor market despite a higher economic growth rate relative to its European counterparts, and relates the labor market failures to the economic crises with a special focus on the recent global crisis. Furthermore, it has characterized the labor market institutions which have actively played a role during the current crisis in order to help our understanding of the diversity of labor market performances across the selected EU countries. It is important to notice however that a formal modeling and testing of the possible causal nexus between institutions and outcomes is well beyond the purpose of this chapter. It will, instead, be the specific object of the next two chapters of the dissertation.

Being aware of the necessity of an econometric analysis to provide conclusive results, the findings acquired throughout the paper can be summarized as follows. First, the problems Turkey has been facing in the labor market seem to be far beyond being explained by economic downturns. The recent experience with the current economic crisis has shown that labor market flexibility, which has often been recommended to many countries as well as to Turkey to overcome the bottlenecks in the labor market, does not necessarily bring about a successful outcome in the event of an adverse economic shock. Germany, for instance, is a glaring case during the crisis with an optimum interaction between labor market institutions. In particular, a substantial degree of employment security associated with highly flexible working time arrangements and, where feasible, also with efficient active labor market programs may have contributed to the success of a country in accommodating the adverse shock without any employment loss. It is needless to say that there is not a single recipe to be proposed to all countries. Rather each country should prescribe their own recipes according to the country specific

characteristics, learning from the Germany experience.

The Turkish economy, despite its commonalities with the new member states of the EU, has many peculiar characteristics specific to its labor market. The Turkish labor market, despite some rigidities, can not be characterized overall as an inflexible market. The limited number of regulations, and in cases where regulations exist, the limited degree of compliance leave little room for the arguments which link the high rate of unemployment or poor employment creation performance of the labor market to the so-called rigidities. It can be asserted that even if substantial progress is achieved in employment creation through flexibilization of the labor market, this progress would not remove all labor market imbalances. The large number of unskilled labor force in urban areas dropping out of agriculture, the dramatically low rate of female participation especially in urban areas and the large size of informal employment would still remain as major challenges. In this regard, special attention should be paid to the labor demand side. There is in fact considerable scope for interventions to improve the labor market outcomes, particularly for women, including but not limited to regulations encouraging nonstandard types of employment, effective training programs, country-wide children's nursery services and sufficient child raising allowances. The hope is that this study opens further avenues into more detailed discussions on tackling those challenges and developing policy implications.

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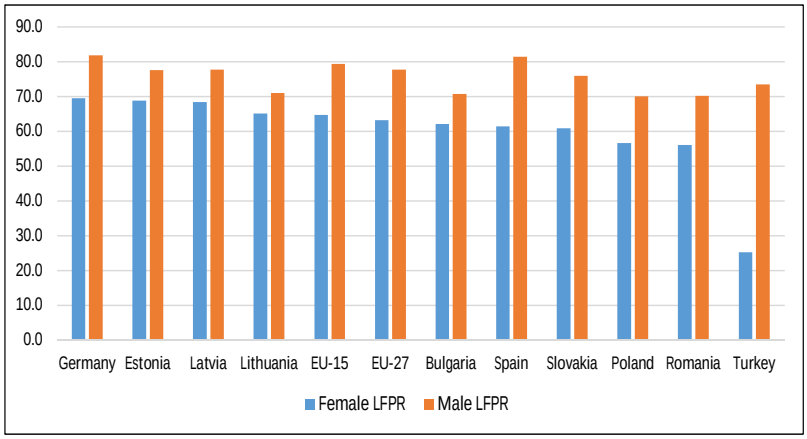
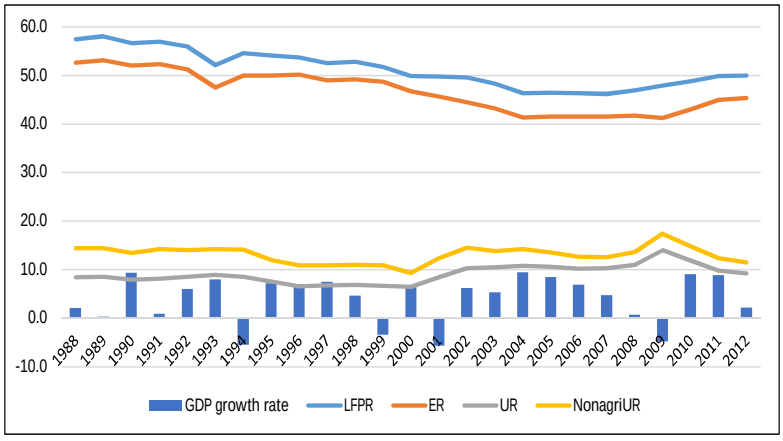
Figures

Figure 1.1: **Labor force participation rate by gender, 2007**



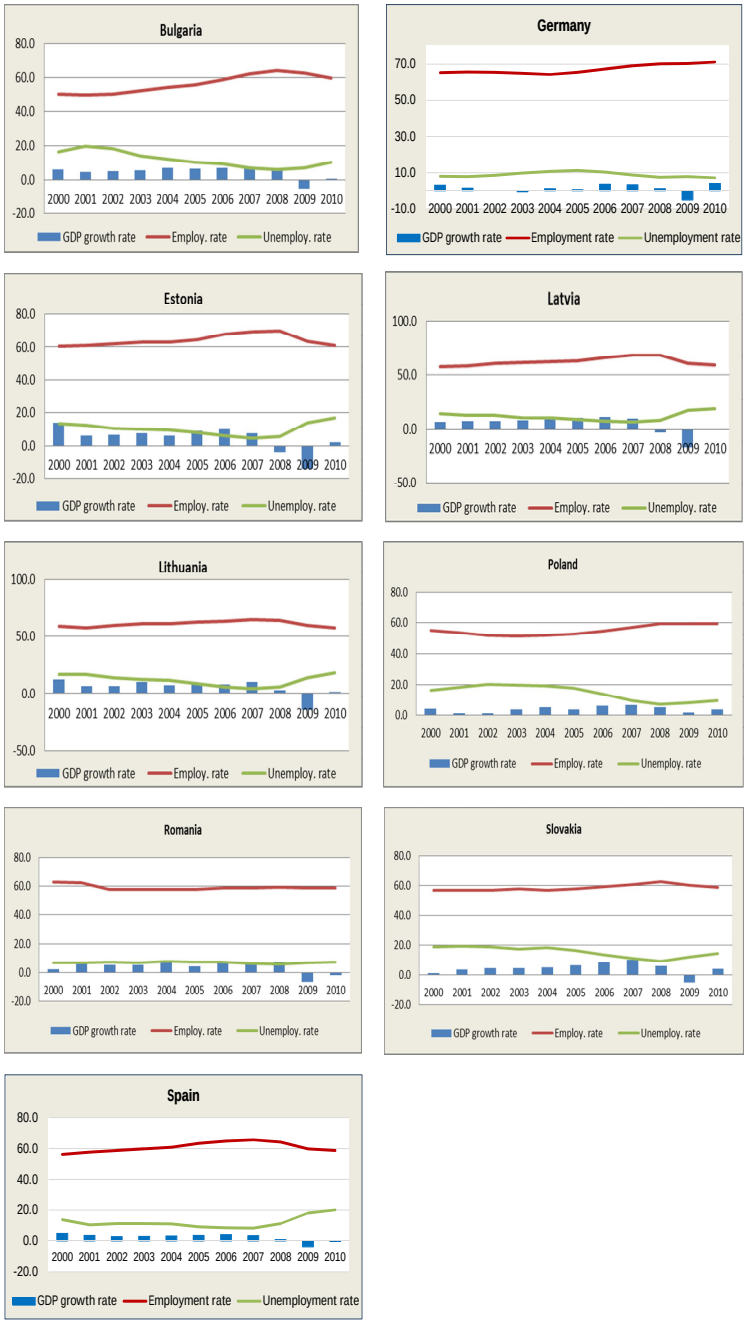
Source : Eurostat, 2013.

Figure 1.2: **Labor market developments in Turkey between 1988 and 2012**



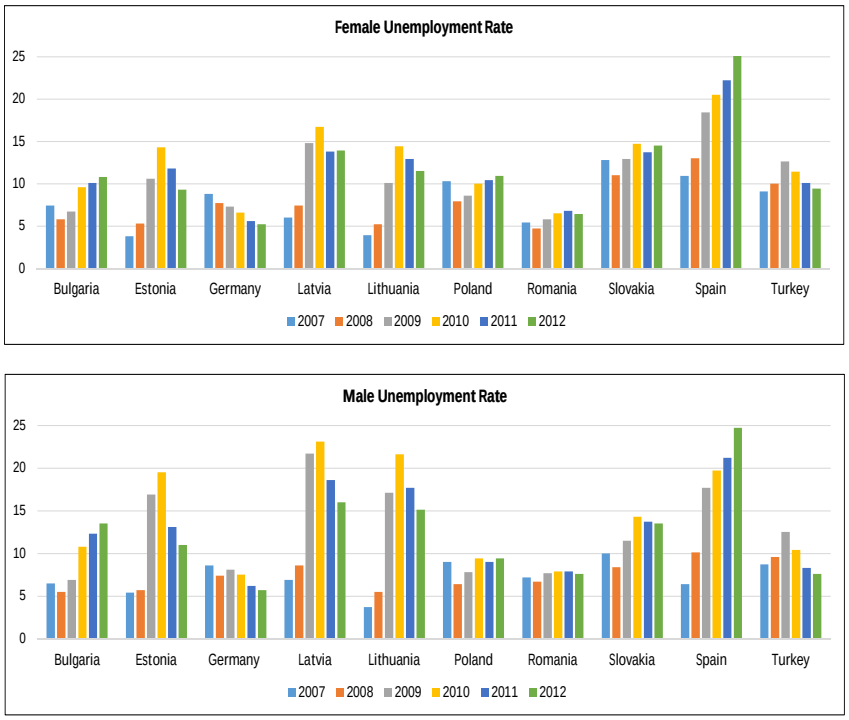
Source : Turkstat, 2013.

Figure 1.3: **Labor market developments in the selected EU countries between 2000 and 2010**



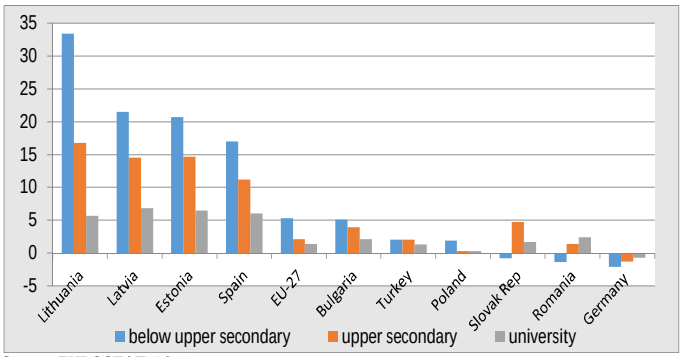
Source : Eurostat, 2013.

Figure 1.4: **Unemployment rate by gender between 2007 and 2012**



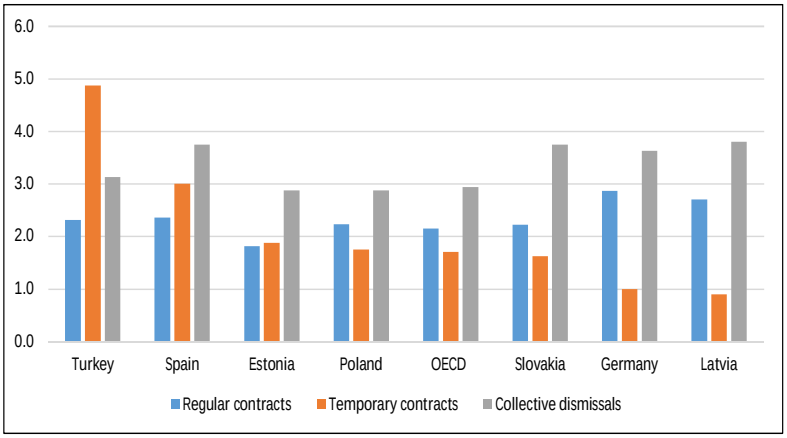
Source : Eurostat, 2013.

Figure 1.5: **Percentage point changes in unemployment rate by education levels between 2007 and 2010**



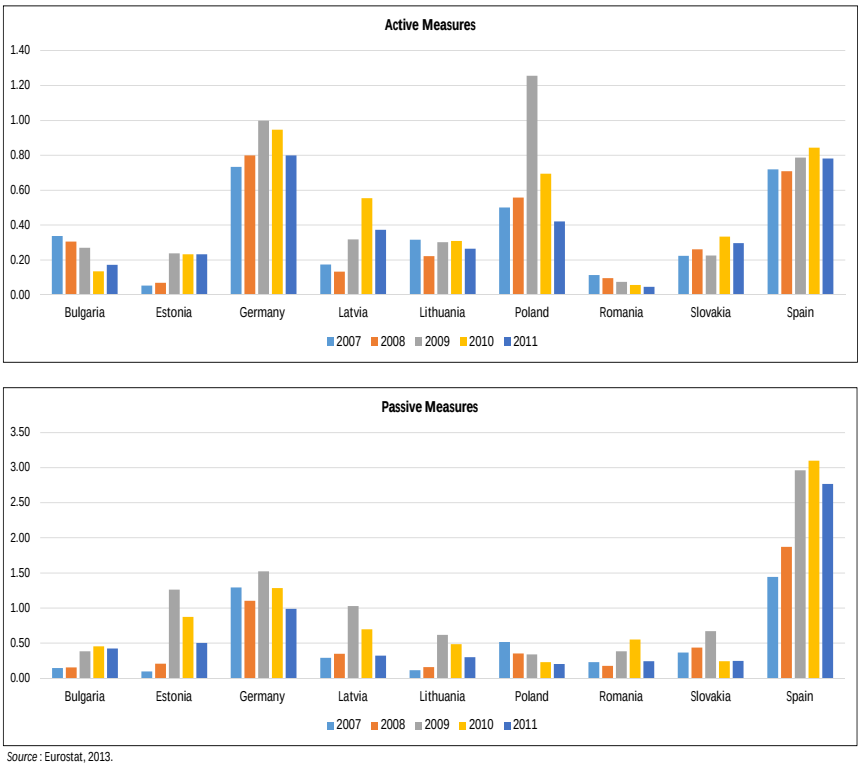
Source: EUROSTAT, 2011.

Figure 1.6: **Employment protection legislation index, 2010**



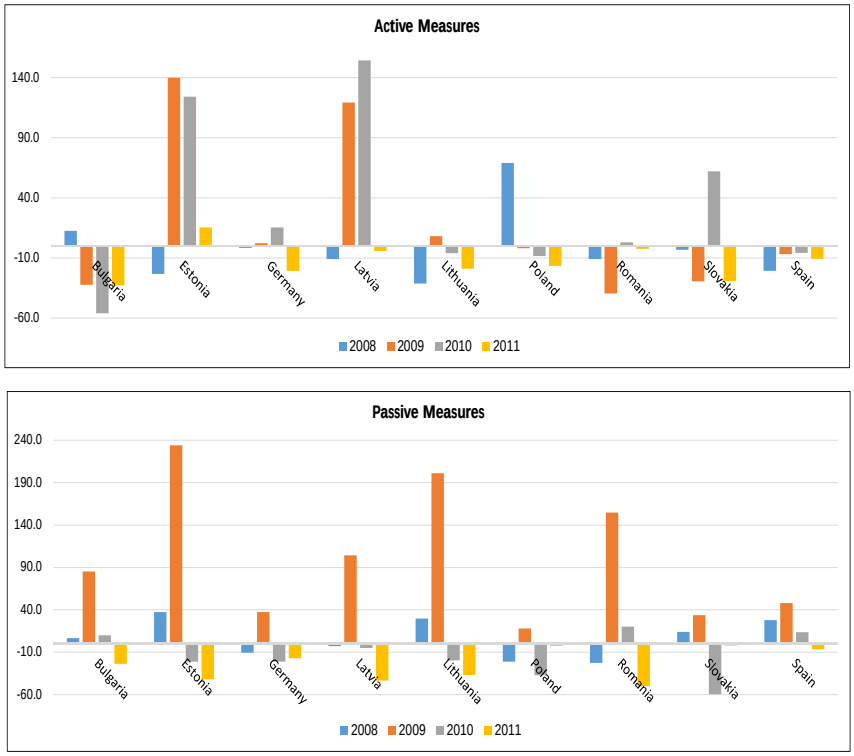
Source : OECD, 2013.

Figure 1.7: **Spending on labor market policies between 2007 and 2011**
(as a share of GDP)



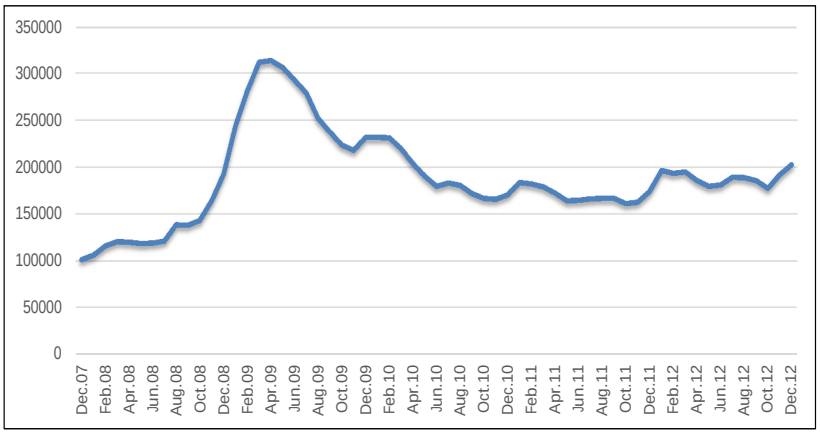
Source : Eurostat, 2013.

Figure 1.8: **Annual change in the number of participants to labor market programs between 2008 and 2011**
(with respect to previous year)



Source : Eurostat, 2013.

Figure 1.9: **Number of beneficiaries of the unemployment insurance fund in Turkey between 2007 and 2012**



Source : Iskur, 2013.

Tables

Table 1.1: **Rates of employment and labor force participation**

	1995	2000	2007	2008	2009	2010	2011	2012
Labor Force Participation Rate								
Bulgaria	:	60.7	66.3	67.8	67.2	66.5	65.9	67.1
Estonia	73.0	70.2	72.9	74.0	74.0	73.8	74.7	74.9
Germany	71.0	71.1	75.6	75.9	76.3	76.6	77.2	77.1
Latvia	70.1	67.2	72.8	74.4	73.9	73.2	72.8	74.4
Lithuania	72.1	70.8	67.9	68.4	69.8	70.5	71.4	71.9
Poland	67.2	65.8	63.2	63.8	64.7	65.6	66.1	66.5
Romania	71.5	68.4	63.0	62.9	63.1	63.6	63.3	64.2
Slovakia	69.2	69.9	68.3	68.8	68.4	68.7	68.7	69.4
Spain	61.1	65.4	71.6	72.6	73.0	73.4	73.7	74.1
Turkey	54.4	49.9	49.1	49.8	50.8	51.9	53.2	53.3
EU-15	67.2	69.0	71.9	72.3	72.4	72.4	72.5	73.0
EU-27	:	68.5	70.4	70.8	70.9	71.0	71.2	71.8
Employment Rate								
Bulgaria	:	51.5	61.7	64.0	62.6	59.7	58.4	58.8
Estonia	64.6	60.4	69.4	69.8	63.5	61.0	65.1	67.1
Germany	64.6	65.6	69.0	70.1	70.3	71.1	72.5	72.8
Latvia	59.9	57.5	68.3	68.6	60.9	59.3	60.8	63.1
Lithuania	62.3	59.1	64.9	64.3	60.1	57.8	60.3	62.2
Poland	58.9	55.0	57.0	59.2	59.3	59.3	59.7	59.7
Romania	65.4	63.0	58.8	59.0	58.6	58.8	58.5	59.5
Slovakia	60.6	56.8	60.7	62.3	60.2	58.8	59.3	59.7
Spain	46.9	56.3	65.6	64.3	59.8	58.6	57.7	55.4
Turkey	50.4	46.7	44.6	44.9	44.3	46.3	48.4	48.9
EU-15	60.1	63.4	66.8	67.1	65.8	65.4	65.5	65.2
EU-27	60.7	62.2	65.3	65.8	64.5	64.1	64.3	64.2

Source: Eurostat, 2013; the earliest data for Estonia and Romania are from 1997 and for Latvia and Lithuania are from 1998. Turkstat, 2013 for Turkey of the years 1995 and 2000.

