HACETTEPE UNIVERSITY INSTITUTE OF POPULATION STUDIES

DEMOGRAPHY PROGRAM

ESSAYS ON THE LINKAGES BETWEEN FERTILITY AND WOMEN'S EMPLOYMENT IN TURKEY: WORKING AND MOTHERING

AYŞE ABBASOĞLU ÖZGÖREN

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of Doctor of Philosophy

in Demography

Ankara

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Supervisor

Prof. Dr. A. BANU ERGÖÇMEN

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November, 2015

ACCEPTANCE AND APPROVAL

This is to certify that we have read and examined this thesis and that in our opinion it is fully adequate, in scope and quality as a thesis for the degree of Doctor of Philosophy in Demography.

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This thesis has been accepted by the above-signed members of the Committee and has been confirmed by the Administrative Board of the Institute of Population Studies, Hacettepe University.

Date: …. / …. / 2015

…….
Prof. Dr. A. Banu Ergöçmen
Director

To my mother, Prof. Dr. Ufuk Abbasoğlu,
who has been my companion through
this dissertation journey in Sweden.

Bu tez Türkiye Bilimsel ve Teknolojik Araştırma Kurumu (TÜBİTAK)'nun 2214-A - Yurt Dışı Doktora Sırası Araştırma Burs Programı kapsamında desteklenmiştir.

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ABSTRACT

ESSAYS ON THE LINKAGES BETWEEN FERTILITY AND WOMEN'S EMPLOYMENT IN TURKEY: WORKING AND MOTHERING

The conflict between worker and mother roles has been studied in the literature thoroughly primarily to investigate the decline in fertility as part of demographic transition. The literature on this relationship in the developed world suggested a shift from a negative relationship to a weakening negative or even a positive relationship. This is explained by the decreasing role incompatibility between working and mothering caused by changes in the societal response and institutional context. The evidence from developing countries, on the other hand, indicates a less clear picture due to slow or ongoing demographic transition.

In this paper, we look at the mechanisms underlying the relationship between fertility and employment of women in a developing country context: Turkey, using data from 2008 Turkey Demographic and Health Survey (TDHS-2008). It is the first TDHS survey, which included employment histories of ever-married women. Using event history analyses, we investigate determinants of becoming pregnant given non-pregnancy, entering employment given non-employment, and exiting employment given employment, separately. The methodology is hazard modeling where piece-wise constant exponential models are applied. We try to interpret our results from the perspective of role incompatibility hypothesis.

Our findings indicate that conception risks of all orders are higher for non-employed women compared to employed women when we control for residential variables. Furthermore when we decompose employment with respect to job characteristics, it is observed that risk of conceptions is higher in jobs where roles are assumed to be more compatible such as jobs in the agricultural sector and jobs without any social security. The effect of fertility on employment appears to be as follows: Employed pregnant women (especially for their first child) or women with infants have higher risks of exiting employment. Non-employed women do not enter employment due to pregnancy, young children or higher parities. These findings clearly imply a two way negative relationship between fertility and employment in Turkey. We explain this finding by increasing incompatibility between roles of working and mothering in time.

ÖZET

TÜRKİYE'DE DOĞURGANLIK VE KADIN İSTİHDAMI İLİŞKİSİ ÜZERİNE ÇALIŞMALAR: ÇALIŞMA VE ANNELİK

Çalışan kadın ve anne rolleri arasındaki uyuşmazlık öncelikle demografik dönüşümün bir parçası olan doğurganlıktaki düşüşü araştırmak amacıyla detaylıca çalışılmıştır. Gelişmiş ülkelerde bu ilişki üzerine yapılan çalışmalar negatif bir ilişkiden zayıflayan negatif bir ilişkiye ve hatta pozitif bir ilişkiye geçildiğini savunmuşlardır. Bu durum toplumsal yansımadaki ve kurumsal bağlamdaki değişiklerin yol açtığı çalışma ve annelik arasında azalan rol uyuşmazlığı ile açıklanmaktadır. Gelişmekte olan ülkelerdeki bulgular ise yavaş ilerleyen veya halen devam etmekte olan demografik dönüşüm nedeniyle daha az belirgin bir tasvir sunmaktadır.

Bu çalışmada gelişmekte olan bir ülke olan Türkiye'de 2008 Türkiye Nüfus ve Sağlık Araştırması (TNSA-2008) verisi kullanılarak kadınların doğurganlığı ve istihdamı arasındaki ilişkinin altında yatan mekanizmalar incelenmektedir. TNSA-2008 evlenmiş kadınların çalışma tarihçelerini içeren ilk TNSA araştırmasıdır. Olay tarihçesi analizleri kullanılarak ayrı ayrı gebe olmayan kadınlar için gebe kalmanın, çalışmayan kadınlar için istihdama girmenin ve çalışan kadınlar için istihdamdan çıkmanın belirleyenleri analiz edilmektedir. Kullanılan yöntem, parçalı sabit üstel modellerin kullanıldığı risk modellemesidir. Sonuçlar rollerin uyuşmazlığı hipotezi perspektifinden yorumlanmaya çalışılmıştır.

Bulgular yerleşim ile ilgili değişkenler kontrol edildiğinde çalışmayan kadınların çalışan kadınlara kıyasla her sıradaki gebelik risklerinin daha yüksek olduğunu göstermektedir. Ayrıca istihdam iş özelliklerine göre ayrıştırıldığında tarım sektöründe olan veya sigortasız işler gibi rollerin daha örtüşmekte olduğunun varsayıldığı işlerde gebelik riskinin daha yüksek olduğu gözlenmiştir. Doğurganlığın istihdama etkisinin ise şu şekilde olduğu gözlenmiştir: Çalışan (özellikle ilk çocuğuna) gebe kadınların veya bebekli kadınların işten çıkma riskleri daha yüksektir. Çalışmayan kadınlar ise gebelik, küçük çocuklar veya daha fazla çocuk sayısı nedeniyle işe girmemektedirler. Bu bulgular açıkça Türkiye'de doğurganlık ve istihdam arasında iki yönlü negatif bir ilişkiye işaret etmektedir. Bu sonuç, zaman içinde işçi ve annelik rolleri arasında artan uyuşmazlıkla açıklanmaktadır.

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INTRODUCTORY NOTE

This thesis, which analyzes the relationship between fertility and employment of women in Turkey using micro data, has been designed with a different structure than conventional theses produced at the Institute. The aim of this Introductory Note is to present (i) the relatively new and different structure of the thesis at hand, (ii) research questions of the thesis, (iii) concluding remarks in general, (iv) limitations of the thesis overall, and (v) suggestions for future work in the field. The thesis is composed of three main chapters: (1) conceptual paper comprised of literature review and the contextual framework for the research subject, (2) an essay on the effect of employment on births (conceptions) of different orders, and (3) an essay on the effect of fertility on employment exits and entries. In addition to literature review and contextual framework, the first chapter includes sections on data description, summary of the two essays, and an overall concluding discussion related to the thesis. The two essays, on the other hand, have relatively independent characters and have their own introductions, contextual parts, data descriptions, findings and conclusion sections, individually.

The main aim of the thesis is to understand the relationship between fertility and employment of women in Turkey with an approach of role incompatibility hypothesis. As presented in the conceptual paper (first chapter), role incompatibility hypothesis is not the only argument to understand the relationship between fertility and employment of women however the approach of role incompatibility hypothesis has been adopted in this thesis due to its applicability to developing country contexts. Furthermore, its applicability to the context of Turkey has already been verified by Stycos and Weller (1967) in their study on the link between fertility and employment of women in Turkey using 1963 survey data. Stycos and Weller (1967) find support for the hypothesis in Turkey, where they conclude that there is no relation between fertility and employment of women due to compatibility between worker and mother roles of women. Another reason for the choice of role incompatibility hypothesis is its dominance in the literature on the relationship between fertility and employment of women. Specifically there are two mainstreams in the literature on this

relationship: (i) role incompatibility hypothesis, and (ii) societal response hypothesis. Societal response hypothesis tries to find an explanation for positive relationship between fertility and employment in *developed* countries. This relies on the fact that according to some authors the sign of the relationship between fertility and female employment turned to positive after 1980s in the developed world. Since this thesis focuses on a developing country –Turkey, use of role incompatibility hypothesis appears to be more reasonable. Finally the measures used in role incompatibility hypothesis comply with micro-level approach. According to the role incompatibility hypothesis there are two mechanisms determining the level of the conflict between the roles of workers and mothers: (i) the organization of production (the nature of the task), and (ii) the social organization of childcare. Both of these mechanisms can be situated in a micro-level analysis depending on the availability data. Societal response hypothesis, on the other hand, provides more an institutional approach, which is more proper for macro analysis settings. As a final remark on the choice of the approach of this thesis, female autonomy hypothesis could be another perspective analyzing the relationship between fertility and employment of women in Turkey. However data limitation regarding sexual and reproductive autonomy of women in a retrospective setting is the main reason for not choosing female autonomy hypothesis in this thesis.

The research questions of the thesis can be presented in three parts. The research question of the conceptual paper puts forward the framework for the relationship between fertility and employment of women by presenting (i) the literature review in general and (ii) context of Turkey. The author tries to analyze what can be postulated regarding the relationship between fertility and employment in Turkey *a priori* by analyzing the context in this chapter. The research questions of the first essay (second chapter) are:

- What are the main factors affecting first, second, third, and fourth and higher order conceptions focusing on employment status of women?
- How are job characteristics related to progression to first, second, third and fourth and higher order conceptions?

- How do trends of births of different orders evolve over time?
- How do the findings provide support for role incompatibility hypothesis in Turkey taking into consideration the institutional context in Turkey?

Finally, the research questions of the second essay (third chapter) are:

- What are the determinants of employment entries and exits focusing on fertility of women? How women's fertility (child parity and age of children) is related to these employment outcomes.
- How do trends of employment and non-employment evolve over time? What may be the factors that shaped this trend?
- How do the findings provide support for role incompatibility hypothesis in Turkey taking into consideration the institutional context in Turkey?

In brief, the first essay analyzes the effect of employment status of women on conception risks and the second essay the effect of fertility on employment outcomes of women. In other words two essays analyze the same relationship, where the variables of interest change places.

Findings from the first essay indicate that conception risks of all orders are higher for non-employed women compared to those of employed women when residential variables are controlled. When employment is decomposed with respect to job characteristics, risk of conceptions are found to be higher among women in jobs where roles of mother and worker are more compatible such as jobs in the agricultural sector and jobs without any social security. Findings from the second essay suggest that there is a negative effect of fertility on employment of women, especially on employment entry. Employed pregnant women have higher risks of exiting employment. Non-employed women do not enter employment due to pregnancy, young children or higher parities. These findings overall suggest a two-way negative association between fertility and employment of women in Turkey. The context related to fertility and employment decisions of women appears to play a

role in this outcome. The four dimensions of the context are institutional (family policies), structural (labor market), cultural (values and norms for women's social roles), and economic (living standards). In Turkey reconciliation mechanisms are not yet developed as in Western Europe countries. Although there has been an attempt to switch to active familialistic policies; passive family policies are still in effect. Public provision of child care is at very low level considering crèches and day-care nurseries in Turkey. Considering the labor market structure of Turkey, first striking feature is the low participation rates of women. Additionally there has been a sectoral shift from agriculture to service sector in time according to sectoral distribution of female jobs from the retrospective information from 2008 Turkey Demographic and Health Survey (TDHS-2008). The organization of production, i.e. the nature of the task, in female jobs have been changing favoring more incompatibility between worker and mother roles in Turkey. Although job characteristics of women in Turkey suggest that working hours of women are more flexible; this is not due to reconciliation mechanisms but rather to job characteristic of women, which are mostly in the private sector, unpaid and without any social security coverage. Cultural norms in Turkey attribute the role of care-giver to mothers. Child care and house-related work are expected to be carried out by women. Institutionalization of child care is very low in Turkey. The dominance of patriarchal family model care regime persistent throughout history, and low employment rates of women and cultural norms seem to be correlated. Finally living standards affect the employment-fertility decisions of women through economic dimension. Considering economic crises in Turkey that took place in 1994, 2001 and 2008, living standards of women have been fluctuating in time. It is suggested that economic crises affect women of different educational levels differently. Low educated women tend to enter labor market on a temporary basis and as a second bread-winner in the family to overcome financial problems. High educated women on the other hand appear to leave the labor market due to familial reasons such as marriage, husband's will and household care. Additionally poor economic conditions are expected to cause fertility declines or fertility postponement in general. Considering low educational level (primary level or less) of married women economic crises are expected to reinforce the negative relationship between employment and fertility of women in Turkey. In line

with propositions of role incompatibility hypothesis, the contextual evolution appears to be favoring increasing incompatibility between worker and mother roles of women since 1970s. Stycos and Weller (1967)'s finding, using 1963 survey data, that there was no relationship between fertility and employment of women due to compatibility between worker-mother roles in Turkey should be updated based on the findings of this thesis. Increasing incompatibility between worker-mother roles appear to be responsible for changing association between employment and fertility of women from insignificance to strong negative one due to changes in the nature of the task of women, specifically a sectoral shift towards less agricultural jobs and more services jobs; and social organization of childcare not supporting women due to low institutionalization of childcare and decreasing parental surrogates around women due to changing family structure and nucleation of families in Turkey.

Findings related to women employed in the agricultural sector needs further emphasize. Women employed in the agricultural sector have conception risks similar to those of non-employed women. This indicates that there is no difference between being non-employed and working in the agricultural sector in terms of conception risks of all orders. This finding is in line with the role incompatibility hypothesis, which suggests that there is no relationship between women's employment and fertility where roles of worker and mother are compatible. The findings of the expanded models in this thesis suggest risks of conceptions are higher for non-employed women and women employed in the agricultural sector suggesting no difference between working and not working related to fertility outcomes when only agricultural sector is considered.

This study is not free of limitations. Although the mechanisms underlying role incompatibility hypothesis are used to interpret the findings, the study at hand does not aim at a direct test of the hypothesis. The reason lies in the data limitations. Although nature of the task can be controlled via retrospective information on job characteristics, organization of childcare cannot be included in the analyses due to lack of data for childcare in the family in an event-history setting. This fact leaves one of the two pillars of the hypothesis unanalyzed. Another limitation of the study is

that institutional macro variables could not be linked to micro-level analyses although *calendar year* variable was included in the models. This variable controlled for external macro-level factors to some extent. However this thesis explains micro linkages with macro variables as a descriptive level, not adapting an institutional approach. Although this seems to be matter of methodological choice rather than a limitation, an institutional approach can be more explanatory understanding the contextual influences on the relationship in question.

In line with the limitations, future studies can have a more institutional approach employing cross-country works or having different contexts in the analysis. These works can focus on developing countries which have not yet completed demographic transition. It is an interesting research question whether these countries will experience the sane-fertility-female employment relationship as their developed counterparts in the future in terms of switching to a weakening negative relationship or even positive linkage.

Within the context of Turkey, future studies in this field can focus on the same models using different data sets. A good example is TDHS-2013, which provides rich retrospective information on employment, fertility, migration and marriage events of all women including never-married women as well –differently from TDHS-2008. Such a research would show the changes in the employment-fertility relationship in Turkey in addition to providing a cross-check for the study at hand. Other research topics suggested can be derived from findings of this thesis, which are (i) underlying reasons of the recent two child preference and parity among women in the public sector, (ii) motivations for exiting employment among working pregnant women and women with infants, and (iii) comparison of attitudes related to career and family motivations, i.e. material aspirations and orientations towards family and work of employed and non-employed women. All these studies would provide valuable information in the field related to the context of Turkey.

CHAPTER I

FRAMEWORK FOR THE RELATIONSHIP BETWEEN FERTILITY AND EMPLOYMENT OF WOMEN IN TURKEY AND SUMMARY OF THE STUDIES

I.1. INTRODUCTION

The conflict between worker and mother roles has been studied in the literature thoroughly, primarily to investigate the decline in fertility as part of demographic transition. The literature on this relationship in the developed world suggests a shift from a negative relationship to a weakening negative or even a positive one. This shift is explained by the decreasing role incompatibility between worker and mother roles of women that are caused by changes in the societal response and institutional context. The evidence from developing countries, on the other hand, indicates a less clear picture due to slow or ongoing demographic transition.

As a country in the third stage of demographic transition and late stage of fertility transition, fertility rate has been found to be 2.26 five years preceding 2013 in Turkey. Socio-demographic and economic factors played varying roles in the demographic transition of Turkey; however, employment of women has never been a main triggering factor in the fertility transition of the country. Women's participation in labor force has been relatively low in Turkey with only 34 percent compared to OECD average of 63 percent in 2013 (OECD Employment Database, 2014). Aiming at increasing labor force participation rates of women and with pronatalist sayings of the government, harmonization of working career and family life has gained more interest in the academia and governmental politics[1] only recently.

[1] Work and family life reconciliation policies are policies that aim at developing legal, institutional and social mechanisms to harmonize work load at home and responsibilities at work place.

Studies exploring how women's employment status is interrelated with their childbearing in Turkey are rather limited in number. This thesis aims to find out whether employment of women depresses or encourages the first time or higher order childbearing, and how childbearing of women affect the entry for and exit from employment. Event history analysis has been used to explore these linkages. Data used for analyses are from 2008 Turkey Demographic and Health Survey. This is the first study in which event history analysis is used to analyze these linkages in a developing country context in the world. Additionally this thesis intends to interpret the findings associating them with the role incompatibility hypothesis. However this is carried out at a descriptive level since data for all components of the hypothesis in an event history setting are not available.

The macro context is vital for shaping the employment-fertility nexus. Hence, in this section the framework for studying the relationship between fertility and employment of women is presented. The theoretical framework and literature review are succeeded by the context of Turkey in which fertility-employment nexus is discussed in detail followed by a description of the data used for analyses. Lastly a brief summary of findings from the two empirical studies is provided.

In Section II, the effect of employment on fertility is analyzed. The determinants of first, second, third, and fourth and higher order conceptions are analyzed with specific reference to employment status. Moreover employment status is expanded into categories related to job characteristics to investigate whether the relationship changes according to the nature of employment. How the conception intensities evolved in time is also demonstrated.

In Section III, the relationship running from fertility to employment of women is analyzed. Determinants of employment exits and employment entries are investigated focusing on fertility variables of parity, age of youngest child and a composite fertility variable. Additionally how employment and non-employment intensities evolved over time are presented.

I.2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

The relationship between fertility and female labor force participation (LFP) has, explicitly or implicitly, been of interest in the literature of demography. Studies on this linkage are based on a thorough and old-rooted theoretical background. The roots lie in fundamentals of demographic transition theory and in a major component of it, the fertility decline. "*Historical fertility transition is the process by which much of Europe and North America went from high to low fertility in the nineteenth and early twentieth centuries*" (Guinnane, 2011). Notestein (1950), lists three types of populations: incipient decline populations, transitional group and high growth potential populations. According to Notestein (1950), every population moves from one type to another as a result of demographic evolution which is triggered by modernization. Incipient decline populations correspond to populations that have completed transition from high mortality and fertility to low fertility and mortality in line with experiences of Europe, North America and Oceania. This first typology of Notestein (1950) presents historical fertility transition process. A universal theory of fertility transition emerged as transition to low fertility has either been completed or underway in almost every country (Casterline, 2001).

Before fertility transition initiated, Malthusian perspective analyzed the relationship between economy and population. However the view that socio-economic growth would bring fertility increases was not realized. Malthusian view did not bring a functional explanation for the occurrences of the nineteenth and twentieth centuries because it was rather limited and could not foresee the conditions of twentieth century. Theoretically fertility transition can be considered as an escape from the Malthusian world (Guinnane, 2011, p. 595), trying to bring a perspective which explains the present demographic conditions and scientific links.

This section first presents fertility transition theories and how they link with the fertility-employment nexus. Secondly, hypotheses underlying the relationship between fertility and employment are presented. Finally, some theoretical issues related to fertility employment linkages such as causality, spatial perspective, time

dimension along with micro and macro literature, specifically event history studies in the field followed by studies within the context of Turkey are presented.

Some mechanisms underlying the fertility transition theories involve the relationship between fertility and employment of women. Before coming to hypotheses related to this relationship, fertility transition theories will be discussed briefly.

According to Mason (1997), there are six major theories of fertility decline:

(1) Classic demographic transition theory
(2) Transition theory
(3) Caldwell's theory of wealth flows
(4) Neoclassical microeconomic theory of fertility
(5) Easterlin's framework, and
(6) Ideational theory

Demographic transition theory focuses on the effect of structural changes on fertility. The theory explains fertility decline with alterations through social life caused by industrialization and/or urbanization. The mechanisms behind the fertility decline are as follows: These changes first cause a mortality decline increasing survival of children, which in turn increases the sizes of families. Urbanization and industrialization causes the cost of children to increase and this accompanied with increasing survival of children discourages parents from having larger families (Mason, 1997). According to Notestein (1953), as society modernizes, mortality decline is followed by fertility decline with a certain time lag. Costs of children rises and economic value of children weakens. Major improvements in child survival and being less motivated for having children brings fertility control. Galor and Weil (1996) put emphasis over the mechanism running from increasing capital to fertility decline as follows:

> *"First, increases in capital per worker raise women's wages, since capital is more complementary to women's labor input than to men's. Second, increasing women's relative wages reduces fertility by raising the cost of children more than household income. And third, lower fertility raises the level of capital per worker. This positive feedback loop generates a demographic transition: a rapid decline in fertility accompanied by accelerated output growth."*

As it is seen demographic transition theory explains fertility decline by a mechanism running from structural change and socio-economic development to fertility via demand and supply for/of children affecting motivation for fertility. According to this framework women's employment is related to fertility negatively.

Second fundamental fertility theory is the second demographic transition theory, which was developed by Lesthaeghe (1983, 1995). Lesthaeghe added "*a shift in values toward individualism and self-fulfillment that occurs with rising affluence and secularization*" into economic modernization (Mason, 1997, p. 444).

The theory of Caldwell regarding the flow of wealth (Caldwell, 1982) focuses on the direction of intergenerational wealth flows. This theory is suspicious towards the family planning policies. According to Caldwell's theory, high fertility is advantageous in high fertility societies. Onset of fertility decline is the reversal of intergenerational wealth flow, and non-familial production reverses the wealth flow. The main reason of fertility decline is the "emotional nucleation of the family", and this could be caused by forces related to economy or culture. This makes children beneficiary within family life, not parents. This in turn causes the reversal of intrafamilial wealth flows (Mason, 1997, p. 444). Theory of Caldwell has received harsh criticisms due to mainly lack of empirical support and not being clear on determination of familial wealth flows (Schultz, 1983; Kaplan & Bock, 2001).

The fourth main theory of fertility transition is neoclassical microeconomic theory of fertility, which was founded by Becker (1960) and Schultz (1973).

According to the theory, there are three determinants of couple's choice of fertility. These are "*relative costs of children versus other goods, the couple's income, and their preferences for children versus competing consumption patterns (tastes)*" (Mason, 1997, p. 444).

Fifth theory is founded by framework of Easterlin (1975, 1978; Easterlin & Crimmins, 1985). This theory adds the microeconomic fertility model, the supply of children. Three proximate determinants explain fertility, which are the supply of children, that is, the number of children that parents would bear in the absence of planned fertility limitation; the demand for children, or the number of surviving children they would like to have; and the costs of fertility regulation, where "costs" are psychic, social, and monetary costs. This theory does not involve institutional factors, either (Mason, 1997, p. 445).

Wilson and Cleland developed ideational theory. This theory links "the diffusion of information and new social norms about birth control" to "timing of fertility transition". The diffusion of birth control information affects contraception behaviors via social interaction, which in turn regulates fertility and causes fertility decline. Cleland and Wilson focus on psychological shift caused by structural modernization of societies and diffusion of innovations. During the onset of decline spread of knowledge and ideas take place, and during fertility transition culture is effective, which is composed of moral values, nature of family unit, and compatibility of traditional and new ideas (Cleland & Wilson, 1987). Although the lack of evidence in Africa for this theory is criticized, Bongaarts and Watkins (1996) find the processes through which diffusion occurs important for the timing of fertility declines (Mason, 1997, p. 445).

In addition to theories mentioned by Mason (1997), some authors considered institutional settings and policies into the framework. For instance Dasgupta (2000) uses externalities in his model: Cost-sharing (structure of property rights), conformity and contagion, interactions among institutions, household labor

needs and local commons, and institutional reforms and policies having an impact on fertility. He analyzes channels affecting fertility in his model.

With a further focus on the broad picture, some mechanisms are observed in the relationship within fertility and women's employment. First mechanism comes from the conventional structural hypothesis. "*The conventional socio-economic structural hypothesis includes the classical demographic transition theory, Caldwell's theory of intergenerational wealth flows, and microeconomic theories, which mainly include Becker and Schultz's 'new home economics', and Easterlin's hypothesis*" (Narayan & Peng, 2006). There are also other theories not covered by Mason (1997). First one is

> "*threshold hypothesis (United Nations 1963), which states that there are threshold values or ranges of certain social, economic, and health variables which need to be crossed by a population before any decline in fertility can be expected*" (Masih & Masih, 1999, p. 465).

All these theories involve the structural hypothesis. These theories put emphasize in convetional socio-economic determinants. Female labor force participation is among these factors. The remaining factors are: *"The level of per capita real income, rate of urbanization, ..., level of education, rate of infant mortality, life expectancy at birth, the average age of females at first marriage"* and etc. Some certain level of these indicators should be met before fertility transition to take place. Hence, socio-economic structural hypothesis take in the scope of the role of women's labor force participation on initial fertility decline. According to Guinnane (2011), industrialization altered role of women in labor force.

> *"Industrial Revolution created new opportunities and trade-offs for women. It offered better-paying work that could not be combined with child-minding; a woman spinning yarn at home could also care for children, while a woman working in a textile factory could not. Some industries*

> *refused to hire married women at all, thus giving women an incentive to delay marriage."*

Another hypothesis explaining fertility transition is the ideational hypothesis. The recent developments on the literature on Asia highlight

> *"the importance of planned family planning and a few years of mass female schooling (which are components of ideational forces) rather than the conventional structural socio-economic factors in order to bring about an initial decline in fertility in developing countries"* (Masih & Masih, 1999, p. 465).

This hypothesis implicitly states the importance of economic and social infrastructure, i.e. female education to bring fertility transition onset. That is, for initial fertility decline, development in female school enrolment ratios is needed (Masih & Masih, 1999, p. 465).

The relationship between fertility and female labor force participation do not find correspondence in the ideational hypothesis. When it finds correspondence in structural hypothesis, there is clearly a negative relationship between female labor force participation and fertility.

Narayan and Peng (2006) investigate the determinants of fertility rate in China over the period of 1952-2000. They test validity of structural versus ideational hypothesis in their study. The dependent variable in their model is the log of total fertility rate and the key explanatory variables are real per capita income, infant mortality rate, female illiteracy and female labor force participation rates. Their results suggest that socio-economic development played the main role in China's fertility transition supporting structural hypothesis.

The theories presented above relate to the "initial" fertility decline. In general, on the other hand, the theoretical context envisaging the relationship

between fertility and female employment has more arguments. According to Dixon-Mueller (1994), there are three major arguments about influence of women's employment on fertility. They are (i) role incompatibility hypothesis, (ii) opportunity cost hypothesis, and (iii) female autonomy hypothesis. Additionally, Narayan and Smyth (2006) mention (iv) societal response hypothesis.

I.2.1. Role Incompatibility Hypothesis

The role incompatibility hypothesis, which is sometimes cited as maternal role incompatibility hypothesis, is the most grounded and influential theory in analyzing the relationship between work of women and fertility. Role incompatibility hypothesis argues that *"an inverse relationship between women's work and fertility occurs only when the roles of worker and mother conflict"* (Mason & Palan, 1981). In most specifications of this hypothesis there are two mechanisms determining the level of the conflict between the two roles: the organization of production, and the organization of childcare (Mason & Palan, 1981). As Dixon-Mueller (1994) puts, roles of mother and worker are most incompatible where job is away from home and where people believe that mothers or close relatives should care for their children. Stycos and Weller (1967) mention these two mechanisms in their paper, as the nature of the task and the social organization of childcare.

The former factor relies on the fact that it is relatively easier to combine worker and mother roles in a family farm or cottage industry[2]. Thus, this mechanism relies heavily on the industrial settings. Mason and Palan (1981, p. 551) explains as follows:

> *"... industrial organization of production removes work from the home and organizes labor in terms of interests of employers rather than the interests of households. Hence most women in industrialized societies must sell their labor to unrelated employers, who require that they have to work*

[2] Jaffe and Azumi (1960) found that in both Puerto Rico and Japan, the fertility of women engaged in home industries was approximately equal to that of women not in the labor force.

in factory, office or store where children are unwelcome and do so on a relatively inflexible schedule. Hence women cannot be close to their children while working. This contrasts the household-based or family controlled production in rural Third World. Rural Third World women, on the other hand, enjoy proximity to their children while working and greater flexibility in scheduling than do their industrial counterparts".

The availability of parental surrogates in or near women's homes, is the other factor affecting the relationship between the roles. It is easy to work outside home if parental surrogates are cheaply available in the form of relatives, friends or state agencies (Stycos & Weller, 1967). Since Third World women often have relatives living nearby, they are thought to enjoy inexpensive, reliable babysitting help to a much greater extent compared to women in urban and industrial settings. In line with structural hypothesis, modernization involves not only industrialization of employment but also a decline in extended-family households and a decreasing pool of domestic servants which is expected to bring an inverse relationship between fertility and employment.

Another important factor in role incompatibility hypothesis is the contraceptive technology. According to Stycos and Weller (1967), where the roles are relatively incompatible, there should be a relation between employment and fertility but the degree and nature of it would be determined by which efficient contraceptive technology is available. According to Stycos and Weller (1967) summarize:

"...where the roles of mother and employed woman are compatible, we should not anticipate a relation between fertility and employment; where they are incompatible, the relation will depend on the availability of birth control technology...Where birth control is readily accessible, working women presumably would regulate fertility to lessen the strain of incompatible roles."

They schematize the hypothetical relation of fertility to female employment as follows:

Table I.2.1.1.1. Hypothetical relation of fertility to female employment

Birth Control	*Mother-Worker Roles*	
	Compatible	Incompatible
Available	No relation	Employment influences fertility
Not available	No relation	Fertility influences employment

Source: Stycos and Weller (1967, p. 216)

In their study Stycos and Weller (1967) study the link between fertility and employment in Turkey with data from the survey carried out in 1963. The survey covered 2,700 married couples in 240 villages (less than 2000 inhabitants), 46 towns (2,000-15,000), 21 cities of at least 15,000 population and metropolitan cities of Ankara, İstanbul and İzmir. Each married woman aged 15-45 was asked whether she worked for pay or goods in the past year, and if she had worked, whether she had done so primarily inside or outside home. They control for residence, employment status, education and exposure to contraception within marriage separately, and find no difference by employment status regarding fertility. They find differential fertility in Turkey; however it is associated with residence and education rather than labor force status. This finding is consistent with role incompatibility theory as presented in the chart above.

When we look at other studies carried out on role incompatibility hypothesis, most of them support the hypothesis. Jaffe and Azumi (1960) analyze the link between fertility and employment of women in cottage industries in Puerto Rico and Japan. They take cottage industries as economic activities that are carried on, at, or near the home of the worker. Although they do not mention the name of "role incompatibility hypothesis", their work relies on the cornerstones of the hypothesis. Their findings indicate that in Puerto Rico, fertility of women working in cottage industries is nearly the same as that of women not in the labor force. Women, who

are employed outside the home in non-agriculture, bear about one-half child fewer than women employed in cottage industries and women not in the labor force. In Japan, the findings are similar: fertility is highest among women who are agricultural workers and is lower among women who are out of the labor market. A minor difference between fertility of women who are not working and workers in home industries is present. Wage earners engaged in non-agriculture, on the other hand, have lowest fertility levels. Hence these findings are in line with the role incompatibility hypothesis.

Weller (1968) provides support for role incompatibility hypothesis as well for Puerto Rico. The hypothesis Weller (1968) tests is that "*the greater the incompatibility between the roles of mother and worker, the greater the differential fertility behavior of workers and women not in the labor force*". The sample used in the paper is the currently partnered women between ages of 15 and 49 who are resident in the middle and lower class types of neighborhoods in San Juan, Puerto Rico. Measures of role incompatibility used are occupation, child-care patterns and normative orientation toward the employment of mothers away from home. The hypothesis gains support.

In another paper, Gendell et al. (1970), analyze the effect of women's economic activity on cumulative fertility in a Latin American city: Guatemala City in 1964. They use data from 1964 Guatemala census of population. The sample used in the analyses amounted 9,500 women aged 15 years or more in Guatemala City. The activity status in their analyses is composed of three categories: domestic servants, other active and inactive. In cross-tabulation analyses, when age and educational level are controlled, the relationship between activity status and fertility are eliminated or weakened in some categories. However among the 35 years or older category, there is a relationship: Inactive women have largest cumulative fertility and domestic servants the smallest. They use multiple regression analyses with an additive, and non-additive model which includes all two-way interactions. It is observed that the latter model adds little variance to the model, hence interpretations are made using the additive model. However there are greater deviations from

additivity among never-married women than ever-married. According to the authors, this may be due to strong influence of employer selectivity for marital status and fertility. The results, again, prevail that being economically active has a reducing effect on fertility levels. However compared to marital status, education and age; activity status is the least influential variable on cumulative fertility. Interestingly working as a domestic servant had a considerably more negative net association with fertility than other types of economic activity did. This finding seem to contradict Stycos and Weller (1967)'s argument that *"domestic service in developing countries is an economic activity which is more compatible with motherhood than are other occupations"* and the role incompatibility hypothesis. However it does not. According to the authors,

> *"Like other active women working away from their own homes, domestics are subject to their employers' determination of job qualifications and working conditions. In their case (i.e., the domestics), what appears to be unacceptable to the employer is not simply the incorporation of childbearing tasks with the job, but childbearing itself. Hence, with few exceptions, the question of the compatibility of the mother and worker roles in respect of live-in domestic servants does not arise."*

In other words, there is employer preference for single or childless women. Notion of role incompatibility is therefore inapplicable to domestic servants.

Concepcion (1974) analyzes the relationship between female labor force participation and fertility in three Asian countries: Thailand, Philippines and West Malaysia, although their other descriptive results cover nine Asian countries. Their focus is mainly on modernization and the linkage between two variables: women's work and fertility. They have a residential approach and emphasize the importance of the context on this relationship. Their data indicated that female labor force participation in the urban metropolis was characterized by lower fertility levels. Outside the metropolitan city in Asian countries, the differences in fertility were found to be smaller or negligible. Urban rural residence had greater influence than

employment *per se*. The paper clearly supports role incompatibility hypothesis and concludes:

> *"This pattern suggests that a wider separation of work and family roles among employed women in the urban metropolis lowers the fertility of urban working women, whereas the general absence of such conflict in rural society results in labor force participation having little or no effect on fertility."*

Gurak and Kritz (1982) employ a different model in their analyses: a sequential dynamic model analyzing the relationship between female employment and fertility in Dominican Republic in mid-1970s. The data they use cover women aged 20 to 39 with a sample of 1041 women. They use longitudinal retrospective study design. The analysis is limited to all women who were in a marital union for at least 48 of the 60 months from January 1973 to December 1977. In their dynamic models, there are three dependent variables:

(i) Interval fertility: Whether or not a birth occurred during the five-year interval (1973-1977)

(ii) Proximate employment: number of months employed during the 24 months prior to the year of that birth (interval birth if exists, if not 24 months prior to year 1975)

(iii) Subsequent employment: number of months employed during the 12 months subsequent to the birth/non-birth year

According to the results there is no significant relationship between proximate employment and fertility. Hence authors use type of occupation instead of duration of employment, as well as dummy variables for women who initiated a job during 18 months prior to year of interval birth for appropriate occupations. Type of work is found to be unrelated to fertility. Their finding is that only women in white-collar jobs who had just initiated employment had a slightly lower probability of having an interval birth than did all other women. This finding may reflect the

presence of some incompatibility between employment in high status jobs and childbearing. However over the long term, fertility and employment are inversely related with each other. The findings are in line with the propositions of role incompatibility hypothesis, where no relationship between fertility and employment is found due to low incompatibility.

Role incompatibility hypothesis has never lost its popularity in the literature. Rindfuss and Brewster (1996), analyze the implications of variation in the degree of conflict between mother and worker roles for fertility behavior. The variation in the degree of conflict is measured as the variation in the social organization of work and childcare arrangements. They argue that degree of role incompatibility can describe the differentiation in fertility levels and trends in developed countries. Their review suggests that childcare arrangements can play an essential role in mediating the relationship between work and family. However, as shown by the example of West Germany, maternal leave policies and cash benefits do not stimulate fertility.

I.2.1.1. Critiques of Role Incompatibility Hypothesis

An important study, which is critical to role incompatibility hypothesis is Mason and Palan (1981)'s. Their criticisms are mainly as follows:

- While the hypothesis speaks when to expect a negative versus non-negative relationship, it does not speak about when to expect a positive relationship.
- Few authors tried to integrate the hypothesis with other variables that change during modernization such as formal educational systems, shift in net intergenerational transfers, changes in status allocation and social mobility.
- The hypothesis takes childcare as exogenous, however in fact it is a matter of household choice.

Mason and Palan (1981) use the Malaysian Fertility and Family Survey (MFFS) with a sample of approximately 6,400 ever-married women aged 50 and under interviewed during late 1974 and early 1975. They have various multivariate models in their analyses. First one tests for role incompatibility hypothesis; it has a recent version as well, which has main variables for last five years. Additionally they have two additive models with occupational variables and interactions (with residence). The results are as follows:

- The results are consistent with the role incompatibility hypothesis among Chinese and Indian women, although not among Malays (rural group shows inverse relationship, not urban).
- Normatively based conflicts between work and child care result in negative employment-fertility relationships far more than do spacio-temporal conflicts.

When direct measures of composition of household and organization of work added in the model, the results are:

- In most of the cases, there is no clear tendency that women without parental surrogates to display more negative employment-fertility relationships then do the women who have a surrogate in the home.
- Only occupational results comply with role incompatibility hypothesis. For worker class and location of work, the results are inconsistent with the hypothesis.

Later they develop a new framework to study the relationship:

"Specifically, the household's opportunity structure is hypothesized to be the ultimate determinant of its childcare standards, its fertility, and its

internal division of labor, and hence the major force shaping the employment-fertility relationship."

"By opportunity structure, we refer to the types of social relations through which households accumulate status or resources, and by which they redistribute them intergenerationally. There are three aspects of opportunity structure that seem especially important for the household's decisions about childcare standards, fertility and the internal division of labor. These are (1) the extent to which the household depends upon the individual wage earning of its members for its income as opposed to depending upon a jointly run economic venture, (2) the extent to which mothers versus children are able to contribute to household income, and (3) the importance of formal schooling for the transmission of resources and status to the younger generation."

As it is observed this hypothesis has a broader institutional approach.

I.2.2. New Home Economics (Opportunity Cost Hypothesis)

Neoclassical view also assumes incompatibility between maternal and worker roles, but is more narrowly economic. The New Home Economics or the neoclassical theory of fertility mentioned previously in this section takes couple's income and relative costs of children as fundamental variables influencing fertility behavior. According to the opportunity cost hypothesis, a woman is most motivated to restrict childbearing where the income she foregoes by having a child and staying home is the highest. Expected wage rates are generally estimated from years of schooling adjusted by the probability of finding employment (Dixon-Mueller, 1994).

As Matysiak (2011, p. 44) argues, the micro-economic analysis of the fertility and employment relationship was founded by "Mincer's (1963) theory of labor supply" and "Becker's (1965) theory of time allocation". Based on their works,

Willis (1973) developed a theoretical model, acknowledged as the "price-of-time model".

> *"In this model a couple chooses an optimal allocation of woman's time between home production (including care) and paid work maximizing household's utility from a certain combination of parental consumption (parents' standard of living), number of children and their quality, subject to household's lifetime budget constraints."* Matysiak (2011, p. 44).

> *"(Household lifetime budget constraint) depends on the amount of time mother spends in employment, her market wage, the father's lifetime earnings, and other non-labor income."* Matysiak (2011, p. 44).

The demand for children decreases if cost increases. This is due to the budgetary limits. Costs of children are direct and indirect. Direct costs are financial expenditures. Indirect cost of children comprises opportunity cost of time of parents. Opportunity cost of parent's time is measured as value (price) of time put by the parent for childbearing effort. Woman's market wage and value of depreciated human capital are some examples to this case. Woman's employment increases household budget, hence demand for children, which is "*income effect*". On the other hand, working women have greater opportunity costs compared to unemployed women which is "*price effect"*. Hence, effect of woman's employment on demand for children is ambiguous.

In this model, time allocation is also a choice variable. A woman enters employment when the market wage exceeds her reservation wage. Reservation wage is the value of women's time devoted to home. The mothers with young children have greater reservation wages compared to women having no children (or older children), since increased care raises the value of women's time devoted to home known as the "*price effect"*. However having another child increases the financial expenditures of the household lowering mother's reservation wage which is the

"*income effect*". As the income effect begins exceeding price effect through growing children, mother participates in the work force (Matysiak, 2011, p. 44).

As Matysiak (2011) mentions, in price-of-time model, although two activities compete with each other, they do not omit each other. Relationship between "income effect" and "price effect" determines whether the mother will enter the labor market and remain childless, or bear a child at home, or combine working with childbearing.

Gregory's (1982) model presents a good example for the neoclassical model of fertility and female labor force participation which has two basic partial equilibrium equations:

$$B = f(P_c, P_z, I, N, C)$$

$$L_f = g(P_h, W_f, N, C)$$

where B is births (fertility), L_f presents female labor supply, P_c denotes the price of children, P_z denotes the price of other goods, I denotes family income, N denotes norms affecting fertility and labor force behavior, P_h presents the value of woman's time in the home, W_f denotes woman's market wage, C denotes demographic control variables that affect B and L_f. In the births equation, P_c captures the substitution effect, P_z the effects of substitutes and complements, I the income effect, which is small due to child quality-quantity trade off. The own-price effect is expected to be negative and the income effect to be small and positive. The norm effects cause shifts in the demand curve. For the female labor supply equation: a women participate in work force if her market wage exceeds her reservation wage (opportunity cost of her time in the home ($W_f > P_h$). Finally according to Gregory's model, fertility and labor supply equations are interrelated as follows (simultaneous equations):

$$B = f\left(P_c(L_f), P_z, I, N(L_f), C\right)$$

$$L_f = g\left(P_h(B), W_f(B), N, C\right)$$

Gregory (1982) in his analysis on the Soviet Union and Eastern Europe finds that there is an insignificant effect of female participation rate on fertility. However the female participation equation supports expected results: fertility has a negative effect on female participation.

Matysiak (2011) criticizes neo-classical approach since it lacks material aspirations in the model and includes only absolute income. Finally the approach lacks women's child and employment preferences, and assuming these are distributed among women identically is unrealistic.

I.2.3. Female Autonomy Hypothesis

Third hypothesis, namely, the female autonomy hypothesis envisages a negative relationship between women's employment outside home and fertility as well. It argues that

> *"...by providing alternative sources of social identity and economic support, employment outside home could reduce women's dependence on men and children (especially sons); broaden girls' and women's social horizons, thus helping to counter family-based pronatalist pressures; increase women's desire to delay marriage (or to avoid or terminate an unsatisfactory union) and to space and limit births; and to contribute to greater sexual and reproductive autonomy."* (Dixon-Mueller, 1994, p. 234).

İsvan's (1991) study is an empirical example of this hypothesis which mentions women's relative power in the domestic decision process and their

autonomy as additional factors affecting the employment-fertility relationship. İsvan (1991) suggests an alternative factor for the relationship between fertility and employment, having a non-neoclassical approach which assumes the household as a democratic and/or consensual unit. This factor is the women's relative power and/or autonomy. Which one of these two factors will be influential depends on the cultural context. In cultural settings where gender conflicts are resolved through confrontational means, domestic power of the wife is expected to influence the interrelationship between fertility and employment of women. In settings where gender conflicts are resolved through non-confrontational means, degree of female autonomy should replace power as major predictor of the household bargain of reproductive and productive roles.

In her study, İsvan (1991), studies the case of Turkey using 1968 Survey of Family Structure and Population Issues carried out by the Institute of Population Studies. The sample size is 4,500 households. In her model the dependent variable is the length of open birth interval in months meaning the months between the last birth and the date of the interview. This variable is an inverse measure of recent fertility. The measures of power are reproductive decision power, social decision power and economic decision power. The index of domestic autonomy, on the other hand, measures *"the degree to which the respondent is allowed to depart from Islamic norms for female behavior in the public sphere"*. The covariates are age, husband's residence status, type of place of residence, total number of pregnancies, and current employment status. Interaction variables of power and autonomy with employment are included in the model as well.

The findings indicate that when the level of autonomy is controlled, the power variables have insignificant effect on employment-fertility relationship. This is an expected result considering the cultural context of Turkey that involves non-confrontational gender conflict resolving mechanisms.

I.2.4. Societal Response Hypothesis

Final hypothesis is the societal response hypothesis. This hypothesis tries to find an explanation for positive relationship between fertility and employment in developed countries. This relies on the fact that according to some authors the sign of the relationship between fertility and female employment turned to positive after 1980s (Ahn & Mira, 2002). As Narayan and Smyth (2006, p. 565) mentions, "*the societal response hypothesis suggests that societal level responses such as changing attitudes towards working mothers, increased availability of childcare and state-authorized paid maternity leave have reduced the incompatibility between childbearing and female employment in most developed countries*". Brewster and Rindfuss (2000) argue that the relationship between fertility and employment can be more complex than the role incompatibility theory envisages. For instance Bernhardt (1993) adds a feminist perspective by adding "gender structures in society" and resulting "power relations within marriage" into weakening incompatibility of employment and motherhood. She states that Sweden is an example for this, where gender equality and birth-rate near replacement level coexist. She has also institutional explanations for this co-existence such as "growth of part-time work and increasing availability of institutionalized child care" It can be argued that her work is also on the side of societal response hypothesis. Brewster and Rindfuss (2000) focus on institutional determinants of role incompatibility, and argue that

> *"the negative association between fertility and labor force participation can be expected to diminish as the conflict between work and family responsibilities is reduced—whether by a change in the nature of work life, shifts in the social organization of childcare, or a combination of the two."* (Rindfuss & Brewster, 1996, p. 262).

According to Rindfuss and Brewster (1996), the incompatibility between work and fertility is a variable and it can be changed via social, economic and institutional forces. That is why in some countries changes in the institutional context have enabled women to combine work and childbearing better.

In the same line, Brewster and Rindfuss (2000) suggest how to set up an ideal framework to study the relationship between employment and fertility of women. Their study focuses on industrialized countries. The authors argue that role incompatibility hypothesis is no longer enough to accommodate the relationship between childbearing and employment. This is mainly due to the changing relationship from negative to positive in last three decades. The review they present indicate that the effects of childbearing on labor force participation appears to be temporary. On the other hand effect of employment on childbearing is strongly negative theoretically.

The starting point of societal response hypothesis is the positive correlation between employment and fertility of women starting with mid-1980s. It can be argued that recent studies found large support for societal response hypothesis such as Engelhardt et al. (2004) in their macro study five European countries: France, West Germany, Italy, Sweden and the United Kingdom covering the period of 1960-1994. In their study where error correction models are used, bidirectional Granger causality is found between fertility and employment.

The authors also find that there was a weakening negative relationship between fertility and employment in OECD countries. This result is in line with the societal response hypothesis which supports that changes in the institutional context have lessened the incompatibility between childrearing and female employment. This hypothesis suggests that "*societal level responses have eased the incompatibility between childrearing and female employment in most developed countries*" (Engelhardt et al., 2004).

I.2.5. Some Theoretical Issues

I.2.5.1. Causality

Some of the literature uses association to replace causality. Association and causality are two different concepts indeed. Even event history models are

sometimes referred as causality analyses. However as in their models of second and third births in Sweden, Hoem and Hoem (1989, p. 49) mention:

> *"These statements should be understood to describe the effect of the covariates on the intensity of childbearing, and not as indicating a direction of causality which runs only from the covariates to fertility, particularly when a time-varying covariate, such as employment, is being considered."*

Hence the issue of causality is different and any conclusions based on this should be made cautiously. Weller (1977, p. 43) lists four possibilities of ways of causality between labor force participation and fertility:

1. Family size affects labor force participation;
2. Labor force participation affects family size;
3. Both family size and labor force participation affect each other; and
4. The observed negative relationship is spurious and is caused by common antecedents of both variables

The role incompatibility hypothesis is mostly discussed under the second category. However nothing in the theory suggests one way should be studied over the other. Hence the two events occupy symmetric positions in the hypothesis. The fourth approach has been mostly studied by economists. As Lehrer and Nerlove (1986) notes, "*not all of female labor supply-fertility nexus can be traced to the influence of exogenous factors, but only some part of it*".

I.2.5.2. Spatial Perspective

The contextual macro and micro explanations presented up to here clearly indicates that there should be a spatial perspective in studies analyzing the relationship between fertility and employment of women. Before 1980s, although the

inverse relationship between employment of women and fertility was pronounced in economically developed countries, it tended to be weak or absent in the developing or less developed areas. Moreover the probability of an inverse relationship is higher in urban areas than in rural areas (Concepcion, 1974, p. 503). In line with this Weller states that:

> *"the relationship between female labor force participation and fertility is dependent upon the nature of the female's participation as well as the milieu in which this participation occurs. Fertility as well as labor force participation are multidimensional concepts, and the mix of these dimensions changes concomitantly with the level of modernisation. Hence the context in which female labor force participation occurs in a less modernised setting, and the demographic effects of this participation may be quite different than in a more modernised setting. The more obvious changes are those that occur in the occupational and industrial structure of the labor force and in the proportion of unpaid family workers in the labor force."*[3] (Concepcion, 1974, p. 504).

Moreover the contextual differences are emphasized by Sipila (1975):

> "*In rural areas of industrialized countries, however, where agricultural work is not so incompatible with raising a large family, the relationship between female employment and fertility often disappears. Also, in most developing countries the employment-fertility relationship is less clear, and particularly so in rural areas, where the value of large numbers of children remains strong and where employment is likely to be in the fields where a woman may keep her young children with her while working."*

[3] R. H. Weller: " Female labor force participation, fertility and population policy ", paper contributed to the 1973 General Conference of the International Union for the Scientific Study of Population, Lifge, p. 2.

Hence any study which analyzes the relationship between employment and fertility of women should take into account the spatial context.

At first instance it may seem that studies carried out for developed countries outweigh studies on developing countries on the linkage between fertility and employment. However the evidence provides no support for this. Indeed number of studies on developing countries on the issue is quiet high. In this section some of them were presented in the Role Incompatibility Hypothesis part. Some of these studies will be presented in this sub-section.

Most of the studies carried out for developing countries focus on Latin America. Stycos (1965) uses 1959 Lima, Peru birth registration data and looks at women's fertility in different occupations. Mean birth order by age of mother is identical for housewives and service workers. Mothers in professional and technical categories have 14 percent fewer births and office workers 43 percent fewer. The strongest relation between fertility and employment is observed among the lowest economic class with low birth control rates. On the other hand, in the upper class no difference is found. This suggests that this relationship is not due to conscious controls on fertility (contradicting Table 1.2.1.1).

Schockaert (2005) argues that the review of literature in Latin America provides different conclusions. According to the studies association can be strongly negative, weakly negative, non-existent or positive. Schockaert (2005) explains this differentiation. He argues that context is an important variable that should be accounted for. Contextual variables like developmental and fertility level, and period affect the findings. A weakening association was found for Latin America. This was explained by the decline in the proportion of wage-earners employed in modern jobs and increases in the proportion of non-wage earner females.

Recent studies in Latin America provide conflicting results. Crucesa and Galiani (2007) analyze the impact of fertility on labor supply of mothers in Argentina and Mexico using same sex variable as an instrument. The data they use are Mexico

2000 and Argentina 1991 censuses. Their OLS estimates indicate a negative relationship between having parity higher than two and labor supply of women.

Agüero and Marks (2008) investigate the causal effect of fertility on female labor supply in six Latin American countries using DHS data. The authors use infecundity as the instrumental variable. Use of this instrumental variable enables one to include childless women as well allowing for a larger sample. After using the infertility instrument, fertility does not causally affect female labor force participation. This result contradicts Crucesa and Galiani's (2007) findings.

Finally Caceres-Delpiano (2012) looks at the mechanism running from fertility to employment of women for developing countries using an instrumental variable approach having multiple births as the instrument. Data used in the study is DHS data with sample of 15-49 aged women from 40 developing countries. OLS estimates suggest that fertility has a depressing effect on employment of mother in general. However the child parity has a stimulating effect on employment when it comes to unpaid, seasonal and non-wage jobs. Two stage least squares estimates suggest a negative effect of fertility in general as well. Overall his findings suggest that fertility appears to have a discouraging effect on working of women.

I.2.5.3. Long-run versus Short-run

As Cramer (1980) puts it, "*dominant effects are from fertility to employment in the short run and from employment to fertility in the long run*". This argument is supported by the review of three articles presented by Connelly (1996). The three articles are Rosenfeld (1996), Macunovich (1996), and Rindfuss and Brewster (1996). In Jones' (1982) study time dimension is also emphasized implicitly. Direct impact of birth on women's employment in Jones' study is taken as strongly negative at first, but becomes less important over time.

I.2.5.4. Macro versus Micro Studies

There can be made differentiation between micro and macro studies explaining the association between fertility and female employment. Macro studies, mostly concentrate on the association rather than causation whereas micro studies focus on the latter. This section briefly provides the main topics in the field of macro and micro studies.

I.2.5.4.1. Macro Literature

Prior to mid-1980s, main focus of macro studies was explaining the decline in fertility by a rise in labor force participation of women in the last 40 years in the industrialized world. Authors of second demographic transition explained decline in fertility by "*rising economic autonomy of women and their attempt for self-fulfillment among other things*" (Matysiak & Vignoli, 2008). Becker emphasized the importance of increasing opportunity costs due to enhancements in educational and labor market attachments of women in falling propensity to having children (Matysiak & Vignoli, 2008). Since mid-1980s, on the other hand, the countries with highest participation rates have become the ones with highest fertility rates among industrialized countries. The declining fertility trend reversed in these countries. This observation led scholars to question whether the relationship between fertility and employment changed its sign at the macro level. The reversal sign was explained mainly by societal response hypothesis:

> "*weakening incompatibility between childrearing and females' employment resulting from changes in the socio-cultural and institutional context, i.e. changing attitudes towards working mothers and introduction of family and labor market policies aiming at the reconciliation between work and family*" (Matysiak & Vignoli, 2008, p. 365).

However other studies showed the correlation between fertility and employment did not indeed change its sign when one accounts for cross-country

heterogeneity, but rather the negative association was weakened (Kögel, 2004). Kögel's (2004) work indicate that the relationship did not show a difference in sign. Only for countries outside the Mediterranean and Scandinavia, the correlation became weaker after mid-1980s. In line with Kögel's findings, Engelhardt et al. (2004) find that the negative relationship between fertility and labor force participation became weaker in time for all non-Mediterranean countries, but no positive relationship is observed.

I.2.5.4.2. Micro Literature and Event History Studies

The micro literature in the field is extensive. The relationship is generally found to be negative. An important study is Matysiak and Vignoli's (2008). In their meta-analysis, Matysiak and Vignoli (2008) restrict their work to studies analyzing transition of women to birth (30 papers, 90 effects) and to employment (29 papers, 58 effects of young children aged 0-6) only. Moreover they only look at longitudinal studies to look at relationships only between 1990 and 2006. Univariate analysis indicate that "*the effect of young children on mothers' entry into employment is negative and significant, whereas the effect of women's employment on childbearing is zero*". The multivariate results indicate that the depressing impact of young children on employment entry is most pronounced in conservative and least pronounced in social-democratic systems. The negative effect of employment of women on fertility, on the other hand, is strongest in familialistic, liberal and conservative welfare systems, and lowest in post-socialist ones. Studies limited to married or lonely mothers had higher effect sizes than those covering all women. The magnitude of size effects was influenced by controlling for partner characteristics, social background of the respondent, macro characteristics, women's job characteristics. Finally birth order was an influential variable, with negative effect of females' work on childbearing being much lower in the first parity than in higher order parities.

After this review of meta-analysis, the remaining of this section provides a review of studies studying the linkages between fertility and employment using event history analysis.

Hoem and Hoem (1989) analyze the impact of women's employment on second and third births in Sweden when micro level factors are considered. The data set used is Swedish fertility survey conducted by Statistics Sweden in 1981. Piecewise constant baseline intensity is assumed and only categorical variables are used. It is found that second birth risks are affected by work status and educational attainment of woman, and her marital or cohabitation status. Differences in intensities between those who worked full-time and part-time were small and insignificant. Fertility of housewives exceeded that of members of the labor force. For third births, the most important variables appear to be demographic variables.

Hoem (1993) uses Swedish Fertility Survey of 1981. This analysis looks at the two way relationship between labor force participation of women and fertility different from Hoem and Hoem (1989). In the first part of her analysis, Hoem (1993) analyzes the determinants of entering the labor force fifteen months after the birth of the second child using logistic regression. The second part of the study investigates determinants of third birth employing hazard regression. The findings indicate that labor force participation declines due to childbearing. However employment history does not affect the progression to the third birth. Another interesting finding is that more education is associated with higher likelihood to proceed to third birth. Hoem (1993) offers as a hypothesis that "*the current general fertility trends in affluent populations may be governed more by ideational developments that flow through societies as a whole than by an accumulation of effects of materialistic computations made independently by individual couples*".

Kravdal (1994) analyzes the impact of work experience on entry into motherhood. In this paper, the Norwegian Family and Occupation Survey of 1988 is used. The hazard models indicate that women's occupational and educational activities are crucial determinants of timing of first births. The association between

cumulated labor market experience and first birth is found to be strong. Kravdal's (1994) findings indicate that the effect of educational level is weak and of work experience is strong.

Drobnič et al. (1999) analyzes the impact of variables related to family on employment of women in US and West Germany. Entry into and exits from employment are investigated considering full-time and part-time differentiation. The method authors employ is piece-wise constant exponential model of event history analysis. Childrearing variables are number of children, preschool child (a woman has at least one young child up to 6 years of age), school child (no child younger than 6 years but at least one child younger than 18 years of age), grown-up child (none of the children is younger than 18 years). Child variables are all time-varying. Age, cohort, period, marital status, and education are also controlled for. Their findings indicate that existence of preschool children has a dampening effect on full-time employment, but the effect is stronger for German women than for American women. In the U.S. having older children also increases the risk of leaving full-time employment. However, the number of children has no effect on the transition rate. "*A typical female employment pattern in Germany consists of full-time work until marriage and children, a prolonged stay out of the labor market, and a return to paid employment via part-time work when the youngest child reaches school age. Unmarried mothers often opt for full-time jobs when children grow older. This difference reflects the disparity in disposable family income but also results from policies that support single mothers' employment*". In the U.S. the number of children is not significant when the age of the youngest child is controlled, but in Germany there is a consistent relationship between an increase in the number of children and an increase in participation in paid employment.

Drobnič's (2000) paper is similar to Drobnič et al.'s (1999) study in terms of methodology and data set used. However the focus is different. Drobnič (2000) focuses on how children affect the labor force participation of married and single mothers in the US and West Germany, separately. Employment is own paid employment. Entry and exit from employment are studied separately. The dependent

variables are the same as in Drobnič et al. (1999). The explanatory variables are childrearing history, number of children, children before first employment spell, age (linear and quadratic form), education, work experience, cumulative duration of employment interruptions, historical periods, data source control dummy variable. The findings related to childbearing indicate that in Germany pre-school children increase the risk of transition from full-time to non-employment for both single and married mothers compared to single women without children. For married women the effect is much higher. For transition from part-time to non-employment, the effect is insignificant. School child effect is positively significant for only married women for transition from full-time to non-employment. Grown up child effect is positively significant for only married women for transition from full-time to non-employment. Parity decreases the risk of transition from full-time to non-employment for married mothers only. In US, pre-school children affect full-time employment the same way as in Germany, i.e. for married women pre-school children affect transition from part-time to non-employment positively. School child affect transition from part-time to non-employment positively as well for both lone and married mothers. Grown up child effect is positively significant for only married women for transition from full-time to non-employment. Parity is insignificant for employment exits. In Germany, single and married mothers with pre-school children are less likely to enter full-time employment (for part-time the effect is insignificant). Married mothers with school child are less likely to enter full-time but more likely to enter part-time employment. Grown up child increases risk of entry into part-time employment (not full-time) for both lone and married mothers. Parity increases the risk of employment entry. In US, pre-school children decreases full-time employment re-entry and increases part-time employment re-entry for married mothers only (for lone mothers no significant effect). School child increases full-time employment entry for single mothers, decreases full-time employment entry for married mothers, increases part-time employment entry for married mothers. Grown up child decreases full-time employment entry. Parity is insignificant for employment entries. Drobnič et al. (1999) and Drobnič's (2000) papers indicate the importance of differentiation between part-time and full time work in addition to marital status of the mother.