Table 1.2: **Labor market indicators in Turkey by educational attainment, 2007**

	TOTAL			MALE			FEMALE		
	Labor force participation rate	Employment rate	Unemployment rate	Labor force participation rate	Employment rate	Unemployment rate	Labor force participation rate	Employment rate	Unemployment rate
OVERALL									
Total	46.2	41.5	10.3	69.8	62.7	10.0	23.6	21.0	11.0
Illiterate	18.1	17.1	5.2	36.9	32.3	12.4	14.4	14.2	1.7
Below high-school	44.6	44.2	9.8	69.0	61.8	10.3	19.6	18.4	7.8
High-school	48.8	42.1	13.9	64.9	57.7	11.0	28.4	22.1	22.1
Vocational high-school	64.5	56.8	12.0	80.6	72.7	9.7	36.4	28.8	20.9
University and above	77.3	69.8	9.7	82.6	76.4	7.4	69.4	59.8	13.9
URBAN									
Total	44.3	39.0	12.0	69.3	61.8	10.8	19.8	16.6	16.1
Illiterate	9.3	7.9	15.1	33.0	25.8	21.8	5.1	4.7	7.6
Below high-school	40.0	39.6	12.0	67.5	59.5	11.6	12.8	12.3	14.4
High-school	47.5	40.8	14.1	63.4	56.4	11.0	28.0	21.6	22.7
Vocational high-school	62.7	55.1	12.2	79.7	71.9	9.8	35.2	27.7	21.2
University and above	76.9	69.4	9.7	82.2	76.0	7.4	69.2	59.7	13.6

Source : Turkstat, 2013.

Table 1.3: **Main labor market outcomes in Turkey**

	1988	2007	2008	2009	2010	2011	2012
Working age population	63.3	72.6	72.8	73.2	73.7	74.0	74.3
Labor force participation rate	57.5	46.2	46.9	47.9	48.8	49.9	50.0
Female	34.3	23.6	24.5	26.0	27.6	28.8	29.5
Male	81.2	69.8	70.1	70.5	70.8	71.7	71.0
Employment rate	52.6	41.5	41.7	41.2	43.0	45.0	45.4
Female	30.6	21.0	21.6	22.3	24.0	25.6	26.3
Male	75.1	62.7	62.6	60.7	62.7	65.1	65.0
Informal employment*	58.1	45.4	43.5	43.8	43.3	42.1	39.0
Unemployment rate	8.4	10.3	11.0	14.0	11.9	9.8	9.2
Non-agricultural	14.4	12.6	13.6	17.4	14.8	12.4	11.5
Urban female	28.3	16.1	16.6	20.4	18.7	16.5	15.5
Urban male	9.7	10.8	11.6	15.3	12.6	10.2	9.4
*Youth**	17.5	20.0	20.5	25.3	21.4	18.4	17.5
*Long-term**	50.8	30.3	26.8	25.3	28.6	26.5	24.6

Source : Turkstat, 2013.

* Informal employment is the share of undeclared employment in total employment, youth unemployment involves unemployed people less than 25 years old, and long-term unemployment refers to being unemployed for more than one year.

Table 1.4: **Gross value-added and employment rate by sectors**

	1995	2000	2007	1995	2000	2007	1995	2000	2007
	Agriculture			Industry			Services		
	Gross Value Added								
Bulgaria	16.7	13.6	6.0	29.6	21.3	24.5	53.7	65.1	69.5
Estonia	5.8	4.8	3.1	26.3	22.0	20.3	67.9	73.2	76.6
Germany	1.3	1.3	1.0	25.4	25.3	26.5	73.3	73.4	72.5
Latvia	9.0	4.6	3.6	25.7	17.6	14.3	65.3	77.8	82.1
Lithuania	11.0	6.3	3.9	24.5	23.6	22.2	64.5	70.1	73.9
Poland	8.0	5.0	4.3	28.4	24.0	24.5	63.6	71.0	71.2
Romania	19.2	12.1	6.5	31.9	29.0	27.5	48.9	58.9	66.0
Slovakia	5.9	4.5	4.1	32.7	29.1	30.3	61.4	66.4	65.6
Spain	4.5	4.4	2.9	21.9	20.9	17.3	73.6	74.7	79.8
Turkey	15.7	10.8	8.5	26.4	24.6	22.3	57.9	64.6	69.2
EU-15	2.6	2.2	1.6	23.5	22.2	19.8	73.9	75.6	78.6
EU-27	2.9	2.3	1.8	23.7	22.4	20.2	73.4	75.3	78.0
	Employment Rate								
Bulgaria	22.5	12.3	7.2	26.2	33.0	35.8	51.3	54.6	57.0
Estonia	10.1	6.8	4.6	28.7	34.9	35.9	61.2	58.3	59.5
Germany	3.0	2.5	2.2	36.1	33.6	30.0	60.8	63.9	67.8
Latvia	17.7	14.2	9.4	22.5	27.0	29.0	59.8	58.8	61.7
Lithuania	19.3	18.1	10.2	22.8	27.3	30.9	57.9	54.5	58.9
Poland	27.9	17.4	14.0	25.2	31.7	31.1	46.9	50.9	54.9
Romania	45.3	39.0	25.8	22.4	28.7	33.1	32.3	32.3	41.1
Slovakia	9.0	6.9	4.2	30.1	37.3	39.5	60.9	55.8	56.3
Spain	7.9	6.6	4.5	30.4	31.0	29.4	61.7	62.5	66.1
Turkey	44.1	36.0	22.0	26.7	24.0	27.3	29.2	40.0	50.7
EU-15	4.8	4.0	3.2	30.6	29.0	26.4	64.6	67.0	70.4
EU-27	8.5	7.1	5.1	21.5	29.7	27.8	70.0	63.2	67.1

Source : Eurostat, 2013, data of employment rate of 1995 is from OECD, LFS, 2010.

* Gross value added at basic prices as a percentage of total.

Table 1.5: **Unemployment rate by age**

	2007	2008	2009	2010	2011	2012
Bulgaria	6.9	5.6	6.8	10.3	11.3	12.3
youth	14.1	11.9	15.1	21.8	25	28.1
Estonia	4.6	5.5	13.8	16.9	12.5	10.2
youth	10.1	12.1	27.5	32.9	22.3	20.9
Germany	8.7	7.5	7.8	7.1	5.9	5.5
youth	11.9	10.6	11.2	9.9	8.6	8.1
Latvia	6.5	8.0	18.2	19.8	16.2	14.9
youth	11.9	14.5	36.2	37.2	31	28.4
Lithuania	3.8	5.3	13.6	18.0	15.3	13.3
youth	6.8	12.2	29	35.3	32.2	26.4
Poland	9.6	7.1	8.1	9.7	9.7	10.1
youth	21.6	17.2	20.6	23.7	25.8	26.5
Romania	6.4	5.8	6.9	7.3	7.4	7.0
youth	20.1	18.6	20.8	22.1	23.7	22.7
Slovakia	11.2	9.6	12.1	14.5	13.7	14.0
youth	20.6	19.3	27.6	33.9	33.7	34
Spain	8.3	11.3	18.0	20.1	21.7	25.0
youth	18.2	24.6	37.8	41.6	46.4	53.2
Turkey	8.8	9.7	12.5	10.7	8.8	8.1
youth	17.2	18.4	22.7	19.7	16.8	15.7
EU-15	7.1	7.2	9.2	9.6	9.7	10.6
youth	15.2	15.7	19.9	20.4	20.7	22.3
EU-27	7.2	7.1	9.0	9.7	9.7	10.5
youth	15.7	15.8	20.1	21.1	21.4	22.8

Source : Eurostat, 2013.

* Youth unemployment involves the age group less than 25 years.

Table 1.6: **Employment rates by nonstandard employment contracts**
(as a share of total employment)

		2007	2008	2009	2010	2011	2012
Bulgaria	*part-time*	1.5	2.0	2.1	2.2	2.2	2.2
	temporary	5.1	4.9	4.6	4.4	4.0	4.4
Estonia	*part-time*	7.2	6.4	9.4	9.8	9.3	9.2
	temporary	2.2	2.4	2.5	3.7	4.5	3.5
Germany	*part-time*	25.4	25.1	25.3	25.5	25.7	25.7
	temporary	14.7	14.8	14.6	14.7	14.8	13.9
Latvia	*part-time*	5.6	5.5	8.4	9.3	8.8	8.9
	temporary	4.2	3.3	4.4	6.8	6.7	4.8
Lithuania	*part-time*	8.1	6.5	8.0	7.7	8.3	8.8
	temporary	3.5	2.4	2.3	2.4	2.8	2.6
Poland	*part-time*	8.5	7.7	7.7	7.6	7.3	7.2
	temporary	28.2	26.9	26.4	27.2	26.9	26.8
Romania	*part-time*	8.6	8.6	8.5	9.7	9.3	9.1
	temporary	1.6	1.3	1.0	1.1	1.5	1.7
Slovakia	*part-time*	2.5	2.5	3.4	3.8	4.0	4.0
	temporary	5.0	4.5	4.3	5.6	6.5	6.7
Spain	*part-time*	11.6	11.8	12.6	13.1	13.7	14.6
	temporary	31.7	29.3	25.5	25.0	25.4	23.7
Turkey	*part-time*	7.9	8.7	10.6	11.1	11.3	11.5
	temporary	11.8	11.1	10.7	11.4	12.2	12.0
EU-15	*part-time*	20.3	20.4	21.0	21.4	21.8	22.3
	temporary	14.9	14.5	13.8	14.1	14.2	13.8
EU-27	*part-time*	17.6	17.6	18.1	18.6	18.8	19.2
	temporary	14.6	14.1	13.6	13.9	14.1	13.7

Source: Eurostat, 2013.

Table 1.7: **Short-time working schemes before and after the crisis**

	Before the Crisis		After the Crisis	
	Compensation	**Max. Duration**	**Compensation**	**Max. Duration**
TUR	The amount of UIB (40% of the daily earnings, less than 80% of the minumum wage)	3 months	150% of the compensation before the crisis	6 months
BUL	no scheme		EUR 613	3 months (until the end of 2010)
LAT*	no scheme		EUR 98 per month during the training period	6 months (until the end of the 2010)
LIT*	no scheme		SSC reimbursed to employers by PES at 100% (plus training grant paid to workers amounting to up to 70% of the min. monthly wage during the training period)	not specified
POL	no scheme		part of the employees' remuneration	6 months
ROM	min. 75% of the basic wage corresponding to the workplace.	not specified	in addition to pre-crisis remuneration, exemption of the payment of SSC for both employers and employees	3 months for the exemption of SSC payment
SLOV	no scheme		EUR 339	max 60 days (until Dec. 2010, with an exemption for workers who has serious operational reasons till Dec. 2012)
GER	share of UIB (= 60-67% of reference net wage) plus supplements possible by employer	6 months (extensions possible)	SSC reimbursed to employers by PES at 50% in the first 6 months of STW.Beginning with the seventh month of STW, the employers receive SSC reimbursed at 100%.	24 months (until December 2010)
SPA	Eligibility to UIB (= 70% for max. 180 days, 60% of reference earnings for the remaining period)	2 years	no change but 50% bonus in SSC payment until the end of 2009	no change

Source: European Comission, 2010; Hijzen and Venn, 2011.

* STW scheme in Latvia is designed under a training program. STW scheme in Lithuania is linked to training programs, but participation to training program is not compulsory as in the case of Latvia, but provides an incentive for workers.

Table 1.8: **Average number of weekly working hours**

	2007	2008	2009	2010	2011	2012
Bulgaria	41.6	41.6	41.4	41.2	40.9	40.7
Estonia	39.5	39.5	38.7	38.8	38.7	38.8
Germany	35.5	35.6	35.7	35.7	35.5	35.5
Latvia	40.7	40.1	39.3	38.8	38.8	38.7
Lithuania		39.1	38.6	38.4	38.1	38.0
Poland	41.0	41.0	40.7	40.6	40.5	40.7
Romania	40.5	40.5	40.4	40.3	40.3	40.3
Slovakia	41.1	41.0	40.8	40.6	40.6	40.8
Spain	39.3	39.1	38.8	38.6	38.4	38.1
Turkey	51.0	50.5	49.4	49.3	48.9	48.4
EU-15	37.2	37.1	36.9	36.8	36.7	36.6
EU-27	37.9	37.8	37.6	37.5	37.4	37.3

Source : Eurostat, 2013.

Table 1.9: **Participation rate in labor market programs, 2011**
(as a share of total participation)

	Active Measures						Passive Measures
	Labour market services	Training	Employment incentives	Supported employment & rehabilitation	Direct job creation	Start-up incentives	Out-of-work income maintenance & support
Bulgaria	0.0	2.2	2.9	0.3	9.1	0.2	85.2
Estonia	6.7	10.4	10.4	0.0	0.4	2.4	69.7
Germany	4.9	15.4	4.6	0.9	4.1	3.2	67.0
Latvia	0.1	14.6	6.7	0.0	24.5	0.4	53.8
Lithuania	0.7	3.2	0.0	8.6	12.2	0.0	75.4
Poland	0.1	0.7	8.8	43.7	0.7	10.0	35.9
Romania	0.0	6.4	9.9	0.0	2.4	0.0	81.3
Slovakia	0.0	0.1	21.6	3.4	13.3	25.2	36.5
Spain	0.2	6.1	33.5	1.4	0.0	6.5	52.4
EU-15	16.6	11.6	13.8	2.0	2.6	2.7	50.7
EU-27	15.1	10.8	13.5	3.8	2.8	2.8	51.1

Source : Eurostat, 2013.
Notes : (1) The latest data available for EU-15 and EU-27 is at 2010.
(2) Unemployment benefits are excluded from passive measures.

Table 1.10: **Spending on labor market programs, 2011**
(as a share of GDP)

	Active Measures						Passive Measures
	Labor market services	Training	Employment incentives	Supported employment & rehabilitation	Direct job creation	Start-up incentives	Out-of-work income maintenance & support
Bulgaria	0.04	0.02	0.01	0.00	0.09	0.00	0.42
Estonia	0.08	0.09	0.04	:	0.00	0.01	0.50
Germany	0.35	0.26	0.06	0.03	0.03	0.07	0.99
Latvia	0.04	0.14	0.06	:	0.13	0.00	0.32
Lithuania	0.08	0.02	0.07	0.04	0.05	:	0.30
Poland	0.08	0.01	0.09	0.19	0.01	0.03	0.20
Romania	0.03	0.00	0.01	:	0.00	0.00	0.24
Slovakia	0.07	0.00	0.10	0.04	0.01	0.07	0.25
Spain	0.10	0.18	0.24	0.08	0.06	0.11	2.77
EU-15	0.25	0.24	0.13	0.08	0.07	0.04	1.37
EU-27	0.24	0.22	0.13	0.08	0.07	0.04	1.30

Source : Eurostat, 2013.
* The latest data available for EU-15 and EU-27 is at 2010.

Table 1.11: **ISKUR responsibilities regarding ALMPs**

	Applications during the year	Vacacies taken during the year	Placements during the year	Registered labor force	Registered unemployed	Number of courses
2007	656,969	186,922	111,375	759,104	696,538	1,200
2008	1,275,674	178,620	109,595	1,095,105	987,840	1,806
2009	1,435,024	165,890	118,278	1,858,855	1,689,349	10,113
2010	1,217,938	368,636	205,231	1,604,355	1,414,541	11,821
2011	1,398,355	660,623	363,672	2,192,145	1,844,965	16,594
2012	2,296,325	991,804	556,587	3,481,725	2,372,262	27,351

Source : Iskur, 2013.

Table 1.12: **Characteristics of unemployment benefits schemes, 2007**

	Payment rate (% of earning base)	Earning base	Max. Duration	Employment (E) & Contribution (C) Requirements*
Tur	50	Net	10	E: 600 days in 3 years C: 120 days continuously
Bul	60	Gross	12	C: 9 months in 15 months
Est	50 (40% after 100 days)	Gross	12	C: 12 months in 36 months
Lat	90% of min. wage (70% for new entrants)	--	6	.--
Lit	70 (later reducted to 60-50%)	--	6	C: 18 months in 36 months
Pol	Fixed amount (27% of average wage)	--	12	E+C: 1 year in 18 months
Rom	50-60	Gross	9	C: 12 months in 24 months
Slov	50	Gross	6	E+C: 3 years in 4 years
Ger	60	Net	12	E: 12 months C: 12 months in 3 years
Spa	70 (60% after six months)	Gross	24	C: 360 days in 6 years

Source: OECD, 2012; 2007, Venn (2012).
* Single worker without children, benefits may differ depending on family situation. All benefit amounts are shown on an annualized basis. "--" indicates that no information is available or not applicable.

Chapter 2

Do Non-Wage Cost Rigidities Slow Down Employment? Evidence From Turkey*

2.1 Introduction

The employment rate in Turkey, fluctuating between 40%-50%, has been ranking the lowest in Europe for the last decade. Even Poland and Romania, amongst the lowest ranking EU countries, have an employment rate more than 15 percentage points higher than Turkey. As discussed in the previous chapter, the divergence in employment rate between Turkey and the EU is mainly because of the dramatically low rate of female employment in Turkey. As of 2007 only 21% of women were employed in Turkey, corresponding to one third of the EU average.

Reasons behind the divergence in employment performances among countries have been central to the literature in labor economics. A number of national and international surveys point at high non-wage costs, particularly high social security contributions in Turkey that create a burden on employers, and this in turn discourages employment creation in the formal sector while encouraging informal employment (OECD, 2007; TCEA, 2006; World Bank, 2006). This view, also shared by the Turkish policy makers, was embodied in a policy intervention legislated in May 2008. The law prescribed a cut (up to 100%) in social security contributions borne by employers who hired young men (aged 18 to 29 years) and women (aged over 18 years) between July 1^{st}, 2008 and June 30^{th}, 2010. The main goal of this paper is to conduct a micro-econometric analysis to evaluate the effectiveness of this policy in creating formal employment for the targeted group (women), something that, to the best of my knowledge, has not been done yet.

Employment subsidy policies in the form of social security contribution cuts have taken

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place in several countries mostly in the northern Europe such as France (e.g. Kramarz and Philippon, 2001), Belgium (e.g. Goos and Konings, 2007), Sweden (e.g. Bennmarker et al., 2008; Egebark and Kaunitz, 2010) and Finland (e.g. Huttunen et al., 2009) over the last two decades. Chile (e.g. Gruber, 1997) and Turkey (e.g. Betcherman et al., 2010; Uysal, 2013) are the only known examples of developing countries where employment subsidies have empirically been analyzed. The employment subsidies generally target disadvantaged groups (e.g. low-wage workers, the young or the old), certain sectors or geographic locations rather than being applied to all workers and/or to all establishments. The availability of certain target groups enables the researchers to analyze the effectiveness of employment subsidies through difference-in-differences and/or triple difference strategy. The studies have mostly found little or no evidence of an employment effect of labor tax reduction with a few exceptions (i.e. Betcherman et al., 2010; Goos and Konings, 2007; Uysal, 2013)[1].

Following the previous studies, my empirical analysis relies on a difference-in-difference-in-differences (triple difference) strategy with the intent of avoiding potential confounding effects of the 2008 economic crisis which coincides with the policy period. More concretely, firstly, the change in the outcome of women aged 30 to 34 (affected by the policy) is compared with the change in the outcome of men of the same age group (unaffected by the policy) between before and after the policy period, assuming that the outcomes of both groups would have had a parallel trend in the absence of the policy. Then the resulting difference is contrasted with the comparison of the relative outcomes of two treatment groups (women and men aged between 25 and 29 years old) which are both subject to the policy and to the crisis between pre- and post-policy period. The latter difference enables the canceling out the crisis effect on women aged 30 to 34 under the assumption that both age groups have been affected by the crisis in a similar way. The estimation results suggest a positive and significant effect of the social security premium incentives on creating employment for the targeted group (women) in the periods shortly after the policy announcement. As far as is known to date, this study is the first attempt to explore the causal relation between Turkish non-wage subsidy policy in 2008 and employment creation. There is only little empirical research on developing countries in the field of employment subsidies. The existing literature, moreover, does not focus on the total number of employment positions created by the policy that this paper intends to explore by using flow data.

The paper is organized as follows: Section 2.2 documents an overview of non-wage cost rigidities in the Turkish labor market and then introduces the policy of interest. Section

[1]The studies by Betcherman et al. (2010) and Uysal (2013) are of particular importance for this analysis as they are conducted in Turkey. While the former evaluates two regional employment subsidies having come into effect in 2004, the latter examines the policy of interest, however, that paper, contrary to this study, does not conduct an econometric analysis, but relies on descriptive statistics.

2.3 describes the data and the technique used to construct flow data. The identification strategy is discussed in Section 2.4, and estimation results are presented in Section 2.5. Finally, Section 2.6 concludes.

2.2 An Overview of Non-Wage Costs in Turkey

Various factors could play a role in explaining the relatively poor employment performance of the Turkish labor market. One convincing explanation for the low rate of employment in the formal sector alongside the large size of informal employment (accounting for 45% of total employment) could be related to the factors increasing the cost of labor, apart from wage cost, given that the only labor cost employers have to bear in the informal sector is wage cost[2].

The so-called "non-wage costs" refer to the part of total labor cost that is not directly related to actual working hours, including income tax on wages, employers' and employees' contributions to the social security premiums and unemployment insurance fund. These costs create a wedge between the cost the employer has to bear for hiring an employee and the wage received by the employee. As the wedge gets wider, the labor cost incurred by employers increases and employers become less willing to hire new workers in the formal sector. A widely used indicator to measure the weight of non-wage costs is *tax wedge*. It is calculated as the ratio of income taxes plus employers' and employees' social security contributions (SSC) to total labor cost. The largest portion of the financial burden of labor taxes is incurred by employers in the majority of the OECD countries, including Turkey (OECD, 2010).

The tax wedge in Turkey, in respect of all three components, is comparable to the EU countries as far as average-income earning singles and couples without children are considered (OECD, 2010). On the other hand, Turkey's ranking becomes well above the EU average as the family size gets larger and the income level decreases. According to the OECD data, the tax wedge in Turkey is the highest in the OECD as well as compared to the EU countries in regards to the low-income families with two children (both single parent at 67% of average wage, and one earner at average wage and the earner at 33% of average wage) (*ibid*). The last point worthy of note is the remarkable fall in the tax wedge in Turkey between 2007 and 2009. OECD (2010) reports that Turkey ranks alongside the ten EU countries with the most significant reduction in tax wedge during this period, accounting for almost seven percentage point decrease for low-earner single persons without children. In fact, the decline in the tax wedge in Turkey corresponds to the period of the approval of a recent regulation that stipulated a cut in employers' SSC. An evaluation of this regulation constitutes the main interest of this paper.

[2]The formal-informal distinction is made on the basis of registration in any social security institution.

2.2.1 The 2008 Employment Package in Turkey

In response to high non-wage costs in Turkey, the policy makers introduced a law also known as " employment package" in May 2008. The package basically provides an exemption for employers from paying SSC with the intent of creating new employment for women (aged over 18 years) and young men (aged between 18 and 29). The exemption would gradually be phased out over a 5-year period. More specifically, the Unemployment Insurance Fund would pay out 100% of employers' SSC for the first year, 80% for the second year, 60% for the third year, 40% for the fourth year and 20% for the fifth year.

Employers can benefit from this subsidy if, and only if, the individuals they hire from the target group in any period between July 1^{st}, 2008 and June 30^{th}, 2010 are *de facto* employed within one year following the effective date of the regulation and in addition to the average number of previously registered insured workers having been declared in the one-year period preceding the effective date of this regulation (Law No.5763, 2008). The law also provides that the newly hired workers shall not be included among the previously registered insured workers in the six-month period preceding the effective date of the regulation. In order to avoid benefiting from the subsidy without creating new employment, the law excludes circulation of workers within sub-companies of the same employer; switching workers between direct or indirect partnerships, and also the situations in which an employer closes his company, opens another one and transfers his workers from the old to the new one.

In fact, the employment package that came into effect on 1 July 2008 was initially designed for one year. However, after the global economic crisis hit the Turkish labor market, a second employment package, extending the duration of the incentives for one more year, was introduced in order to alleviate the unfavorable impacts of the crisis on the effectiveness of the policy (Law No. 5838, 2009). Likewise, to overcome the detrimental effects of the crisis on the labor market, similar employment incentives were introduced in August 2009 (Uysal, 2013). These incentives, regulated under a provisional article added to the Unemployment Insurance Law no. 4447, were provided for all new hirings, regardless of gender and age, for a six-month period. As stated by Uysal (2013), these additional incentives could mitigate the effectiveness of the policy of interest that targeted only female and young male employment. The potential effects of the other employment incentives on my analysis will be touched on later, in Section 2.5 while discussing the estimation results.

2.3 Data and Descriptive Statistics

The empirical analysis relies on quarterly data for the period between 2006 and 2010 from Turkish Household Labor Force Survey. The survey collects information on demographic and labor market characteristics of household members, including information on educa-

tion, age, marital status, employment, working hours, income, unemployment, inactivity and past work experience. The quarterly data allow distinguishing pre- and post-policy periods such that the policy period ranges from the third quarter of 2008 to the second quarter of 2010, while the period before the policy introduction is between the third quarter of 2006 and the second quarter of 2008. Exploiting the advantage of using quarterly data, it is possible for the policy effect to be estimated by each quarter within the policy period, which will be further discussed in the following section. This will enable us to address the concerns raised by Uysal (2013), in that, to characterize whether the policy effect dies away after August 2009 probably because of the other employment incentives that were enacted meanwhile (as mentioned in Section 2.2.1).

Labor supply, constituting the outcome variable of this analysis, can be measured either through static variables such as annual working hours and employment probabilities or through flow variables such as transitions between labor market states. These states are conventionally defined as employment, unemployment and non-participation. The literature related to flow analysis focuses on two different kinds of transitions: worker and job flows. The latter measures whether a new position has been created or destroyed by a firm rather than the changes in the labor market status of the worker which is captured by the former measure (Davis et al., 2006). Basically, job flows are measured on the basis of establishment or firm level data[3], whereas worker flows are measured on the basis of individual or household level data[4]. A flow analysis is considered more appropriate for the aim of this paper that is to evaluate the effectiveness of the policy in creating new employment, which is unlikely to be captured by static variables. Moreover, the data set used in this paper, namely a household labor force survey makes a flow analysis based on worker transitions rather appropriate. Although the survey does not include a panel component, the retrospective questions in the questionnaire such as the labor market status one year before the survey enable us to track individuals in two consecutive survey periods. These retrospective questions are exploited to construct the flow data. For instance, flows from employment to unemployment include the respondents who report their current status as unemployed while their recalled status one year prior to the survey was employed.[5]

[3]Some leading studies on measuring job flows are Davis and Haltiwanger (1992, 1999); Burda and Wyplosz (1994) and Burgess et al. (1994). All these studies calculate gross job creation and destruction rates on the basis of establishment-level data from various sources, especially from the United States (U.S.).

[4]Some leading studies on measuring worker flows are Bleakley et al. (1999), Shimer (2005) and Davis et al. (2006) which use different data sources from the U.S.; Bell and Smith (2002) and Elsby et al. (2010) which use labor force survey of the United Kingdom; Haltiwanger and Vodopivec (1999) which use Estonian labor force survey.

[5]One could raise the *recall bias* problem caused by the response errors in estimating the flows. Following Bell and Smith (2002), I check whether recall bias is a relevant issue for this analysis by looking at the number of 'inconsistent' transitions. In particular, I

New employment creation, defined as the difference between hirings and separations, is calculated by subtracting flows into employment from flows out of employment (Davis et al., 2006). Following Bell and Smith (2002) and Elsby et al. (2010), *hiring* is defined as the sum of flows from unemployment to employment and flows from inactivity to employment, whereas *separation* is equal to flows from employment to unemployment plus flows from employment to inactivity. Flows between unemployment and inactivity are also examined in order to capture a potential change in the job searching behavior of individuals. Table 2.1 presents flow rates for nine possible transitions between and within labor market states of employment (E), unemployment (U) and inactivity(N). The flow variables displayed in the table are denoted by two letters, representing the initial and arrival labor market states, respectively.

According to the figures reported in Table 2.1, the Turkish labor market seems somewhat static with substantially low rates of transitions between labor market states relative to transition rates within the states. During the sample period between 2006 and 2010, around 40% of the population (aged 15 and above) are employed, and only one tenth of them have transited into employment from unemployment or inactivity, the remainder (36%) have already been in employment since the previous year. On the other hand, the hiring rate (the sum of UE and NE) has seen almost one percentage point increase between 2008 and 2010 despite a constant trend at the outset of the sample period, which provides rough evidence for the effectiveness of the policy of interest. Table 2.1 makes clear that the increase in the hiring rate is attributable to the increase in UE rather than NE. Moreover, the separation rate (the sum of EU and EN) has also seen more than one percentage point increase between 2007 and 2009 probably because of the crisis effect, and then it has started to decrease with the recovery from the crisis.

The policy could also have an impact on within-employment transitions through formalization of the existing job and/or by changing the type of employment (i.e. full-/part-time versus permanent/temporary)[6]. However, there is no information in the survey about the social security coverage and employment type of the previous year's job. Therefore, it is impossible to examine the employment-to-employment transitions in these respects. Nevertheless, it is feasible to track what kind of jobs the individuals transit into without

compare the responses to the question asking the current and the previous year's status of the individuals with those related to the duration of their current status. That there is a consistency between the two responses avoids us worrying about the recall bias problem. For instance, the number of persons who report their current status as employed and their status in the previous year as nonemployed is equal to the number of persons who report the starting date of work as the survey year. The equality holds also for the flows into unemployment and inactivity.

[6]According to Turkstat (2012) definition, the respondents who report themselves as part-time employed include those whose usual weekly working hours are substantially fewer than those having full-time jobs. In the Labor Act, normal work week for a full-time worker is determined as 45 hours (Law 4857, 2003).

knowing the type of job they were working during the previous year. As Table 2.2 presents, 47% of the employed people in the sample do not have a social security coverage as of 2007, and transitions into employment are more likely to be into informal employment which account for 63% of total flows into employment. Informality is more common among female workers relative to their male counterparts, especially among women aged 30 to 34[7]. In parallel, the incidence of transiting into informal employment is higher among women.

On the other hand, atypical employment arrangements such as part-time and temporary employment do not represent a considerable proportion in total employment. As displayed in Table 2.2, only one tenth of the employed people work in a part-time job while the remainder have a full-time job. Similarly, only 5% of the employed hold temporary contracts. Part-time employment is higher by far among women for both age groups, whereas it is the reverse as regards to temporary employment. The low incidence of atypical employment arrangements is accompanied by a larger share of transitions into regular jobs. As a share of the total flows into employment, flows into full-time and permanent employment account for 90% and 80%, respectively.[8]

2.4 Identification Strategy

Identification is achieved by exploiting the fact that the policy intervention targets specific groups of individuals in the population and that the individuals can be observed before and after the policy period. This allows using difference-in-differences (DD) strategy to analyze the employment effect of the policy on women and young men. Recalling the policy design described in Section 2.2.1, the treatment group (those targeted by the policy) could be selected from among men aged 20-29 and women over 18 years old, and the control group (those not targeted by the policy) could be selected from among men aged over 29 years. Given that the data do not provide exact ages of the individuals, but 5-year age brackets, in order to explore the causal effect of the policy on employment creation for young men, the relative outcomes of men aged 25 to 29 are compared with those of men

[7]For sake of brevity, Table 2.2 only includes the age groups of 25-29 and 30-34 on which the identification strategy is built.

[8]In relation to the short-term employment arrangements, one may raise the point of *time aggregation bias*. If individuals change their labor market status more than once in a year, the recorded transitions would be biased as the short-term transitions across states are suppressed in discrete data (Lin and Miyamoto, 2010). Given the small share of (flows into) atypical employment along with the immobility of the labor force, short-term transitions are not expected to be a worrying issue for the Turkish context. Above all, according to the regulation of interest, the newly hired workers cannot be among the previously registered workers of the same employer. Such a restriction on short-term transitions would rule out a potential problem of time aggregation.

aged 30 to 34 between before and after the policy introduction[9]. Similarly, to evaluate the employment effect of the policy on women, the relative outcomes of women aged 30 to 34 are compared with those of men of the same age group between before and after the policy introduction[10].

In particular, firstly, a comparison in the changes in the outcome of the treatment group between before and after the policy introduction is made by taking differences across time but within the group, which enables us to remove any group specific unobserved effects but time fixed effects. The same comparison is replicated for the control group. Then the difference (across groups) of these two differences is noted which enables us to get rid of any time trend[11]. In principle, the coefficient obtained through the double differences yields the causal effect of the intervention under the assumption that the outcomes of treatment and control groups would have had parallel trends in the absence of the policy (Angrist and Pischke, 2009). The so-called *common trend assumption* is the key identifying assumption of this strategy. Following Angrist and Pischke (2009), the credibility of this assumption is validated by examining the long run employment trend in treatment and control groups prior to the policy period. The employment trend for men and women in the concerned age groups is roughly parallel between 2003 and 2008, as shown in Figure 2.1[12]. In relation to this, I test the difference in the mean of relevant observable characteristics between

[9]One may raise the point that men aged 30, for instance by the third quarter of 2009, were indeed in the treatment group one year before, when they were 29, although they are counted in the control group as the treatment and control groups are constructed based on the current age cohort. This could create a problem for the empirical analysis as the outcome variable of interest is a flow variable which is constructed based on the labor market status in the previous survey year. More concretely, the estimation results would be understated. Unfortunately, it is not possible to capture age changes up to 5 years due to the unavailability of the data. However, the extent of the problem is not expected to be too large to threaten the overall estimation results given that this problem contains only men at the age of 30 in the survey period between the third quarter of 2009 and the second quarter of 2010. In other words, the control group is clean of treated individuals for the first half of the policy implementation year as well as for men aged over 30 years old.

[10]It is considered more plausible to compare closer age groups with similar characteristics rather than, for instance, comparing 60-year-old women with 30-year-old-men who have different probabilities of finding a job because of their unlike age-specific characteristics.

[11]See appendix 2.A.1 for the formal expression of the DD strategy within a regression framework.

[12]The first red vertical line in Figure 2.1 is on 2003 which denotes an approximate date for the end of the 2001 crisis, a domestically oriented crisis hit hard the labor market. The latter vertical line, on the other hand, is on 2008, belonging to the year of policy introduction as well as the onset of the global economic crisis. Furthermore, I also check the trend in hiring and separation rate of the treatment and control groups between 2006 and 2010 given that the micro data are available only for this period. Similar to what is observed for the employment trend, the flow rates show quite a parallel trend for the concerning subgroups till the policy period, as can be seen in Figure 2.2.

the treatment and control group. The results support the hypothesis of no significant difference between the two groups.

One potential problem in this analysis would be if employers had expected the enactment of the policy and strategically delayed hiring new workers or fired the existing workers in the control group until the law was introduced with the intent of benefiting from the incentives. It is needless to worry about such a problem in this context given that the policy was announced only two months before the implementation period, and benefiting from the incentives is conditional on additional hiring as mentioned before.

The DD strategy would have been appropriate to analyze the causal effect of the policy intervention if the crisis had not affected the labor market outcomes of the subgroups differently. Given the differential effect of the crisis across treatment and control groups, as can be seen in Figure 2.3, the policy evaluation through DD strategy is potentially confounded by the crisis effect. In order to rule out the possible confounding effects of the crisis, difference-in-difference-in-differences (DDD) strategy is exploited. This strategy is advantageous over a double difference analysis in policy evaluation, especially in the presence of an economic shock which could play a determining role in the effectiveness of the policy. Technically speaking, DDD strategy requires three dimensions to be implemented, which are age, gender and time in this context. Since the policy of interest targets all women over 18 years old, it is unlikely to use a group of women as a control group and accordingly to conduct a DDD analysis for evaluating the policy effect on men. Therefore, the evaluation based on DDD strategy is confined to the effect of the policy on women.

As a first step, a standard DD estimator is implemented by comparing the change in the outcome of women aged 30 to 34 (affected by the policy) with the change in the outcome of men of the same age group (unaffected by the policy) between pre- and post-policy period, assuming that the outcomes of both groups would have had a parallel trend in the absence of the policy. Then the resulting difference is contrasted with the comparison of the relative outcomes of two treatment groups (women and men aged between 25 and 29 years old) who are both subject to the policy and to the crisis between pre- and post-policy period[13]. This difference basically enables us to cancel out the crisis effect on women aged 30 to 34 under the assumption that both age groups have been affected by the crisis in a similar way.

The validity of this last assumption is tested in two steps. The first step is to test whether there is an age effect. To do this, a comparison is made in the relative outcomes of women aged 30 to 34 with their younger counterparts aged 25 to 29 between two periods before the policy intervention. Finding a statistically significant estimate of the coefficient of the interaction term would suggest the existence of an age effect, which would violate the assumption unless the age effect is the same for both genders. The second step is to

[13]See appendix 2.A.2 for a formal expression of DDD strategy within a regression framework.

test whether the age effect is the same for women and men. To this end, the DDD analysis is replicated for the pre-policy period. If the null hypothesis that the coefficient estimate(s) of the triple interaction term are significantly different from zero is not rejected, it would imply that a comparison between two age cohorts would eliminate the differential crisis effect even if there is evidence of age effect, and so the identifying assumption would hold. In such a scenario, the second step test would be sufficient to prove the validity of the assumption. Given that no significant estimate was found in either step, the first step results are not presented for sake of brevity. The placebo test results are discussed in more detail in the following section.

A last point worthy of note is the possible heterogeneity in the policy effect across periods. In particular, the policy may be more effective as time goes on or, on the other hand, the effect may be stronger just after the announcement of the policy, then phases out with the passing of time. In order to see whether the policy effect is quarter- and/or year-specific, three specifications are estimated based on the empirical strategy just outlined above. First, the policy effect is imposed to be constant across quarters over the period. More specifically, there is no allowance for quarter and year specific dummies, and the comparison is between the entire period after the policy introduction and the entire period before the policy. This specification is called "period specific" policy effect. Next, the policy effect is imposed to be constant across quarters within a year, but allowing for variation between years by introducing year specific dummies for the policy period. This specification enables the estimation of the policy effect for each year over the policy period. Thirdly, an allowance is made for heterogeneous policy effect across quarters by including year specific quarter dummies. This time the comparison is between each quarter within the policy period and the entire period before the policy intervention. This most flexible specification provides separate estimates of the policy effect for each quarter over the policy period[14]. Furthermore, each quarter within the policy period is compared to the corresponding quarter in the pre-policy period in order to test the role of seasonality in policy effectiveness.

2.5 Results

Table 2.3 presents the aggregate effect of the policy over the period. In fact, the same parameter is estimated in each column of the table, however, each column represents a different specification changing depending on the restriction imposed, as described in the previous section. The estimation results presented in this and in the following tables include all the control variables (i.e. completed years of schooling and marital status of the individuals, number of children in the household and a variable for urban/rural divide)

[14]See appendix 2.A.3 for formal expression of specifications within a regression framework.

in levels and of their interactions, although adding control variables does not change the significance of the results, but the precision of the estimates. The standard errors displayed in the tables are *bootstrap* standard errors stratified at gender and age level[15].

According to the DD estimation results displayed in the top and middle panels of Table 2.3, the probability of being hired for men aged 25 to 29 increased significantly above that for men aged 30 to 34 after the policy introduction, whereas a negative change was observed in the probability of being hired for women aged 30 to 34 relative to men of the same age group. The estimated negative effect of the policy on women could be attributable to the inability of the DD strategy in eliminating the differential effect of the crisis on different genders. That the negative and significant estimate obtained from the DD strategy turns into positive after canceling out the crisis effect implies the confounding role of the crisis in evaluating the policy.