Grimm and Bonneuil (2001) analyze labor market transitions of women between 1935 and 1990 in France using employment histories of women with multiple spells. The method used is discrete-time competing risk Cox event history model. Covariates are family structure, marital status, age, education attainment, work experience, nationality, birth cohort, and macro-economic fluctuations. Four events are analyzed: transition from employment to inactivity, from employment to unemployment, from inactivity to employment, and from unemployment to employment. The results indicate that exits from employment were less frequent for mothers of larger families. Comparing the exit hazard rate out of employment for mothers of three or more children to mothers of less than three suggests that financial needs tended to drive mothers of large families back to work. In spite of this growing need of income of larger families, return to employment decreases with the total number of children. One child is not enough to prevent the mother from returning to work, but the more children, the less likely this return becomes in France.

Meron and Widmer (2002) use data from reproductive and work histories collected in a French national survey (The INSEE survey on Youth and Careers). Periods of unemployment at the beginning of a union appear to result in postponement of the first birth. Women who experience unemployment have very different family behavior from home-makers, who have a first child more rapidly than women who are in the labor market. Unemployed women postpone birth of a first child with the expectation of better times. This result confirms that a period of unemployment is not at all the same as a period of inactivity, i.e. with regard to fertility, unemployed women are quite different from homemakers.

Budig (2003) employs continuous-time event-history analysis in her paper analyzing three events for the US: Transition from non-employment to part-time versus full-time employment having pregnancy status as the independent variable, transition from non-employment to full-time and part-time employment again having pregnancy status as the independent variable, and transition from non-pregnancy to pregnancy having part-time and full-time employment as independent variables. Cumulative fertility measures are used as covariates in the study as number of pre-

school (0-5 age) children and older children. Based on the findings of the models generated from the dataset of NLYS from 1982 to 1994, the employment of women (either full- or part-time) decreases the likelihood of childbearing. When compared to unemployed women, the risk of childbearing is 16 percent less among women in a full-time job and 15 percent less among the ones in part-time job. Moreover pregnancy considerably eliminates the risk of labor force participation of women. Accordingly, pregnant women are 50 percent and 56 percent less prone to get involved in a full- and part-time job, respectively. Besides, the chance of women to participate in the labor force declines as the number of children attending a preschool increases. The study also points out that the impact of pregnancy on employment is minor whereas labor force participation significantly eliminates the childbearing tendency. Having children at preschool decreases the labor force participation while grown-up children raise the tendency towards full-time labor force participation, especially among married women. Besides, Vikat (2004) highlights a strong correlation between income and women's labor force activities when entering the motherhood whereas the strength of correlation decreases with the second child.

In their micro study, Aassve et al. (2006) investigate the life cycle relationship of work and family life in Britain using British Household Panel Survey with data from the 1940s to the late 1990s. They use multi-process modeling with hazard regression technique with five equations on events of births, union formation and dissolution, employment and non-employment. According to this model developed by Lillard (1993), unobserved heterogeneity component of the equations are correlated. They find that employment levels do not affect fertility levels much (but has a negative relationship), whereas changes in union formation and fertility events have larger effects on employment. Births affect employment entry negatively and significantly except for second birth. First birth affects employment exit positively, whereas second and third birth negatively.

Stier and Yaish (2008) analyze the dynamics of leaving and re-entering labor market for women in Israel. Three groups of effective factors are timing of childbearing, human capital and structural factors. They use data from a panel survey

named “2001 mobility study”. Childbearing increases the risk of exiting employment and human capital reinforces paid employment of women. Employment in the public sector is found to provide suitable atmosphere to combine work and family lives.

Matysiak (2009) employs the same model as Aassve et al. (2006) for Poland analyzing events of birth and employment entry and exits. Negative effect of children on employment of women is found. As birth order increases, the likelihood of entry into employment declines. The effect of employment on progression to birth is negative as well. However this effect is smaller. Matysiak (2009) finds that women use employment-first strategy in Poland and they enter employment before entering motherhood.

Finally Ma (2013) analyzes employment and motherhood entry in South Korea for 1978-2006 using piece-wise constant exponential event history model. On the whole Ma (2013) finds that patterns of motherhood transition are similar to the ones observed in the West. Women who left labor market have significantly higher first birth intensity than women in the labor force or never employed women. Moreover among wage earners women employed in the public sector have higher motherhood entry risks than women working in the private sector.

I.2.5.5. Why Do the Results Differ?

The findings of event history analyses in the field reveal that no consensus has been reached regarding the relationships between fertility and employment entry/exits in the literature. It is observed that the studies in the field cover developed countries only. Moreover the important dimensions that should be taken into account are institutional context, part time versus full time differentiation, marital status of the woman, birth order, definition of employment variables (inactivity, homemakers, non-employed, unemployed), age of children, and number of children (parity). When such contradictory results emerge, meta-analyses in the field gain importance as they provide scholars quantitative evaluations of the literature review in the field. Hence Matysiak and Vignoli’s (2008) argument that “*the effect of young children on*

mothers' entry into employment is negative (with average size effect of -0.31) and significant, whereas the effect of women's employment on childbearing is zero" is an important finding that should be emphasized. Our review suggests that the effect of fertility variables on employment is large (especially young children or pregnancy) compared to the effect of employment on fertility although there are studies who find the reverse magnitude of effects.

I.2.6. Studies on the Linkages between Fertility and Employment in Turkey

Stycos and Weller (1967) and Isvan (1991)'s studies were pioneer studies on relationship between fertility and women's employment in Turkey. They are mentioned in Section I.2.1 and I.2.3, respectively in detail.

Three recent studies appear on directly the relationship between fertility and childbearing in Turkey: Şengül and Kıral (2006)'s study on analyzing the effect of decisions of fertility (measured as total number of children and number of children younger than 7 years old) on female labor force participation using sex of first child as the instrument. They use data from Household Labor Force Survey from the first quarter of 2003. They find that children, especially presence of young children decrease the probability of working of women in Turkey. Abbasoglu (2009) uses macro-level data to investigate the "causal" link between female labor force participation and fertility in Turkey covering the period 1968 to 2006 using Johansen-Juselius approach. She investigates the existence of long-run relationship as well as the causal link between female labor force participation and fertility in Turkey. She finds that there was an inverse long-run and a negative feedback relationship between fertility and women's employment in a multivariate setting composed of fertility, female labor force participation, infant mortality, and female illiteracy. Finally there is an important study by Sevinç (2011), which analyzes the effect of fertility on female labor supply using sex composition of children and twins at second birth, separately as instruments. When we look at the literature in this field for Turkey, Sevinç improves the approach studied by Şengül and Kıral (2006)'s

study on the impact of fertility on labor force participation of women. Şengül and Kıral (2006) use sex composition of children as the instrument in their study using data from Household Labor Force Survey by TURKSTAT.

Sevinç's methodology is mainly instrumental variables approach, as well. Sevinç (2011) analyzes effects of sex of first, second and third children (female avoidance or male preference so as to say), and twin birth as proportion of twin births in total births (due to sample size restrictions) on fertility and hence labor force participation of women. Data used in this study come from TDHS surveys carried out by HUIPS of 1993, 1998 and 2003. Data are pooled due to high sample size needed to have sufficient number of twin birth observations. Ever-married women aged 20-44, and who live in urban areas constitute the sample of data used for analyses. Since the instruments require existence of children, women with no children are excluded. The dependent variable in the analyses, which is the labor supply decision of women, is presented by the (binary) indicators of "currently working", "worked in last 12 months" or "works for cash". Another labor force variable is "days worked in last 12 months". The fertility variable is the number of children. The instrumental variable of sex composition is computed as dummies indicating whether all children are female: one female child (F), two female children (FF), three female children (FFF). The instrumental variable, same sex, is meaningful for families with at least two children, since sex balancing behavior is observed starting with two children. The covariates are age, age squared, age at first birth, dummies for region and dummies for type of residence, (town vs. small city), current marital status and educational level of women. Sevinç (2011) finds that female avoidance instrument give mixed results (no causal relationship), but twin-birth instrument implies negative and strong(er than OLS estimates suggest) causal effect of fertility on labor supply of women. He explains these contradictory findings by "heterogeneity of the effects across the subpopulations", emphasizing that female avoidance is more prevalent in Eastern or small cities, or among people with low education; and the causal effect of fertility on employment of women is insignificant among such subgroups. Since twin per birth instrument is equally likely to affect all women, the 2SLS estimates using this instrumental variable could be used to

interpret the causal linkage overall: On average, labor supply of women is affected negatively by more children in Turkey.

I.3. CONTEXT OF TURKEY

I.3.1. Fertility Transition in Turkey

Fertility transition of Turkey has been underway since the 20th century. Today with its declined level of fertility and mortality Turkey is in its last stage of demographic transition. Table I.3.1.1. presents selected population indicators for 1927-2023 period by stages of demographic transition. According to Shorter (SIS, 1995), the first stage of demographic transition in Turkey took place between 1920 to mid-1950s and it was presented by declining mortality rates and high fertility rates. Throughout the period of 1925-1955, pronatalist population policies[4] were in effect. Among a number of reasons for the preference of pronatalist policy one major reason was the re-establishment of the country after three big wars that caused heavy human losses (Fişek, 1967; Peker, 1983).

The second stage of demographic transition in Turkey took place between 1950s and beginning of 1980s (SIS, 1995). Decline in mortality due to medical technology and improved health services led to increases in life expectancy and decreases in infant deaths. This period is signified with the initiation of fertility decline. Fertility transition started its course during this period.

[4] Some selected examples for the pronatalist population policy: In 1929, families with more than five children were exempted from paying road tax. In 1930, families with six or more children were rewarded with medals. In 1930 General Hygiene Law with no 1593 was put into force in which Ministry of Health and Social Aid was held responsible for easing of births and reducing child mortality. With the Article no. 152 of General Hygiene Law, importation, distribution and sale of any type of contraceptive or equipment for inducing abortion were prohibited. Only tools and materials used for medical treatment sold on prescription by pharmacies were allowed. In 1936 and 1953 severe penalties due to induced abortion were included under the heading of "Crime against the integrity and health of race". In 1938, with an amendment to Turkish Civil Code of 1926, the minimum age of marriage was declined from 18 to 17 for males and from 17 to 15 for females (Law no. 3453) (Peker, M., 1983 and Levine & Üner, 1978).

Table I.3.1.1. Selected population indicators, Turkey 1927-2023

	Year	*Population (millions)*	*Average annual population growth rate (‰)*	*Crude birth rate (‰)*	*Crude death rate (‰)*	*Total fertility rate*
Stage 1	1927	13.648				
	1935	16.158	21.1			
	1940	17.821	17.0	45.6	31.4	
	1945	18.790	10.6	43.1	33.9	6.69
	1950	20.947	21.7	45.9	27.0	6.72
Stage 2	1955	24.065	27.8	48.2	23.5	6.43
	1960	27.755	28.5	46.8	19.8	6.18
	1965	31.391	24.6	42.9	16.4	5.89
	1970	35.605	25.2	39.0	13.5	5.64
	1975	40.348	25.0	34.5	11.6	5.31
Stage 3	1980	44.737	20.7	32.2	10.0	4.56
	1985	50.664	24.9	26.9	9.0	3.68
	1990	56.473	17.1	24.8	7.8	3.12
	2000	67.804	15.4	21.6	7.3	2.53
	2008	71.517	12.7	18.2	5.5	2.16
	2023	84.247	11.2	14.0	6.1	1.85

Source: TURKSTAT 2015a, 2015b, 2015c, 2015d, 2015e; TFR up to 2000 from Shorter, 2003

The highest population growth rate occurred in the 1955-1960 period with 2.85 percent. The First Five-Year Development Plan (1963-1967) prepared by the State Planning Organization that was established in 1960, emphasized problems associated with rapid population growth for the first time. Population Planning Law no. 557 adopted on 10th of April, 1965 is considered as the changing point of pronatalist population policies. This law provided the couples with the right to determine the number and spacing of their children. This law legalized importation, distribution and sale of contraceptives and enabled the provision of services free of charge at public health institutions. Additionally prohibition of abortion was removed provided that birth would have a health risk on the mother or on the child. The official program was implemented intensely from 1965 until 1969. Demand for children started to decline in 1950s. TFR reached below-six in mid-1960s transferring Turkey to early-mid transition stage of fertility transition. It took only

one decade to pass to the next stage; mid-transition phase, having TFR levels below 5 in Turkey.

In 1983, Family Planning Law no. 2827 has been adopted while repealing the 1965 Law. With this new law, policy was further improved and voluntary surgical contraception and induced abortions until 10th week of pregnancy were legalized and permission was given to all health professionals to insert IUD. Together with the social and economic change fertility decline gained pace and TFR reached a level of 4 by mid-1980s and to a level of 3 by the second half of 1980s. According to the results of TDHS-2013, fertility rate is just above replacement level with a TFR of 2.26.

The literature on the onset of fertility decline in Turkey puts forward various factors for the course of decline. The remaining part of this section will present an overview of this literature.

In 1950s one of the most significant demographic processes in the socio-economic transformation of Turkey is the internal migration from rural to urban settlements. Taeuber (1958) considers rural to urban migration and villagers' contact with outsiders as main factors responsible for fertility decline in Turkey. She also points out widespread mortality decline as one of the factors associated with fertility decline. Among factors related to fertility decline in Turkey, Fişek and Shorter (1968) lists three components: (i) declining infant and child mortality between mid-1920s and mid-1950s, (ii) diffusion of low fertility norms, knowledge of birth control methods, and (iii) attributes of Western-type culture with centers of diffusion being İstanbul and İzmir. Özbay (1984; 1990), lists two factors: mortality decline and structural changes in society and economy, specifically in family and household formation system. The structural changes involved 1950s' trade liberalization, advancements in agriculture and infrastructure, and supporting of foreign capital. Mechanization in agriculture was another development in this era. With modernization, demand for children declined. Brought by these structural changes, a transformation occurred in the family and household formation system.

As to Shorter in SIS (1995), main trigger of the nationwide fertility decline was selective internal migration. Low fertility members of rural families moved to urban areas. In time, weight of high fertility areas in national fertility declined and that of low fertility areas increased. In cities fertility decline occurred due to two main factors: (i) lower child mortality which brought the fact that desired family size were reached at lower parities, and (ii) changing life styles due to concerns and considerations about future of children.

Özbay (1992) emphasizes role of empowerment of young males vis-à-vis their traditional families. Behar (1995) stresses the importance of use of male dominated contraceptive methods, namely withdrawal and condom, and declines in desired number of children by husbands in general course of transition. Yavuz (2008) argues that transitions were more pronounced in rural areas of Southern and Western regions. For instance Starr (1989) in her analysis on rural areas of the province of Bodrum argues that gender relations became more egalitarian.

Women's education was emphasized among main triggers of fertility transition in Turkey. Schnaiberg (1971) points out the role of change of traditional family roles brought by urbanization (measured by urban residence during childhood) and education of women. Kağıtçıbaşı (1982) labels women's education as the strongest modernizer during this era. Furthermore Shorter (1969) argue that literacy (less pronounced in rural areas) brought by social and economic development had a major effect on fertility transition in Turkey. According to Shorter (1969), in rural areas, on the other hand, social factors were responsible for fertility decline.

In general the literature on fertility transition in Turkey provides support for structural hypothesis rather than ideational hypothesis, whereas the effect of female labor force participation has been minimal. Farooq and Tuncer (1974) analyze the relationship between fertility and economic and social development for the time period 1935-1965 applying time series analysis. Data from five censuses are used in the study. Among all socio-economic factors, female literacy had the most

pronounced effect on fertility. The authors find that the effect of female non-agricultural labor force participation is low on the trend of crude birth rates. The authors suggest that "*fertility decline does not completely rely on the adoption of family planning and such population control programs, but also in the speeding up of the economic and social transformation process*". Another study that gives support to the structural hypothesis for Turkey is Behar's (1995). According to Behar (1995, p. 36-37),

> "*factors of demand played a more important role in fertility reduction than those of supply. In other words, societal and structural factors –which enhanced women's status, improved children's health and education, and began to eradicate poverty, appear to have created a demand for fertility control. This demand was far more important in promoting Planned Parenthood than the efforts of official family planning policies and the subsequent supply of contraceptives*" (Abbasoglu, 2009).

I.3.2. Macro Context under Microscope

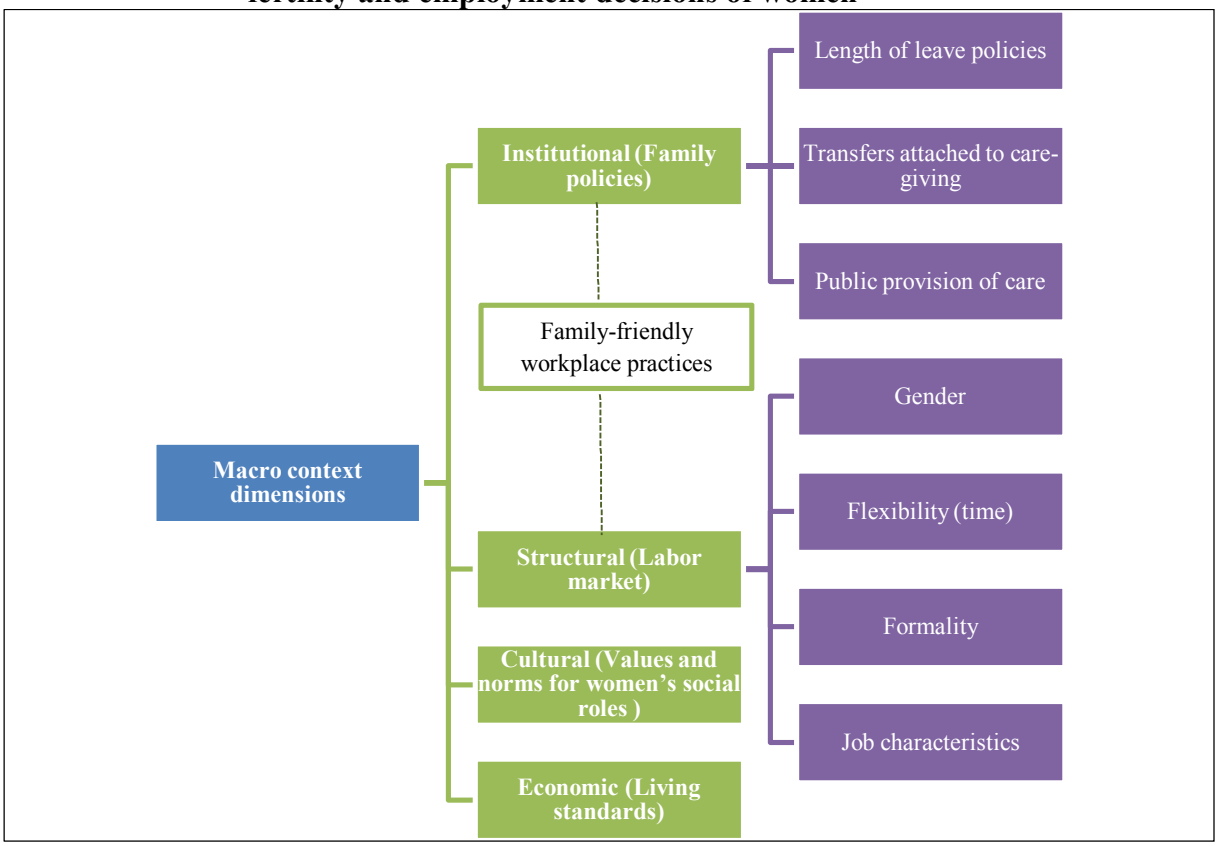
In this section macro context underlying the relationship between fertility and employment in Turkey is presented with related indicators and their comparisons with other OECD countries[5]. Four dimensions of the macro-context that are considered to be related to women's fertility and employment decisions will be presented: (i) institutional (family policies), (ii) structural (labor market structures), (iii) cultural (gender norms), and (iv) economic (living standards).

Figure I.3.2.1 summarizes the structure of this section as regards dimensions related to women's fertility and employment decisions. Within this framework, institutional dimension includes family policies and three pillars of it: length of leave policies, transfers attached to care-giving and public provision of care and related legislation in Turkey. Structural dimension includes labor market indicators such as

[5] OECD countries are chosen to be the comparison group as more efforts in reconciliation of work and family life have been carried out in this group of countries.

gender gap in employment, flexibility in terms of time, share of informal jobs in the labor market and job characteristics of women. Third dimension is the cultural dimension, which involves values and norms for women's social roles. Final dimension is economic including living standards, which can be indicated by macro variables such as unemployment rate and GDP per capita. Finally there are family-friendly workplace practices, which can either be classified in institutional or structural dimension such as how working time arrangements are set and working from home opportunities. All these dimensions determine how employment and fertility affect each other.

Figure I.3.2.1 Structure of four dimensions of the macro context related to fertility and employment decisions of women



Note: Modified from Matysiak (2011)'s framework, which mentions first level four dimensions.

I.3.2.1. Institutional Dimension

According to comparative welfare state research, social policies and institutions affect the relationship between labor force participation of women and fertility by either assisting mothers to combine work and family life or not supporting them to combine the roles of mothering and working (Neyer, 2013; Andersson et al., 2014). Depending on the institutional framework, either of two family models may be dominant: (i) male-breadwinner model prevailing for decades or (ii) dual-earner model, which emerged due to increasing labor market uncertainties, increasing family dissolution rates and changing women and men aspirations. In societies which support male-breadwinner model, women's employment and earning power is likely to be negatively related to fertility. However in dual-earner societies this association may be even positive. When both women and men are expected to work, any of the person's employment may be a prerequisite for having children. In Turkey, care regime has been patriarchal family model. İlkkaracan (2010) presents how care regime was shaped in Turkey with the cyclical changes.

In developed countries, there has been a shift from single-earner household model to dual-earner model. In Turkey the situation has been different. In the modernization and development phase of Turkey, patriarchal family model care regime has not evolved into a more egalitarian form, but it has rather become stronger. The periods in which the household model was shaped can be grouped in three for the period after Second World War: Import-substitution industrialization (1950-1980), export oriented growth (1980 and onwards) and financial liberalization (from the 1990s and onwards).

Import-substitution industrialization (1950-1980): Migration from rural to urban has been prevalent during this period and the process of housewifery, i.e. transition from unpaid agricultural worker to full-time housewifery. Urban modern labor market was male dominated and the care regime was shaped by the patriarchal family model with man earning money and woman as full-time care giver.

Export oriented growth (1980 and onwards): In the literature this period had been shaped by feminization of labor (Standing, 1999; Çağatay, Elson and Grown, 1995) due to increasing demand for cheap and flexible female labor and decline in real wages putting pressure on single earner family model. Turkey, on the other hand, has been among exceptional cases where feminization trend had not been observed. However in non-agricultural sector, female employment increase accelerated (where the indicator is increase in employment of women compared to increase in female population in the working age). In spite of relative feminization in the non-agricultural labor, there has been a decline in female employment overall (no feminization). In the non-agricultural sector, in export sectors there has been demand for cheap and low educated women, in the services sector there has been demand for educated females, where the latter has been the main driver of the (limited) feminization in the non-agricultural sector.

Financial liberalization (1990 and onwards) and the periods of crises: Two antagonist effects were observed during this period. Economic crises led to declines in both female and male employment, real wages declined leading to rise in male unemployment and fall in female unemployment. The weak female labor demand conditions in line with lack of reconciliation mechanisms led to continuation of patriarchal family model. In non-agricultural employment relative feminization and in total employment overall defeminization occurred. Entry of low educated women into labor market was on a temporary basis and a secondary earner position to overcome financial problems the family faces. Educated women (secondary or high school level of education), conversely, left the labor market due to familial reasons such as marriage, husband's will, and household care. During 1994, 2001 and 2008-2009 economic downturns, employment of married women in the urban areas increased, mainly among low educated women due to financial problems in the family. Among the higher educated group of women, employment rates declined (İlkkaracan, 2010).

To sum up family model in Turkey has been mainly male bread-winner model. Family models are determined by the welfare state institutions in the society

and a component of welfare state is the family policies. Family policies can be categorized in two: Active family policies and passive family policies (Bozçağa, 2012). Active family policies can be defamilializing models easing the familial load through "defamilializing policies" like in region of Scandinavia. Active family policies can be familialistic policies as well comprising of "generous parental leave policies, and direct and indirect transfers for care, and provision of public care" like in "conservative" welfare regimes. If these policies are lacking, family policies can be classified as passive family policies.

Low female labor participation rates in Turkey have prodded the government to pay special attention to family policies favoring less incompatibility between worker and mother roles of women. However, these policies covered selected groups of women, particularly civil servants implying a passive family policy framework.

Recently governmental efforts have taken place in favor of active familialistic policies in Turkey although it would be too early to label Turkey as an active family policy adopter. In accordance with the new initiatives, in January 2015, Ministry of Family and Social Policies in Turkey coordinated and prepared "Family and Dynamic Population Structure Conservation Program Plan of Action". Based on this plan and pronatalist approach of the government, new regulation on birth grant was passed on April 2015 stating that every mother would get 300TL for her first child, 400TL for second child, and 600TL for higher order births born after 15th of May, 2015. Additionally part-time employment for employed mother for the first two months for the first child, the first four months for the second child and the six months for the third child will be a legal right in 2016. Cash benefits has been a policy tool for reconciliation of the government in Turkey as they encourage fertility as well. However the impact of cash benefits on fertility has been limited according to the literature. As mentioned in Section 1.2.1, Rindfuss and Brewster's (1996) review suggests that childcare arrangements play an essential role in facilitating the relationship between work and family. On the other hand, cash benefits do not stimulate fertility in the long-term. They may be effective on temporary measures of

fertility such as timing of fertility (Aassve & Lappegard (2009) on the case of Norway), however their impact on the quantum of births is rather limited (Letablier et al. (2009) on European countries; Kim (2014) on Canada). Additionally as presented in Section of "Transfers Attached to Care-giving" below, it is generally argued that cash transfer policies institutionalize patriarchal family model rather than harmonizing work and family lives (İlkkaracan, 2010) provided that they are effective. Association of child-care directly with home-based care is causing drawbacks of the governmental policies in Turkey. Instead of increasing public provision of child-care, cash transfers have been emphasized more in the agenda of the government. Motherhood and its so-called sanctity is highlighted by statesmen to such an extent that mothers even hesitate to send their 0-3 aged children to crèches. Home-care presented as the only option for child-care creates gender-biased implications yielding withdrawal of mothers from the labor market.

Main indicators of family policies in general are "maternity leave (pregnancy leave), paternity leave, parental leave, which follows the period of maternity leave (does not exist in Turkey), family-friendly workplace practices, public spending on family benefits, typology of family benefits, use of child-related leave by mothers and fathers, additional leave entitlements of working parents, public spending on childcare and early education, and enrolment in day-care and pre-schools" (OECD Family Database, 2014a). In Turkey, instruments of family policies are maternal leave, breastfeeding leave, paternity leave; tax incentive to employers, cash grants, and facilitation of access to childcare services. Legislation regarding family policies relies on three Laws: Law No. 657 on Civil Servants, Labor Act No. 4857, and Social Insurance and General Health Insurance Act No. 5510. The following figure presents the details of the legislation regarding the family policies:

Table I.3.2.1.1. Legislation on leaves and transfers attached to care-giving in Turkey

Provided tool	*Status of social security*	*Requirements for using*	*Amount of allowance*	*Beneficiary*	*Duration of use*
Benefit for temporary incapacity	4/a and 4/b	90 days short term insurance premium	Inpatient treatment ½, outpatient treatment 2/3	Insured woman	8 weeks before and after birth, in case of multiple births plus two weeks before delivery
Maternity leave	4/c		Current salary	Female civil servant/in case she dies civil servant father	8 weeks before and after birth, in case of multiple births plus two weeks before delivery
Nursing benefit	4/a and 4/b	120 days short term insurance premium	95 TL (year 2013)	Insured woman/in case she is uninsured insured father	Once
Breastfeeding leave	4/a	Having kid younger than 1 year old	Current salary	Insured woman	1.5 hours per day
	4/c	After maternity leave ends			First six months 3 hours per day, second six months 1.5 hours per day
Unpaid leave	4/a			Insured woman	Up to six months
	4/c			Female civil servant/Male civil servant whose wife gave birth/Civil servant who adopted a child younger than 3 years old	Up to 24 months
Paternity leave	4/c		Current salary	Civil servant father	10 days
Family allowance	4/c		250*civil servant salary coefficient (plus one coefficient for kids of age group 0-6 including 72nd month)	If both wife and husband are civil servants only father	Every month
Birth grant[6]	4/c		2500*civil servant salary coefficient (184.59 TL)	If both mother and father are civil servants only father	Once

Source: Directorate General on the Status of Women (KSGM), 2013
Note: 4/a: workers, 4/b: self-employed, 4/c: civil servants

[6] On 7th of April, 2015, new regulation on birth grant was published in the Official Gazette. According to this code, every mother (if the mother is dead, the father) will get 300TL for their first child, 400TL for second child, and 600TL for third and higher order births for births born after 15th of May 2015. The only condition to receive this grant is to be a citizen of Turkey.

There are three pillars of family policies: (i) length of leave policies, (ii) transfers attached to care-giving, and (iii) public provision of care (Bozçağa, 2012). Analyzing the status of Turkey in these three pillars, Bozçağa (2012) puts Turkey in the category of a welfare system with passive family policies as "its leave policies and cash transfers attached to care-giving are not citizenship-based" (except the birth grant). Social rights in this field are entitled mostly to civil-servants or target groups in need (poor families for instance). The remaining of this section presents indicators related to these three pillars of family policies in Turkey.

Length of Leave Policies

Maternal and paternal leave policies are set by two laws: Law No. 657 on Civil Servants and Labor Act No. 4857.

Bakırcı (2010) presents an overview of Turkish Law on reconciliation of work and family responsibilities within the framework of international law and EU Law. As no regulations regarding contracted employees exist in Turkey, only regulations on workers and civil servants are evaluated. According to Bakırcı (2010) some improvements are needed in the legislation related to leaves:

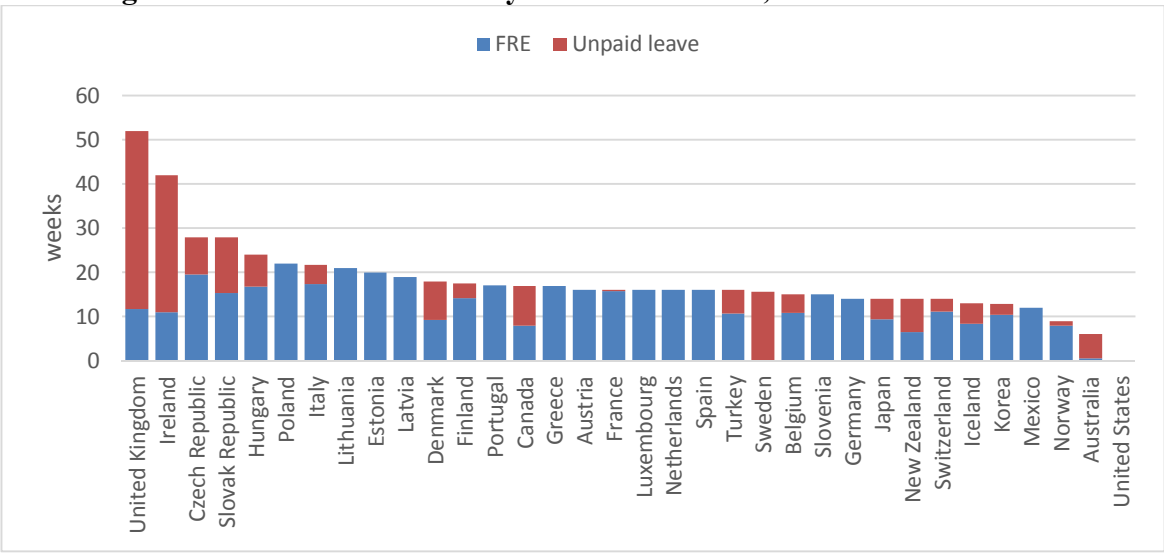
- Women workers lose earnings. They are only paid in terms of benefit for temporary incapacity as 1/2 or 2/3 of their salary.
- No paternal leave regulation exists for workers legislation. In case of civil servants, paternal leave is only for 10 days.
- No child leave regulation exists within the framework of parental leave. However ILO, UN and EU regulations involve child leave for biological children of couples or adopted children within the framework of parental leave. In Turkey, (unpaid) child leave is assumed to be used by only biological children of women.
- No regulation on parental leave exists in Turkish legislation. In general, parental leave means leave for some time for the two parents for caring

of their children until they reach a certain age. Although regulation draft for parental leave was involved in the draft law on amendment to Public Servants Law and Labor Code dated 27 December 2004, it had several drawbacks. Ideally a parental leave should be regulated as with a duration of at least 8 months (instead of 6), some part of it should not be transferable from man to woman, and should be paid leave (not unpaid).

When we compare length of leave policies of Turkey with OECD countries a composite indicator should be used. To make comparison between countries, a composite indicator named full-rate equivalent (FRE), which is "the full rate equivalent of the proportion of the duration of paid leave if it were paid at 100% of last earnings", can be used according to OECD.

This indicator can be calculated for maternity leave, paternity leave and parental leave, separately. Figure I.3.2.1.1 presents the FRE's and unpaid leave periods in terms of weeks for maternity leave only:

Figure I.3.2.1.1. Paid maternity leave entitlement, OECD countries



Source: OECD family database on
http://www.oecd.org/els/soc/PF2_1_Parental_leave_systems_1May2014.pdf

When compared to OECD countries, Turkey stands less than OECD average of paid maternity leave, and no paid paternity leave (OECD family database, 2014a). Turkey ranks below the OECD average for FRE for maternity leave, which is 12.8 with a value of 10.7. This calculation assumes users of leave as insured women and not civil servants, who get 2/3 of monthly salary as outpatients. When it comes to paternal leave, 10 days of leave is not counted in the OECD database as it is only for civil servant fathers, whereas the average for OECD countries is 2.7 months for fathers.

Transfers Attached to Care-giving

As to transfers attached to care-giving in Turkey, "*family allowances are only paid to civil servants, and there is no tax deduction*" (Bozçağa, 2012). Family allowance is paid until the child is 25 years old. However if the daughter is unmarried, or daughter or son cannot work due to physical disability family allowance is continued to be paid. The amount of family allowance is too low to affect fertility rate or female labor force participation rate. However according to Bakırcı (2010), in the long run these allowances can increase fertility rates or keep women away from labor market, provided that they are effective; hence tax deductions seem to be better ways to reconcile family and work life .

It is generally argued that cash transfer policies institutionalize patriarchal family model rather than harmonizing work and family lives. Indeed cash transfers related to caring responsibilities support that one person (mostly the woman) is responsible for caring of the child, elderly or disabled staying at home with the cash transfer support. This outcome makes this policy reinforcing gender discrimination, exclusivist from the labor market and institutionalizing poverty (İlkkaracan, 2010). İlkkaracan (2010) ground this conclusion on Jaumotte's (2004) study, where Jaumotte (2004) argues that:

> *"Another form of government support for families with children is child benefits, which are essentially lump-sum transfers for the*

> *maintenance of children. While childcare subsidies reduce the relative price of formal childcare and, therefore, increase the relative return of market work, child benefits only have an income effect and may just lead to a reduction in labor supply. Thus, although they may be justified on grounds of horizontal equity across different family types and reducing child poverty, child benefits are less desirable than childcare subsidies from the angle of raising female participation."* (Jaumotte, 2004, p. 60).

According to Silvera (2010) in her analysis on France, for households with inferior working conditions and low earnings, cost-benefit analysis suggests that these women exit the labor market. Direct cash transfers to families resulted in employed women's -especially low waged- returning home and caused declines in employment of women as a result of withdrawals from the labor market due to financial reasons.

In line with these empirical findings, political practices of cash transfers are not recommended since they are held responsible for institutionalizing poverty and gender inequality. This is even more pronounced in countries like Turkey due to the cultural context which assumes that woman is the main responsible care-giver for the child and the family. In the Turkish context (See Section I.3.2.3 on cultural dimension) it is evident that in case that cash transfers are efficient enough to stimulate fertility and employment decisions of women, employed women will be the agents leaving the labor market and bearing the main responsibility for child-care. Unless attitudes towards gender roles are altered in the society, there are small chances that cash benefits would not yield to institutionalization of poverty of women and gender discrimination. For Turkey, Yılmaz (2012) presents an example of effect of conditional cash transfers (CCT) on 656 women receiving CCT and 250 women in the control group, in provinces of Mersin, Adana, Antep, Mardin and Diyarbakır. Yılmaz (2012) finds that CCT does not yield to increasing influence of women in decision-making in the household, but rather emphasizes the care responsibilities of women reinforcing the gendered division of labor in the family mainly due to strong patriarchy. Additionally for cash transfer to affect social status

of women, its efficiency should be high enough. In case of conditional cash transfers in Turkey, the amount is too little to affect household budget and social status of women. Moreover empowerment of women in terms of decision-making related to household, gaining autonomy and power outside the patriarchal structure is not provided by CCTs, but only mothering role of women is emphasized.

Public Provision of Care

The final aspect of family policies is the availability of public care services that lessens the burden of child care. Child care and pre-school system in Turkey is as follows as presented by Bakırcı (2010):

(1) Child care services (0-3 years old):

- Crèches and day care centers launched by employers and public institutions for their employees,
- Other crèches and day-care centers belonging to other institutions such as Social Services and Child Protection Agency and municipalities,
- Private crèches and day-care centers,
- Another fourth group can be identified where a domestic worker carries out child care services at home.

(2) Pre-school education (3-6 years old)

- Day care centers and dorms launched by employers and public institutions for their employees,
- Other day care centers and dorms belonging to other institutions such as Ministry of Education and Social Services and Child Protection Agency,
- Private day care centers and dorms.

Labor Law Article no. 88 brings an obligation to employers to open a breastfeeding room (provided that there are at least 100-150 women employees) and crèches (provided that there are at least 150 women employees) close to the workplace. However, to consider only the number of female workers gives employers a ground for hiring women less than these thresholds. Besides the lack of a threshold which includes both female and male workers, tax exemption for the employers who are obliged to open crèches is also lacking.

Regulation on Pregnant and Breastfeeding Women article no. 16 states that children of female workers and children of male workers where mother died or divorced and does not have the custody can make use of rooms and crèches. According to Bakırcı (2010), this regulation reinforces the perspective that gives the child care responsibility to only women. Instead the regulation should give the right to use the crèche to children of men and women equally.

Public Servants Law Article No. 191 regulates the establishment of crèches and pre-schools for children of public servants aged 0-6 in public institutions. According to this article, if there are at least 50 children of workers, who are in the age group of 0-6 years old, the institution should open a child care center. The threshold of 50 children in public institutions can be criticized.

Ecevit (2010) presents and overview of early childhood care and education within the framework of reconciliation of work and family life. According to her analysis, public institutions, which are under the Ministry of Education, are almost non-existent for 0-3 age group of children. This situation is also stated in Bozçağa's (2012) study.

Pre-school education in Turkey starts with kindergartens, and children aged 3-4 years old (36-66 months old) attend these schools. Number of kindergartens in Turkey has been increasing and reached 1698 in 2008-2009 period. Although the rate of increase in private kindergartens is higher than that of public ones, 60 percent of kindergartens are public (MoE, National Education Statistics in Ecevit, 2010).

Nursery classes under Ministry of Education are schools of pre-school education for children aged 48-66 months[7]. Private nursery classes constitute only 3 percent of the total (583 in 20128 nursery classes in 2008-2009 period) (MoE, National Education Statistics in Ecevit, 2010).

In addition to pre-school education under Ministry of Education, there are private crèches and day-care nurseries. Usually crèches target 0-3 year-old children, and day-care nurseries serve children of 3-6 years-old. In 2008-2009 period, the number of crèches and day-care nurseries was 1505. Number of students in private crèches and day-care nurseries (29641 in 2008-2009) outweighs those in public crèches and day-care nurseries (15206 in 2008-2009) (MoE, National Education Statistics in Ecevit, 2010).

The school enrolment rate for the children of age group of 36-48 months increased slightly from 2.7 percent in 2007-2008 to 4.1 percent in 2009-2010 (private information from MoE General Directorate of Pre-school in Ecevit, 2010). This indicates that 96 percent of children aged 36-48 months old are cared by their families by 2010. The school enrolment rate for children of the age group 48-60 months old is higher: 16.1 percent in 2009-2010. However this indicates that there are still non-institutionalized care of children aged 48-60 years old of 84 percent. Enrolment rate of children aged 60-72 months old, on the other hand, is much higher: 61 percent. These results indicate that early childhood school enrolment in Turkey mainly involved children aged 60-72 month old by 2010. For children before that age, no institutionalization takes place.

Finally early childhood care takes place at home in Turkey. Data related to domestic care services are almost non-existent except a few surveys. These surveys are Turkey Demographic and Health Surveys and Family Structure Survey in Turkey (2006 and 2011).

[7] With an amendment in the regulation on primary school institutions on 26th of July, 2014, kindergarten school age was changed from 36-72 months to 36-66 months, and for nursery class from 48-72 months to 48-66 months. However by obtaining a medical report, 66 month duration can be extended to 72 months.

According to TDHS-2008 results, Table presents the person who looks after child younger than five years old when respondent is at work.

Table I.3.2.1.2. Person who looks after child younger than five years old while mother is working, TDHS-2008

	Herself	Husband	Female children	Respondent's mother	Mother in law	Male children	Other relatives	Babysitter	Institutional	Not worked since last birth	Other	Number of respondents
Employer	*	*	*	*	*	*	*	*	*	*	*	11
Waged worker (regular)	9.8	4.5	3.3	29.7	22.3	0.5	3.7	3.4	15.8	4.5	2.6	115
Salaried government official	4.7	4.3	0.0	23.0	13.4	0.0	1.8	24.4	19.6	5.1	3.8	104
Daily waged (seasonal, temporal)	30.9	1.1	14.0	4.2	28.0	1.7	6.6	3.5	0.0	0.0	10.0	98
For her own (regular)	*	*	*	*	*	*	*	*	*	*	*	22
For her own (irregular)	73.7	2.8	2.0	1.4	8.8	0.0	5.4	0.0	2.7	0.0	3.1	103
Unpaid family worker	35.0	0.7	10.3	3.0	38.7	0.4	5.9	0.0	1.3	0.8	3.8	301
Total	31.0	2.5	6.5	11.2	25.4	0.5	4.7	5.3	6.8	1.9	4.1	754

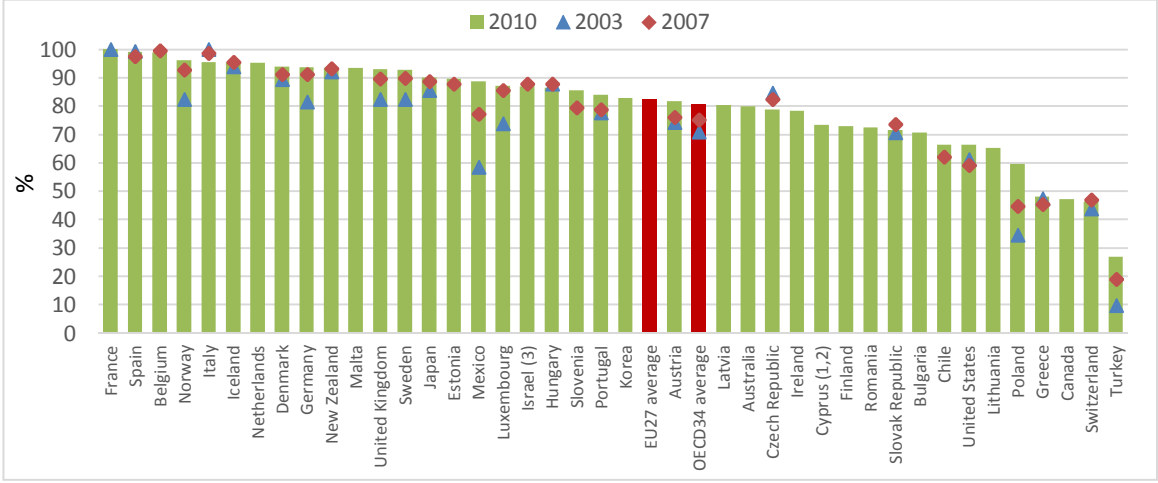
Source: TDHS-2008
* There are less than 25 unweighted cases

According to the results 31 percent of employed women who have at least one child under five years old take care of their children themselves. Since women working unpaid at home or in the agriculture are involved as well, this result seems reasonable. Following mother herself, mother of the husband (mother in law) takes care of young children with 25 percent. Respondent's mother comes as the third with 11 percent. Percentage of husband taking care of children at the household is very rare with 3 percent. Gender gap in terms of taking care of children is prevalent in Turkey. Involvement of father or male children adds to only 3 percent in total. An important point is the proportion of institutional care, which shows institutionalization in children of pre-school age. This proportion is only 7 percent and kindergartens are used mainly by regular waged workers or salaried government officials. On the other hand, women working for their own take care of their children themselves mostly (74 percent). None of women working for their own hire a babysitter to take care of their children. Hiring a babysitter is a way to cope with child care for only salaried government officials.

Results from Family Structure Surveys in Turkey for 2006 and 2011 reveal low educational institutionalization of pre-school age children as well. According to the results of these surveys in Turkey, 92 percent of young children in the household are taken care by their mothers in 2006, and 88 percent in 2011. These proportions are much higher compared to TDHS-2008 results. The reason is that TDHS-2008 includes only employed mothers. According to Family Structure Survey in Turkey, 2011, mothers are followed by mother in law (5 percent), mother's mother (4 percent), and crèches or kindergarten (3 percent). This result once more reflects low institutionalization of child-care in Turkey, and suggests that young children are taken care of at home. Another finding this survey results indicate is that with increasing education, shares of care givers as mother herself or other family members decrease and share of kindergartens or babysitters increase (Beşpınar, 2014).

As an indicator related to policies affecting relationship and reconciling between fertility and employment of women on the OECD database is "the enrolment rate of young children in day-care and pre-schools". Since there is no data available for Turkey on day-care enrolment of children, only information on pre-school enrolment rates are provided in Figure I.3.2.1.2. Turkey ranks as the last country that has lowest enrolment rates of children age three to five years old in pre-school education programs since 2003.

Figure I.3.2.1.2. Average enrolment rate of children aged three to five years of age in pre-school educational programs, OECD countries



Source: OECD Family Database (2014b); retrieved from OECD family database

To sum up, public provision of child care in terms of crèches and day-care nurseries is at very low level in Turkey. Additionally it is almost non-existent for children under three years of age.

Family-Friendly Workplace Practices

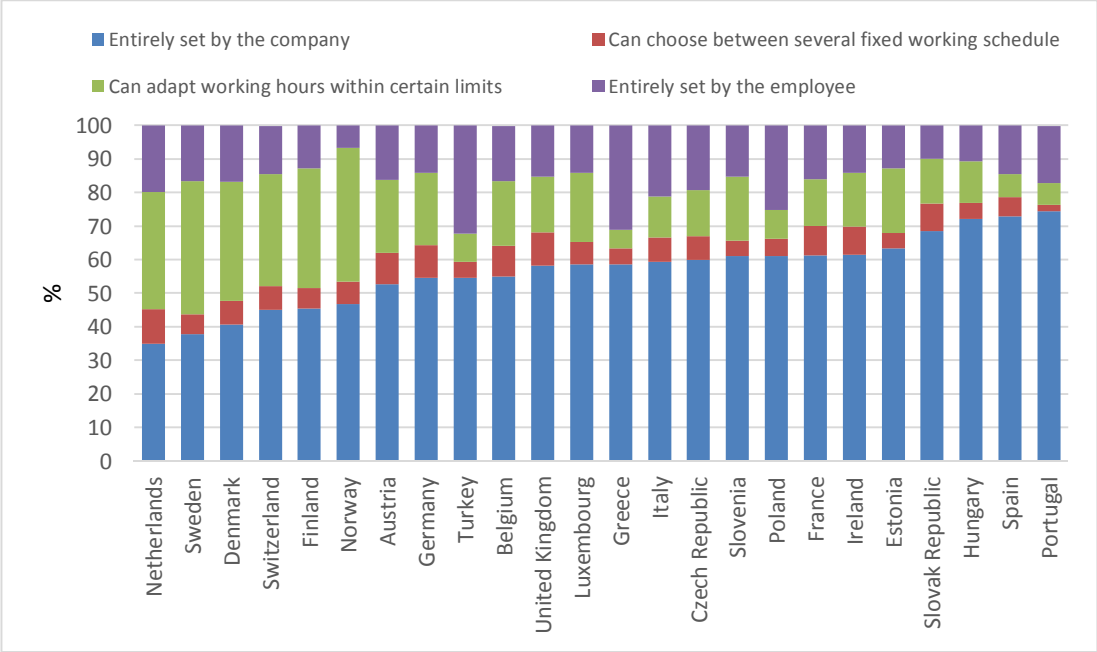
Another indicator of family policies is the family-friendly workplace practices according to OECD. The indicators under these practices can be argued to have a place in the intersection between legislative and structural context, i.e. institutional and labor market context.

In Turkey, no direct responsibilities are obligatory for employers or the state for flexible work types based on regulations. Hence parents have the responsibility to provide reconciliation themselves. Labor Law regulates flexible working conditions in the legislation. Rolling work time, condensed work week, make-up work, shift working, part-time work, working on call, working from home are the flexible work types regulated in the legislation. However most of these arrangements do not require any demand of the employee, and are under initiative of the employer. Moreover women who work part-time (same as full-time) need 7200 days of premium paying before they get retirement pension. Due to its toughness to reach 7200 days while part-time working, women may choose to work in jobs with no social security or not working at all.

One of the obstacles against work and family life reconciliation in Turkey is the long working hours, and the gender gap in working hours at home and at work. Compared to OECD countries, where the standard working week is around 40 hours (OECD, 2007), working hours in Turkey (49,4 hours a week on average) is much more. Working hours in the labor market is less for women compared to men. However as regards domestic labor, working hours at home for women is much longer than men's. In total, working hours at home and at work are higher for women (45 hours a week) than for men (37 hours a week) (TURKSTAT, 2006 Time Use Survey) (İlkkaracan, 2010).

When we look at working time arrangements in Turkey, it is observed that time arrangements set by the employee are relatively more, compared to other OECD countries (Figure I.3.2.1.3). However it should be noted that this is an issue related to the job characteristics as well. In jobs with no social security coverage and jobs in agricultural sector, this flexible trend is expected to be observed.

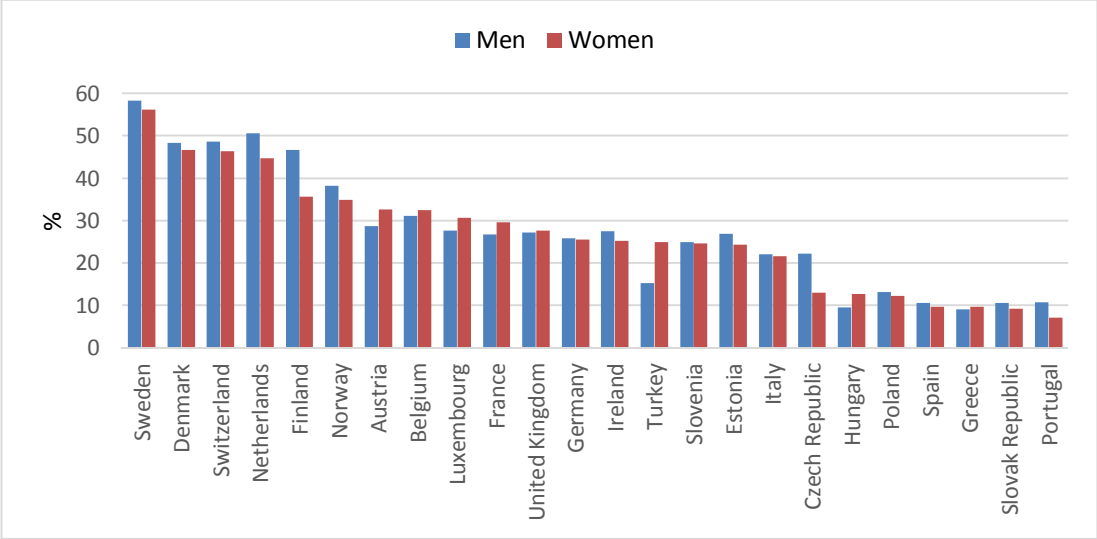
Figure I.3.2.1.3. How working time arrangements are set: Proportion of employees having working time set, OECD countries, 2009



Source: OECD family database
Note: Data refer to 2005 for Switzerland.

As shown in Figure I.3.2.1.4., proportions for employees with opportunities to change working hours, is higher among women employees than among their male counterparts. Turkey ranks slightly less than OECD average for females (26.6 %) with the proportion of 24.9.

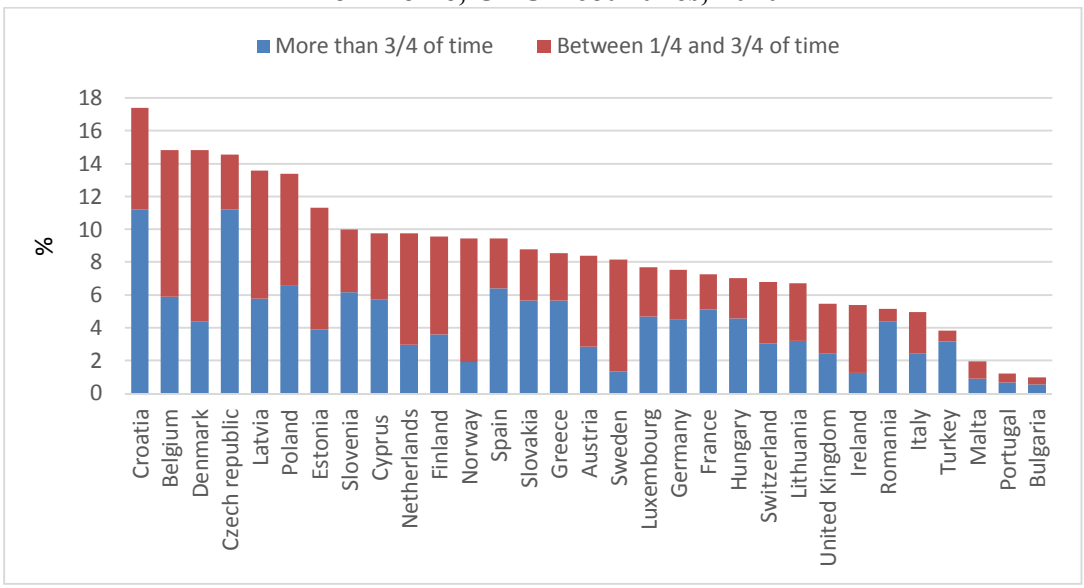
Figure I.3.2.1.4. Gender gaps in opportunities to change working hours, 2009: Proportion of male and female employees who can adjust and/or decide their working time, OECD countries



Source: OECD family database

Another indicator introducing more flexibility to employment decreasing incompatibility between working and mothering roles is the proportion of female employees working from home. Turkey has values among the bottom five countries in the list proposing relatively more rigid working conditions among women.

Figure I.3.2.1.5. Working from home: Proportion of female employees working from home, OECD countries, 2010



Source: OECD family database

Indicators of family-friendly workplace practices show that Turkey has flexible working hours for women, and this is more common among women than men. However proportion of female employees working from home is lowest among OECD countries. Considering the structure of the labor market in Turkey (see next section below) it is hard to say Turkey adopts family-friendly workplace practices. These practices are mostly related to the job characteristics of women, which are mostly in the private sector, unpaid and without any social security coverage (see next section for details).

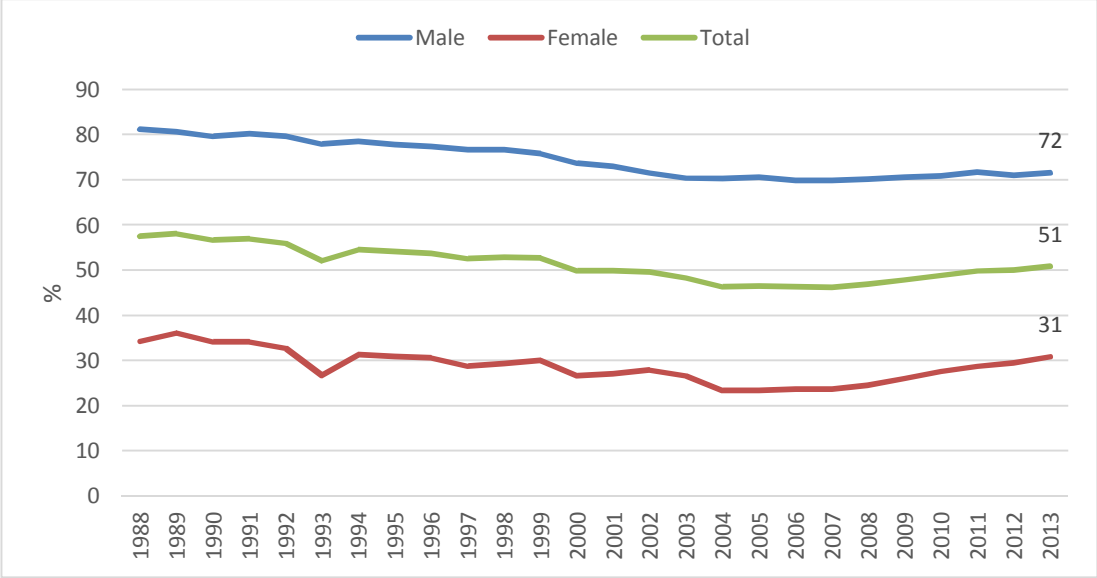
I.3.2.2. Structural Dimension (Labor Market Framework)

In Turkey, three patterns regarding labor market are observed since 1988: (i) male labor force participation rates are higher than female rates, (ii) rural labor force participation rates are higher than urban rates, and (iii) male-female differential is higher in urban areas than in rural areas (Tunalı, 2003). In addition to these patterns, since 2004, there has been slight improvement in labor force participation rate of women from 23 percent to 31 percent in Turkey. This has been mainly due to increases in urban areas. Some part of this increase is explained in "The Ministry of Family and Social Policies General Directorate on the Status of Women"s study in 2014 as:

> *"In interpreting all this information, it is compulsory to take into account the Home Care Service Program. The program was initiated in 2007 by the Act number 2022, and the people taking care of disabled family members at home were assigned salaries at the net minimum wage level within the scope of the program. The program has covered 427,434 people providing care services by the year 2013, most of which were women. These people has been included in Employment in Social Services without Accommodation Sector category under the Human Healthcare and Social Service Activities by TurkStat since the year 2011. Therefore, the increase in the employment of the middle-aged women with low levels of education who had been previously providing homecare service on an unpaid basis as*

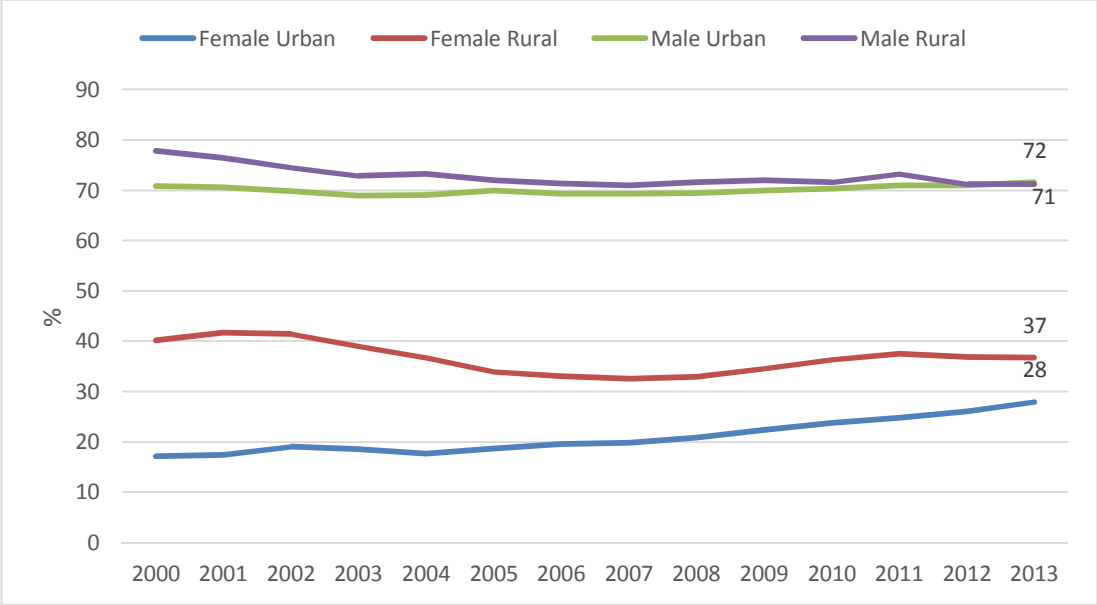
housewives is largely due to their inclusion in the employment statistics after they had been a part of the Home Care Service Program." (The Ministry of Family and Social Policies General Directorate on the Status of Women, 2014, p. 44)

Figure I.3.2.2.1. Labor force participation rate for non-institutional population by year (15 + age), Turkey 1988-2013



Source: Turkish Statistical Institute (TURKSTAT) (2014), Labor force statistics database

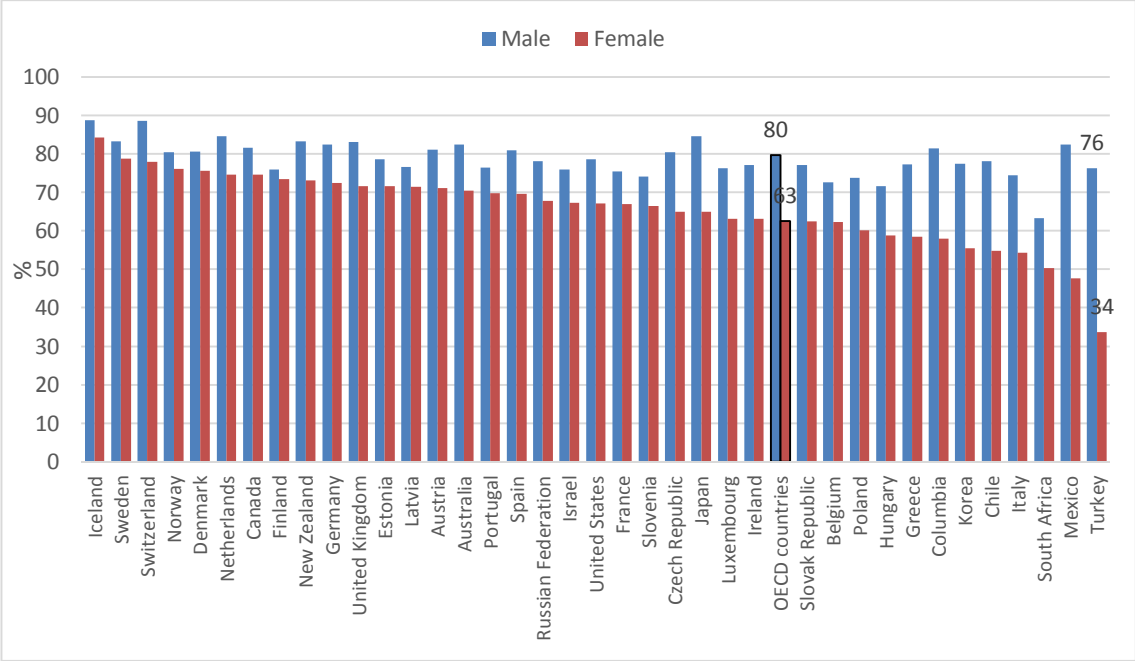
Figure I.3.2.2.2. Labor force participation rate by gender, type of place of residence and year (15 + age), Turkey 2000-2013



Source: Turkish Statistical Institute (TURKSTAT) (2014), Labor force statistics database

When we compare labor force participation rate in Turkey with other OECD countries, we see that regarding female rates, Turkey ranks as the last country with 34 percent for population of 15-64 years old in 2013.