The discussion henceforth continues with the DDD estimation results which, I believe, are more reliable as this strategy enables the elimination of the potential confounding factors. The credibility of the DDD results, namely the validity of the identifying assumption of the DDD analysis is checked through a placebo test using data belonging to the pre-policy period, as mentioned in Section 2.4. In particular, the DDD analysis is replicated based on the comparison of two periods both are before the policy intervention. As Table 2.B.1 in the appendix displays, the null hypothesis is not rejected for any quarter, which provides no evidence of the violation of the assumption. Consistent with the test results, Figure 2.3 and Figure 2.4 show similar patterns of two age cohorts within a gender.

As mentioned above, the estimation results presented in Table 2.3 differ in terms of the restriction imposed. In particular, the restriction loosens as going from column (3) to column (1). Accordingly, the magnitude of the estimate of the policy effect becomes

[15]Considering the concerns about the reliability of the inferences in DD estimation strategies using OLS standard errors, a *bootstrap* technique is used to fix-up the standard errors. In particular, the bootstrapped standard errors presented in the tables are based on a random resampling of individuals repeated 1000 times from each of the four stratums on which the treatment and control groups are built; namely men and women aged 25-29 and 30-34. As indicated by earlier work, the main goal is to preserve the dependence structure in the target population so as to rule out the over-rejection problem induced by the serial correlation in the common group component in the error term (Angrist and Pischke, 2009; Bertrand et al., 2004; Cameron et al., 2008; Conley and Taber, 2011; Donald and Lang, 2007). Despite these concerns, I found only a small difference between the bootstrap and the OLS (robust) standard errors which is observable from the fourth decimal. Though not presented in the paper, standard errors computed with different bootstrap designs, for instance, without strata option and with a different number of replications also deliver similar results. On the other hand, following a widely applied approach for correcting OLS standard errors, I estimate clustered-robust variance estimator with clusters at the level of policy variable, namely age, gender and year specific quarters. The insufficient number of observations in each cluster and accordingly little variability within clusters yields inconsistent estimates, and thus the clustered standard errors are not presented here. If someone is interested, all the results can be provided upon request.

higher as variation among years and across quarters is allowed. The DDD estimation results, displayed in the bottom panel of Table 2.3, suggest that as for the most restricted specification which imposes constant policy effect across quarters, the probability of being hired for a woman aged 30 to 34 increased by 0.2% relative to a man of the same age group after the policy introduction. The same probability increased by 1% as for the less restricted specification which allows the policy effect to vary between years, and by 3% as for the most flexible specification which allows for variation across quarters. However, neither the estimates of the variable *hiring* nor the variable *separation* are statistically significant as far as the aggregate effect of the policy over the period is concerned.

There may be some quarters where the policy is effective while in other quarters the estimated policy effect could be null, thus aggregating over the policy period would make the estimates statistically insignificant. The validity of this hypothesis was checked through the Wald test and evidence of heterogeneous policy effect across quarters was discovered, as presented in Table 2.4. The estimation results reported in the table point out that the disaggregation of the policy effect by quarter yields positive and statistically significant results for certain periods. In particular, the probability of being hired for women aged 30 to 34 above men of the same age group increased by 1.4% in the third quarters of 2008 and 2009, and by 1.6% in the fourth quarter of 2009, after removing the crisis effect[16]. Moreover, the positive effect of the policy on the variable hiring is mostly attributable to the flows from unemployment rather than those from inactivity, which is in accordance with the transition statistics presented in Table 2.1.

According to the estimation results reported in the tables, the coefficient estimates of the variable *separation* are always statistically insignificant. This is actually in line with the expectation given that the eligibility for the subsidy is on the condition of hiring new employees in addition to the average number of registered workers declared in the previous year. This condition rules out the possibility that employers fire an existing worker and hire a new one at the end of the first year to benefit from the full subsidy. Nevertheless, both employment creation and destruction effects of the policy are estimated so as to measure net employment growth.

What could be the underlying reasons behind the significant policy effect in some quarters along with insignificant effect in the others? First, a check was made whether seasonality matters in characterizing the policy effect by introducing non-year specific quarter dummies in the interaction term. In particular, each quarter over the policy period is compared with the same quarter before the policy intervention. For instance, the third quarter after the policy period (of 2008 and 2009) is compared with the third quarter before the policy period (of 2006 and 2007). The results indicate no evidence of

[16]As for the year specific policy effect, the policy effect is null even if the average policy effect is disaggregated by year. The estimation results of this specification are reported in the bottom panel of Table 2.4.

seasonality in the sense that the coefficients of the interaction terms were found statistically insignificant. In fact, there is one evident explanation for the quarter-specific pattern in the policy effect. As mentioned in Section 2.2.1, the policy announced in May 2008 was initially designed for one year. After the economic crisis hit the labor market by the third quarter of 2008, the government decided to extend the policy period for one more year, and the statistically significant estimates in 2009 are detected precisely in quarters at the beginning of the second implementation year of the policy. As proposed by Uysal (2013), the reason why the policy effect dies out by the end of 2009 could be related to the introduction of new employment incentives provided for all new employment creation[17].

Relying on the coefficient estimates in Table 2.4, further light will be shed on how much new employment was created by the policy. Given that new employment is defined as the difference between total hirings and separations, the relevant question is which aggregation level is proper for calculating total hirings and separations. Since the main interest of this study is to explore the causal effect of the policy on the treated, hiring and separation are aggregated by multiplying the corresponding probability with the number of women aged between 30 and 34 years (treated group) in the policy period. Focusing on the quarters in which there is evidence of significant policy effect, it was established that the policy created 92 new employment positions for women aged between 30 to 34 years in the third quarter of 2008, 54 positions in the third quarter of 2009 and 63 positions in the fourth quarter of 2009. This amounts to totally 209 new employment positions, accounting for 1.4% of the number of women in the relevant age group in the sample. Remarkably these magnitudes are similar to the employment gains reported by Uysal (2013) using descriptive statistics.

Furthermore, there could be a heterogeneity in the policy effect across sectors given that the female labor force is not evenly distributed across sectors in Turkey. The services sector is the largest employer for women as depicted in Figure 2.4. Almost half of the employed women aged 30-34 are hired in the services sector, whereas the industry and construction sectors account for less than one fifth of the female employment. To disag-

[17]Uysal (2013) also raises concerns that regional employment incentives, having been enacted since 2004, could limit the effectiveness of the policy of interest. Given that the regional incentives are in force throughout the entire period, before and after the policy introduction, they could be considered as an overall change in the economy provided that the provinces benefiting from the regional incentives do not change over the period. In this sense, the potential effects of the regional incentives can be canceled out by the triple difference method under the main assumption of this strategy; that is, other institutional changes (such as regional incentives) affect the employment of both the treatment and control groups similarly during the sample period. The ideal test of this hypothesis would be to run the analysis region by region so as to check whether there is any difference in the DDD results between targeted and non-targeted regions. However, unfortunately, the quarterly data do not provide information at the provincial level. Therefore, this paper, as in the case of Uysal (2013), is confined to a national-level analysis.

gregate the policy effect by sector, the data are stratified by four main sectors; services, industry, agriculture and construction. The estimation results presented in Table 2.5 suggest that the probability of being hired for women aged 30 to 34 in the services sector increased by 6.2% in the third quarter of 2008, 4.1% in the third quarter of 2009 and 4.2% in the fourth quarter of 2009 relative to their male counterparts of the same age cohort -after removing the crisis effect. Consistent with the previously reported results in Table 2.4, there is no significant effect in the other quarters which results in an insignificant effect when aggregating over the policy period. Moreover, no evidence was found of significant policy effect in the other sectors for any quarter in line with the aforementioned expectations.

Lastly, the effect of the policy on job searching behavior of the individuals is examined. The DDD analysis suggests a positive but statistically insignificant policy effect on transitions from inactivity to unemployment, but on the other hand, a strongly negative effect on transitions from unemployment to inactivity. These results imply that the policy prevents the women in the treatment group from withdrawing from the labor market, but does not encourage the women outside the market to start looking for a job. A possible effect of the policy might be on employment-to-employment transitions through formalization of the existing employment. However, as mentioned in Section 2.3, the data do not allow us to determine whether the increase in formal employment has resulted from the formalization of previously non-registered (informal) employment, neither can it determine whether the policy has affected the probability of changing the type of employment. What can be done primarily is to estimate what kind of jobs the labor transited into due to the policy by stratifying the data. The DDD results indicate that the policy is effective only in regular jobs (i.e. full-time and permanent). This is in consistency with the low share of atypical employment arrangements (i.e.part-time and temporary) in total employment, presented in Table 2.2. Considering that informal workers are not covered by social security and accordingly by the policy, naturally the policy effect is only seen in the formal sector, which is in line with the findings reported by Uysal (2013). This could also explain the ineffectiveness of the policy in atypical employment arrangements given that workers hired in part-time or temporary jobs are unlikely to be covered by a formal protection instrument.

2.6 Conclusion

This paper evaluates the impact of a reduction in the employer's share of the social security premiums on employment creation for the policy target group (women). Using quarterly data for the period of 2006-2010 from the Turkish Household Labor Force Survey, the employment effect of the policy on women is estimated through a triple difference technique. Although the aggregate policy effect over the period -net of the crisis effect- is not

significant, the disaggregation of the policy effect by quarter yields positive and statistically significant results for the quarters shortly after the policy announcements. While the effectiveness of the policy could be attributable to the importance of re-announcement, the reason why the effect dies out at the end of 2009 could be related with the mitigating effect of the other incentives to all new hirings having been enacted meanwhile.

The estimation results based on the triple difference strategy could be interpreted as the causal effect of the policy given that the results are robust to different specification tests which support the internal validity of the identification strategy. Moreover, the overall consistency with the findings of Uysal (2013) strengthens the power of the estimates. This paper is not only the first study to conduct a causal evaluation of a recent non-wage subsidy policy in Turkey, but also proposes the importance of announcement frequency in the effectiveness of the policy for the agenda of Turkish policy makers, which could be relevant also for future policy designs in the Turkish labor market.

According to the Social Security Institution records, five sixths of total applications for benefiting from the subsidy were made after the second announcement of the policy (Topcu, 2011). This supports the argument of the importance of re-announcement to enhance the policy effectiveness. Moreover, the policy has recently been revised upon the request of the public opinion to extend the coverage of the incentives. According to the new law, the incentives shall be provided for all new hirings without a restriction on gender and age (Law No. 6111, 2011). It is hoped that this study will be a basis for future research on evaluation of such similar policies in Turkey.

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Appendix

2.A. Identification Strategy within a Regression Framework

2.A.1. Difference-in-Differences Strategy

This subsection describes the specification estimated through difference-in-differences technique -using quarterly data from the third quarter of 2006 to the second quarter of 2010-. To do so, it begins by introducing the following notations:

1. Let $Q_{(i,j)}$ for $(i,j) \in T$ denote the time dummy variable which is equal to 1 for the ith quarter of the jth year, and 0 otherwise. The order of the years is the obvious one: 2006 is the first, 2007 is the second and so on. In particular, $Q_{(2,3)}$ is 1 if and only if the variable under consideration is the second quarter of the year 2008, and 0 otherwise. Given that the sample period is ranging from the third quarter of 2006 to the second quarter of 2010, the set T is defined as:

$$\begin{aligned}\mathcal{T} = \{&(3,1),(4,1),(1,2),(2,2),(3,2),(4,2),(1,3),(2,3),\\ &(3,3),(4,3),(1,4),(2,4),(3,4),(4,4),(1,5),(2,5)\}.\end{aligned}$$

2. The group of people consisting of men aged 30 to 34 is defined to be the control group, while the group of people consisting of either men aged 25 to 29 or women aged 30 to 34 is defined to be the treatment group. Once the control and the treatment groups are introduced, the dummy variable G called the group indicator is defined to be 1 for the treatment group and 0 for the control group.

3. The dummy variable P called the time indicator is by definition equal to 1 for the period following the date of the policy introduction (i.e. between 3^{rd} quarter of 2008 and 2^{nd} quarter of 2010), and 0 for the period preceding the date of the policy introduction (i.e. between 3^{rd} quarter of 2006 and 2^{nd} quarter of 2008). For future reference I introduce the set

$$\mathcal{R} = \{(3,3),(4,3),(1,4),(2,4),(3,4),(4,4),(1,5),(2,5)\}.$$

4. X_k denotes a vector of other control variables including education level, marital status and the living area (urban/rural) of the individual k, and pairwise interactions of these controls.

Finally, the following regression is estimated through OLS:

$$Y_k = \sum_{(i,j)\in\mathcal{T}} \alpha_{(i,j)} \cdot Q_{(i,j)} + \beta_1 \cdot G + \beta_2 \cdot (P \cdot G) + X_k' \cdot \delta + \varepsilon_k \qquad (2.1)$$

where Y_k denotes the outcome variable of the individual k which is a measure of flow data (i.e. labor force transitions between employment, unemployment and inactivity). The coefficient of the interaction term β_2 constitutes the main interest of this analysis yielding the average effect of the policy over the period. This coefficient can simply be obtained through the following differences:

$$\begin{aligned}\beta_2 = &\{E(Y_k|G=1,P=1) - E(Y_k|G=1,P=0)\} \\ &- \{E(Y_k|G=0,P=1) - E(Y_k|G=0,P=0)\}\end{aligned}$$

2.A.2. Difference-in-Difference-in-Differences Strategy

In this subsection, the triple difference strategy is exploited to evaluate the policy effectiveness with the aim of ruling out the potential confounding effects of the recent economic crisis which are unlikely to be eliminated through standard difference-in-differences technique (indicated in the previous section). While keeping the notations of the previous section intact, some new variables are introduced:

1. F denotes the gender dummy which is equal to 1 if the individual is female, 0 otherwise.
2. A denotes the age dummy which is equal to 1 for ages between 30 and 34, and 0 for ages between 25 and 29.
3. The products $(P \cdot A)$, $(A \cdot F)$ and $(P \cdot F)$ are pairwise interactions between the indicators of P, A and F and the product $(P \cdot F \cdot A)$ is the triple interaction of the same indicators.

The following regression is estimated by OLS:

$$\begin{aligned}Y_k &= \sum_{(i,j)\in\mathcal{T}} \alpha_{(i,j)} \cdot Q_{(i,j)} + \gamma_1 \cdot F + \gamma_2 \cdot A + \gamma_3 \cdot (A \cdot F) \\ &+ \gamma_4 \cdot (P \cdot A) + \gamma_5 \cdot (P \cdot F) + \gamma_6 \cdot (P \cdot F \cdot A) + X_k' \cdot \delta + \varepsilon_k \qquad (2.2)\end{aligned}$$

where the coefficient (γ_6) of the triple interaction term indicates the average effect of the policy over the period.

γ_6 could also be obtained through the difference in double differences of:

$$\begin{aligned}&\{[E(Y_k|A=1,F=1,P=1) - E(Y_k|A=1,F=0,P=1]\} \\ -&\{[E(Y_k|A=1,F=1,P=0) - E(Y_k|A=1,F=0,P=0]\}\end{aligned}$$

where women are subject to the policy, whilst men are not.

$$\{[E(Y_k|A=0,F=1,P=1) - E(Y_k|A=0,F=0,P=1)]\}$$
$$-\{[E(Y_k|A=0,F=1,P=0) - E(Y_k|A=0,F=0,P=0)]\}$$

where both groups are subject to the policy and to the crisis.

While the first double difference is exactly the same as the standard difference-in-differences estimator for the treatment group of women aged 30 to 34, the second double difference enables the canceling out the differential effect of the crisis, and the difference between these two yields the causal effect of the intervention.

2.A.3. Specifications

In this subsection there is an introduction to three types of specification depending on the restriction imposed on the time indicator in the interaction term.

(i) *Period specific policy effect*: Estimating equation (2.1) and equation (2.2), the policy effect is imposed to be constant across quarters over years. The double difference estimator is constructed by interacting the group indicator (G) with a single time dummy (P) that is equal to 1 for the whole period following the date of the policy introduction, and 0 for the whole period preceding the date of the policy introduction. Likewise, the triple estimator is obtained by interacting the gender dummy (F) and age dummy (A) with the same time dummy (P).

(ii) *Year specific policy effect*: The constant policy effect is imposed across quarters within a year, but allowing variation between years. To this end, I introduce a new dummy variable S_m for $m \in \{1,2,3\}$, which is defined to be equal to 1 for the mth year within the policy period, and 0 otherwise. Indeed, S_1 is equal to 1 if year is 2008 and the period is after the policy introduction (i.e. third and fourth quarter), S_2 is equal to 1 if year is 2009 and S_3 is equal to 1 if year is 2010 and the period is until the end of the policy period (i.e. the first and second quarter). The difference-in-differences estimator (see equation (2.1)) becomes the sum of three interaction terms each of which belongs to separate years within the policy period (see equation (2.3)). Similarly, the triple difference estimator (see equation (2.2)) can be written as the interaction of the age, gender and time dummies aggregated over three years within the policy period (see equation (2.4)). Keeping the notations the same as the previous section, it is estimated that:

$$Y_k = \sum_{(i,j)\in\mathcal{T}} \alpha_{(i,j)} \cdot Q_{(i,j)} + \beta \cdot G + \sum_{m=1}^{3} \phi_m \cdot (S_m \cdot G) + X_k' \cdot \delta + \varepsilon_k \tag{2.3}$$

$$\begin{aligned} Y_k &= \sum_{(i,j)\in\mathcal{T}} \alpha_{(i,j)} \cdot Q_{(i,j)} + \gamma_1 \cdot F + \gamma_2 \cdot A + \gamma_3 \cdot (A \cdot F) + \sum_{m=1}^{3} \theta_m \cdot (S_m \cdot A) \\ &+ \sum_{m=1}^{3} \rho_m \cdot (S_m \cdot F) + \sum_{m=1}^{3} \phi_m \cdot (S_m \cdot F \cdot A) + X_k' \cdot \delta + \varepsilon_k \end{aligned} \tag{2.4}$$

where ϕ_m indicates the policy effect in the m-th year within the policy period, and $\sum_{m=1}^{3} \phi_m$ refers to the aggregate effect of the policy over the entire policy period.

(iii) *Quarter-year specific policy effect*: The policy effect is allowed to vary across quarters over years. In this specification, the difference-in-differences estimator in equation (2.1) and the triple difference estimator (see equation (2.2)) become the sum of eight interaction terms each of which belong to separate quarters within the policy period (see equation (2.5) and equation (2.6)).

$$Y_k = \sum_{(i,j)\in\mathcal{T}} \alpha_{(i,j)} Q_{(i,j)} + \beta \cdot G + \sum_{(i,j)\in\mathcal{R}} \phi_{(i,j)} (Q_{(i,j)} \cdot G) + X_k' \cdot \delta + \varepsilon_k; \tag{2.5}$$

$$\begin{aligned} Y_k &= \sum_{(i,j)\in\mathcal{T}} \alpha_{(i,j)} Q_{(i,j)} + \beta_1 \cdot F + \beta_2 \cdot A \\ &+ \beta_3 \cdot (A \cdot F) + \sum_{(i,j)\in\mathcal{R}} \theta_{(i,j)} (Q_{(i,j)} \cdot A) + \sum_{(i,j)\in\mathcal{R}} \rho_{(i,j)} (Q_{(i,j)} \cdot F) \\ &+ \sum_{(i,j)\in\mathcal{R}} \phi_{(i,j)} (Q_{(i,j)} \cdot F \cdot A) + X_k' \cdot \delta + \varepsilon_k \end{aligned} \tag{2.6}$$

where $\phi_{(i,j)}$ indicates the policy effect in the i-th quarter of the j-th year, and $\sum_{(i,j)\in\mathcal{R}} \phi_{(i,j)}$ refers to the aggregate effect of the policy over the entire policy period.