Figure I.3.2.2.3. Labor force participation rate, 15-64 years old, OECD countries, 2013

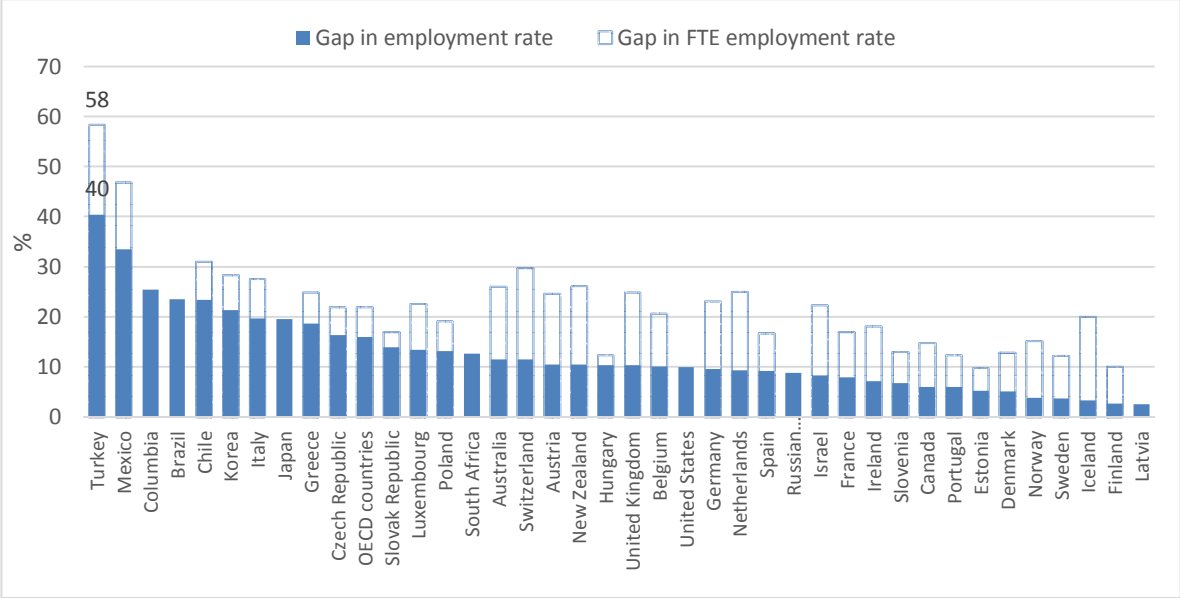


Source: OECD Employment Database (2014)

Gender Gap in Employment Rates

Low female participation rates bring out the issue of gender gap. In Figure I.3.2.2.4, gender gaps in employment rates are presented. Gender gaps are also presented as differences in the full-time equivalent (FTE) rates. This is the difference between men and women if they were all working for 30 hours or more per week in their main job. Gender gaps in employment rate and in full time equivalent employment rate are highest among OECD countries with 40 and 58 percent, respectively in 2012.

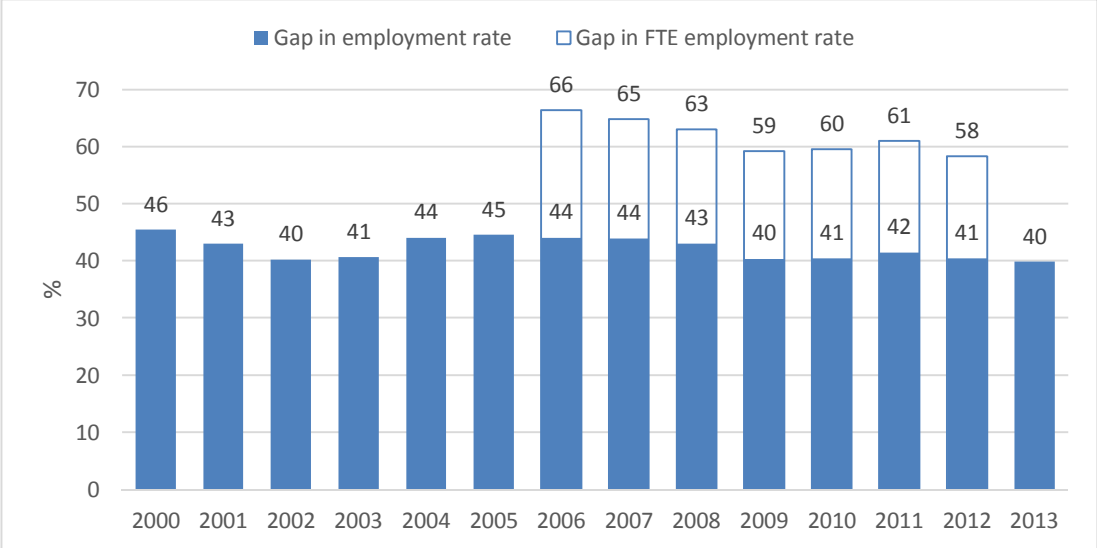
Figure I.3.2.2.4. Gender gap in employment rate and full time equivalent employment rate, 15-64 years old, OECD countries, 2012



Source: OECD Employment Database (2014)

Although female labor force participation rate has been improving in time in urban areas and overall, gender gap in employment rate remains at 40 percent in 2013. In terms of full time equivalent employment rate the gender gap is much higher with 58 percent in 2012. This is the maximum level among OECD countries as well.

Figure I.3.2.2.5. Gender gap in employment rate and full time equivalent employment rate by year, Turkey, 2000-2013



Source: OECD Employment Database (2014)

İlkkaracan (2010) analyzes the gender gap in employment in Turkey and its link with lack of reconciliation mechanisms in Turkey. According to İlkkaracan (2010), there are two reasons of the gender gap in employment: women's low level of education and gendered cultural patterns. The lack of reconciliation mechanisms interact with these two factors leading to gender gap in employment and socioeconomic inequalities within women and families. These two factors and their interactions with lack of reconciliation mechanisms feed these inequalities and fed by those in equalities creating a trap.

Women's low level of education: Human capital theory and labor supply model of it envisages that there is a positive relationship between education and labor force participation. This is due to the fact that with education wages, i.e. opportunity cost of not being employed increases. In Turkey this theory is reflected much stronger among women than men, i.e. as educational level of women increases, their participation rates jump. The reason is that with more education, access to the work and family life reconciliation mechanisms becomes easier. The mechanism is straightforward: education increases the likelihood of employment in the formal sector providing access to legal rights and crèche services (even being limited).

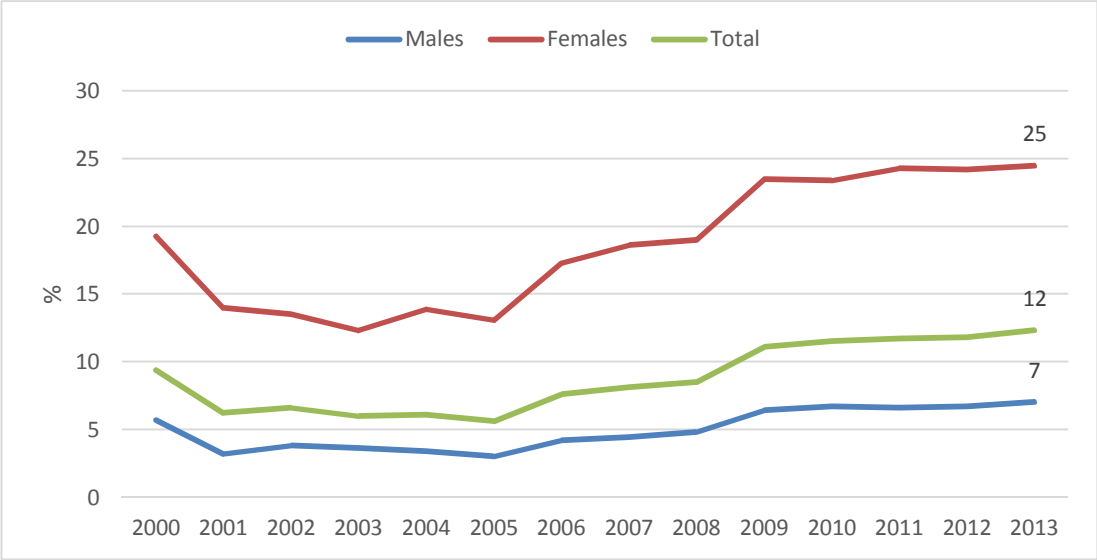
Gendered cultural patterns: Gendered cultural patterns see primary task of women as being wife and mother and place of women as home. According to this conservative approach, women can enter the labor market at the secondary position provided that she carries out these tasks. By definition, these cultural patterns interact with reconciliation issue (see section I.3.2.3 for more details).

Flexibility (time)

In addition to levels of employment rates, part-time employment is an important indicator which affects the relationship between women's employment and fertility. Incidence of part-time employment as a proportion of total employment for females has been over the proportion for males in Turkey, with female rate of 25 percent and with male rate of 7 percent in 2013. These values are very close to

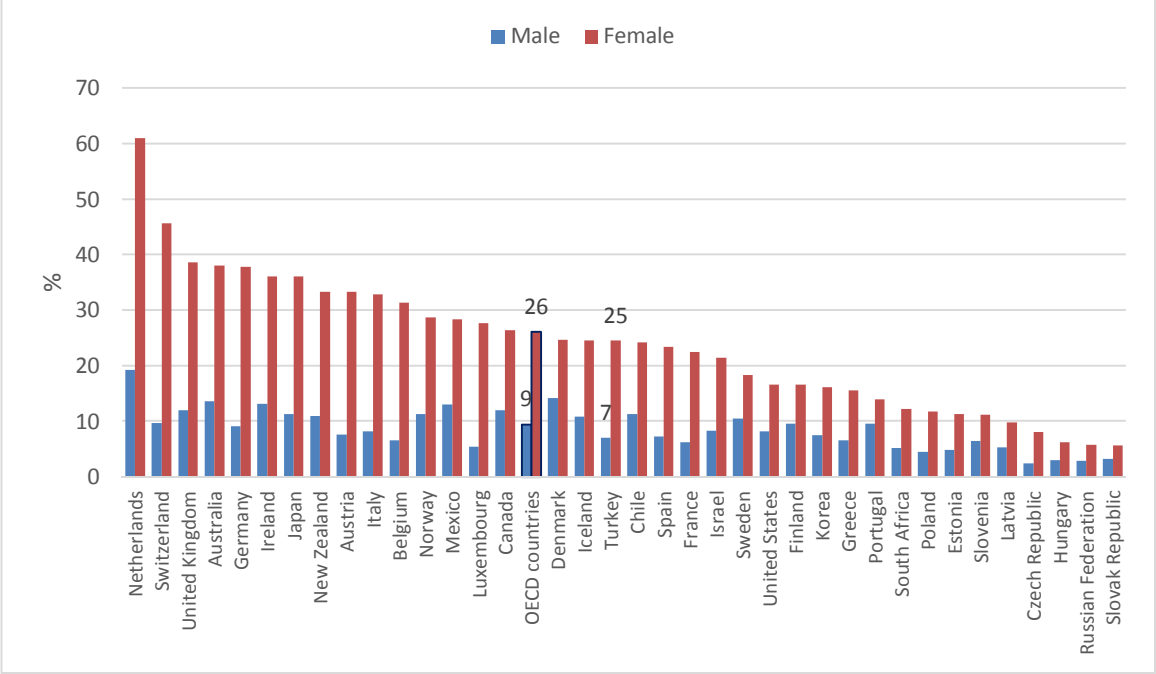
OECD average proportions with 26 and 9 percent for females and males, respectively.

Figure I.3.2.2.6. Incidence of part-time employment by year, Turkey: Part-time employment as a proportion of total employment, 2000-2013



Source: OECD StatExtracts (2014)

Figure I.3.2.2.7. Incidence of part-time employment: Part-time employment as a proportion of total employment, OECD countries, 2013



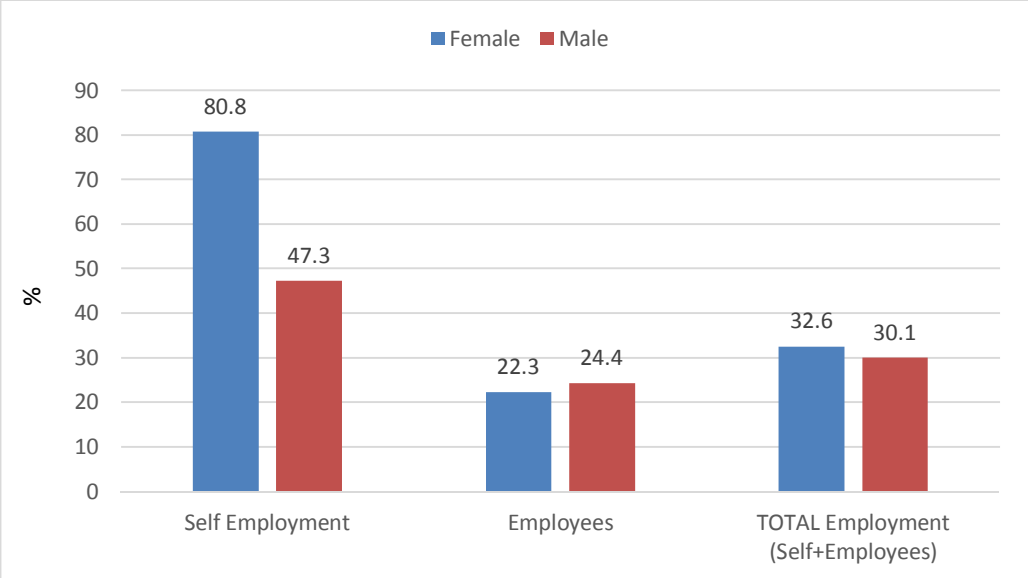
Source: OECD StatExtracts (2014)

Informal sector

Another indicator giving information about the structure of the labor market is the informality in the labor market. According to 2013 World Development Report on Jobs (WB, 2012), informality is an important gray area because there is still no consensus on what is meant by informal jobs. Some schools of thought link informality to characteristics of firms, some to characteristics of workers, and some to modes of production and levels of productivity. Moreover relatively few countries produce *regular* statistics on informality.

The most recent ILO source suggests that in Turkey share of informal employment is 30.6 percent. According to ILO, again, the informal employment share for Turkey by gender is presented in Figure I.3.2.2.8.

Figure I.3.2.2.8. Share of informal jobs in total employment as % of non-agricultural employment by gender, Turkey 2009



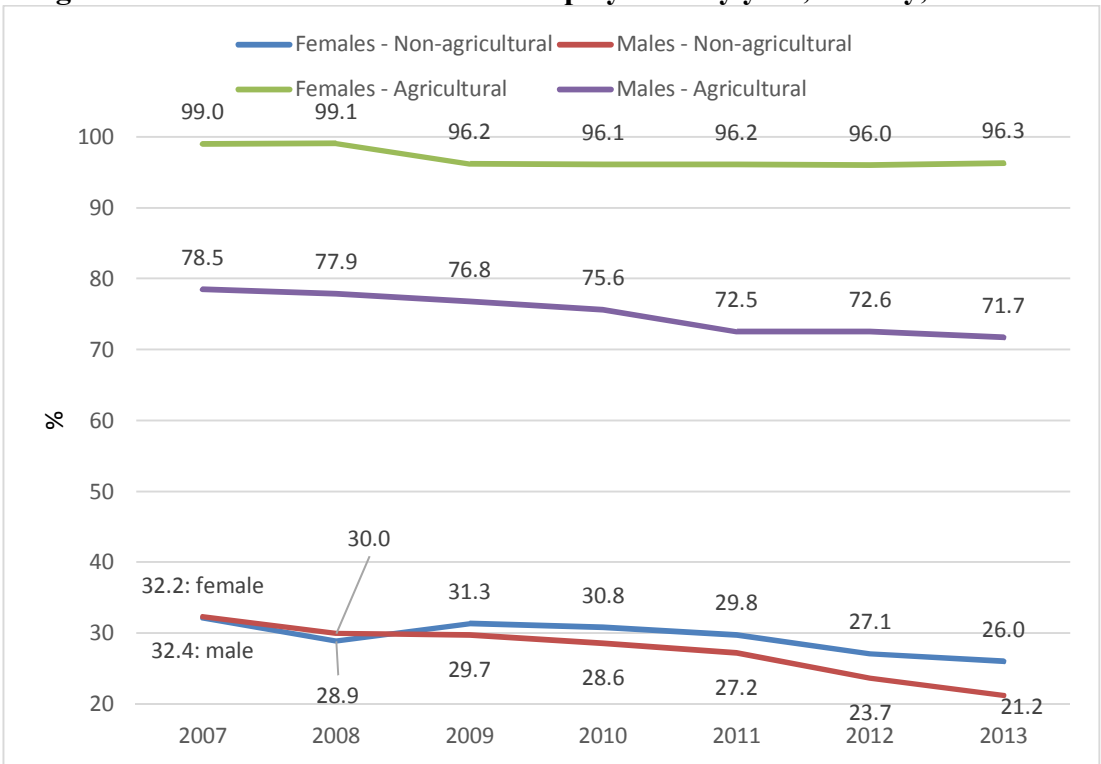
Source: ILO & WIEGO, 2009: LABORSTA, online statistical database

As it is seen, share of informal employment presented as informal jobs in total employment is much higher in self-employment, especially among females. 81 percent of non-agricultural employment is informal jobs among women. Overall,

share of informal employment is similar among men and women; women having a slightly larger share as 32.6 percent compared to 30.1 percent.

Informal sector and social security coverage do not have the same definition and meaning: A person may be employed in the formal sector without any coverage or a person may be employed in the informal sector with social security coverage. However unregistered or uncovered employment can be used as a proxy for informal sector. As it is observed, the difference between share of informal jobs and share of uncovered employment in non-agricultural employment for females is very small: 1.3 percentage points (Figure I.3.2.2.8 and Figure I.3.2.2.9). When one observes the share of uncovered employment by year in Turkey since 2009, one pattern is clear: share of uncovered employment has been decreasing both for females and males. By 2013, this share was 26 percent for women for non-agricultural employment. The extent of uncoverage is much higher in the agricultural sector, as expected, especially among females.

Figure I.3.2.2.9. Share of uncovered employment by year, Turkey, 2007-2013



Source: Turkish Statistical Institute (TURKSTAT) (2014), Labor force statistics database

Job Characteristics

The indicators presented in this section are obtained from the TDHS-2008 data. It is observed that in last 12 months prior to the survey, service sector lead the labor market, however agricultural sector has a high share as well with 40.5 percent. Jobs where female workers are employed are mainly in the private sector, and unpaid family worker status has the highest prevalence with 32.5 percent. Almost half of employed women are non-wage earners indicating that they are either self-employed or unpaid workers. In line with these, social security coverage due to employment is at a very low level: 68.8 percent of employed women in last 12 months has no coverage at all.

Table I.3.2.2.1. Job characteristics: Percent distribution of last jobs of ever-married women age 15-49 employed in the last 12 months preceding the survey by job characteristics, Turkey 2008

	Weighted percent	Unweighted number
Sector of job		
Agriculture	40.3	1,095
Industry	8.6	164
Service	51.1	1,160
Public versus private		
Public	11.3	277
Private	88.8	2,142
Wage status of job		
Employer	1.6	33
Waged worker (regular)	27.0	543
Salaried government official	9.4	236
Daily waged (seasonal/temporal)	11.9	307
For her own (regular)	5.5	117
For her own (irregular)	12.0	306
Unpaid family worker	32.4	869
Other	0.2	7
Missing	0.0	1
Wage status of job (summary)		
Wage earner	49.9	1,119
Non-wage earner	49.8	1,292
Other	0.2	7
Missing	0.0	1

(Table I.3.2.2.1 continued)		
	Weighted percent	**Unweighted number**
Social security coverage of job		
None	68.8	1,749
SSK	19.8	396
Emekli Sandigi	8.9	215
BAGKUR	2.3	50
Private	0.1	4
Other	0.1	3
Missing	0.0	2
Social security coverage of job (summary)		
Uncovered	68.8	1,749
Covered	31.1	665
Other	0.1	3
Missing	0.0	2

I.3.2.3. Cultural Dimension (Values and Norms for Women's Social Roles)

According to World Values Survey Wave 6 carried out in 2010-2014 period, covering 57 countries (World Values Survey Association, 2014), values and norms for women in Turkey do not involve being employed. 63.6 percent of males and 55.1 percent of females agree that "When jobs are scarce, men should have more right to a job than women". Fifty-one percent of males and 43 of percent of females agree that "If a woman earns more money than her husband, it's almost certain to cause problems". Seventy-three percent of males and 66.8 percent of females agree or strongly agree that "Being a housewife is just as fulfilling as working for pay". Moreover according to TDHS-2013 results, main reason not to work for non-employed women has been stated as "being house-wife" with 21.7 percent, "caring for children" with 19.2 percent, and "partner/family does not allow to work" with 14.8 percent, being among top four answers (HUIPS, 2014). According to TDHS-2008 results the proportions were 22.4 percent for "being house-wife", 31.2 percent for "caring for children" and 19.6 percent for "does not allow to work" being the top three answers for main reason not to work for non-employed women (HUIPS, 2009).

This indicates a 12 percentage point decrease in the proportion of women stating "caring for children" as a reason for not working in the last five years between 2008 and 2013.

Results from Research on Family Structure in Turkey 2006 and 2011 (Beşpınar, 2014) provide similar findings related to values and norms towards employment of women and women's role in child-care. According to the 2006 survey, 23 percent of men thought it was not appropriate for women to work as paid/salaried. In the 2011 survey this question was modified as "Do you think it is appropriate for a woman to work?", as paid or unpaid. Twenty-six percent of men considered it was not appropriate for a woman to work in 2011. Among women, the share who found it inappropriate to work for women themselves was 10 percent for both of the surveys. The percentages in rural areas (19 and 22 percent in 2006 and 2011, respectively) were slightly higher than in urban areas (15 and 16 percent in 2006 and 2011, respectively). In Northeast and Southeast regions, percentage who did not approve employment of women were highest in 2011 with 39 and 36 percent, respectively. Educational level and wealth status were associated with levels of approval as well. Share of population who approved employment of women was higher among persons with higher level of education and wealth. In both 2006 and 2011 surveys, the most commonly stated reason why it was inappropriate for women to work has been "a woman's primary duties are household management and childbearing" with 62 and 56 percent, respectively. The proportions were slightly higher among women with 65 and 57 percent. The reason that "children will suffer" were stated by 7 and 8 percent of individuals in 2006 and 2011 Research on Family Structure, respectively.

Another survey which questioned the values and attitudes towards women's role in the family and in career life outside the family is the survey on "Family, Employment and Gender in Turkey" by Çarkoğlu and Kalaycıoğlu (2013) coordinated with International Social Survey Program (ISSP). According to the results of this survey, 48 percent of respondents do not agree with the view that "a working mother can build a relationship between her child as intimate and trustful as

a non-working mother". When compared with ISSP 2002 results for other countries, Turkey ranks as the first country with the highest rate of disapproval. Twenty-three percent of respondents absolutely agree that "it is possible that a pre-school aged children is affected badly by his/her mother's working" in Turkey in 2013, compared to 16 percent according to ISSP 2002 World results. Sixty-one percent of respondents in Turkey agree that "it may be good to have a job, however most women primarily want to have family and kids". "Being a housewife is just as fulfilling as working for pay" statement is approved by 45 percent of respondents, whereas the same statement is disapproved by only 27 percent. Statement of "main task of men is to earn and that of women is to take care of house and children" is approved by 42 percent of respondents and disapproved by 34 percent. Fifty-five percent of respondents think that a woman should not work after all if she has a pre-school age child according to 2013 Turkey survey, whereas this percentage is 40 percent according to the ISSP 2002 World results. On the other hand, in Turkey 67 percent of respondents agree that both male and female should contribute to the household budget. According to Çarkoğlu and Kalaycıoğlu (2013) these results suggest that in an ideal setting in a family in Turkey, the mother should be a housewife and spend most of her time on young children. When the children grow up, she can consider working. However in an urbanized and industrialized society it is required that both man and woman provide financial support to the family so that employment of woman in order to contribute to the household budget is generally accepted. In short, societal role of woman is both incurring child and family responsibilities, and working in order to address the financial needs of the family in Turkey. Finally 69 percent of respondents think that an ideal situation for work-family life of a family who have a pre-school aged child is when father is full-time employed and mother stays at home.

These values indicate that values and norms in Turkey favor low employment rates of women and child care and house-related work are expected to be carried out by women. In case living standards are low in the family favoring the income effect to be in play, women may be encouraged to find non-wage jobs without any social coverage favoring role compatibility. If the living standards are

high, women tend to be excluded from the labor market supporting male bread-winner model and role incompatibility. This manifests the economic dimension, which is presented below.

I.3.2.4. Economic Dimension (Living Standards)

Low economic standards are expected to increase women's labor supply. Most of the researches support this hypothesis (Matysiak, 2011). For instance for Turkey, Karaoglan and Okten (2015) analyze how labor supply of married women react to the involuntary transition of employment to unemployment of their husbands. Their findings indicate that such transitions encourage women to enter the labor market.

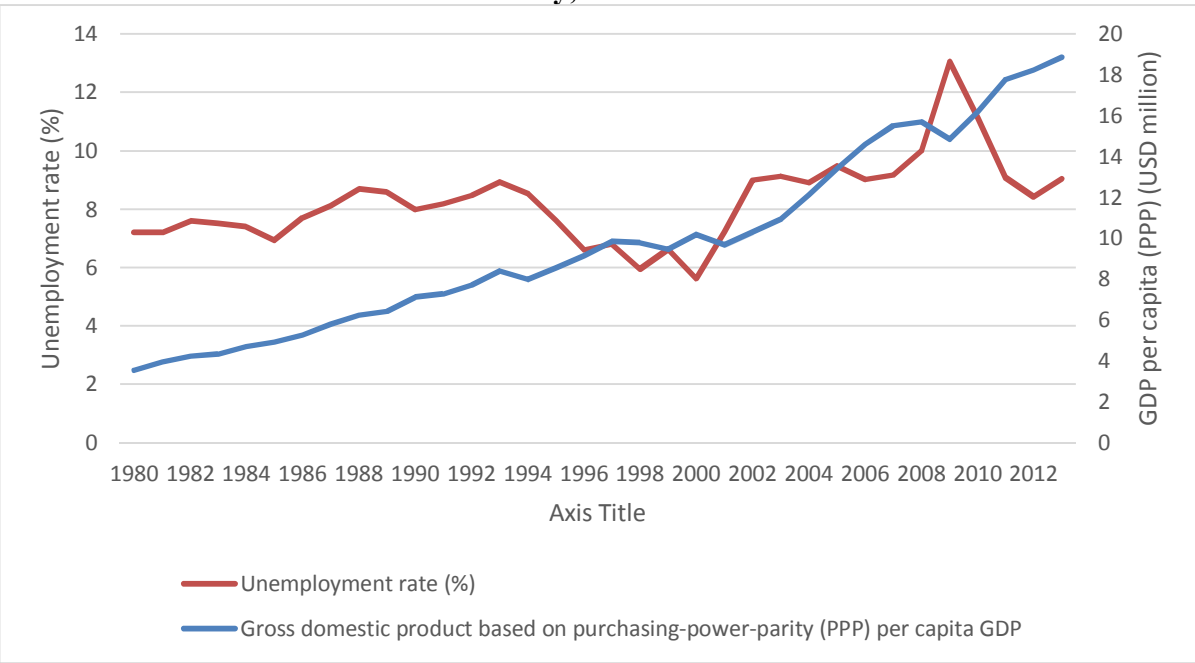
The effect on fertility is less clear as there is a quality-quantity trade-off for children (Becker & Lewis, 1973). However poor economic conditions are expected to cause fertility declines or fertility postponement. Most of the research has findings in line with these propositions.