2.B. Appendix Tables

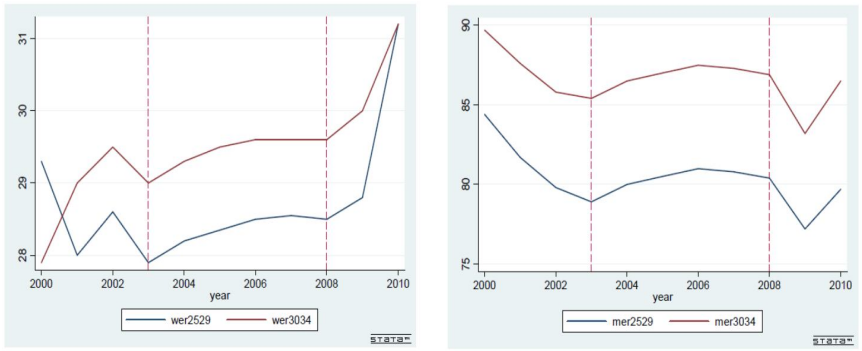
Table 2.B.1: **Placebo test results for the DDD estimation**

	(1) **Hiring**	(2) **UE**	(3) **NE**	(4) **Separation**	(5) **EU**	(6) **EN**
	Year-Quarter Specific Policy Effect					
DDD_{Q3-06}	-0.009	-0.003	-0.007	0.006	0.000	0.006
	(0.007)	(0.006)	(0.004)	(0.006)	(0.005)	(0.004)
DDD_{Q4-06}	-0.013	-0.005	-0.008	-0.005	-0.008	0.003
	(0.008)	(0.006)	(0.005)	(0.006)	(0.005)	(0.004)
DDD_{Q1-07}	-0.002	0.001	-0.003	0.000	-0.003	0.004
	(0.008)	(0.006)	(0.005)	(0.006)	(0.005)	(0.004)
DDD_{Q2-07}	-0.011	-0.004	-0.007	-0.003	-0.002	-0.001
	(0.008)	(0.006)	(0.005)	(0.006)	(0.005)	(0.004)
DDD_{Q3-07}	-0.003	0.002	-0.004	0.007	0.000	0.007
	(0.008)	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)
DDD_{Q4-07}	-0.002	0.000	-0.002	-0.002	-0.005	0.002
	(0.008)	(0.006)	(0.005)	(0.006)	(0.005)	(0.004)
DDD_{Q1-08}	0.007	0.011	-0.005	0.002	0.000	0.002
	(0.007)	(0.007)	(0.005)	(0.007)	(0.005)	(0.004)
DDD_{Q2-08}	-0.005	0.001	-0.006	-0.003	-0.001	-0.003
	(0.008)	(0.006)	(0.005)	(0.007)	(0.005)	(0.004)
No. Obs.	190,035	190,035	190,035	190,035	190,035	190,035
R^2	0.63	0.51	0.28	0.40	0.33	0.15
	Year Specific Policy Effect					
DDD_{2006}	-0.011	-0.004	-0.007	0.001	-0.004	0.005
	(0.007)	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)
DDD_{2007}	-0.004	0.000	-0.004	0.000	-0.002	0.003
	(0.005)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)
DDD_{2008}	0.001	0.006	-0.005	-0.001	-0.001	0.000
	(0.006)	(0.005)	(0.004)	(0.005)	(0.004)	(0.003)
No. Obs.	190,035	190,035	190,035	190,035	190,035	190,035
R^2	0.63	0.51	0.28	0.40	0.32	0.15

Robust standard errors in parenthesis (*** p<0.01, ** p<0.05, * p<0.1)

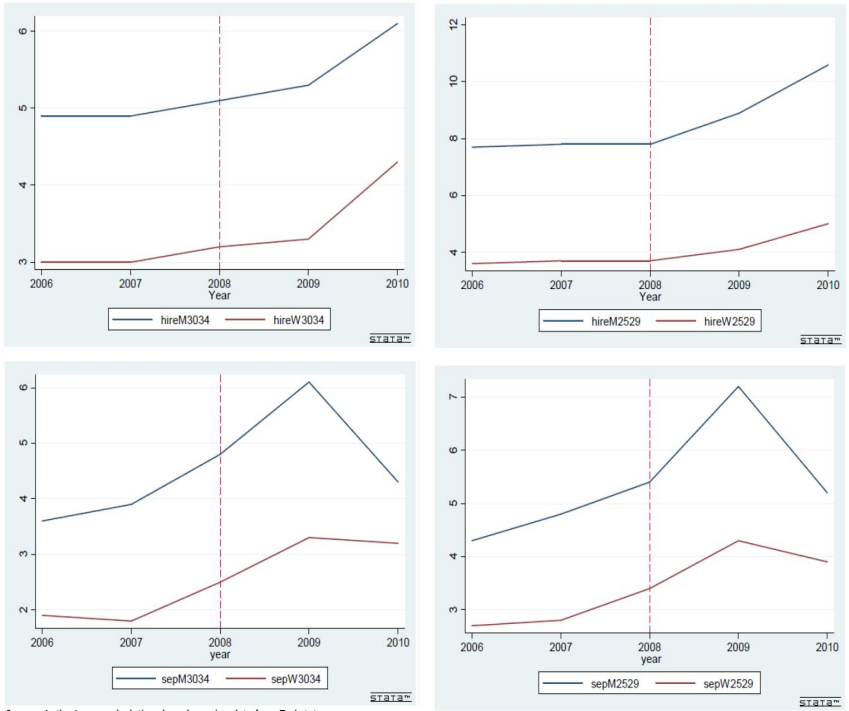
Figures

Figure 2.1: **Employment rates of the treatment and control groups between 2000 and 2010**



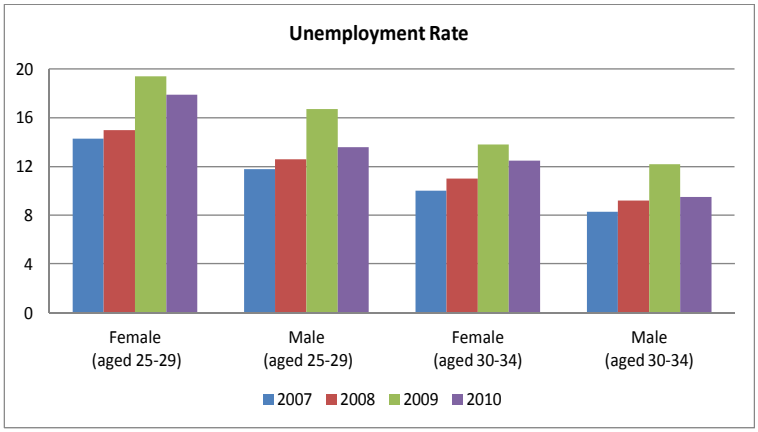
Source : Turkstat, 2013.

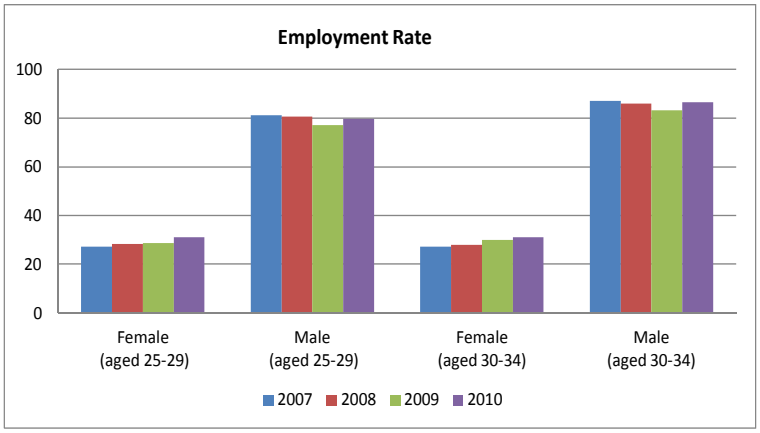
Figure 2.2: **Flow rates of the treatment and control groups between 2006 and 2010**



Source : Author's own calculations based on microdata from Turkstat.
Note : Flow rate is the ratio of the number of flows to the number of individuals of the correponding gender and age group.

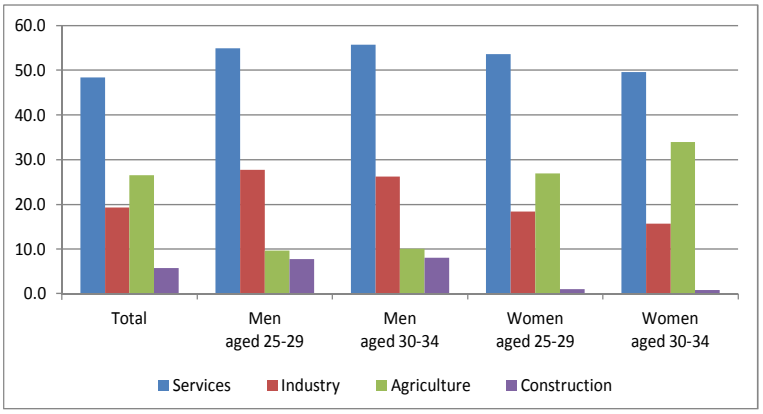
Figure 2.3: **Unemployment and employment rates of treatment and control groups between 2007 and 2010**





Source: Turkstat, 2011.

Figure 2.4: **Sectoral composition of the employment, 2007**
(as a share of total employment in the corresponding age group)



Source: Author's own calculations based on micro data from Turkstat.

Tables

Table 2.1: **Rates of stock and flow variables**
(as a percentage of population aged 15 and over)

	2006	**2007**	**2008**	**2009**	**2010**
Stock Variables					
Employment (E)	40.2	40.0	40.1	39.6	41.4
Unemployment (U)	4.4	4.4	4.8	6.4	5.3
Inactivity (N)	55.4	55.7	55.1	54.0	53.3
Flow Variables					
UE	1.8	1.8	1.9	1.9	2.7
NE	2.4	2.4	2.2	2.1	2.4
EU	1.0	1.2	1.5	2.3	1.5
EN	1.4	1.4	1.6	1.7	1.7
NU	1.1	1.1	1.2	1.3	1.3
UN	1.3	1.3	1.2	1.2	1.1
EE	36.0	35.8	36.0	35.6	36.3
UU	2.0	2.1	2.1	2.8	2.6
NN	53.0	53.0	52.3	51.1	50.5

Source: Author's own calculations based on micro data from Turkstat.

Table 2.2: **Informal and atypical employment, 2007**

	Total (15+)	**Men (25-29)**	**Women (25-29)**	**Men (30-34)**	**Women (30-34)**
As a share of total employment:					
Informal	47.6	33.0	42.1	28.8	50.7
Flows into Formal	3.8	5.1	7.1	2.6	3.7
Flows into Informal	6.7	4.6	7.2	3.0	7.3
As a share of total flows into employment:					
Flows into Informal	63.6	47.2	50.4	53.8	66.4
As a share of total employment:					
Part-time	9.4	2.7	14.0	2.7	18.4
Flows into Full-time	9.5	9.4	12.6	5.4	8.9
Flows into Part-time	1.1	0.4	1.7	0.2	2.3
As a share of total flows into employment:					
Flows into Part-time	10.0	3.6	12.2	3.3	20.3
As a share of total employment:					
Temporary	5.4	5.8	3.0	5.6	4.6
Flows into Permanent	6.1	6.6	10.3	3.3	6.0
Flows into Temporary	1.5	1.4	1.0	1.2	1.8
As a share of total flows into employment:					
Flows into Temporary	19.6	17.4	8.7	26.2	23.2

Source: Author's own calculations based on micro data from Turkstat.

Table 2.3: **Aggregate effect of the policy over the period**

	(1)	(2)	(3)
	Quarter-year specific	**Year specific**	**Period specific**
	Difference-in-Differences: Young Men		
Hiring	0.050*	0.013*	0.003
	(0.027)	(0.008)	(0.003)
UE	0.024	0.007	0.002
	(0.020)	(0.008)	(0.002)
NE	0.017*	0.006*	0.001
	(0.009)	(0.003)	(0.001)
Separation	0.005	0.000	0.001
	(0.019)	(0.007)	(0.002)
EU	0.019	0.004	0.002
	(0.017)	(0.006)	(0.002)
EN	-0.014	-0.004	-0.002
	(0.008)	(0.003)	(0.001)
	Difference-in-Differences: Women		
Hiring	-0.052***	-0.018***	-0.007***
	(0.016)	(0.006)	(0.002)
UE	-0.056***	-0.021***	-0.007***
	(0.014)	(0.005)	(0.002)
NE	0.004	0.003	0.000
	(0.010)	(0.004)	(0.001)
Separation	-0.020	-0.004	-0.003
	(0.016)	(0.006)	(0.002)
EU	-0.073***	-0.023***	-0.009***
	(0.013)	(0.005)	(0.002)
EN	0.051***	0.019***	0.006***
	(0.010)	(0.004)	(0.001)
	Difference-in-Difference-in-Differences: Women		
Hiring	0.030	0.010	0.002
	(0.026)	(0.01)	(0.003)
UE	0.023	0.007	0.002
	(0.021)	(0.008)	(0.003)
NE	0.007	0.003	0.001
	(0.015)	(0.006)	(0.002)
Separation	0.007	0.001	0.001
	(0.023)	(0.009)	(0.003)
EU	0.010	0.001	0.001
	(0.018)	(0.007)	(0.002)
EN	-0.003	0.000	0.000
	(0.014)	(0.005)	(0.002)

* Bootstrap standard errors with 1000 replications are in parenthesis (*** p<0.01, ** p<0.05, * p<0.1).
** The number of observations of difference-in-differences for "young men" is 144,954 and for "women" is 147,534; and that of difference-in-difference-in-differences is 305,590.

Table 2.4: **DDD estimation results**

	(1) **Hiring**	(2) **UE**	(3) **NE**	(4) **Separation**	(5) **EU**	(6) **EN**
	Year-Quarter Specific Policy Effect					
DDD_{Q3-08}	0.014**	0.005	0.009**	-0.005	-0.001	-0.004
	(0.006)	(0.005)	(0.004)	(0.006)	(0.005)	(0.004)
DDD_{Q4-08}	-0.007	-0.005	-0.002	-0.002	-0.004	0.002
	(0.006)	(0.005)	(0.004)	(0.006)	(0.005)	(0.004)
DDD_{Q1-09}	-0.008	-0.006	-0.002	0.002	0.004	-0.002
	(0.007)	(0.005)	(0.004)	(0.007)	(0.006)	(0.004)
DDD_{Q2-09}	-0.007	-0.007	-0.000	-0.001	0.004	-0.005
	(0.007)	(0.006)	(0.004)	(0.007)	(0.005)	(0.004)
DDD_{Q3-09}	0.014**	0.010*	0.004	0.004	0.007	-0.003
	(0.007)	(0.006)	(0.004)	(0.007)	(0.006)	(0.004)
DDD_{Q4-09}	0.016**	0.012**	0.004	0.003	0.001	0.002
	(0.007)	(0.006)	(0.004)	(0.006)	(0.005)	(0.004)
DDD_{Q1-10}	0.005	0.006	-0.001	0.003	-0.001	0.004
	(0.007)	(0.006)	(0.004)	(0.006)	(0.005)	(0.004)
DDD_{Q2-10}	0.003	0.008	-0.005	0.003	0.001	0.003
	(0.007)	(0.006)	(0.004)	(0.006)	(0.005)	(0.004)
No. Obs	305,590	305,590	305,590	305,590	305,590	305,590
R^2	0.68	0.56	0.29	0.49	0.42	0.18
Wald	0.05	0.19	0.35	0.97	0.93	0.64
	Year Specific Policy Effect					
DDD_{2008}	0.006	0.001	0.005*	-0.004	-0.002	-0.001
	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
DDD_{2009}	-0.001	-0.001	-0.001	0.002	0.004	-0.002
	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)
DDD_{2010}	0.005	0.007	-0.002	0.003	0.000	0.003
	(0.005)	(0.005)	(0.002)	(0.004)	(0.003)	(0.003)
No. Obs	305,590	305,590	305,590	305,590	305,590	
R^2	0.68	0.56	0.29	0.48	0.41	0.18
Wald	0.46	0.51	0.26	0.60	0.48	0.42

Bootstrap standard errors with 1000 replications are in parenthesis (*** p<0.01, ** p<0.05, * p<0.1)

Table 2.5: **DDD estimation results by sector**

	Quarter-Year Specific Policy Effect							
	Hiring				**Separation**			
	Services	Industry	Agriculture	Construction	Services	Industry	Agriculture	Construction
DDD_{Q3-08}	0.062***	0.022	-0.009	0.174	-0.010	0.032	-0.024	-0.158
	(0.021)	(0.040)	(0.024)	(0.174)	(0.020)	(0.041)	(0.021)	(0.128)
DDD_{Q4-08}	-0.026	-0.033	-0.019	-0.130	0.014	-0.020	-0.032	0.094
	(0.020)	(0.042)	(0.028)	(0.173)	(0.019)	(0.042)	(0.022)	(0.163)
DDD_{Q1-09}	-0.014	-0.012	-0.006	-0.103	-0.002	0.007	-0.005	0.150
	(0.021)	(0.037)	(0.027)	(0.138)	(0.020)	(0.042)	(0.025)	(0.157)
DDD_{Q2-09}	-0.008	0.004	-0.037	0.166	-0.010	0.025	-0.028	-0.063
	(0.021)	(0.041)	(0.026)	(0.165)	(0.020)	(0.042)	(0.020)	(0.144)
DDD_{Q3-09}	0.041**	0.025	0.044	0.169	0.002	0.052	-0.021	0.140
	(0.021)	(0.039)	(0.025)	(0.173)	(0.021)	(0.043)	(0.022)	(0.184)
DDD_{Q4-09}	0.042**	-0.032	-0.006	0.164	-0.016	0.033	-0.021	0.223
	(0.021)	(0.040)	(0.030)	(0.215)	(0.020)	(0.020)	(0.020)	(0.213)
DDD_{Q1-10}	-0.020	-0.036	0.013	0.178	0.021	0.056	-0.002	-0.130
	(0.021)	(0.039)	(0.028)	(0.182)	(0.020)	(0.038)	(0.020)	(0.175)
DDD_{Q2-10}	0.006	-0.055	-0.022	0.046	0.008	0.058	0.006	0.001
	(0.021)	(0.039)	(0.026)	(0.152)	(0.018)	(0.039)	(0.018)	(0.153)
	Year Specific Policy Effect							
DDD_{2008}	0.043***	-0.006	-0.014	0.110	0.003	0.005	-0.018	-0.057
	(0.015)	(0.031)	(0.019)	(0.108)	(0.014)	(0.031)	(0.016)	(0.105)
DDD_{2009}	-0.009	-0.004	-0.001	0.128	-0.007	0.036	-0.018	0.044
	(0.012)	(0.023)	(0.015)	(0.097)	(0.116)	(0.024)	(0.012)	(0.096)
DDD_{2010}	0.013	-0.040	-0.006	0.037	0.015	0.047	0.002	-0.059
	(0.016)	(0.029)	(0.020)	(0.111)	(0.014)	(0.029)	(0.014)	(0.119)

Bootstrap standard errors with 1000 replications are in parenthesis (*** p<0.01, ** p<0.05, * p<0.1)

Chapter 3

How Do Married Women Respond When Their Husbands Lose Their Jobs? Evidence from Turkey During the Recent Crisis

3.1 Introduction

"Added worker effect" (AWE) has been extensively discussed in the literature to explain the labor supply response of wives to their husbands' unemployment by entering the labor force (*extensive margin*) or increasing their working hours (*intensive margin*). This paper empirically assesses the extensive margin of AWE for the period of the global economic crisis of 2008 in Turkey. Turkey saw an approximately 3-percentage-point decrease in the male employment rate between 2007 and 2009 associated with a proportional *increase* in the female employment rate. The increase in the female employment rate was completely attributable to married women, whereas the employment rate of single women remained constant over the period. The goal of this paper is to analyze to what extent this opposite movement of spousal labor supply is caused by AWE.

Identification of AWE is a challenging task given the potential endogenity problems primarily arising from complementarity between leisures of spouses, assortative mating as well as joint determination of spousal labor supply. The gender-segregated structure of the Turkish labor market offers an ideal setting to empirically assess AWE: the 2008 crisis provides a source of variation in the production level of male-dominated sectors that is exogenous to married women's participation behaviors. This variation in the output of male-dominated sectors is used as an instrument for the husband's unemployment *after removing* the co-variation in the output of other sectors with higher female participation, the variation attributed to individual characteristics and the variation in time trend.

The first-stage estimation results suggest a strongly negative correlation between the instrument and the husband's displacement. This prevents us from worrying about the weak instrument problem. The internal validity of the identification strategy sketched above is supported by the fact that there is an unusual variation in the residuals predicted from the output regression of the male-dominated sectors conditioning on all the controls. In particular, this so-called "unpredicted" component of the male sectors' production exhibits a sudden, sharp slump with the outburst of the crisis, while having a smooth trend for the rest of the period.

Panel data used for this analysis allows for controlling the time-invariant unobserved heterogeneity via individual fixed effects. The IV estimation results with fixed effects suggest that a husband's unemployment explains 54% to 64% of the observed increase in the probability of his wife's labor force participation. The magnitude of the estimate depends on after how many quarters the wife responds to her husband's displacement. The effect starts to be seen after one quarter following his displacement, becomes the largest two quarters after the husband became unemployed, while the effect dies out by the fourth quarter of the displacement. To the best of my knowledge, this paper is the first attempt to explore the "causal" relation between a husband's job loss and his wife's participation decision during the global recession in Turkey. Furthermore, it is the first study that accounts for potential delays in the labor supply response of wives to their husbands' displacement.

Most of the literature relies on simple probit and tobit analyses depending on the extensive or the intensive margin of AWE of their interest. Relatively few studies in the literature address the potential endogeneity problems involved while assessing AWE[1]. Some of these studies rely on a structural equation model, others rely on a non-linear latent variable model (with fixed effects) grounded on a theoretical basis or an instrumental variable approach. This paper is methodologically closest to Goux et al. (2014) that exploits an exogenous variation in spousal work hours induced by a regulation introducing a shorter workweek in France in the late 1990s. In fact, Baslevent and Onaran (2003) and Karaoglan and Okten (2012) explore the same issue using data from Turkey for the years of 1988 versus 1994 and for the period of 2000-2012, respectively. While Baslevent and Onaran address endogeneity by modeling spouses labor participation decision simultaneously, Karaoglan and Okten do not deal with the potential endogeneity problems. As a consequence, their empirical findings differ substantially: the former study finds strong evidence of AWE only for the crisis year of 1994 (in line with my results), on the contrary the latter observes the evidence of AWE for expansionary years. Both studies rely on cross-sectional annual data, whereas this study utilizes a novel data set with a panel design. Moreover, the empirical analysis adopted in this study is conducted on a quar-

[1]The leading studies are Blundell *et al.* (2012), Cullen and Gruber (2000), Goux *et al.* (2014), Heckman and MaCurdy (1980) and Maloney (1991).

terly basis which allows for capturing the transitory response of a wife to a brief spell of unemployment faced by her husband. This is unlikely to be captured by the early work in Turkey using long-term measures of labor supply.

The paper is organized as follows. Section 3.2 introduces the theoretical reasons why AWE may or may not arise. Section 3.3 presents some stylized facts for Turkey. While Section 3.4 introduces the data, Section 3.5 presents the identification strategy. Then Section 3.6 provides the estimation results and Section 3.7 concludes.

3.2 Conceptual Framework

Theoretical grounds of AWE developed by Mincer (1962, 1966) and Long (1958) date back to half a century ago. However, the first attempts at an empirical analysis of the AWE were made after two decades, in the early 1980s, by Heckman and MaCurdy (1980, 1982) and Layard *et al.* (1980). Currently there are a large number of empirical studies examining AWE mostly from the U.S.. Empirical evidence for the existence of AWE is mixed even within the same country. While some early work found small but significant AWE (in the *U.S.* by Cullen and Gruber, 2000; Heckman and MaCurdy, 1980, 1982; Lundberg, 1985), some others revealed no evidence of it (in the *U.K.* by Layard *et al.*, 1980; in the *U.S.* by Juhn and Murphy, 1997; Maloney, 1987, 1991). On the other hand, more recent work has generally documented supporting evidence for AWE (in *France* by Goux *et al.*, 2014; in *Japan* by Kohara, 2009; in *Turkey* by Baslevent and Onaran, 2003; Karaoglan and Okten, 2012; in the *U.S.* by Blundell *et al.*, 2012; Mattingly and Smith, 2010; Spletzer, 1997; Stephens, 2002). Given the diversity of the findings in the previous literature, the remainder of this section explains the channels why AWE may arise and why it may not be empirically detected.

In a static model of household labor supply, a husband's job loss might lead to an increase in the labor supply of his wife in two ways. First, in order to compensate for the transitory reduction in family income due to the husband's unemployment, the nonparticipating wife would be more likely to enter the labor force, and similarly the participating wife would be more willing to increase her working hours under the assumption that leisure is a normal good (*income effect*). Secondly, the increased non-market time of the husband would reduce the relative value of the wife's non-market time and lower the opportunity cost of her market work given the substitutability of the wife's leisure with the husband's through home production (*substitution effect*). Replacement of the wife's time in household activities with the husband's non-market time would make the wife tend to work more (Lundberg, 1985).

In a life-cycle model, on the other hand, the presence of liquidity constraints is regarded as the main motive to justify a transitory impact on the wife's labor supply during her husband's unemployment spell. If families are liquidity-constrained or face fixed con-

sumption commitments, they would be unable to smooth consumption over the husband's unemployment spell, hence the wife would tend to work more in order to compensate for the reduction in the family income. Conversely, AWE should not arise in the absence of any liquidity constraint: an effective unemployment insurance system along with a well-functioning credit market would serve as an income compensation mechanism in the event of an adverse income shock.

In the life cycle context, it is also important to consider whether the income loss is anticipated or not. The fully anticipated income loss would not produce any income effect on the present values of the wealth providing that there is no liquidity constraint[2]. In such a scenario the only reason for the AWE to rise is the substitution effect which is expected to be small as pointed out by the previous research (Lundberg, 1985). On the other hand, an unanticipated income loss is likely to give rise to an AWE regardless of the presence of liquidity constraint. The uncertainty could also appear with regard to the timing of job offers and accordingly the duration of the unemployment spell.

It may be difficult to detect AWE in empirical studies because of three main issues: a complementarity between leisures of spouses, assortative mating[3] and the dominance of discouraged worker effect. There may be a positive and high correlation in unobserved tastes for leisure among wives and husbands in the same household (for instance, spouses enjoy spending time together). If husbands with a higher taste for leisure also have a higher probability of losing their job, then the AWE may not be detected (Maloney, 1991). Assortative mating in tastes for work between wives and husbands might bias against finding an AWE, especially if the analysis relies on a cross-section of data (Cullen and Gruber, 2000). In other words, if there is assortative mating, then women whose husbands are more likely to be unemployed would be less likely to be employed. Given the negative correlation between the husband's unemployment and the wife's market wage among the assortative-mated couples, wives with frequently unemployed husbands would be less likely to compensate for the income loss because of the unusually low wage rates they both face in the labor market. Lastly, given that spouses are subject to the same macroeconomic conditions, the economic downturn that caused the husband's unemployment may directly reduce the wife's employment propensity through a reduction in her shadow wage although she may wish to increase her labor supply in response to her husband's unemployment. In this case, the so-called "discouraged worker effect" would dominate the AWE (Lundberg, 1985; Maloney, 1991).

[2]One may argue that income effect could still appear in a scenario of a fully-anticipated job loss through labor supply response to the anticipation of the unemployment rather than the realized unemployment. This issue is difficult to investigate empirically with the available data and is left for further research

[3]Assortative mating means that individuals with similar phenotypes (observable characteristics) mate with one another more frequently.

3.3 Stylized Facts

This section aims to provide some descriptive statistics for Turkey to motivate the identification strategy. First of all, it characterizes the gender segregation in the labor market for the pre-crisis period. Then, it discusses how the gender gap in employment has evolved during the crisis, which in fact constitutes the motivation of this paper. Lastly, the duality in the labor market is discussed with a special focus on the sectoral distribution of employment. It particularly examines the output and employment changes in the male- versus female-sectors throughout the crisis period. These features of the Turkish labor market are at the core of the identification strategy illustrated in the next section.

The Turkish labor market exhibits a fully segmented structure from the gender perspective. Many researchers from Turkey point out the significant role of the cultural factors in the society in explaining the dramatically low rate of female labor force participation (Aran *et al.*, 2010; Dayioglu and Kirdar, 2009; Gunduz-Hosgor and Smith, 2006). As Table 3.1 displays, while 34.4% of single women were participating in the labor force in 2007, the participation rate was only 21.6% for married women. The increasing responsibilities of women related to household chores after marriage make them, particularly those in urban areas, withdraw from the labor market. Aran *et al.* (2010) report that only one fifth of the poorly educated urban women continue working after having the first child. Although they have a higher educational attainment, the participation rate of urban women decreases by a 15 percentage point upon the first baby's birth, and does not reach its earlier level. On the other hand, men who were not working before the marriage enter the labor force to afford their (new) families' living expenses. Consistent with this argument, labor force participation among married men is much higher relative to their single counterparts, as presented in Table 3.1.

The gender-segregated structure of the Turkish labor market has exhibited an unusual pattern during the recent economic crisis. Table 3.1 reveals that the average unemployment rate reached unprecedented figures, increasing to 14% in 2009 from 10.3% in 2007. Both men and women suffered from the increase in unemployment rate during the crisis, whereas the rates of labor force participation and employment showed different patterns across genders. The most distinctive difference was observed among married people. The labor force participation rate among married women which was around 22% before the crisis rose to 25.3% in 2009. Married men, on the other hand, being more likely to be attached to the labor market had a constant participation rate of about 76% over the period. Likewise, an almost 3 percentage-point increase was observed in the employment rate among the married women between 2007 and 2009. This was associated with a proportional decrease in the employment rate of married men. This opposite movement among married people constitutes the main motivation of this paper.

The duality in the labor market can also be observed in the sectoral distribution of employment. There are some sectors dominated by male labor force such as manufactur-

ing, construction, wholesale and retail trade, and transport, storage and communication services in which the proportion of female labor force fluctuates no more than 15% (see Figure 3.1). An inspection of Figure 3.2 makes clear that these male-dominated sectors are the ones hit hardest by the recent economic crisis in terms of output losses. On the other hand, there are some sectors such as education, health and social work related services where female labor force is relatively higher (above the average female employment rate). In these sectors the production levels were barely affected by the crisis.

In parallel to the output losses during the crisis, manufacturing and construction, followed by trade and transportation services, saw the severest decline in the employment rate between 2008 and 2009. On the other hand, the employment rate in the other sectors where female labor force is relatively higher did not show a considerable change during the period (see Figure 3.3)[4]. The overall change in the employment rate of the male- versus the female- sectors can be seen in Figure 3.4.

In fact, the employment outcomes in the male sectors were adversely affected by the crisis for both married and single people. As can be seen in the upper panel of Figure 3.5, the deterioration in the employment rate among the married is attributable to husbands rather than wives. On the other hand, the employment rate in the female sectors increased among married people during the crisis. In line with the AWE hypothesis, this increase is due to the upturn in the trend of married women by 2008, whereas the employment rate among married men in those sectors showed a constant trend thereafter.

3.4 Data

The main data come from the 2007-2010 panel of the "Survey on Income and Living Conditions (SILC)" which has been conducted by the Turkish Statistical Institute (Turkstat) since 2006. The survey provides detailed information on demographic characteristics such as age, education and marital status, labor force characteristics such as current employment status, working hours, job characteristics, past work information, reason for job change, labor and other income, household characteristics and living conditions.

SILC is the first attempt in Turkey in consideration of its panel structure, which allows for tracing the same individuals in the working age population over the period. The rich set of data on labor market characteristics, as well as its panel design, make SILC unique and invaluable for analyzing the AWE in the Turkish context. The previous literature has generally addressed the inability of cross-sectional data to uncover the true estimate of AWE (e.g. Cullen and Gruber, 2000). An obvious shortcoming of the cross-sectional data is that they cannot adequately capture the inter-temporal decisions of wives to enter the

[4]For the sake of brevity, the male-dominated sectors and the other sectors where female participation is relatively higher will henceforth be called male- and female- sectors, respectively.

labor force in response to the unemployment of their husbands (Spletzer, 1997). To the best of my knowledge, this study is the first attempt to estimate the AWE in Turkey by using longitudinal data.

Although SILC is designed on a yearly basis, the monthly information related to the labor market status of individuals enables us to conduct a short-run analysis of the AWE by constructing a quarterly measure of labor supply. Thus, this study is able to dispense with the concerns addressed by Lundberg (1985) and Spletzer (1997) about the inability of the annual measures of labor supply in capturing the transitory response to a brief spell of unemployment faced by the husband. The previous studies in Turkey, on the other hand, relying on the annual measures are not able to capture the short-run AWE .

The identification strategy exploited in this paper relies on an exogenous variation in sectoral output induced by the crisis of 2008. The final data set for the empirical analysis is thus built by complementing SILC with additional information on sectoral output that comes from the "Survey on National Accounts". These two data sets are merged based on the information of the survey period[5].

The specific question addressed in this paper is well-defined only for married couples. Thus, the resulting panel sample is restricted to only (married) couples who do not change their marital status or their partners over the sample period, and those who divorce, become widowed or change their partners are excluded from the sample. Since the paper focuses specifically on the *extensive margin* of AWE, the initial sample is composed of nonparticipating wives married with working men. In this sample, the empirical counterpart of AWE is the difference between the probability of entering in the labor force among nonparticipating wives whose husbands become unemployed in a following period and the same probability among those whose husbands remain employed. To avoid the potential endogenity problems to be discussed in the following section, the sample is further restricted for the regression analysis in a way to include only involuntary separations that occurred within the crisis period.

Table 3.2 displays how the labor market outcomes of the individuals evolve across the years by the labor market status of their spouses. The general pattern observed across years is that wives are more likely to be labor force participants if their husbands are employed. When the participation rates of wives are examined conditional on the employment status of their husbands, the relevant percentages are 28.1% versus 2.6% in 2008 and 28.3% versus 3.2% in 2009. The most common type of mating is nonparticipating wives with working husbands which represent the initial sample of the regression analysis. Their share in the full sample of couples fell from 53.1% in 2008 to 51.3% in 2009. On the other hand, the incidence of the least likely case, participating wives with non-employed husbands, increased from 2.6% in 2008 to 3.2% in 2009.

The descriptive statistics presented so far are consistent with the presence of AWE.

[5]Further information on the data sources is presented in Appendix 3.A.1.

However, a more elaborate analysis is required to give a causal interpretation of such correlations. The next section illustrates the approach considered in this paper.

3.5 Identification Strategy

In order to estimate the labor supply response of wives to their husbands' job losses, the analysis starts with a regression of the wife's labor force participation on husband's unemployment:

$$Y_{ift} = \alpha + \beta D_{ift} + X'_{ift}\Omega + \epsilon_{ift} \tag{3.1}$$

where: Y_{ift} is a binary variable indicating participation status of the nonparticipating wife i of couple f which is equal to 1 if she enters in the labor force at time t and 0 if she stays inactive[6]; D_{ift} is a binary variable indicating displacement status of the husband i of couple f which is equal to 1 if he loses his job at time t and 0 if he stays in employment; X_{ift} is a vector of individual covariates including age, educational attainment, past work experience of wives and husbands; number of children aged up to 5 years and aged between 6 and 14 years. The covariates of past work experience are of particular importance in order to control for permanent unobserved characteristics such as the wife's propensity to work and the husband's unemployment incidence over the life cycle (Spletzer, 1997). The covariates also include the presence of other adults in the household that do not work. As they can take care of the children or help in household chores, I expect them to have an explanatory power in the participation decision of the wife.

β is the parameter of interest in the regression function in equation (3.1). The critical question is whether the (OLS) estimate of β can be interpreted as AWE. One concern is the endogeneity problem arising from voluntary unemployment of the husband. As pointed out by the early work, the more likely the wife increases her labor supply, the more easily the husband may choose to resign from his job (Kohara, 2009). To rule out such a problem, the sample is restricted to "involuntary separations" by excluding resignations. However, the husband's unemployment could still be endogenous in the labor supply decision of his wife, unless it is unexpected. If the family anticipates the job loss, the wife may adjust her labor supply according to their expectancy before the displacement. Since the interest is to analyze the wife's labor supply response to the realized unemployment of her husband, the anticipated job losses have to be excluded. Therefore, only job losses that occurred during the period of the recent global crisis are included in the analysis, assuming that the crisis is unexpected. One may argue that an involuntary job loss, even if it is unanticipated, would not be exogenous if those who are dismissed from their jobs are the less productive

[6]Labor force participation includes both employed and unemployed persons. The latter is composed of people who are not working but actively seeking a job. Thus, entering in the labor force refers to those who are involved in job search, which is explicitly asked to the respondents in the survey.

workers. This would not be an issue if the sample could have been restricted to the lay-offs due to plant closings, however, the data limitation does not enable us to do so. To deal with this problem, the past work experience of the husband is included in the regression as a covariate which could be regarded as a proxy for the tendency towards being displaced due to some permanent unobserved characteristics such as his productivity.

The final, yet important source of bias in the OLS estimate of β is the simultaneity in labor supply behaviors of spouses. One possible way to deal with this endogeneity problem is implementing an IV estimator. The 2008 crisis provides an exogenous variation in the production level of male-dominated sectors that is exploited to instrument the husband's displacement. In particular, the instrument is constructed based on the variation in the production level of the male-dominated sectors induced by the crisis *net of* the variation in the production level of other sectors with higher female participation, *net of* individual characteristics, particularly of their past work experiences and *net of* the deterministic trend. As will be discussed in the following section, the instrument has a negative and strong correlation with the husband's displacement. This prevents us from worrying about the weak instrument problem.

Equation (3.2) presents the first-stage regression:

$$D_{ift} = \alpha_0 + \alpha_1 Z_{st} + \alpha_2 F_{st} + \alpha_3 T + X'_{ift}\Omega + \varepsilon_{ift} \tag{3.2}$$

where: D_{ift} is the dummy variable for the husband's unemployment as described in equation (3.1); the variable Z_{st} indicates the output of sectors s in which men dominate, and the variable F_{st} indicates the output of sectors s with higher female participation. One may be concerned about the crisis effects going beyond the male-dominated sectors. It is likely that the recession has led to a general worsening of macro-economic conditions which might have a direct effect on female participation decision. The variable F is included in the regression to rule out such a potential endogeneity problem. The variable T indicates a reference time period running through the set of $\{1, 2, ..., 6\}$ which is identified with the set of $\{(2008, quarter3), (2008, quarter4), ..., (2009, quarter4)\}$, where $T = 1$ corresponds to $(2008, quarter3)$, $T = 2$ corresponds to $(2008, quarter4)$, and so forth. Including the time variable allows to control for the deterministic trend in the sectors of interest. The vector X includes the same control variables previously considered in equation (3.1).

The main identifying assumption of this empirical analysis is that the only link between the output changes in the husband's sector and the wife's participation decision is the husband's displacement. Two key observations corroborate this assumption. First, there is a full gender segregation in the sectoral distribution of employment, and the sectors which men dominate in are the ones the crisis hit hardest, while the sectors with a higher female labor force were not affected by the crisis, as discussed in Section 3.3 (see Figures 3.1-3.2). Thus the changes in the production level of the male-dominated sectors are not expected to have a direct effect on the female participation decision, as long as the output

change in the other sectors with higher female participation is controlled. As mentioned above, this covariate captures the general worsening of macro-economic conditions due to the recession.

The second observation supporting the internal validity is represented by Figure 3.6. The instrumental variable proposed for this analysis has to be interpreted as the "unpredicted" component of the male sectors' production: identification exploits the output variation in the male sectors that is left after removing the co-variation with the production in the female sectors, the variability attributed to individual characteristics and the variability in time trend. If this "unpredicted" component is exogenous to the husband's displacement, it should exhibit an unusual fluctuation during the crisis and rather a smooth trend for the rest of the period. I check this argument by considering the pattern of the output of the male- and female- sectors. I consider equation (3.3) and (3.4) below.

$$Z_{st} = \gamma_{1,0} + \gamma_{1,1} T + X'_{ift} \Omega_1 + \upsilon_{1,ift} \tag{3.3}$$

$$F_{st} = \gamma_{2,0} + \gamma_{2,1} T + X'_{ift} \Omega_2 + \upsilon_{2,ift} \tag{3.4}$$

Equations (3.3) and (3.4) present the regressions of the output of the male- and female-sectors respectively, conditioning on individual characteristics (X) and time trend (T). Figure 3.6 plots the residuals from equations (3.3) and (3.4) which are denoted by a dashed blue line and a dotted green line, respectively. It also plots the difference between the two residuals which is denoted by a solid red line. This difference has a stable and a smooth trend till the onset of the crisis, exhibits a sudden fall with the outburst of the crisis after the third quarter of 2008, and then it levels out. The slump observed between the third and fourth quarters of 2008 is unusual to the overall trend. In other words, the largest source of variation in the "unpredicted" component comes from the 2008 shock and the output fall in this period was largely unexpected. This is a supporting evidence for the unanticipated change in the output of the male-dominated sectors, which is exogenous to the husband's displacement.