Additionally economic crises appear to affect different groups of women differently. As mentioned before husband's employment status is important determining employment of woman. Moreover as mentioned in Section I.3.2.1 periods of economic crises affect women differently according to their educational level. Educated women (secondary or high school level of education), leave the labor market due to familial reasons such as marriage, husband's will, and household care. Among the higher educated group of women, employment rates declined. However employment of married women in the urban areas increased, mainly among low educated women due to financial problems in the family (İlkkaracan, 2010).

Figure I.3.2.4.1 presents trends in GDP per capita and unemployment rate in Turkey between 1980 and 2013. As expected when GDP per capita falls due to economic crisis -in 1994, 2001 or 2008 for instance- unemployment rates go up as well. GDP per capita has been increasing although there have been fluctuations of

interruptions around economic breakdowns. Unemployment rates responded to these interruptions considerably. Although more detailed analyses are needed to derive at a conclusion regarding how living standards affected female employment-fertility relationship; increasing unemployment and declining fertility may indicate a weakening in the relationship. However how increasing unemployment is reflected in women's employment is important to derive an a priori statement and the mechanisms should be studied at a multivariate setting.

Figure I.3.2.4.1. Gross Domestic Product (GDP) per capita and unemployment rate in Turkey, 1980-2013



Source: International Monetary Fund, World Economic Outlook Database 2014

I.4. DATA DESCRIPTION

The dataset utilized in this study belongs to 2008 Turkey Demographic and Health Survey (TDHS-2008). This survey is the fourth among DHS series in Turkey and ninth national demographic study since 1968 in Turkey. The fundamental goal of TDHS-2008 was to gather information on socioeconomic and sociodemographic components of households and ever-married women between 15 and 49.

TDHS-2008 is a household survey with weighted, multistage, stratified cluster design. TDHS-2008 covered 10,525 completed household interviews with a response rate of 88.4 percent, and 7,405 completed individual interviews with ever-married women who were 15-49 years old with a response rate of 92.5 percent.

I.5. SUMMARY OF EMPIRICAL FINDINGS

The summaries of the two studies in this thesis are presented in this section. The detailed methodology and analyses of the studies are presented in Section 2 and Section 3, separately in detail.

I.5.1. Study I: Linkages between Fertility and Employment of Women in Turkey: Conception Models Using Data from TDHS-2008

This study analyzes the effect of employment on fertility using event history analyses in Turkey. The determinants of first, second, third, and fourth and higher order conceptions are analyzed with specific reference to employment status as an explanatory variable. Moreover employment status is expanded into categories as to job characteristics to investigate whether the relationship changes according to the nature of employment. How does conception intensities evolve in time is another research question of this study. Last but not least the findings are discussed with the approach of role incompatibility hypothesis considering the institutional context in Turkey.

The study shows that in Turkey first conception occurs 8 months after first marriage, second conception takes place 2.5 years after first birth, third conception takes place 5.5 years after second birth, and higher order conceptions take place 4.6 years after previous birth. First birth is universal for ever-married women in Turkey. By 10 years after marriage, only 4 percent of women remain childless. It is observed that in past calendar periods the risks of conceiving a child have been higher; even more pronounced for transitions to parities of two and over. Relative risks of

conceptions declined considerably in time except for first conception. Descriptive results indicate that there is no significant difference between intensities of third and higher order conceptions with respect to employment status. However when job characteristics are taken into account it is observed that women employed in the agricultural sector, in private sector, in uncovered jobs or as non-wage earners have higher birth intensities, separately. According to multivariate analyses, when residential variables are controlled, employment status is an influential variable affecting the risk of conceptions of all orders. Non-employed women have 13 percent higher risk of first conception compared to employed women. Compared to employed women, relative risk of conception is 1.12, 1.10 and 1.14 for second, third and fourth and higher order conceptions for non-employed women.

These findings provide support for role incompatibility hypothesis since when the nature of the task is taken into account; a negative relationship occurs between employment and fertility of women. In jobs where roles are expected to be more compatible, higher fertility risks prevail. On the other hand, among women who work in covered jobs or in non-agricultural jobs, birth intensities are lower. Working in the agricultural sector is almost equivalent to being non-employed in terms of its relation to the risk of childbearing. Working in the public sector is associated with higher risk of second conception but lower risk of third conception compared to working in the private sector. Being non-wage earner increases the risk of conception except for fourth and higher order. Finally working in a job without any social security increases the risk of conception.

I.5.2. Study II: Linkages between Fertility and Employment of Women in Turkey: Employment Models Using Data from TDHS-2008

This study analyzes the relationship running from fertility to employment of women in Turkey using event history analyses. Determinants of employment exits and employment entries are analyzed focusing on fertility variables of parity, age of youngest child and a composite variable constructed with two former variables. Additionally how employment and non-employment intensities evolved over time is

analyzed. Last but not least the findings are discussed with the approach of role incompatibility hypothesis considering the institutional context in Turkey.

Since 1989-1995 period, both job exit and job entry intensities have been increasing in time, especially the former. Increase in risk of job exits, is especially valid for women with no children and pregnant women. Relative risks of entering employment increased after 1989-1995 period except for pregnant women and women with infants. Basic descriptive findings for the job-exit model indicated that more than half of jobs end by ten years after starting the employment in Turkey. The median duration of employment is estimated as 8.2 years overall. Descriptive findings of job-entry model indicated that employment entry intensities are low and duration of non-employment is high for ever-married women in Turkey. In ten years after start of non-employment, only 25 percent of spells end in employment. Median duration of transition from non-employment to employment is 31.3 years. Multivariate job-exit model provided mixed results with respect to fertility variables. Not all parity and age of youngest child categories appear to be significantly related to employment exits. The results indicated that once women establish themselves in the labor market, even if they have more kids, they do not exit the labor market. However pregnant women have higher risks of job exits compared to women with infants. When the child reaches at age one, the risk becomes lower compared to women with infants. Hence, job exit intensity increase appears to be a temporary phenomenon restricted to pregnancy period and infant-child period of women. The job-entry model indicated that as number of living children (parity) increases, risk of entering employment declines for non-employed women. Moreover as age of youngest child increases, risk of job entry increases. If woman is pregnant, risk of job entry is lower compared to women with infants. If woman has no child, risk of entering employment is higher compared to women with infants. These findings indicate that non-employed women do not enter jobs due to pregnancy, young children and higher parities. As the youngest child grows older; risk of entering employment increases.

Considering the context of Turkey, our findings provide support for role incompatibility hypothesis suggesting a negative relationship running from fertility to employment of women.

I.6. CONCLUDING DISCUSSION

This thesis explores the linkages between employment and fertility of women within the context of Turkey using event history analysis. Specifically it analyzes (i) how employment status and job characteristics of women are associated with first, second, third, and fourth and higher order childbearing, and (ii) how fertility of women is associated with employment entries and exits of women. Our findings indicate that conception risks of all orders are higher for non-employed women compared to employed women when we control for residential variables. Furthermore when we decompose employment with respect to job characteristics, it is observed that risk of conceptions is higher in jobs where roles are assumed to be more compatible such as jobs in the agricultural sector and jobs without any social security. The linkage running from fertility to employment appears to be as follows: Employed pregnant women (especially for their first child) or women with infants have higher risks of exiting employment. Non-employed women do not enter employment due to pregnancy, young children or higher parities. Hence more dimensions of fertility play a role keeping women away from the labor market in Turkey. These findings clearly imply a two way negative relationship between fertility and employment in Turkey.

It has been almost four decades since Stycos and Weller (1967) found no relationship between fertility and employment in Turkey due to high degree of compatibility of working and mothering roles. Our results, on the other hand, suggest that the situation changed in time. Incompatibility between roles of working and mothering should have increased in time yielding a negative relationship between the two events. According to the role incompatibility hypothesis, two mechanisms determine the level of the conflict between the two roles: (1) the organization of production (the nature of the task), and (2) the social organization of childcare. When

we look at distribution of jobs of women with respect to sector, it is observed that share of jobs in the agricultural sector has been declining considerably from 1975 to 2008 from 96 percent to 36 percent accompanied with increases in the services sector from 3 to 55 percent. Although no historical information is available related to social organization of childcare, recent figures indicate that early childhood care takes place at home and mainly by mother herself in Turkey. According to TDHS-2008 results, 31 percent of employed women who have at least one child under five years old take care of their children themselves. Institutionalization of child care is very low in Turkey with 7 percent of children attending kindergartens according to the same survey. These indicate an increasing degree of role incompatibility in Turkey, which is consistent with our findings.

We would like to elaborate on four of our findings, which are expected to propose future research questions as well:

(1) Two child norm among women employed in the public sector: Our findings revealed higher second birth and lower third birth intensities for women employed in the public sector compared to women employed in the private sector. Women employed in the public sector have higher fertility rate (2.33), even above average of Turkey (2.16) according to TDHS-2008. Women aged 40-49 employed in public sector had lower number of children ever born (1.97) compared to women employed in private sector (3.20), where the mean number of children ever born at the national level was 3.34 using TDHS-2008. These results indicate a recent increase in fertility among women employed in the public sector. The reasons of such an increase should be elaborated further, preferably in a qualitative setting.

(2) Motivations affecting working pregnant women and working women with infants to exit employment: Risk of exiting employment was found to be higher among pregnant women and women with infants, but not among women with higher parities. This indicates that expectations of these women are pessimistic in terms of combining worker and mother roles in the future. Another reason could be discrimination against these women, especially in the private sector. Qualitative

analysis in this field would be rewarding in terms of reasons motivating these women to exit the labor market.

(3) Fertility as a reason for low employment rates of women: Labor force participation of women has been declining in Turkey. The main factor for this decline was explained by increasing migration from rural to urban areas. Our findings suggest that various dimensions of fertility have been keeping women away from the labor market. These dimensions are number of living children (parity) and age of youngest child including pregnancy. Hence pronatalist policies should consider the impact of their implications on labor force participation of women as well. Reconciliation mechanisms should be developed in parallel with population policies.

(4) Selectivity of employed women compared to non-employed women due to different reactions to higher number of living children; the former group being non-responsive and the second group being responsive: Our findings indicated that employed women do not quit their jobs due to higher number of living children. On the other hand non-employed women do not enter employment and do remain inactive due to higher parities. This indicates that there should be differences between employed and non-employed women with respect to their material aspirations or orientations towards family and work.

Although our findings and the context of Turkey related to the relationship between employment and fertility of women imply support for role incompatibility hypothesis, we could not account for all aspects of the hypothesis due to data limitations. No data were available in event history setting related to social organization of childcare and use of contraceptive within marriage. We assumed that the macro context was influential shaping the relationship between fertility and employment. Hence it was attempted to speculate on implications of our micro-level findings using macro indicators. Explaining micro linkages with macro variables was kept at descriptive level. Future studies can have a more institutional approach. As Schockaert (2005) suggests:

> *"it could be said that until now, empirical studies of the relation between women's employment and fertility have sought to obtain generalizations of the following type: work of type x leads to fewer liveborn children than work of type y, controlling for z. In our view, we should move towards generalizations of the following type: work of type x and fertility evolve in opposite directions (or in parallel) via the mechanism y which can be understood by the social relations z. We would thus obtain a theoretical generalization via an institutional analysis which sheds light on the relationship between the phenomena in question."* (Schockaert, 2005, p. 166).

Having an institutional analysis, it is an interesting question whether developing countries that have not completed demographic transition will experience the same fertility-female employment relationship as their developed counterparts in the future.

CHAPTER II

LINKAGES BETWEEN FERTILITY AND EMPLOYMENT OF WOMEN IN TURKEY: CONCEPTION MODELS USING DATA FROM TDHS-2008

II.1. INTRODUCTION

How employment of women affect their fertility is a research question, whose popularity has been increasing in the last few decades. Some theories based on the linkage between fertility and employment of women, envisage a negative relationship between the two such as role incompatibility hypothesis, female autonomy hypothesis, opportunity cost hypothesis and Easterlin relative income hypothesis. Societal response hypothesis, on the other hand, suggests a positive relationship provided that changing attitudes towards working mothers, increased availability of childcare and state-authorized paid maternity leave reduce the incompatibility between childbearing and female employment. Societal response hypothesis seems to be valid for some of developed countries reflected as changing relationship between employment and fertility of women from negative to positive according to some authors, or a weakening negative relationship between the two after 1980s among OECD countries. The relationship between fertility and employment of women depends heavily on the context of analysis. That is why studies may find negative or positive relationship between the two variables. The spatial context is also important as Weller states that

> *"the relationship between female labor force participation and fertility is dependent upon the nature of the female's participation as well as the milieu in which this participation occurs. Fertility as well as labor force participation are multidimensional concepts, and the mix of these dimensions changes concomitantly with the level of modernisation. Hence the context in which female labor force participation occurs in a less modernised setting, and the demographic effects of this participation may be*

> *quite different than in a more modernised setting. The more obvious changes are those that occur in the occupational and industrial structure of the labor force and in the proportion of unpaid family workers in the labor force."*[8] (Concepcion, 1974, p. 504).

Micro level studies on the linkage between fertility and employment of women have concentrated mostly on Latin American countries. In Turkey, few studies on the effect of female employment on fertility are available and conflicting results have been found. Studies of Stycos and Weller (1967) and Isvan (1991) are pioneer studies on the relationship between fertility and women's employment in Turkey. In their study Stycos and Weller (1967) examine the relationship between fertility and employment in Turkey using data from a survey carried out in 1963. The survey covered 2,700 married couples in 240 villages (less than 2000 inhabitants), 46 towns (2,000-15,000), 21 cities of at least 15,000 population and metropolitan cities of Ankara, İstanbul and İzmir. Each married woman aged 15-45 was asked whether she worked for pay or goods in the past year, and if she had worked, whether she had done so primarily inside or outside home. They find differential fertility in Turkey; however it is associated with residence and education rather than labor force status. This finding is consistent with role incompatibility theory which suggests that no relationship between fertility and employment would occur if there is compatibility between worker and mother roles. İsvan's (1991) study find support for female autonomy hypothesis which suggests that

> *"by providing alternative sources of social identity and economic support, employment outside home could reduce women's dependence on men and children (especially sons); broaden girls' and women's social horizons, thus helping to counter family-based pronatalist pressures; increase women's desire to delay marriage (or to avoid or terminate an*

[8] R. H. Weller: "Female labor force participation, fertility and population policy", paper contributed to the 1973 General Conference of the International Union for the Scientific Study of Population, Liège, p. 2.

unsatisfactory union) and to space and limit births; and to contribute to greater sexual and reproductive autonomy." (Dixon-Mueller, 1994, p. 234)

İsvan (1991) suggests an alternative factor for the relationship between fertility and employment, having a non-neoclassical approach which assumes the household as a democratic and/or consensual unit. This factor is the women's relative power and/or autonomy. In her study, İsvan (1991), studies the case of Turkey using 1968 Survey of Family Structure and Population Issues conducted by Hacettepe University Institute of Population Studies with a sample of 4,500 households. In her model the dependent variable is the length of open birth interval in months meaning the months between the last birth and the date of the interview. This variable is an inverse measure of recent fertility. The measures of power are reproductive decision power, social decision power and economic decision power. The index of domestic autonomy, on the other hand, measures *"the degree to which the respondent is allowed to depart from Islamic norms for female behavior in the public sphere"*. The findings indicate that when the level of autonomy is controlled, the power variables have no significant effect on the strength of employment-fertility relationship. This is an expected result considering the cultural context of Turkey involves non-confrontational gender conflict resolving mechanisms.

Finally, Abbasoglu (2009) uses macro-level data to investigate the "causal" link between female labor force participation and fertility in Turkey covering the period 1968 to 2006 using Johansen-Juselius approach. She investigates the existence of long-run relationship as well as the causal link between female labor force participation and fertility in Turkey. She finds that there was an inverse long-run and a negative feedback relationship between fertility and women's employment in a multivariate setting composed of fertility, female labor force participation, infant mortality, and female illiteracy.

These three studies in Turkey differ according to their micro versus macro scope, approaches (role incompatibility hypothesis versus female autonomy hypothesis) and methodologies yielding different results. This study at hand will

employ a micro approach to study the effects of employment on fertility of women in Turkey using event history analysis. To the author's knowledge, this is the first study, which studies this linkage in a developing country context employing event history analysis. Indeed use of event history analysis when studying this linkage has been suggested by various studies. One example is Felmlee's (1984) study suggesting that

> *"Finally, event histories need to be constructed for women's fertility behavior as well as their labor force behavior, which would allow for additional investigation of the interdependence of fertility and employment activity."*

Another example is Bernhardt (1993) emphasizing:

> *"An analytical tool devised for such life-history data is the so-called hazard regression method, which has the advantage of allowing the inclusion of women who did not experience the event of interest during the period of observation. Another advantage is the possibility of incorporating so called time-varying covariates, that is variables that take on different values at different points in time (such as marital status). In analyzing transitions from one parity to another, it is for example possible to include current employment as a time-varying covariate, as was done for example by Hoem and Hoem (1989)."* (Bernhardt, 1993, p. 34)

Hence employing event history models, i.e. hazard regression method, provides various advantages.

As mentioned before, the contextual framework is fundamental shaping the relationship between fertility and employment. Turkey's labor market is characterized by low female labor force participation rates (Table II.1.1). In Turkey, three patterns regarding labor market are observed since 1988: (i) male labor force participation rates are higher than female rates, (ii) rural labor force participation

rates are higher than urban rates, and (iii) male-female differential is higher in urban areas than in rural areas (Tunalı, 2003). The gender gap in the labor market is striking in Turkey. Regarding low female labor force participation rates İlkkaracan (2010), argues that there are two reasons of the gender gap in employment: women's low level of education and gendered cultural patterns. The lack of reconciliation mechanisms interact with these two factors leading to gender gap in employment and socioeconomic inequalities within women and families. These two factors and their interactions with lack of reconciliation mechanisms feed these inequalities and fed by those inequalities creating a trap.

Table II.1.1. Labor force participation rate for non-institutional population by year and sex (15 + age), Turkey 1988-2013

Year	*Male*	*Female*	*Total*	*Year*	*Male*	*Female*	*Total*
1988	81.2	34.3	57.5	*2001*	72.9	27.1	49.8
1989	80.6	36.1	58.1	*2002*	71.6	27.9	49.6
1990	79.7	34.1	56.6	*2003*	70.4	26.6	48.3
1991	80.2	34.1	57.0	*2004*	70.3	23.3	46.3
1992	79.6	32.7	56.0	*2005*	70.6	23.3	46.4
1993	78.0	26.8	52.1	*2006*	69.9	23.6	46.3
1994	78.5	31.3	54.6	*2007*	69.8	23.6	46.2
1995	77.8	30.9	54.1	*2008*	70.1	24.5	46.9
1996	77.3	30.6	53.7	*2009*	70.5	26.0	47.9
1997	76.7	28.8	52.6	*2010*	70.8	27.6	48.8
1998	76.7	29.3	52.8	*2011*	71.7	28.8	49.9
1999	75.8	30.0	52.7	*2012*	71.0	29.5	50.0
2000	73.7	26.6	49.9	*2013*	71.5	30.8	50.8

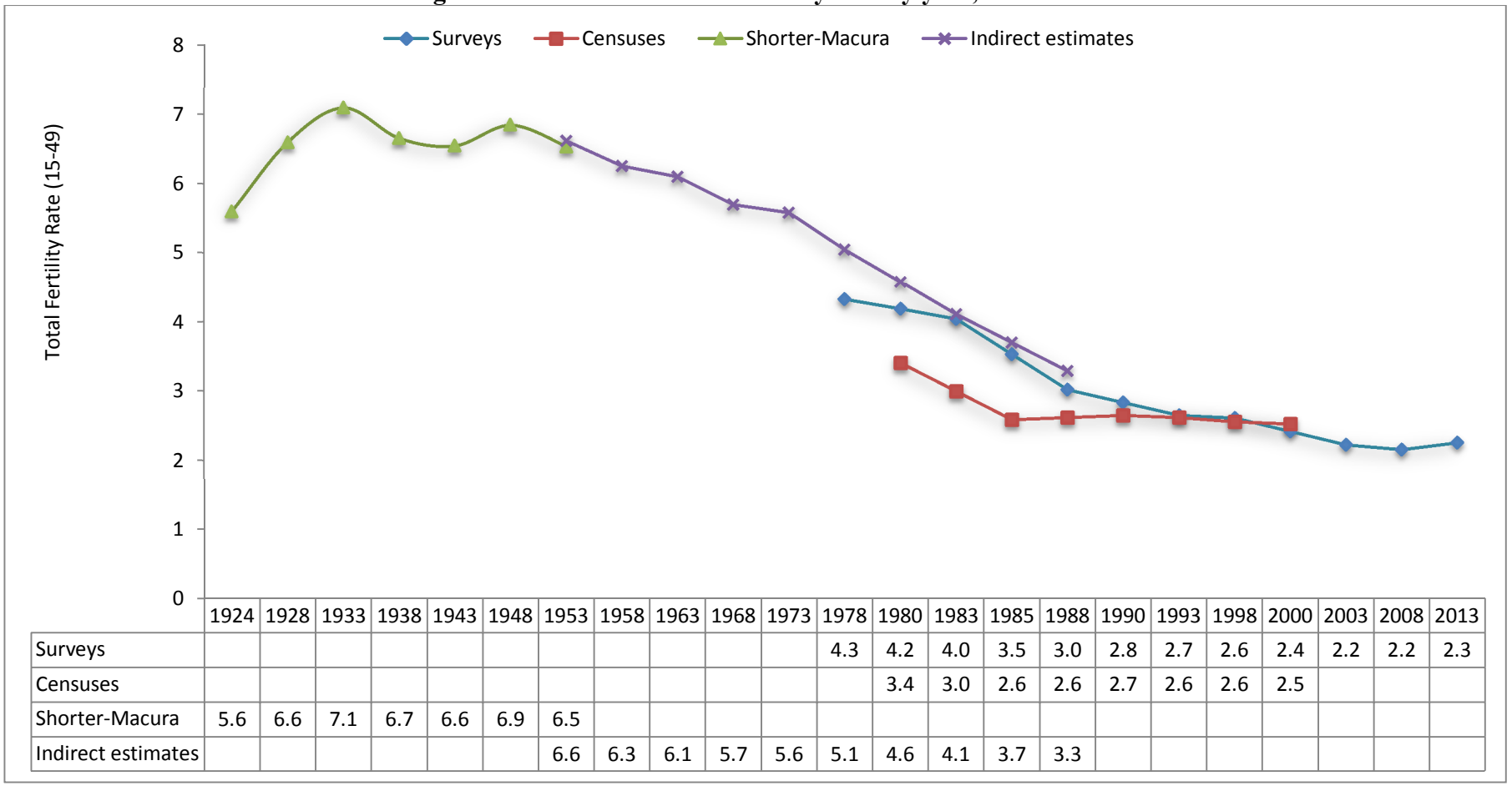
Source: Turkish Statistical Institute (TURKSTAT) (2014), Labor force statistics database

In Turkey, fertility rate has been declining in time as presented in Figure II.1.1. Fertility decline gained pace after 1970s and total fertility rate reached level 4 by mid-1980s (mid-late transition) and level 3 by second half of 1980s (late transition). According to the results of TDHS-2013, fertility rate is just above replacement level with the level of 2.26. Female labor force participation has not been among triggers of fertility transition. Instead, female education and urbanization were among structural factors that were associated with the onset of fertility transition in Turkey.

Turkey is a country with passive family policies despite new initiatives to switch it to active familialistic policies. Additionally male bread-winner model has been the main family model in Turkey in history and currently. Additionally enrollment rate of pre-school age children in kindergartens is low and mostly mothers take care of their children less than five years of age while working. Moreover values and norms in Turkey favor low employment rates of women and child care and house-related work are expected to be carried out by women according to these norms. These contextual influences suggest a role incompatibility between working and mothering roles of women and it can be said that reconciliation mechanisms have not yet been so developed in Turkey. Having an approach of role incompatibility hypothesis, the following research questions are analyzed:

- What are the main factors affecting first, second, third, and fourth and higher order conceptions focusing on employment status of women? How women's employment status is related to these fertility events?
- How are job characteristics related to progression to first, second, third, and fourth and higher order conceptions?
- How do trend of births of different orders evolve over time? What may be the factors that shaped this trend?
- How do the findings provide support for role incompatibility hypothesis in Turkey taking into consideration the institutional context in Turkey?

Figure II.1.1. Trends in total fertility rate by year, 1924-2013



	1924	1928	1933	1938	1943	1948	1953	1958	1963	1968	1973	1978	1980	1983	1985	1988	1990	1993	1998	2000	2003	2008	2013
Surveys												4.3	4.2	4.0	3.5	3.0	2.8	2.7	2.6	2.4	2.2	2.2	2.3
Censuses													3.4	3.0	2.6	2.6	2.7	2.6	2.6	2.5			
Shorter-Macura	5.6	6.6	7.1	6.7	6.6	6.9	6.5																
Indirect estimates							6.6	6.3	6.1	5.7	5.6	5.1	4.6	4.1	3.7	3.3							

Source: SIS, 1995; HUIPS, 1999; 2004; 2009; 2014 modified from Koç et al., 2010

II.2. FERTILITY BY EMPLOYMENT STATUS OF WOMEN IN TURKEY

In this section fertility indicators by employment status of women in Turkey is presented using TDHS-2008 data. Total fertility rates[9] of non-employed women in last three years (never employed women and non-employed women in last 3 years) are higher than fertility rates of employed women in last three years (Figure II.2.1). Fertility rate of employed women is below replacement level with the level of 1.67. Among employed women in last three years, there are differences related to job characteristics[10]. Women working in the agricultural sector (2.17) have higher fertility rates than women employed in other sectors. Women working in the public sector (2.33) have higher fertility than women employed in the private sector (1.59). This is expected as public sector provides more stable and regular employment positions for women, which may provide a financial guarantee for women to progress to higher order births. Total fertility rate of non-wage earners (1.92) is higher than that of wage-earners (1.51). Most of these women are unpaid family workers working in the agricultural sector. Considering that roles of mothering and working are more compatible in the agricultural jobs, this result is expected, as well. Finally related to the social security coverage of the job, there are slight differences between fertility rates of women working in uncovered and covered jobs. Total fertility rate of women working without any social security (1.74) is higher than that of women working with social security (1.52). Women in all categories of employment except women working in agricultural sector and public sector, have fertility rates below national level of 2.16. These findings indicate there are fertility differentials according to employment status of women in general, and job characteristics which favor compatibility between worker and mother roles encourage fertility except jobs in the public sector.

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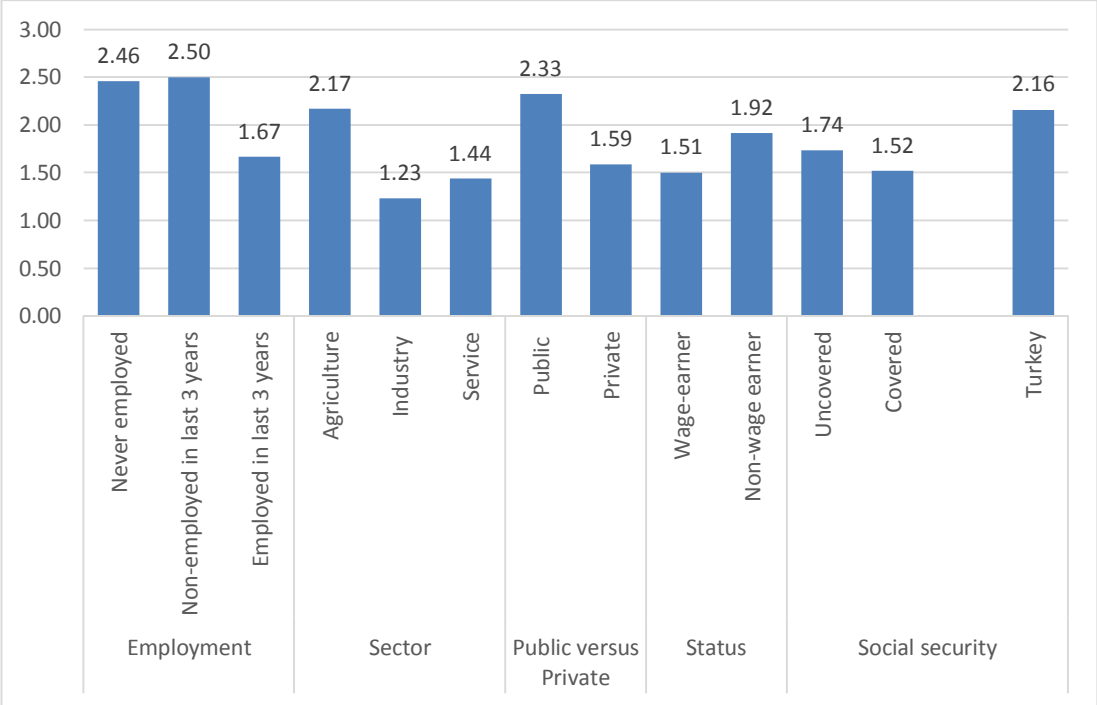
[9] For the last three years before TDHS-2008. Total fertility rate (TFR) is computed by summing the age-specific fertility rates and multiplying them by the age interval (5). TFR is defined as the number of children a woman would have by the end of her childbearing years assuming that she would experience the currently observed age-specific rates. TFR is a period measure of fertility and represents the current situation in fertility.

[10] For the last job in last three years.

Figure II.2.1. Total fertility rates by employment status, TDHS-2008

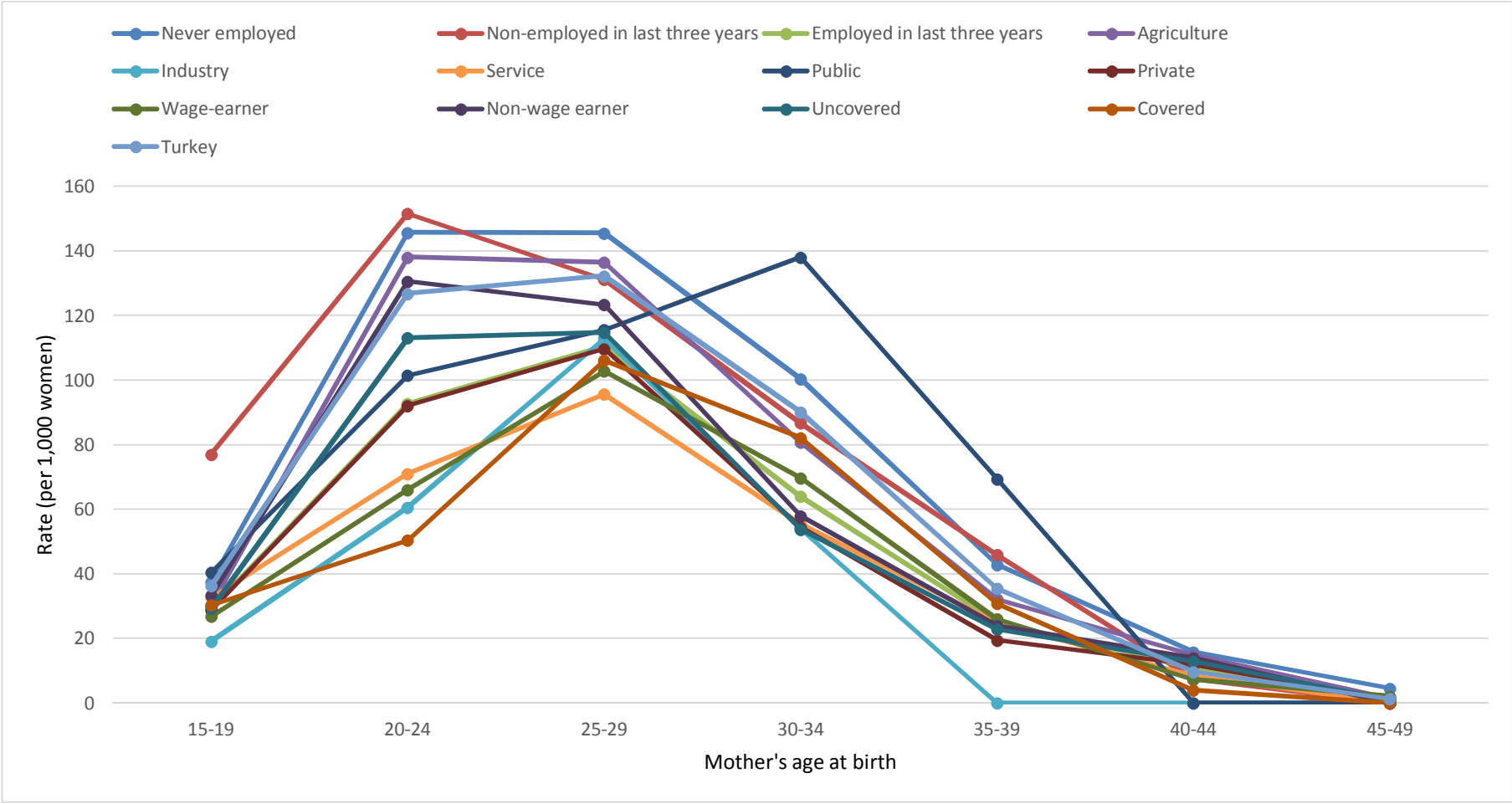


The age pattern of fertility is reflected by age-specific fertility rates. Age specific rate of fertility is computed by dividing the number of births to women in a specific age group during the three-year preceding the survey by number of women-years of exposure during the same period. Age specific fertility rates according to employment status of women are presented in Table II.2.1 and Figure II.2.2. It is observed that main reproductive years of women in Turkey are their twenties except for women employed in the public sector. The age group at which fertility peaks is 25-29 in Turkey by 2008. However according to employment status or job characteristics, this peak age group changes: for never employed or non-employed women in last three years, women working in the agricultural sector, and non-wage earner employed women the peak age group is 20-24. Three exceptional patterns are observed for ever-employed women non-employed in last three years, women working in the public sector and in industry sector. The delay in motherhood is observed among women working in the public sector, at which the age group that fertility peaks is 30-34.

Table II.2.1. Age-specific fertility rates per 1,000 women for three years preceding the survey by employment status, TDHS-2008

	Mother's age at birth	*15-19*	*20-24*	*25-29*	*30-34*	*35-39*	*40-44*	*45-49*	*TFR*
Employment	Never employed	38	146	146	100	43	16	5	2.46
	Non-employed in last three years	77	152	131	87	46	7	0	2.50
	Employed in last three years	29	93	111	64	25	11	1	1.67
Public versus private *Sector*	Agriculture	30	138	137	81	32	15	1	2.17
	Industry	19	61	113	54	0	0	0	1.23
	Service	33	71	96	55	25	8	0	1.44
	Public	40	101	116	138	69	0	0	2.33
	Private	29	92	110	55	20	12	1	1.59
Status	Wage-earner	27	66	103	70	26	7	2	1.51
	Non-wage earner	33	131	123	58	24	14	0	1.92
Social security	Uncovered	29	113	115	54	23	13	1	1.74
	Covered	30	50	106	82	31	4	0	1.52
	Turkey	36	127	132	90	36	10	1	2.16

Figure II.2.2. Age-specific fertility rates per 1,000 women for three years preceding the survey by employment status, TDHS-2008

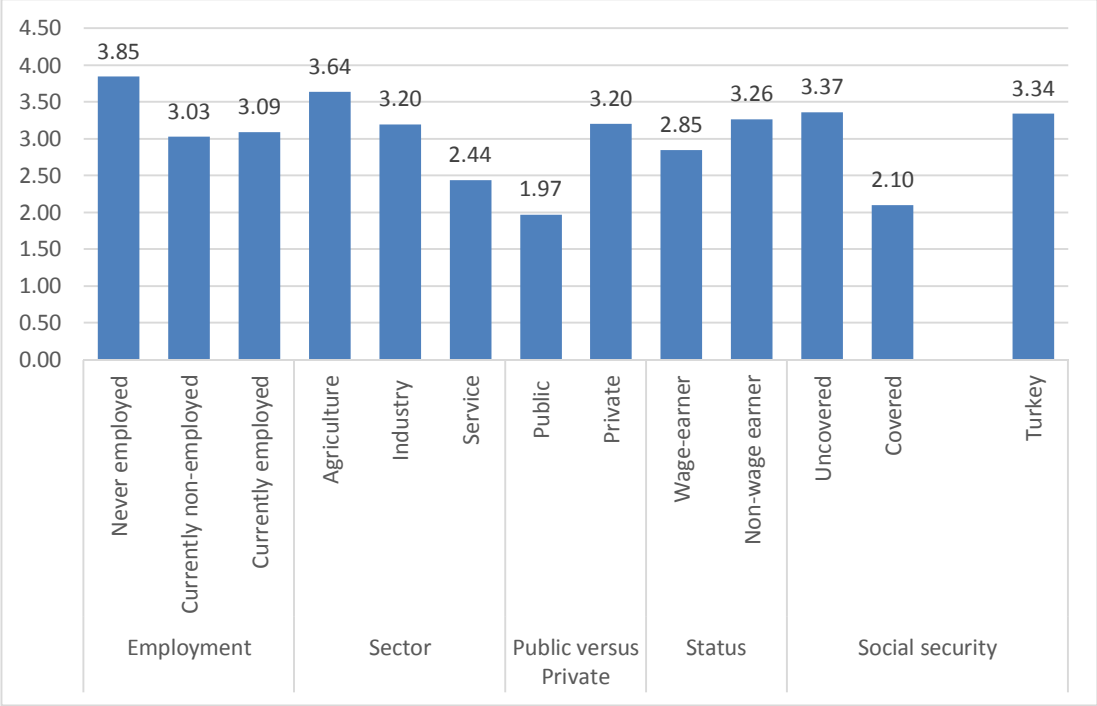


Mean number of children ever borne[11] by the group of women of age 40-49 can be computed by dividing the total number of children borne by women in the age group 40-49 by the total number of women in this age group. Generally CEB is calculated for this age group of women as they have already completed their fertility. It is observed that mean number of children ever born is 3.34 children to women aged 40-49 (Figure II.2.3). Women working in the public sector and working in covered jobs have the lowest number of children.

The difference between total fertility rate and mean number of CEB to women age 40-49 should be low if fertility levels have been stable in time. If fertility levels have been falling, the total fertility level should be low compared to mean number of CEB. The overall difference is 1.18 representing a decline in fertility level in last few decades. The largest decline has been observed among women employed in industry sector or working in uncovered jobs or in private sector. An increase in fertility occured among women employed in the public sector according to this simple comparison.

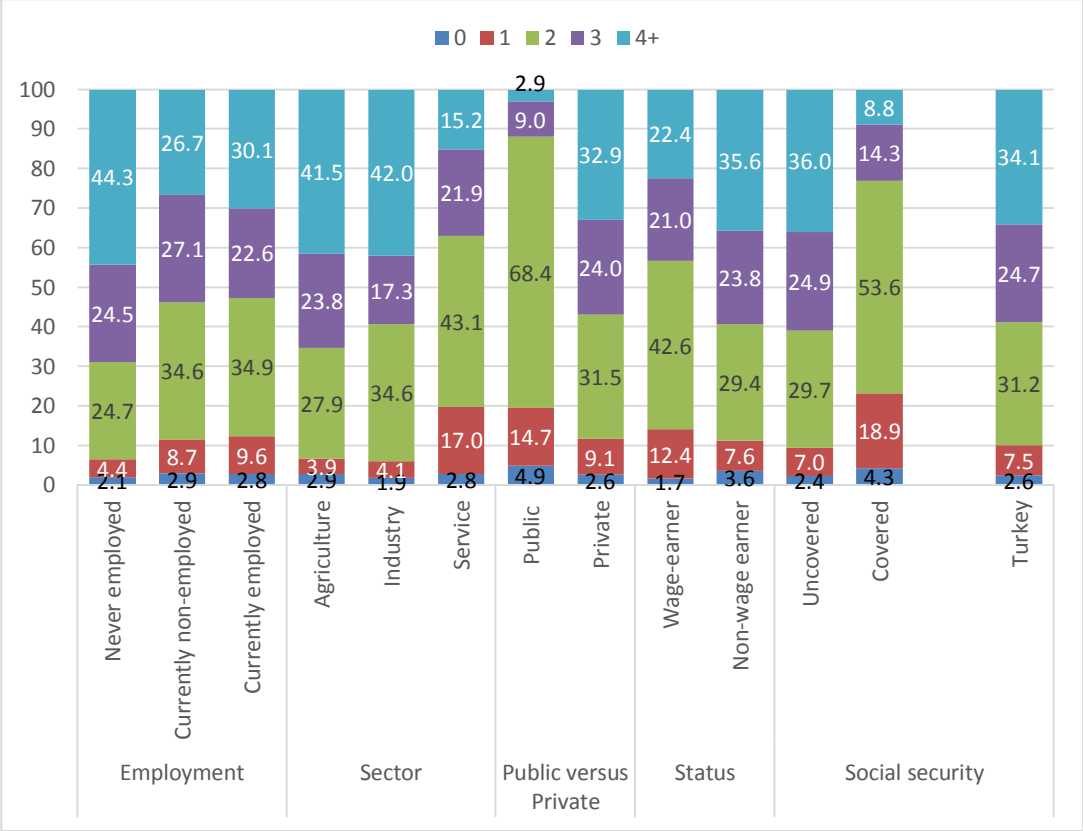
[11] The number of children ever born to a particular woman is an aggregate measure of her lifetime fertility experience up to the moment at which the data are collected. This number gives no information about timing as age, duration of marriage or calendar years.

Figure II.2.3. Mean number of children ever born to women age 40-49 by employment status, TDHS-2008



A more detailed analysis of CEB would involve percent distribution of total CEB to women age 40-49 presented in Figure II.2.4. It is observed that share of childless women in all categories is very low with 2.6 percent in Turkey. Share of women with only one-child is higher among women employed in covered jobs or in public or in service sector. Among employed women two-child norm is prevalent except among women working in the agricultural sector, industry sector, private sector, non-wage earner jobs or uncovered jobs. In these categories of women four or above children has the highest share. Proportion of four or above children ever born is 42 percent among women employed in agricultural sector, 42 percent in industry sector, 33 percent in private sector, 36 percent among non-wage earners and 36 percent among women working in uncovered jobs. Among never employed women this share rises to 44 percent.

Figure II.2.4. Percent distribution of total children ever born to women age 40-49 by employment status, TDHS-2008



Fertility levels by employment status indicate that there are discrepancies between employed women and non-employed women, where non-employed women have higher fertility. Job characteristics appear to be associated with fertility levels as well. Both cumulative and current measures of fertility differ according to job characteristics. It is observed that women employed in agricultural sector, working as non-wage earners with no social security have higher fertility. Women employed in public sector used to have lower fertility, however their current fertility rate is higher than those employed in private sector.

II.3. DATA AND METHODS

This chapter in the first place presents the data source of this study including a section on data quality. Secondly the method of analyses, namely event history analysis will be introduced in detail. The methodology part includes the dependent and independent variables of analyses as well.

II.3.1. Data Source of the Study

The dataset utilized in this study belongs to 2008 Turkey Demographic and Health Survey (TDHS-2008). This survey is the fourth among DHS series in Turkey and ninth national demographic study since 1968 in Turkey. The fundamental goal of TDHS-2008 was to gather information on socioeconomic and sociodemographic components of households and ever-married women between 15 and 49.

TDHS-2008 is a household survey with weighted, multistage, stratified cluster design. The fieldwork of TDHS-2008 took place between October and December 2008. TDHS-2008 covered 10,525 completed household interviews with a response rate of 88.4 percent, and 7,405 completed individual interviews with ever-married women who were 15-49 years old with a response rate of 92.5 percent.

The Household Questionnaire and the Individual Questionnaire are the questionnaires utilized in the survey. In the household questionnaire, information was gathered primarily on socio-demographic characteristics of household members such as age, sex and education in addition to the household facilities. In the Individual Questionnaire, which was applied to ever-married women between 15 and 49, questions about migration, marriage, contraception, pregnancy, birth, pre- and post-natal care and employment were included.

The event history modules were increased in number in this survey. Some other modules such as never-married women and elderly people are also new modules used in this survey.

This thesis makes use of mainly event history modules of TDHS-2008. Traditionally, histories of specific events of birth and marriage have been collected in DHSs. Migration histories were collected in some DHS in Turkey. TDHS-2008 was the first survey, which included employment histories of women in addition to all these information. This study makes use of that rich retrospective information on ever-married women.

II.3.1.1. Data Quality

Since TDHS-2008 is the first TDHS that includes employment history module, data required cleaning in terms of chronological flow of the events. Altough, event histories for migration and employment were edited at a large extent, marriage module required less cleaning. In this section data quality for selected events are presented with unweighted data figures.

Among 7,405 ever-married women, 41 had some missing/unknown information about the year of start or end of employment episode. These cases had been dropped as employment is among our primary variables of analyses.

Due to some intersections of job episodes in some part of women's life, some adjustments had to be carried out. Job history of 119 cases, which referred to 1.6 percent of total, and 2.9 percent of ever-employed women, had to be rearranged so that at each time only one job existed. In addition to this adjustment, manually some month entry and/or exit data were rearranged looking at answers of other question of: "how long have you worked in this job?". These cases were 240 in numbers, which amounted to 3.3 percent of total and 5.9 percent of ever-employed women. After these adjustments, imputations were carried out assuming the months were randomly distributed. According to Table II.3.1, among 4,084 ever worked women 16 percent of women had missing information regarding month of their first job entry. Among women who worked in at least two jobs, 9 percent provided no information regarding their second job entry. As it is seen the proportion of unknown

dates increase as one moves backwards in history. First job, which is the oldest job, has the highest share of imputed months.

Table II.3.1. Employment history module month imputations

Job entry			*Job exit*		
Job order	*Percent*	*Number*	*Job order*	*Percent*	*Number*
1	16.11	4,084	1	12.97	2,644
2	9.18	1,122	2	9.39	639
3	7.85	344	3	6.53	199
4	8.11	111	4	11.11	63
5	(7.89)	38			

Note: Percentages for higher order jobs are not shown due to number of observations less than 25.

After imputations, still some adjustment had to be carried out as some end of months could be before start of the next job. These cases added up to 47 cases, 0.6 percent of all cases and 1.2 of ever-employed women. In an iterative setting, imputations were re-carried out assuming the months were randomly distributed.

Event histories of migration required less data cleaning. Migration histories of 27 cases were corrected. Years of 7 cases were derived looking at other questions such as "how long did you stay at this place?" and "what was the reason for your migration?". 5 cases had to be dropped as it was impossible to derive the year of migration. Imputations related to migration history were carried out taking into account the question of *"For how long did you live in .....?"* (conditional imputations).

Table II.3.2. Migration history module month imputations

Migration order	*Percent*	*Number*
1	6.1	4148
2	5.91	1320
3	4.9	531
4	4.63	216
5	1.05	95
6	(2.63)	38

Marriage history was the data, which required the least cleaning. 35 cases with unknown years of first marriage end were dropped (other dates of marriage related events included no missing cases). Years of 2 cases were derived, and some imputations for missing or unknown months were carried out accordingly (Table II.3.3):

Table II.3.3. Marriage history module month imputations

Marriage start			*Marriage end*		
Marriage order	*Percent*	*Number*	*Marriage order*	*Percent*	*Number*
1	0.38	7,324	1	9.02	499
2	4.95	182			

Finally conceptions that took place before marriage (316 observations) and marriages that took place before the age of twelve (31 observations) were dropped. The final data set involved 6,977 ever-married women.

4.1 percent of women had pre-marital conceptions according to TDHS-2008 results. The factors that differentiated pre-marital conception and pre-marital births from others are analyzed as well. The shares of these groups were not too low: 3 percent of ever-married women had pre-marital conception and marital births. One percent of women had pre-marital conception and pre-marital birth.

Table II.3.4. Marital and pre-marital conceptions, TDHS 2008

	Weighted percentage	*Unweighted count*
no pre-marital conception	95.8	6,417
pre-marital conception and marital birth	3.0	231
pre-marital birth	1.1	88

Note: Women who had births before age 12 and childless women are excluded.

A multinomial model where dependent variable was (0, 1, 2) for (no pre-marital conception, pre-marital conception and marital birth, and pre-marital birth) was run. The results are presented in Table II.3.5:

Table II.3.5. Determinants of having pre-marital conception and pre-marital birth compared to having marital conception according to multinomial regression results (odds ratios)

	Pre-marital conception		Pre-marital birth	
Age at birth				
12-16	2.08	***	4.09	***
17-21	*1.00*		*1.00*	
22-26	0.82		1.14	
27-44	0.47	*	0.28	
Calendar year (birth)				
1972-1987	*1.00*		*1.00*	
1988-1994	1.24		0.90	
1995-2001	1.08		0.47	**
2002-2008	0.32	***	0.02	***
Completed education				
No educ/Prim incomplete	2.80	**	1.83	
Primary	1.46		0.46	
Secondary	2.21		1.06	
High school or higher	*1.00*		*1.00*	
Parental Education				
Mother and father uneducated	1.20		0.65	
Mother educated father uneducated	0.85		0.67	
Mother uneducated father educated	1.12		0.54	
Mother and father educated	*1.00*		*1.00*	
Mother Tongue				
Turkish	*1.00*		*1.00*	
Kurdish	0.89		0.61	
Other	1.06		0.00	***
Childhood place of residence				
Urban	*1.00*		*1.00*	
Rural	1.28		0.93	
Abroad	0.95		0.00	***
Region during childhood				
West	*1.00*		*1.00*	
South	0.86		0.91	
Central	0.86		1.27	
North	1.06		1.65	
East	1.14		2.52	*
Relationship to partner				
None	*1.00*		*1.00*	
Relatives	0.98		0.86	

(Table II.3.5 continued)

	Pre-marital conception	Pre-marital birth
Constant	0.02	0.02
Number of observations	6736	
F (50, 6686)	184.38	
Prob>F	0.00	

Note: Women who had births before age 12 and childless women are excluded as our variable of interest is conception.
Statistical significance: ***: $p \leq 0.01$, **: $p \leq 0.05$, *: $p \leq 0.10$.
Source: Estimations based on TDHS-2008.

The results indicate that premarital conception is not an ideational phenomenon as it is a consequence of second demographic transition in Europe. In Turkey pre-marital conception has been declining since 2002 and pre-marital birth since 1995. Pre-marital conception is more likely among young women age 12-16, and less likely among women age over 27. Finally having pre-marital conception is 2.8 times more likely among women with no education or primary incomplete level of education compared to women with high school or higher level of education. In our bivariate models, we see that likelihood of pre-marital conception was more common in the past, is higher at younger ages, among women educated less than high school, among Kurdish women, higher in rural areas, in regions other than West, especially East, among females with low educated-parents, and among couples who are relatives, separately. These results suggest that concept of marriage might have been misunderstood at TDHS-2008 as the respondents, especially uneducated respondents, might have understood the concept of marriage as a marriage with a ceremony (civil or religious). Instead TDHS-2008 took marriage as cohabitation or living together without the necessity of a ceremony. Due to these facts women with pre-marital conceptions were excluded from the analyses of conceptions.

II.3.2. Methodology

Event history models are statistical methods that analyze the "*occurrence and timing of events*" (Allison, 1995). Modern methods of event history analyses were developed since late 1950s and early 1960s (Allison, 1984). In the biomedical sciences, the method was named as survival analysis or lifetime analysis, for instance studying how long animals survive under each treatment to different doses of toxic substance. Engineers are interested in breakdown of machines and electronic components naming the analysis as reliability analysis or failure time analysis. In the late 1960s and early 1970s the theory of Markov processes to social science data emerged. Then Tuma (1976) introduced explanatory variables into continuous time Markov models. More recently all three approaches (in sociology, biostatistics and engineering) have focused on regression models in which the occurrence of an event depends on a function of explanatory variables rather than distributional methods (such as life table methods). Additionally social scientists have focused on repeated events since most of the events they study can occur many times over the lifetime of an individual (Allison, 1984). Social scientists may call the analysis as time-to-event analysis as well. In this study we call the method as event history analysis.

Events and their causes are of interest in every field of social sciences. Demographers focus on events of births, deaths, marriages, divorces and migration. An event is a qualitative change that occurs at a specific point in time. A gradual change in a quantitative variable is not called an event. Event history data collection is the most appropriate approach to examine the events and their causes. An event history setup is the longitudinal record of events that happened to a sample of individuals. For instance a survey can ask the respondents the dates of their marriages. In order to study the causes of events the event history should also include data on possible explanatory variables. These variables may be constant over time such as mother tongue or they may be time-varying such as income.

However event histories have two features that create major problems for standard statistical methods such as multiple regression. These two features are

censoring and time-varying explanatory variables. Using multiple regression method with the dependent variable as the length of time until the event occurs causes unknown or censored dependent variable values for the persons who do not experience the event during the observation period. Excluding the censored cases or having the maximum length of time for censored cases would cause large biases in a multiple regression. Additionally including explanatory variables that change value during the observation period would be problematic. One solution would be having different variables for each observation period. However for the ones who fail (experience the event) prior to the last period, the variables after the failure month would be irrelevant to the analysis. Censoring and time varying explanatory variables are typical features of event history data that should be handled (Allison, 1984). Another problem with using ordinary least squares to analyze survival data is the assumed distribution of the error term (residuals). In linear regression, the residuals are assumed to be distributed normally. Normality of time to an event is unreasonable (Cleves et al., 2008). As Cleves et al. (2008, p. 2) note:

> *"At its core, survival analysis concerns nothing more than making a substitution for the normality assumption characterized by OLS with something more appropriate for the problem at hand."*

Another issue event history models address is the selectivity in birth order analysis. Selectivity arises from the fact that parity progression from *i* to *i*+1 can only be studied for women who have had at least *i* parity, who are selected on a number of characteristics. Among younger cohorts and higher order parities selectivity is an important issue. One solution for selectivity would be constructing life tables by birth order for some categories of control variables such as age at previous birth, length of previous birth interval, time from first birth to previous birth or duration of motherhood. However carrying out analyses for such subgroups causes small sample sizes leading to unreliable estimates (Rodriguez et al., 1984). Additionally by using life table or Kaplan Meier techniques (which will be explained in this section afterwards) it is not possible to take into account age, education, calendar period or other socioeconomic and demographic variables simultaneously. Regression analysis

would include such list of variables, however as mentioned before censoring and use of time varying variables become a problem in that case.

Event history models combine the basics of life table analysis and regression analysis. Both the proportion (quantum) and timing (tempo) of events are considered in event history models. Additionally this can be done by modeling a function with one or more explanatory factors.

II.3.2.1. Survival Function

Duration in a state is a nonnegative random variable, denoted by *T*. The cumulative distribution function of *T* is denoted *F(t)* and density function if differentiable is *f(t)=dF(t)/dt*. Then the probability that the duration or spell length is less than *t* is

$$F(t) = Pr[T < t] = \int_0^t f(s)ds$$

Survival function is defined as the complementary/reverse of the cumulative distribution function which is the probability that duration equals or exceeds t, defined by (Cleeves et al., 2008)

$$S(t) = Pr[T \geq t] = 1 - F(t)$$

An important objective of survival analysis is to estimate survival or survivorship function, which is denoted by *S*. The survivor function reports the probability of surviving beyond time t. Put differently it is the probability that there is no failure event prior to *t (*Cleeves et al., 2008*)*.The function is equal to one at *t=0* and decreases toward zero as *t* goes to infinity. The survivor function is a monotone, non-increasing function of time.

Descriptive survival analysis techniques such as life table method and Kaplan-Meier estimation (product-limit-estimate of *S(t)*) provide nonparametric and univariate estimate of the survival function. These nonparametric analyses follow the philosophy of "*letting the dataset speak itself*".

For a dataset with observed failure times, $t_1, \ldots, t_k$, where k is the number of distinct failure times observed in the data, the Kaplan-Meier estimate at any time t is given by (Cleves et al., 2008)

$$\hat{S}(t) = \prod_{j|t_j \leq t} \left(\frac{n_j - d_j}{n_j} \right)$$

where n_j is the number of individuals at risk at time t_j and d_j is the number of failures at time t_j. The product is over all observed failure times less than or equal to t. For instance for studying the progression from kth to k+1th birth, nj is the number of women at risk of k+1th birth at time t_j and d_j is the number of k+1th births at time t_j. Kaplan-Meier survival function is a step function with steps as the points in time, t_j.

In this study, Kaplan-Meier method will be employed to explain fertility events in Turkey.

II.3.2.2. Hazard Function (Conditional Failure Rate, Hazard Rate, Intensity Function or Force of Mortality)

Hazard function is defined as the instantaneous probability of leaving a state conditional on surviving to time t. This is defined as

$$h(t) = \lim_{\Delta t \to 0} \frac{Pr[t \leq T < t + \Delta t | T \geq t]}{\Delta t} = \frac{f(t)}{S(t)}$$

The hazard rate ranges from zero to infinity. Zero hazard rate points out no risk while infinity implies the certainty of failure instantly. Over time the hazard rate can increase, decrease, remain constant or even take on more serpentine shapes. The hazard rate can be calculated simply by dividing occurrences to exposures.

II.3.2.3. Proportional Hazard Models

Hazard models assume that hazard rate (dependent variable) is dependent on duration since the onset of exposure and on a set of independent variables. The most commonly applied model is the Cox proportional hazard model. The Cox model (Cox, 1972) asserts that the hazard rate for the j^{th} subject in the data is:

$$h(t|x_j) = h_0(t)\exp(x_j\beta_x)$$

where $h_0(t)$ represents the baseline hazard function, x_j represents a vector of explanatory and control variables used in the analysis, and β_x the corresponding vector of the regression parameters that indicate the effect of variables. The coefficient set of β are estimated by the maximum likelihood methods. In this expression above, the first part is called the baseline hazard function, which represents the effect of time since onset of exposure, for first birth marriage; for second birth first birth; for third, second birth, and for fourth and higher order births, births of previous child. The baseline hazard is the hazard at $x_j=0$. If all covariates are categorical, $h_0(t)$ is the hazard for individuals in the reference (baseline) category of each variable. For this reason is often referred to as the baseline hazard (Steele, 2005). The second component indicates that the hazard rate is associated with values of given covariates.

A feature of the Cox proportional hazards regression model is that $h_0(t)$, the baseline hazard, is given no specific parametrization and can be left unestimated. In other words, the model makes no assumptions about the shape of the hazard over

time. Additionally one subject's hazard is a multiplicative replica of another's; comparing subject *j* to subject *m*, the model states that

$$\frac{h(t|x_j)}{h(t|x_m)} = \frac{\exp(x_j\beta_x)}{\exp(x_m\beta_x)}$$

which is constant, assuming the covariates x_j and x_m do not change over time (Cleves et al., 2008).

The exponents of the regression coefficients β ($exp(\beta)$) can be interpreted as relative risks. To illustrate the interpretation of parameters of the model, suppose we have a single covariate *x* which is coded 0 or 1. We obtain

$$h(t|x = 0) = h_0(t)$$
$$h(t|x = 1) = h_0(t)\exp(\beta),$$

So e^{β} is the ratio of hazard for x=1 to the hazard for x=0. e^{β} is referred to as the relative risk or hazard ratio. When *x* does not affect the hazard, β is zero or $\exp(\beta) = 1$. If β is greater than zero or $\exp(\beta) > 1$, the hazard of the group with *x*=1 is higher, compared to that of the group with *x*=0. If β is less than zero or $\exp(\beta) < 1$, the hazard of the group with *x*=0 is higher. For continuous *x*, the hazard changes by a factor of e^{β} for each 1-unit change in *x* (Steele, 2005).

II.3.2.4. Piecewise Constant Proportional Hazard Regression Models

Hazard models differ according to assumptions regarding the shape of the baseline hazard. In the Cox model, $h_0(t)$ is left unparameterized. In the parametric approach, a functional form for $h_0(t)$ is specified. The exponential model is the simplest parametric model assuming the baseline hazard to be constant:

$$h(t|x_j) = h_0 \exp(x_j\beta_x)$$

Often an in between approach is more appealing. The piecewise constant exponential model is the model most commonly used for doing this (in a continuous time modelling framework). The hazard is assumed constant within pre-specified survival time intervals but the constants may differ for different intervals. It allows for a flexible modeling of the baseline hazard. One can generalize this specification to have a constant hazard within each of j intervals along the survival time axis (Jenkins, 2005):

$$h_0(t) = \begin{cases} h_1, & t \in (0, \tau_1] \\ h_2, & t \in (\tau_1, \tau_2] \\ \quad \vdots & \\ h_j, & t \in (\tau_{j-1}, \tau_j] \end{cases}$$

Hence the piecewise constant proportional hazard model can be viewed as an exponential model which controls for duration or age as a time-varying covariate. Basic time factor is partitioned into several segments, where hazard rates are assumed to be constant within each of these segments, but can change between them.