3.6 Results

This section presents the estimation results of the effect of the husband's displacement on the wife's participation decision based on different specifications. It is reasonable to expect a potential delay in the labor supply response of the wife to her husband's unemployment. As a matter of fact, it may take time for the wife to adjust her labor supply in response to her husband's job loss. To take into account possible delays in the wife's response, six separate regressions are estimated each of which belongs to a different delay period ranging from zero to five quarters. Table 3.3 presents estimation results of each regression in a different column. For instance, the first column reports the change in the probability

of entering in the labor force of a nonparticipating wife in the quarter when her husband has become unemployed, while the last column indicates how the same probability changes five quarters after the husband's displacement.

The main estimator of this analysis is the IV estimator as described in the previous section. To benchmark the IV results, the tables also display the OLS estimates of the parameter β in equation (3.1). A threat to identification could be an omitted variables problem if other (unobserved) factors that affect a wife's participation decision are also correlated with the output shock. To mitigate this potential problem the specification is extended in a way to include individual fixed-effects. The results in Table 3.3 are reported both with and without individual fixed effects. According to the OLS estimates reported in the top panel of Table 3.3, the labor force participation decision of married women has generally a positive association with their husbands' unemployment throughout the delay periods. When individual fixed effects are included in the regression equation, the signs of the coefficient estimates remain the same, as presented in the bottom panel of the table. However, most of the estimates become statistically insignificant (or borderline significant) as the coefficients become smaller -more negative-, and the standard errors become larger[7]. OLS estimates -with and without fixed effects- are relatively small in magnitude and sometimes of the unexpected sign. They are likely to be biased toward zero due to the attenuation bias and thus lead to less positive coefficients. All in all, OLS estimates do not provide support to the presence of AWE[8].

Given this, we now turn to the results based on the IV strategy illustrated in section 3.5 of the paper. The IV approach generates uniformly larger estimates for the parameter β than the OLS estimates. One possible explanation for the sizable difference between IV and OLS estimates is that measurement error in the treatment might bias the OLS estimates downwards. Another explanation common in the IV literature is that the IV estimate identifies a local average treatment effect parameter and that the group of compliers particularly benefits from the treatment. This might be the reason why a larger effect is estimated through IV.

Including fixed effects in the estimation makes a substantial difference within the IV results. While the signs are consistent, the magnitudes of the estimates are lower in fixed effects estimation, generally with larger standard errors. When unobserved (time-invariant) heterogeneity is controlled via fixed effects, the estimated effects are smaller, as can be seen in Table 3.3. The discussion that follows focuses on the IV results with fixed

[7]Larger standard errors in fixed effects estimation indicate a great variation in the predictor variables across individuals despite a little variation over time for each individual. An outcome would be less precise estimates even if the magnitudes of the coefficients are the same.

[8]The endogenity test of the endogenous regressor (husband's displacement) has a p-value of 0.000 for all specifications suggesting that my sample data overwhelmingly rejects the use of OLS in favor of IV.

effects.

The first stage estimation results indicate a sizable, negative and statistically significant relationship between the husband's displacement and the corresponding instrumental variable for every delay period (see the bottom panel of Table 3.3). As the sectoral output declines, the probability of being displaced for a husband increases. To illustrate, the entry in the third column of Table 3.3 indicates that a 10 percentage point fall in the production level is associated with a 1.2 percentage point increase in the probability of being displaced for a husband working in certain sectors. The F-statistics of the instrument are above 10 for most of the specifications and consequently do not suffer from a weak instrument problem (Staiger and Stock, 1997).

The IV results with fixed effects suggest that husbands' unemployment accounts for 54% to 64% of the observed increase in the probability of their wives' labor force participation during the crisis in Turkey. The magnitude of the estimate depends on after how many quarters wives respond to their husbands' displacement. The effect has a reverted U-shape distribution: it emerges after one quarter following the husband's unemployment, becomes the greatest in the second quarter after the job loss and phases out by the fourth quarter of the unemployment. The estimates are consistent with the following interpretation: women waited four to twelve months to enter the labor force probably until they became sure that their husbands were unlikely to find a job. As the economic recovery started by the end of 2009, accordingly as men have regained their comparative advantageous over women in the labor market, the labor supply response of the wives has disappeared. Recalling the discussions in Section 3.2, the evidence supporting the existence of the AWE can be interpreted as follows: the income and substitution effect prevail over complementarity in leisures of spouses during the crisis period in Turkey.

One discernible point in Table 3.3 is the steady decline in the number of observations as going from zero to five quarters of delay. It is because the lagged variables (of husband's displacement) are constructed with respect to the previous quarter, starting from the third quarter of 2008. To keep the sample size fixed in order not to lose information over the delay periods, the lagged variables of the displacement are constructed from the beginning by relying on data before the third quarter of 2008. In this new sample not only the job losses that occurred during the crisis but also those before the crisis are included. Accordingly, the association between the instrument and the husband's displacement loosens given that the instrument is constructed based on the variation in the sectoral output induced by the crisis (see appendix Table 3.B.1.). A more detailed discussion is presented in Appendix 3.A.2.

Aside from the key independent variable, all of the regressions include several other independent variables though not presented in Table 3.3. The independent variables that are essential to construct the instrumental variable are the output of other sectors with a higher female participation and the time trend. While the former enables the control for

the general worsening of macro-economic conditions which are likely to have a direct effect on married women's participation decisions, the latter variable allows for capturing the deterministic trend. Other control variables are those that are likely to have explanatory power for married women's participation decision. Personal characteristics utilized in the regression analysis are the ages of the husband and wife (included quadratically), their years of schooling, their past work experiences, the number of children they have in the 0-5 and 6-14 age groups and the number of other adults in the household that do not work. For the sake of brevity, Table 3.4 presents estimates of the coefficients of control variables just for one specification, namely the 2-quarter delay period, since they are very stable across different specifications.

The magnitudes and the signs of the coefficients are generally consistent with expectations. As displayed in columns (2) and (3) of Table 3.4, the years of schooling of the wife have a strongly positive effect on her participation. So do the husband's years of schooling on her participation, but with a smaller size. His educational attainment has a statistically significant, negative but a small effect on his displacement. The older a wife is, the more likely she is to enter the labor force. Her participation probability peaks at around the age of 35. On the other hand, the probability of the husband's unemployment decreases with his age after 25 years old. Both the husband's and the wife's past work experience have a positive effect on the wife's participation, but the estimated effects are very small. On the other hand, there is a fairly large and negative association between the past work experience of the husband and his displacement.

In line with the findings from the earlier literature, having more children younger than 6 years old decreases the probability of their mother's participation in the labor force, whereas the number of children aged 6 to 14 has no significant effect on the participation of women. This may have to do with the independence of those children from a special parental care. In contrast to expectations, the number of other adults in household is found to have a negative effect on the wife's participation decision though the estimates are only borderline significant. This could be because these elderly people are in need of special care and wives are the potential caregivers. The coefficient estimates of the control variables become statistically insignificant when individual fixed effects are included in the estimation due to the larger standard errors, probably because there is little variability of these controls over time, i.e. across quarters, within individual in the relatively short period (2008-2009) considered in this analysis. Time-invariant controls coefficients cannot be identified within the fixed-effect approach.

3.6.1 Heterogenity in the Added Worker Effect

The analysis of the AWE has so far focused on couples aged between 15 and 64. However, it is likely that older wives close to the age of retirement postpone their labor supply responses. If this argument is true, then restricting the sample to a younger age group

would yield a stronger AWE. Eligibility for retirement in Turkey depends on the gender, age and service duration.[9] The sample is restricted to women aged 15 to 50 to exclude women potentially close to being eligible for retirement. This restricted sample accounts for 77% of the total sample size. The analysis performed in the previous section is replicated for this younger age group to check whether the results are robust to the changes in the ages of spouses.

Table 3.5 presents the estimation results for the restricted samples. Comparing the bottom panel of Table 3.3 with the top panel of Table 3.5 indicates that the AWE is uniformly stronger for the younger age cohort in all delay periods in line with expectations. As for the older cohort (aged 51-64 year), no strong correlation is found in the first stage of the estimation given that estimates are less precise and most coefficients are only significant at 10%. This could be due to the fact that employers prefer not to fire older workers during an economic contraction to avoid incurring in higher firing costs: older workers are more likely to have longer service duration and hence a higher severance pay.

Next, heterogeneity in AWE is explored along an additional dimension, namely education. Indeed, it is reasonable to expect that low-educated people are more likely to be subject to a tighter liquidity constraint under the assumption of a positive correlation between educational level and earnings (savings). Therefore, the expectation is towards finding a stronger AWE among the low-educated couples. Table 3.5 presents the estimation results for the couples with low-educated husbands. Consistent with the expectation, the AWE estimated for the full sample of couples (presented in Table 3.3) is entirely attributable to these low-educated couples. Quite similar results are found if the sample is further restricted in such a way that both husbands and wives are low-educated (see appendix Table 3.B.2.)[10]. This is a symptom for a stronger AWE among couples with high homogamy in education. Considering high homogamy in education as an indicator of assortative mating, this result can be interpreted as follows: assortative mating does not play an obscuring role in detecting AWE in my sample. However, one must be cautious in relying on this interpretation as the AWE hypothesis cannot be tested when both spouses

[9]The minimum age for retirement was first regulated in 1999, but since then has undergone many changes over years (Law No. 4759, 2002; Law No 5510, 2006). Before the regulation, women and men were qualified to be retired regardless of their age provided that they have 20 and 25 years of service, respectively. The age limit, which is currently a minimum of 58 for women and 60 for men, has gradually been pushed up for those who had a certain duration of service at the time the law was enacted.

[10]This is have to do with the small difference between the samples used in Table 3.5 and Table 3.B.2. The largest component of the estimation sample is represented by the low-educated husbands married with low-educated women, that accounts for 66.5% of the whole sample. Table 3.B.2 relies on this subsample. Table 3.5, on the other hand, relies on couples with low-educated husbands, thus including high-educated wives married with low-educated men (which only account for 3.6% of the sample) in addition to the subsample used by Table 3.B.2.

have high level of education since the first stage of the estimation does not work for the couples with high-educated husbands (see the bottom panel of Table 3.5). This could be because high-educated men are less likely to lose their jobs due to the crisis.

3.7 Conclusion

The debate on labor supply response of married women to their husbands' job losses (added worker effect) has escalated with the outburst of the global economic crisis of 2008. This paper contributes to the current debate through an empirical analysis of the added worker effect for the crisis period by relying on a case study on Turkey. To rule out the potential endogeneity problems, especially the simultaneity in spouses' labor supply decisions, in estimating the effect of husbands' unemployment on wives' participation decisions, this paper exploits an exogenous variation in the output level of male-dominated sectors induced by the 2008 crisis as an instrument for the husband's job loss and the gender-segmented structure of the Turkish labor market. This study examines for the first time added worker effect over the recent crisis period in Turkey using longitudinal data.

When the (time-invariant) unobserved heterogeneity is controlled via fixed effects, the instrumental variable estimates indicate that husbands' unemployment accounts for 54% to 64% of the observed increase in the probability of their wives' labor force participation The magnitude of the estimate depends on after how many quarters the wife responds to her husband's displacement. The effect has emerged after one quarter following the husband's unemployment, become the greatest in the second quarter after the job loss and phased out after the fourth quarter of the unemployment. This implies that wives waited for entering the labor market at least one quarter, until they lost their hope about their husbands' finding a job. As the economic recovery started, the husbands again became more likely to be hired and the wives' responses disappeared. The AWE is even stronger when the sample is restricted to a younger age cohort who are far from being retired. The largest effect is found among the spouses who are both low-educated. This implies the importance of liquidity constraints among the low-educated couples in the decision of labor force participation.

The evidence for the presence of AWE is consistent with the following interpretation: the income and substitution effect prevail over the complementarity in leisures of spouses for the crisis period in Turkey. The results furthermore indicate that the discouraged worker effect did not obscure the labor supply response of wives. The dominance of the added worker effect could have brought about a change in favor of female employment trends over the crisis. However, what we know from Turkey's past crisis experiences is that the increase in female participation during the recession is likely to be temporary (Baslevent and Onaran, 2003). Demand side improvements are rather more likely to lead to a permanent increase in womens participation.

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Appendix

3.A.1. More about the Data Sets

Survey on Income and Living Conditions is designed as a rotating panel in which the sample of households and corresponding individuals are traced annually for four consecutive years. The interviews are administered once a year. Every year the survey is conducted for four subsamples. One quarter of the sample is replaced by a new one in each year, thus three fourths of the sample remains unchanged with respect to the previous year. The samples are selected and assigned survey weights so as to be nationally representative. Moreover, the sample size is designed considering possible non-responses, thereby no replacement is undertaken.

On the other hand, the **Survey on National Accounts** records the output levels, namely gross domestic product by kinds of economic activity at constant (1998) prices. The economic activities are classified into 17 sub-sectors, namely Agriculture, Hunting and Forestry; Fishing; Mining and Quarrying; Manufacturing; Electricity, Gas and Water Supply; Construction; Wholesale and Retail Trade; Hotels and Restaurants; Transport, storage and Communication; Financial Intermediation; Ownership and Dwelling; Real Estate, Renting and Business Activities; Public Administration and Defense, and Compulsory Social Security; Education; Health and Social Work; Other Community, Social and Personal Service activities and Private Housekeeping Services.

For the specific aim of the empirical analysis, some sub-sectors are aggregated into two groups based on some specific characteristics. The first group includes the male-dominated sectors which were hit severely by the crisis (manufacturing; construction; wholesale and retail trade; and transport, storage and communication services), whereas the second group involves the sectors with higher female participation (education; health and social work; other community, social and personal service activities and private housekeeping services). These two groups of sectors totally account for 74% of non-agricultural GDP and 85% of non-agricultural employment.

3.A.2. Falsification Exercise using Fixed Sample Size

The number of observations used for the regression analysis changes across the delay periods, as can be seen in Table 3.3. It is due to the fact that the lagged variables (of husband's displacement) are constructed with respect to the previous quarter, starting from the third quarter of 2008. While there is no missing value in the variable of displacement, there is one missing value in the first lag of the variable, two missing values in the second lag of the variable, three missing values in the third lag of the variable and so forth. The lagged variables are constructed in the following way.

	D_0	D_1	D_2	D_3	D_4	D_5
2008Q3	1	.	.	.	.	.
2008Q4	0	1	.	.	.	.
2009Q1	0	0	1	.	.	.
2009Q2	1	0	0	1	.	.
2009Q3	0	1	0	0	1	.
2009Q4	0	0	1	0	0	1

where: D_q for $q \in (0, ..., 5)$ denotes the variable of husband's displacement with a lag of 0

to 5 quarters. The sample period is the crisis period, ranging between the third quarter of 2008 ($2008Q3$) and the fourth quarter of 2009 ($2009Q4$).

One discernible point in Table 3.3 is that the difference in the number of observations between two consecutive delay periods is not equal. The most striking is the difference between "no delay" and "1-quarter delay" periods versus the difference between other consecutive delay periods. It may have to do with the presence of missing values in the control variables, differentiating between years. Think of a control variable fully observed in 2008, but having missing values in 2009 for some individuals. The number of observations for the first two specifications (i.e. no delay and 1-quarter delay) would be much closer to each other given that the zero- and the first-lag of the variable involve information from both 2008 and 2009. However, the other specifications can utilize information only from 2009 which is missing for some individuals. Therefore, the difference in the number of observations between "no delay" and "1-quarter delay" period is the smallest, whereas it is larger and more equal thereafter.

To avoid information loss across the specifications, a new sample is created by keeping the sample size fixed over the delay periods. To this end, the lagged variables of the displacement are constructed from the beginning by relying on data before the third quarter of 2008 (which is before the outburst of the crisis). The way of constructing the lagged variables in the new sample is demonstrated in the matrix below. The sample period of interest is still the crisis period, namely the area within the rectangular frame. To illustrate, as for the survey period of the third quarter of 2008, the first lag of the variable is constructed exploiting the information from the second quarter of 2008, the second lag is constructed based on the information from the first quarter of 2008, and so forth. In doing so, the missing values in the matrix above (drawn for the original sample) are completed by exploiting the information prior to the crisis, which enables a fixed sample size over the delay periods. In this new sample, the focus is on not only the job losses that occurred during the crisis, but also those before the crisis.

	D_0	D_1	D_2	D_3	D_4	D_5
2007Q2	0	$\ddots$	$\cdots$	$\cdots$	$\cdots$	$\cdots$
2007Q3	1	0	$\ddots$			$\vdots$
2007Q4	0	1	0	$\ddots$		$\vdots$
2008Q1	0	0	1	0	$\ddots$	$\vdots$
2008Q2	0	0	0	1	0	$\ddots$
2008Q3	1	0	0	0	1	0
2008Q4	0	1	0	0	0	1
2009Q1	0	0	1	0	0	0
2009Q2	1	0	0	1	0	0
2009Q3	0	1	0	0	1	0
2009Q4	0	0	1	0	0	1

Recall that it is the crisis that provides the exogenous variation in the production level of some specific sectors, and this variation is exploited as an instrument for the husband's displacement. When displacements that occurred before the crisis are added to the sample, naturally the association between the output change in those specific sectors

and the displacement loosens. To express this in technical terms, the coefficient estimates in the first stage are no longer strongly statistically significant in this new sample (see appendix Table 3.B.1). This falsification exercise provides a sense of plausibility of my identification assumption with the following reasoning inspired by Angrist and Pischke (2009: 97). If the only reason for the instrument effects on the wife's participation is the husband's displacement, then the instrument effects on the wife's participation should be zero in samples where the instrument is unrelated to the endogenous regressor.

3.B. Appendix Tables

Table 3.B.1. **Falsification exercise using fixed sample size** (*including fixed effects*)

	No delay	1-quarter delay	2-quarter delay	3-quarter delay	4-quarter delay	5-quarter delay
First Stage						
Male sectors' output	-0.083**	-0.079**	-0.094**	-0.075*	-0.072*	-0.103
	(0.037)	(0.041)	(0.040)	(0.040)	(0.042)	(0.081)
F test	5.01	3.81	5.78	3.52	2.26	0.92
IV estimation						
Husband's job loss	1.526	0.598*	0.660**	0.597*	0.505	1.325
	(1.366)	(0.289)	(0.272)	(0.262)	(0.312)	(1.384)
No. observations	20,427	20,427	20,427	20,427	20,427	20,427
OLS estimation						
Husband's job loss	-0.018	0.010	0.024	0.005	-0.020*	-0.013
	(0.011)	(0.015)	(0.015)	(0.012)	(0.012)	(0.013)
No. observations	20,429	20,429	20,429	20,429	20,429	20,429

[1] *Controls*: age, age-square and past work experience of wives and husbands, number of children (aged up to 5 and between 6-14) and number of other adults in the household.
[2] Standard errors in parenthesis are clustered at quarter-year level (***p<0.01, **p<0.05, *p<0.1)

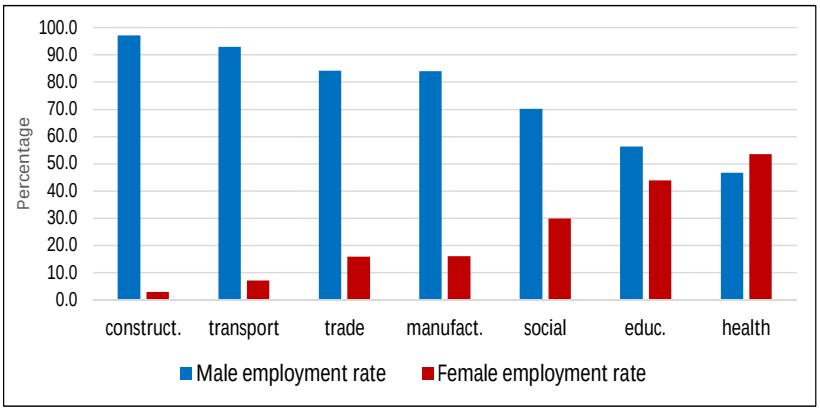
Table 3.B.2. **Homogamy in education: Both spouses educated below high school** (*including fixed effects*)

	No delay	1-quarter delay	2-quarter delay	3-quarter delay	4-quarter delay	5-quarter delay
First Stage						
Male sectors' output	0.124***	-0.135***	-0.186***	-0.134***	-0.139***	-0.298***
	(0.040)	(0.042)	(0.047)	(0.048)	(0.053)	(0.107)
F test	10.35	10.20	9.77	7.92	6.03	7.79
IV estimation						
Husband's job loss	1.471	0.619**	0.659**	0.655**	0.691*	0.816
	(1.094)	(0.315)	(0.314)	(0.316)	(0.385)	(0.517)
No. observations	20,449	19,315	17,779	16,599	15,379	14,194
OLS estimation						
Husband's job loss	-0.012	0.019	0.012	0.009	-0.019	-0.012
	(0.011)	(0.014)	(0.014)	(0.013)	(0.012)	(0.015)
No. observations	20,479	19,337	17,996	16,641	15,408	14,218

[1] *Controls*: age, age-square and past work experience of wives and husbands, number of children (aged up to 5 and between 6-14) and number of other adults in the household.
[2] Standard errors in parenthesis are clustered at quarter-year level (***p<0.01, **p<0.05, *p<0.1)

Figures

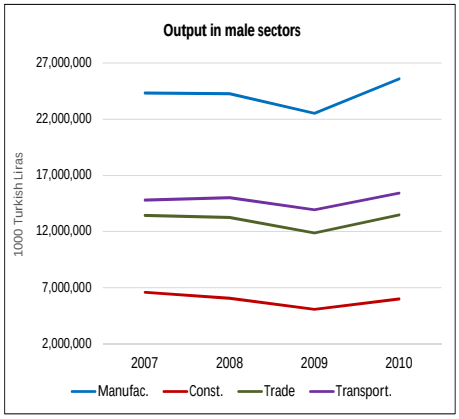
Figure 3.1: **Sectoral distribution of employment by gender, 2007**
(as a share of total employment in the corresponding sector)

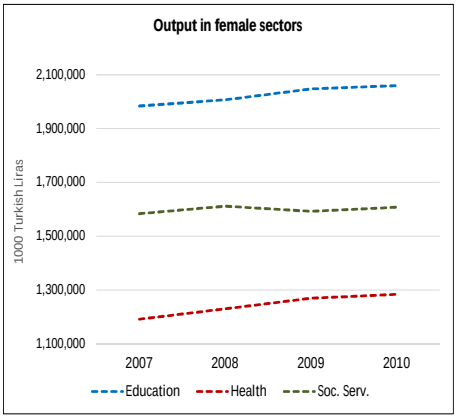


Source : Turkstat, 2013.

Note : The sectors in sequence are Construction; Transport, Storage and Communication; Wholesale and Retail Trade; Manufacturing; Social Services; Education Services; Health and Social Work.

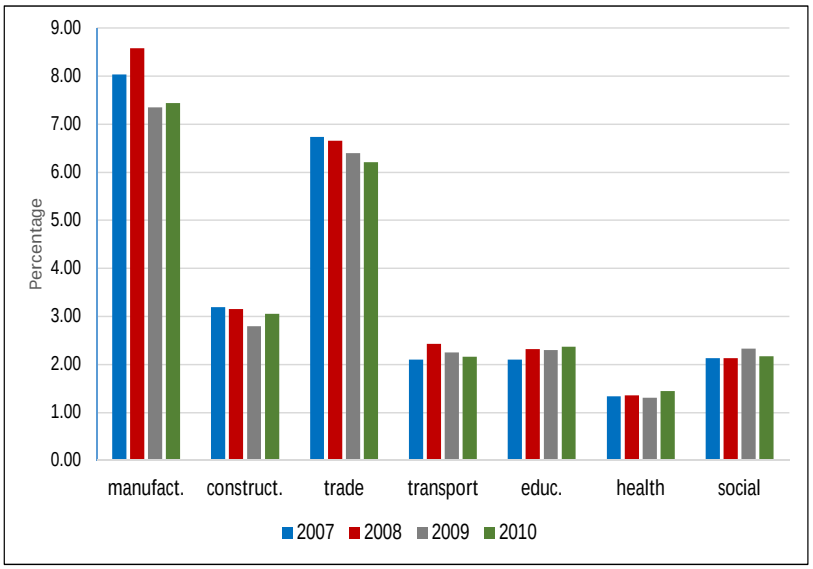
Figure 3.2: **Sectoral output over the crisis period**
(gross domestic product in constant prices)





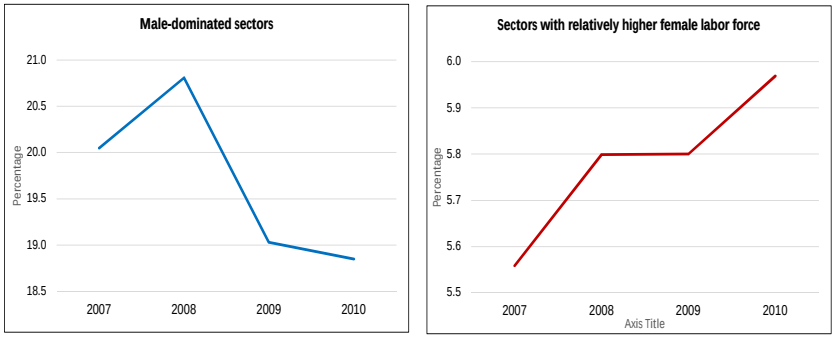
Source : Turkstat, 2013.

Figure 3.3: **Employment rate by sectors over the crisis period**
(as a share of population aged 15-64)



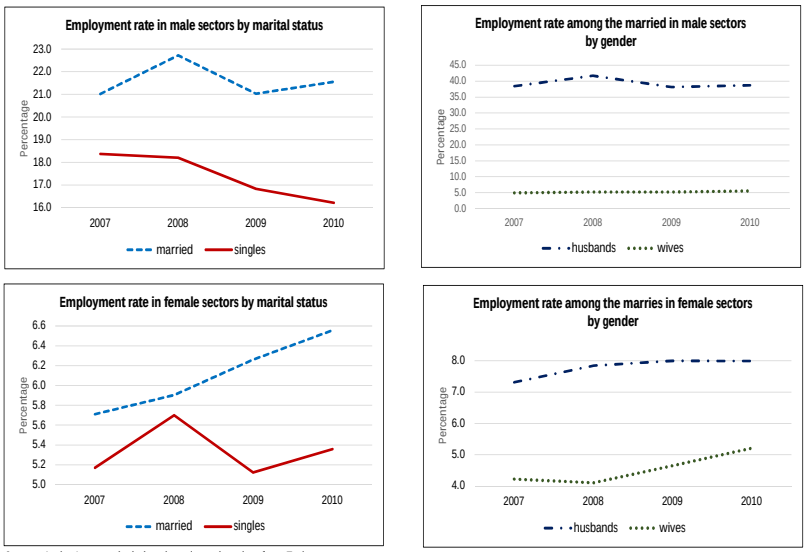
Source : Author's own calculations based on micro data from Turkstat.

Figure 3.4: **Employment rate by sectoral groups over the crisis**
(as a share of population aged 15-64)



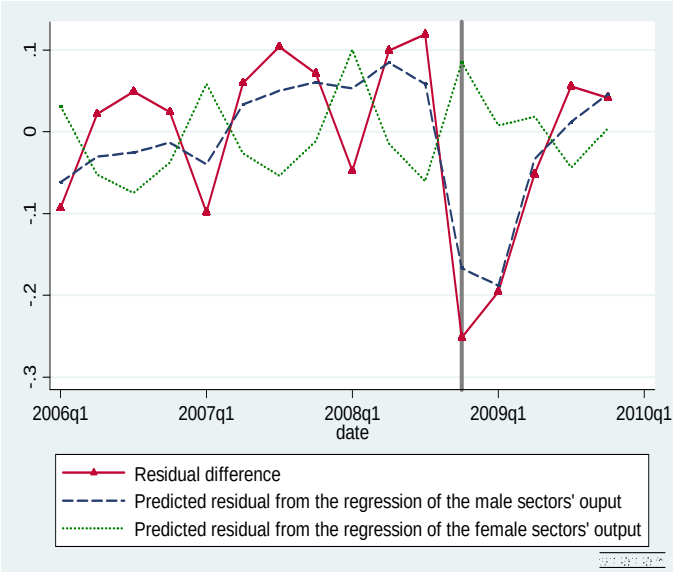
Source : Author's own calculations based on micro data from Turkstat.

Figure 3.5: **Employment rate in sectoral groups by marital status**
(as a share of population aged 15-64 in the corresponding marital & gender group)



Source : Author's own calculations based on micro data from Turkstat.

Figure 3.6: **Internal Validity**



Source: Author's own calculations based on micro data from Turkstat.
Note: The dashed line represents the *predicted residual from the regression of male sectors' output.* The dotted line represents the *predicted residual from the regression of female sectors' output.* The solid line denoted by *residual difference* refers to the difference between the residuals predicted from the male and female sectors.

Tables

Table 3.1: **Labor market indicators by gender and marital status**

	2007	2008	2009	2010
Labor Force Participation Rate	46.2	46.9	47.9	48.8
of which: Female	23.6	24.5	27.0	27.6
of which: Single	34.4	35.3	35.8	36.0
Married	21.6	22.4	25.3	26.4
of which: Male	69.8	70.1	70.5	70.8
of which: Single	57.7	58.3	58.5	59.2
Married	75.9	76.2	76.0	77.0
Employment Rate	41.5	41.7	41.2	43.0
of which: Female	21.0	21.6	23.9	25.0
of which: Single	27.6	28.2	27.6	28.3
Married	20.3	20.9	23.1	24.2
of which: Male	62.7	62.6	59.7	61.7
of which: Single	46.6	46.8	44.8	47.0
Married	70.6	70.3	67.7	70.7
Unemployment Rate	10.3	11.0	14.0	11.9
of which: Female	11.0	11.6	13.3	13.0
of which: Single	19.8	20.0	23.9	22.6
Married	6.0	7.0	9.1	8.2
of which: Male	10.0	10.7	14.9	11.4
of which: Single	19.2	19.8	24.7	20.6
Married	7.0	7.8	11.2	9.2

Source : Turkstat, 2013.

Table 3.2: **Labor market outcomes by spouses' labor market status**

	2008			**2009**		
	Husband *employed* (1)	**Husband** *nonemployed* (2)	**All** (3)	**Husband** *employed* (4)	**Husband** *nonemployed* (5)	**All** (6)
Wife *participating*	1981 (28.1)	186 (2.6)	2167 (30.7)	2100 (28.3)	228 (3.2)	2238 (31.5)
Wife *nonparticipating*	3744 (53.1)	1140 (16.2)	4884 (69.3)	3645 (51.3)	1224 (17.2)	4869 (68.5)
All	5725 (81.2)	1326 (18.8)	7051 (100.0)	5655 (79.6)	1452 (20.4)	7107 (100.0)

Note: The entries denote cell sizes, with percentages in parentheses.

Table 3.3: **Estimation results over a period of 5-quarter delay**

	(1) No delay	(2) 1-quarter delay	(3) 2-quarter delay	(4) 3-quarter delay	(5) 4-quarter delay	(6) 5-quarter delay
First Stage						
Male sectors' output	-0.180***	-0.189***	-0.194***	-0.203***	-0.196***	-0.295***
	(0.028)	(0.028)	(0.026)	(0.029)	(0.025)	(0.081)
F test	42.24	47.14	52.22	49.79	59.29	13.42
IV estimation						
Husband's job loss	1.028	0.842***	1.144***	0.988***	0.924***	0.858
	(1.240)	(0.220)	(0.224)	(0.183)	(0.195)	(0.588)
OLS estimation						
Husband's job loss	-0.005	0.034***	0.031***	0.021**	-0.003	0.007
	(0.007)	(0.011)	(0.011)	(0.010)	(0.008)	(0.011)
No. observations	29,904	28,404	26,353	24,249	22,379	20,584
	with Fixed Effects					
First Stage						
Male sectors' output	-0.095***	-0.114***	-0.120***	-0.119***	-0.114***	-0.251***
	(0.036)	(0.032)	(0.036)	(0.036)	(0.040)	(0.094)
F test	7.88	12.45	11.21	10.20	7.01	7.14
IV estimation						
Husband's job loss	1.004	0.540*	0.639**	0.634**	0.583*	0.518
	(1.466)	(0.283)	(0.296)	(0.301)	(0.308)	(0.387)
No. observations	29,682	28,326	25,964	24,151	22,321	20,528
OLS estimation						
Husband's job loss	-0.006	0.020	0.014	0.007	-0.019*	-0.013
	(0.012)	(0.013)	(0.013)	(0.012)	(0.011)	(0.013)
No. observations	29,904	28,404	26,353	24,249	22,379	20,584

[1] *Controls*: age, age-square and past work experience of wives and husbands, number of children (aged up to 5 and between 6-14) and number of other adults in the household.
[2] Standard errors in parenthesis are clustered at quarter-year level (***p<0.01, **p<0.05, *p<0.1)

Table 3.4: **Estimation results for 2-quarter delay period**

	(1) 1^{st} St.	(2) IV	(3) OLS	(4) 1^{st} St.	(5) IV	(6) OLS
Male sectors' output	-0.194***			-0.120***		
	(0.026)			(0.036)		
Husband's job loss		1.144***	0.031***		0.639**	0.014
		(0.224)	(0.011)		(0.296)	(0.013)
Female sectors' output	-0.039	0.189***	0.040*	-0.050	0.054	0.020
	(0.028)	(0.040)	(0.020)	(0.041)	(0.072)	(0.021)
Time trend	-0.009***	0.000	-0.000	-0.009***	-0.006**	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)
Age of wife	-0.008	0.021**	0.023***			
	(0.008)	(0.012)	(0.009)			
Age of wife squared	-0.013	-0.033*	-0.030***	-0.005	-0.013	-0.011
	(0.012)	(0.022)	(0.005)	(0.021)	(0.028)	(0.010)
Years of schooling of wife	-0.002*	0.021**	0.020***			
	(0.001)	(0.011)	(0.009)			
Wife's work experience	-0.000	0.001*	0.000**	-0.001	0.002**	0.001*
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Age of husband	-0.028***	0.003*	0.002**	-0.026***	0.008	0.013
	(0.008)	(0.002)	(0.001)	(0.008)	(0.018)	(0.013)
Age of husband squared	-0.020*	0.005*	0.004**	-0.010	0.003	0.000
	(0.012)	(0.003)	(0.002)	(0.021)	(0.009)	(0.000)
Years of schooling of husband	-0.003***	0.002**	0.002**			
	(0.001)	(0.001)	(0.001)			
Husband's work experience	-0.012***	0.001*	0.000*	-0.010**	0.001	0.000
	(0.005)	(0.001)	(0.000)	(0.005)	(0.001)	(0.001)
No. children aged 0-5	-0.004	-0.013***	-0.008***	-0.002	-0.014*	-0.013*
	(0.003)	(0.003)	(0.002)	(0.007)	(0.008)	(0.008)
No. children aged 6-14	0.003	-0.001	0.002*	-0.009	0.004	0.000
	(0.002)	(0.002)	(0.002)	(0.006)	(0.009)	(0.008)
No. other adults in the household	0.001	-0.010*	-0.009*	-0.006	-0.003	-0.005
	(0.004)	(0.006)	(0.004)	(0.009)	(0.012)	(0.008)
Constant	5.598***	2.620***	0.707***			0.223
	(1.014)	(0.561)	(0.318)			(0.342)
Fixed Effects	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**
No. observations	26,353	26,353	26,353	25,964	25,964	26,353

[1] Standard errors in parenthesis are clustered at the quarter-year level
(*** p<0.01, ** p<0.05, * p<0.1)

Table 3.5: **Heterogeneity in AWE**
(*including fixed effects*)

	(1) No delay	(2) 1-quarter delay	(3) 2-quarter delay	(4) 3-quarter delay	(5) 4-quarter delay	(6) 5-quarter delay
	Aged 15-50 years					
First Stage						
Male sectors' output	-0.147***	-0.164***	-0.152***	-0.151***	-0.155***	-0.332**
	(0.045)	(0.048)	(0.053)	(0.053)	(0.058)	(0.117)
IV estimation						
Husband's job loss	1.106	0.613**	0.639**	0.662**	0.587*	0.387
	(1.480)	(0.308)	(0.313)	(0.321)	(0.327)	(0.354)
No. observations	23,046	22,028	20,182	18,701	17,276	15,875
OLS estimation						
Husband's job loss	-0.022**	0.021	0.010	0.004	-0.016	-0.014
	(0.010)	(0.014)	(0.013)	(0.013)	(0.012)	(0.014)
No. observations	23,267	22,105	20,475	18,796	17,330	15,927
	Aged 51-64 years					
First Stage						
Male sectors' output	-0.086**	-0.086*	-0.093*	-0.107**	-0.109*	-0.101
	(0.042)	(0.045)	(0.052)	(0.056)	(0.065)	(0.081)
IV estimation						
Husband's job loss	1.490	1.536	0.570	-0.333	1.137	-0.694
	(2.570)	(2.905)	(0.962)	(0.557)	(1.200)	(2.104)
No. observations	6,636	6,298	5,782	5,450	5,045	4,653
OLS estimation						
Husband's job loss	0.014	-0.021	0.033	0.035	-0.035	-0.038
	(0.030)	(0.033)	(0.036)	(0.034)	(0.026)	(0.027)
No. observations	6,637	6,299	5,878	5,453	5,049	4,657
	Educated below high-school					
First Stage						
Male sectors' output	-0.135***	-0.135***	-0.200***	-0.158***	-0.154***	-0.313***
	(0.040)	(0.041)	(0.046)	(0.047)	(0.052)	(0.104)
IV estimation						
Husband's job loss	1.325	0.585**	0.640**	0.659**	0.641*	0.659
	(1.853)	(0.282)	(0.286)	(0.335)	(0.359)	(0.456)
No. observations	21,239	20,449	18,810	17,542	16,243	14,971
OLS estimation						
Husband's job loss	-0.014	0.023	0.011	0.005	-0.015	-0.015
	(0.011)	(0.014)	(0.013)	(0.013)	(0.012)	(0.014)
No. observations	21,320	20,487	19,052	17,598	16,275	14,998
	Educated at high-school or above level					
First Stage						
Male sectors' output	-0.005	-0.061	-0.087	-0.095	-0.030	-0.242**
	(0.042)	(0.045)	(0.047)	(0.046)	(0.050)	(0.099)
IV estimation						
Husband's job loss	4.057	0.773	0.428	-0.493	0.887	-0.065
	(3.807)	(1.387)	(0.974)	(0.861)	(1.332)	(0.832)
No. observations	8,443	7,877	7,154	6,609	6,078	5,557
OLS estimation						
Husband's job loss	-0.045	-0.009	0.027	0.022	-0.036*	-0.004
	(0.018)	(0.025)	(0.036)	(0.029)	(0.019)	(0.016)
No. observations	8,584	7,917	7,301	6,651	6,104	5,586

[1] Each column reports the coefficients of six separate regressions from different delay periods (same as those in Table 3.3) for restricted subsamples of couples: those aged 15-50 (top panel), those aged 51-64 (the second panel from the top), those with low education (the second panel from the bottom), those with high education (bottom panel).
[2] *Controls*: age, age-square and past work experience of wives and husbands, number of children (aged up to 5 and between 6-14) and number of other adults in the household.
[3] Standard errors in parenthesis are clustered at quarter-year level (***p<0.01, **p<0.05, *p<0.1)