II.3.2.5. Repeated Events

Most events social scientists study are repeatable and most event history data involve repeated events for each individual such as births, marriages, job changes, divorces, etc. If the process is not the same across successive events, each event can be analyzed separately. However if the process is the same across these events, each interval between events for each individual can be treated as a separate observation. These intervals/spells can be pooled over all individuals.

However such a model has implicit assumptions. First assumption is that the dependence of the hazard on time since last event has the same form for each successive event. In proportional hazards model of births, for instance, although the

hazard function is unspecified, it must be the same function for the first birth, the second birth, and so on. This assumption can be relaxed by letting the function of baseline hazard to be different for each successive interval by using the method of stratification[12]. Second assumption is that for each individual, the multiple intervals must be statistically independent. For instance in general, one would expect that people who have short birth intervals, will continue to give birth frequently. As long as the explanatory variables in the model account for the dependence, this does not violate the assumption of independence. However in most cases, independence assumption is false, at least to some degree. This leads to (i) still asymptotically unbiased coefficient estimates, but (ii) standard error estimates biased downward (Allison, 1984). Hence the repeated events only affect the variance of the estimates, not the means. To minimize the consequences of violating the independence assumption, additional explanatory variables that represent characteristics of individual's prior event history can be used. The simplest of such variables are number of prior events and length of previous interval.

In our model of conceptions of order four and higher, we have multi-episode data and we need to correct for standard errors in our multivariate analysis. Multi-episode data (birth history data) contain information on more than one event for each individual and special methods are needed to take advantage of this additional information and to deal with the problems that may arise. As Allison (2010) notes, if repeated events are observed for an individual, the standard strategy is to reset the clock to 0 each time an event occurs and treat the intervals between events as distinct observations. Thus, if a person is observed to have two births of order higher than three over a five-year interval, three observations would be created. The last observation would be a right-censored interval, extending from the second higher

[12] In Stata, when fitting proportional hazards models, the exponentiated regression coefficients, labeled as hazard ratios are displayed in the output. However, using stratification the regression outputs displayed the untransformed coefficients instead since the hazard ratios lose their interpretation. Streg command, as a precaution, disallows the display of hazard/time ratios (http://www.stata.com/manuals13/ststreg.pdf). Hence in our model we preferred not to use stratification in order to have comparability of multi-episode model with hazard ratios from previous single-failure models.

order birth until the end of the observation period. In our model, we reset the clock to 0 at each time an event occurs.

Further we assume that the dependence of the hazard on time since last event has the same form for each successive event, i.e. we apply no stratification. Finally we assume independence of individuals but it is unreasonable to assume that birth intervals within each individual are independent. Hence we relax the assumption that birth intervals are independent within each individual. As suggested in Cleves et al. (2008), one solution would be to fit a standard piecewise constant exponential model, adjusting the standard errors of the estimated parameters to account for the possible correlation. This is done by specifying option vce(cluster CASEID) to streg setting the id variable as the pregnancy. Hence we obtain the robust estimate of variance as described in the context of Cox regression by Lin and Wei (1989), with an added adjustment for clustering. Finally we use the order of event as an explanatory variable in our multi-episode model, analyzing conceptions of order four and higher[13].

II.3.2.6. Dependent Variable and the Baseline Hazard

Using piecewise constant proportional hazard model, we investigate determinants of becoming pregnant given non-pregnancy to analyze the linkage running from women's employment to fertility decisions using event history analysis taking into account timing of events. The dependent variables are transition to first, second, third, and fourth and higher order conceptions. Due to structure of our data set composed of "ever-married" women; the observation window opens with the first marriage of the woman[14] for the first conception model. The observation window closes at the interview date or migrating to abroad if emigration exists in life history of the woman.

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[13] We model birth orders of one, two and three separately in single-failure models and do not do clustering in these models.

[14] If we had not started the clock at first marriage but at a specific age, we would have young married respondents that are not matched by any young un-married respondents. Hence we cannot study the probability to have first conception at these young ages.

The fertility models analyze the first conception risk since start of first marriage, second conception risk since first birth, third conception risk since second birth, and finally fourth and higher order conception risks after previous birth. Date of pregnancy is measured as 7 months before the date of live birth[15].

Duration since previous birth (or marriage): We have four different models to analyze fertility patterns. Respectively in these models, the baseline is the duration since first marriage, duration since first birth, duration since second birth, and duration since preceding birth depending on the order of conception. The duration is measured in months and the cut-off points are 12, 24, 36, 48, 60, 84 and 120. These points refer to 1 year, 2 years, 3 years, 4 years, 5 years, 7 years, 10 years cut-off points. In total we have eight segments*: "<1 year"*, "1-2 years", "2-3 years", "3-4 years", "4-5 years", "5-7 years", "7-10 years", and "10+ years". The hazard rates are constant for these time segments, but can vary between them. The reference category is "*<1 year"* shown in italics.

II.3.2.7. Explanatory and Control Variables

For conception models, including the basic time factor (the baseline duration) we have seven time-varying and four time-fixed explanatory and control variables. In the multi-episode model with fourth and higher order conceptions, order of conception is added as a time-fixed covariate leading to five time-fixed explanatory and control variables in total. The reference categories for the variables are shown in italic.

Explanatory variables:

Age at first marriage/previous birth: Age at start of the episode is included as a time-fixed explanatory variable, which is the age at the onset of the risk. Generally this variable has five-year intervals. For the first conception model five

[15] We chose 7 months since in TDHSs birth history intervals can be minimum 7 months, and data entry is corrected in that way.

age categories are included: “12-16”, “*17-21”*, “22-26”, “27-31” and “32-46”. For the second conception model the categories are “12-16”, “*17-21”*, “22-26”, “27-31” and “32-44”. For the third conception model the categories are “13-19”, “*20-24”*, “25-29”, “30-34” and “35-41”. For the fourth and higher order conception model, the categories are “14-19”, “*20-24”*, “25-29”, “30-34” and “35-46”.

Calendar year: Calendar year is a time-varying explanatory variable, which shows the influence of changes in the socio-economic and political environment on birth intensities. This variable shows the trend in the event of interest in time. It is constructed as 7-year intervals in general. Last calendar year is chosen as the reference category in our analyses since we would like to interpret the results relative to the most recent period. For the first birth model, the categories are “1972-1980”, “1981-1987”, “1988-1994”, “1995-2001” and “*2002-2008*”. For the second birth model the categories are “1973-1981”, “1982-1988”, “1989-1995”, “1996-2002” and “*2003-2008*”. For third birth, and fourth and higher order birth models the calendar period categories are the same as in second birth model.

Employment before marriage (time fixed): This explanatory variable is a time-fixed variable as a dummy variable showing whether woman ever worked before marriage or not. It consists of categories as “non-employed” and “*employed*”.

Employment status (time-varying): Our final explanatory variable is the time-varying employment status variable. It is constructed as a dummy variable as “non-employed” or “*employed*”. This variable can be expanded based on the status of employment as sector of employment (agriculture and non-agriculture), public versus private employment, or wage status of employment and social security coverage of employment. The expanded model includes either of these job characteristics variables in addition to other covariates. The expanded model explanatory variables related to employment are presented in the end of this sub-section.

Socio-economic control variables:

Education: This variable reflects the socio-economic profile of the individuals and is a time-varying control variable. This variable is formed based on the assumption that education starts at the age of 6 and continues with no interruptions until the level reported at interview is attained. By this way education variable includes the category of "in education". The categories of this variable are "no education/primary incomplete", "primary level", "secondary level", "*high school or higher level*" and "in education". The former four categories imply completed level of education (graduation) provided that the education is completed.

Residential control variables:

Type of place of residence: Based on event history data for events of migration, we can have time-varying control variable as urban/rural type of residence. The categories of this variable are "*urban*" and "rural". The category of abroad is excluded as cases were censored when they moved abroad. Additionally we excluded the ones who were abroad when the episode started.

Region: The same way type of place of residence was constructed, region variable as a time varying control variable is formed. The categories of this variable are "*West*", "South", "Central", "North" and "East".

Background control variables:

Mother tongue: Mother tongue is a proxy for ethnicity and involves categories of "*Turkish*", "Kurdish" and "Other". As expected it is a time-fixed covariate.

Parental education: This variable is a background variable that is time-fixed as well. It is composed of categories "mother and father uneducated", "one educated other uneducated", and "mother and father *educated*". Hereby educated means at

least primary level of education and uneducated implies no education or primary incomplete.

Marital status: This time-varying control variable is formed using event history data on marriages. It is composed of categories of "separated", "*first marriage*", and "later marriages". Separated correspond to not living together, divorced or widowed.

Other control variables:

Order of conception: This variable is only used in the multi-episode model analyzing fourth and higher order conceptions. It is a time-fixed covariate of next conception order (or event order) with categories of "*fourth*", "fifth" and "sixth or higher order" conception.

Sector of employment: This time-varying explanatory variable is used in an expanded model. This variable refers to sector of the job and it consists of categories of "agriculture", "*non-agriculture*" and "non-employed". Non-agriculture category includes industry and service sectors.

Public versus private sector: This time-varying explanatory variable is used in an expanded model. It consists of categories of "public", "*private*" and "non-employed".

Status: This time-varying explanatory variable is used in an expanded model. It consists of categories of "*wage earner*", "non-wage earner", "other" and "non-employed". Wage earner category includes workers with the status as employer, waged worker (regular), salaried government officer (regular), daily waged (seasonal). Non-wage earner includes workers with the status as for her own (regular), for her own (irregular) and unpaid family worker. Other category includes other statuses that do not belong to the categories above.

Social security: This time-varying explanatory variable is used in an expanded model. It consists of categories of "uncovered", "*covered*" and "non-employed". Uncovered employees are the workers working without any social security. Social security coverage of covered workers are under one of these: SSK (Social Security Authority), Emekli Sandığı (Retirement Fund), Bağ-Kur (Social Security Organization for Artisans and the Self-employed), SGK (Social Security Institution), private insurance or other insurance[16].

The composition of our study population is presented in Appendix A, which contains exposure times, occurrences (events), and their distributions by each of the variables including the baseline.

II.4. ANALYSES OF BIRTHS

This section presents results of descriptive and multivariate event history analyses on fertility events of ever-married women with a specific reference to employment status of women. Progressions to first birth, second birth, third birth, and fourth and higher order births are analyzed.

Descriptive results include Kaplan-Meier estimates of progression from first marriage to the first conception at national level as well as for calendar period and time-fixed explanatory or control variables for the first conception model. The second conception model presents the Kaplan-Meier survival estimates of transition from first birth to second conception; third model from second birth to third conception, and fourth model from previous birth to next conception. The equality of survivor functions shown in graphs are tested using the *log-rank test*. Log-rank test is a nonparametric test appropriate for testing the equality of surviving functions across two or more groups. This test does not test the equality of survivor functions at a specific time point. Rather it is a global test that compares the overall survivor

[16] Until May 2006, there were three separate social security institutions: SSK for private and public sector workers; Emekli Sandiği (ES) for civil servants; and Bağ-Kur for self-employed workers and farmers. In 2006 these were all merged into one institution, the Sosyal Güvenlik Kurumu (Social Security Institution, SGK).

functions. The test works by comparing at each failure the expected versus the observed number of failures for each group and then combining these comparisons over all observed failure times. The relative survival experiences of distinct groups may be characterized by the groups' hazard functions. Thus the null hypothesis of tests computed may be expressed in hazards. The null hypothesis tested is that there is no difference in survival among the *r* groups:

$$H_0: h_1(t) = h_2(t) = \cdots = h_r(t)$$

The chi-squared test statistic is distributed as χ^2 with *r-1* degrees of freedom under the null and if there is a highly significant chi-squared value, the null hypothesis that the survivor functions of the two groups are the same is rejected (Cleves et al., 2008).

Additionally using the survival estimates, percentage of women who do not experience the conception of order of interest within 2 years after marriage/previous birth, within 5 years after marriage/previous birth, within 10 years after marriage/previous birth and median duration of transition to conception in months are presented for the variable employment status and job characteristics. Median durations are presented for all covariates.

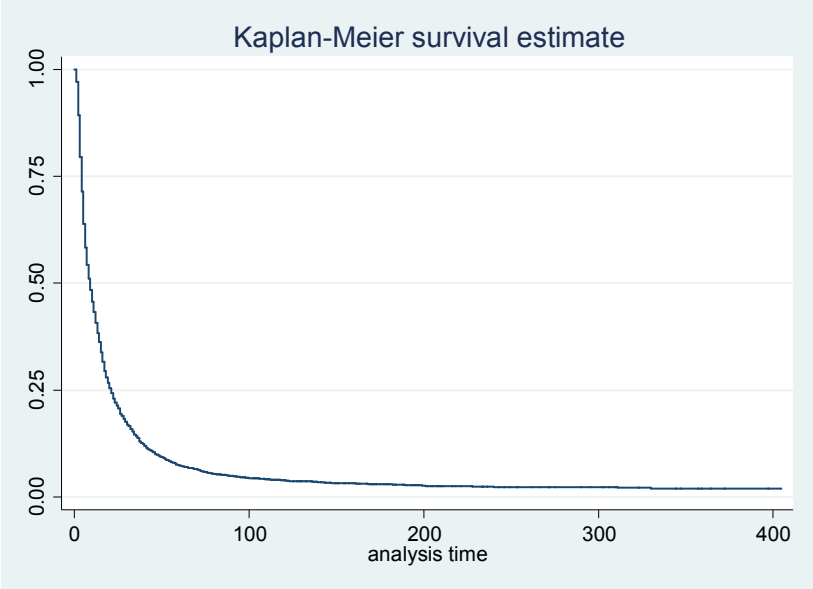
II.4.1. Progression to First Birth

II.4.1.1. Kaplan-Meier Estimates: Differentials in the Transition to First Conception

Kaplan-Meier survival estimates of transition from first marriage to first conception at the national level indicate that first birth is a common phenomenon in Turkey (Figure II.4.1.1.1 and Table II.4.1.1.1). 78 percent of women conceive their first child within two years after marriage, and 93 percent within five years after marriage. By ten years after marriage only 4 percent of women are left childless. The

median first conception interval is estimated as 8.4 months for women overall. This indicates that women progress to first birth very soon after marriage in Turkey.

Figure II.4.1.1.1. Survival estimate of conceiving first child, Turkey 2008



Median duration of transition to first conception among employed women is 2.4 months higher than non-employed women (Table II.4.1.1.1).

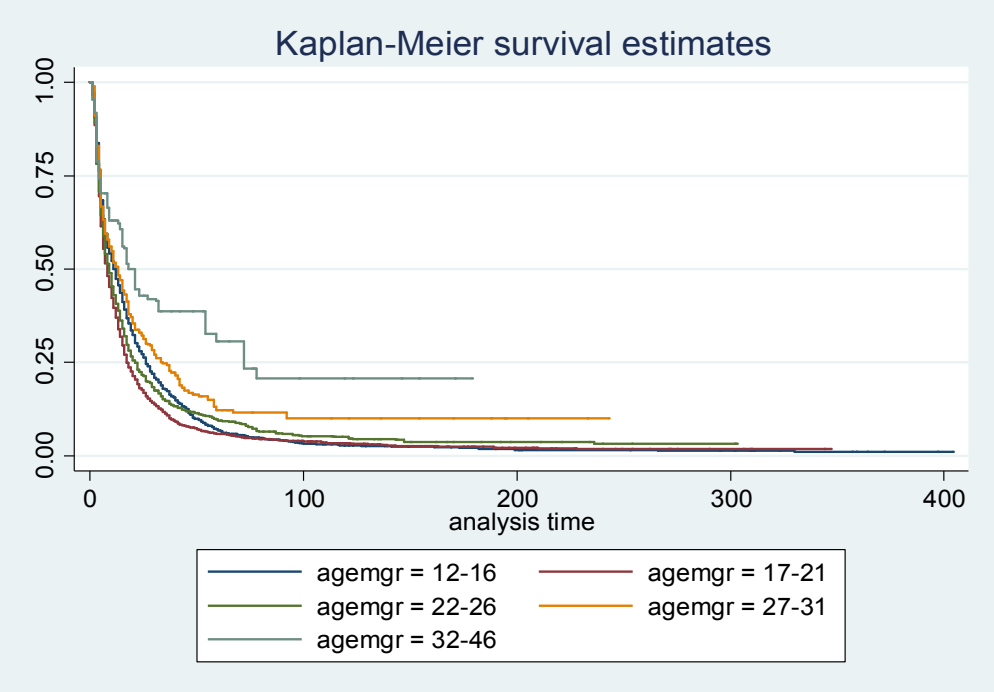
Table II.4.1.1.1. Transition to first conception by employment status: Kaplan-Meier survival curve estimates

	Percentage of women who do not experience first conception within *2 years* after marriage	Percentage of women who do not experience first conception within *5 years* after marriage	Percentage of women who do not experience first conception within *10 years* after marriage	*Median* duration of transition to first conception (months)
Employed	27.7	10.4	4.5	10.2
Non-employed	19.8	6.3	3.7	7.8
Agriculture	22.8	7.1	2.9	8.1
Non-agriculture	34.1	15.3	7.1	12.8
Public	30.2	15.0	5.8	12.1
Private	27.3	9.7	4.3	9.9
Wage earner	34.2	14.3	6.0	12.8
Non-wage earner	22.0	7.3	3.3	8.0
Covered	37.1	17.3	7.8	14.9
Uncovered	23.1	7.4	3.2	8.2
Turkey	22.0	7.4	3.9	8.4

The survivor functions of groups significantly differ according to job characteristics (Table II.4.1.1.1). Survival estimates of women working in the agricultural sector, in uncovered jobs and non-wage earners have relatively lower median durations. Women working in the non-agricultural sector and/or in public sector as wage earners in covered jobs, on the other hand, have relatively higher median duration of transition to first conception. This is an expected result according to role incompatibility hypothesis. In most specifications of this hypothesis there are two mechanisms determining the level of the conflict between the two roles: the organization of production, and the organization of childcare (Mason & Palan, 1981). Stycos and Weller (1967) mention these two mechanisms in their paper as the nature of the task and the social organization of childcare. The former factor relies on the fact that it is relatively easier to combine worker and mother roles in a family farm or cottage industry. For instance the nature of the task in agricultural sector provides more compatibility between worker and mother roles of women, where women can enjoy proximity to their children while working and greater flexibility in scheduling than do their non-agricultural counterparts. These conditions appear to speed up transition to first conception among women working in the agricultural sector, in uncovered jobs as non-wage earners, especially as unpaid family workers. Women employed in covered jobs and in the public sector have relatively higher median durations. This may be due to the fact that first they may want to establish themselves in the labor market before entering motherhood. Furthermore their family and career orientations may differ from their employed counterparts.

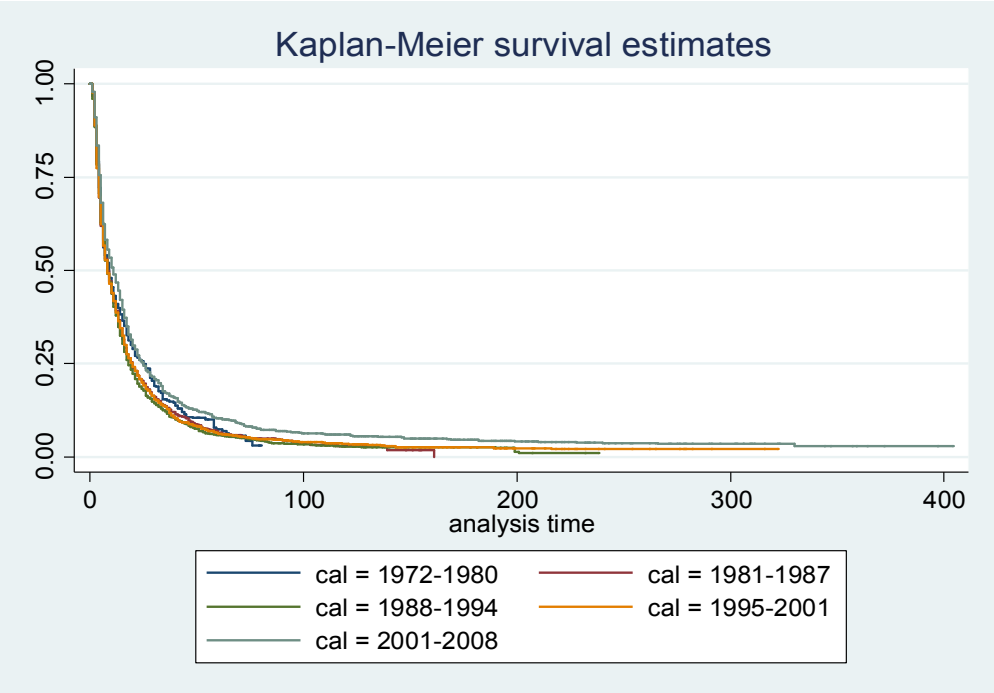
Kaplan-Meier survival estimates of transition to first conception by time-fixed explanatory and control variables, and time-varying calendar period are presented below.

Figure II.4.1.1.2. Survival estimate of conceiving first child, by age at first marriage



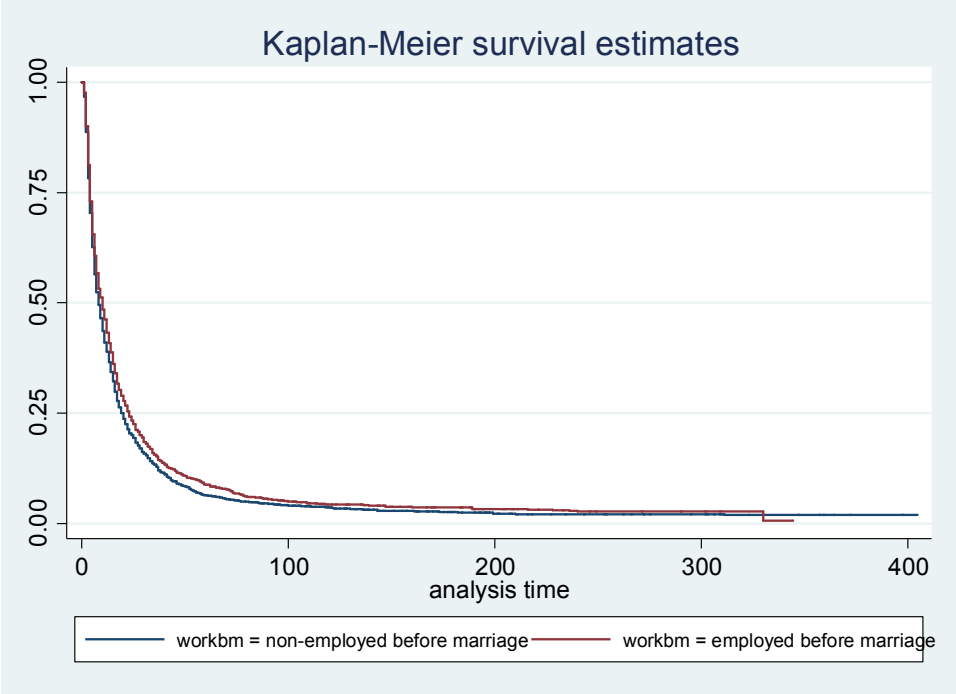
Log-rank test for equality of survival functions: Wald $Chi^2 = 55.31$, $Pr>chi^2 = 0.0000$

Figure II.4.1.1.3. Survival estimate of conceiving first child, by calendar period



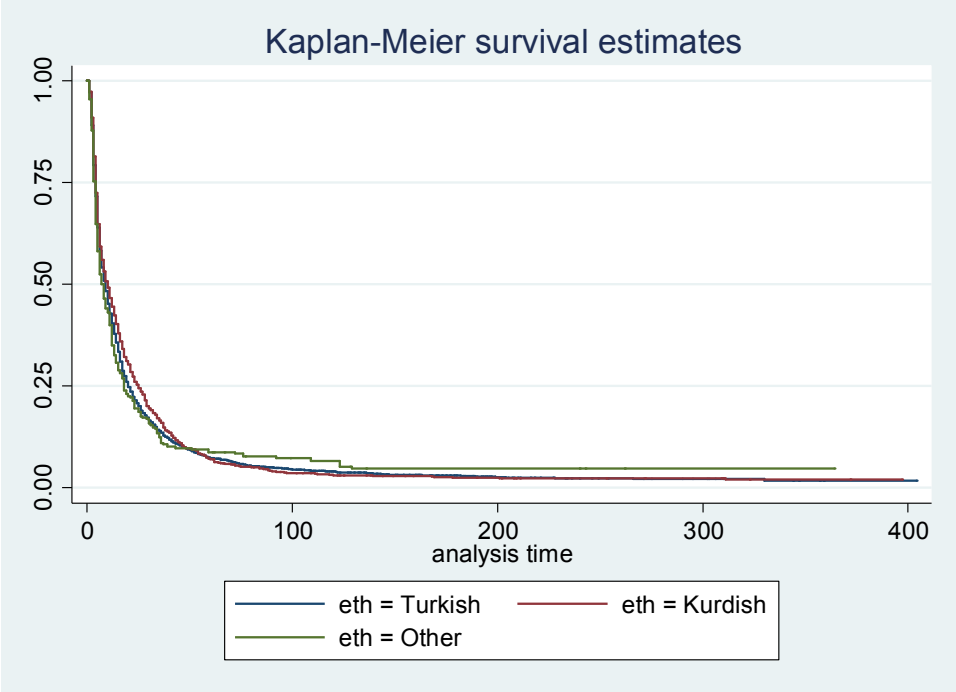
Log-rank test for equality of survival functions: Wald $Chi^2 = 28.72$, $Pr>chi^2 = 0.0000$

Figure II.4.1.1.4. Survival estimate of conceiving first child, by employment status before marriage



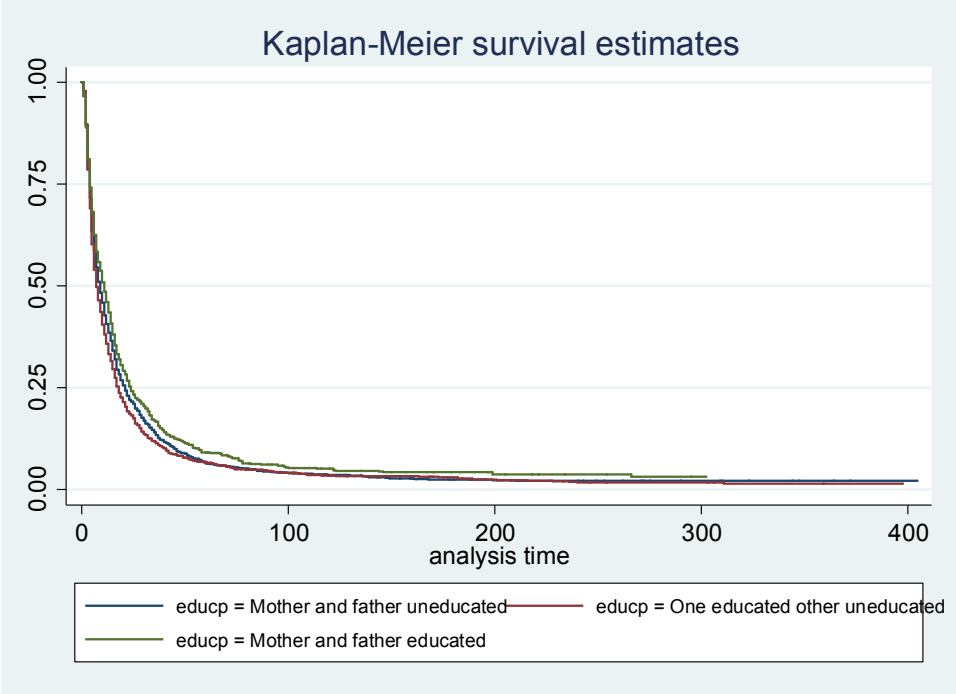
Log-rank test for equality of survival functions: Wald $Chi^2 = 11.65$, $Pr>chi^2 = 0.0006$

Figure II.4.1.1.5. Survival estimate of conceiving first child, by mother tongue



Log-rank test for equality of survival functions: Wald $Chi^2 = 3.18$, $Pr>chi^2 = 0.2039$

Figure II.4.1.1.6. Survival estimate of conceiving first child, by parental education



Log-rank test for equality of survival functions: Wald $Chi^2 = 23.98$, $Pr>chi^2 = 0.0000$

The figures presented above indicate that the survivor functions of women who married at an older age indicate higher proportion of women surviving, i.e. not having first birth compared to their counterparts who married at younger ages, except at the youngest age group. This is an expected fact for that older women have more biological limitations related to fecundity and have shorter duration of exposure to risk of marriage and hence birth. The median first conception interval of women who started a union at age 12-16 is relatively high, which may be due to waiting for some time before reaching menarche age or due to continuing education. Median first conception interval by age at first marriage has a U shape, indicating progress to first conception takes place sooner among women who got married at age 17-21 and 22-26, respectively.

Although log-rank test to compare survivor functions of first birth transitions by calendar periods indicates a difference, median first conception interval do not differentiate much in 1980s and 1990s. After 2001, we see a trend as

an increase in median first conception intervals, although the increase is less than three months. This indicates an increase in the proportion of childless women in first years of marriage who want to postpone entry into motherhood for some time in the last decade. Women employed before marriage have 1.6 month higher median first conception interval than women non-employed before marriage. Women employed before marriage should be eager to work after marriage as well, which may be a factor related to this delay in transition to motherhood. When we look at the educational level covariate, we see that median first conception intervals are higher among women with no education/primary incomplete education or with high school or higher level of education. Former category may be an outcome of an income effect: uneducated women have lower earnings and less capability of affording childbearing. That may be one of the factors leading to delays in motherhood. Women with high level of education, on the other hand, may delay marriage and hence motherhood due to increasing opportunity cost they face after having more years of schooling. This is mainly what the human capital theory envisages. Additionally educated women can control their fertility more consciously and efficiently (Ergöçmen, 1997) compared to their lower-educated counterparts. The region is also associated with different proportions of survivors at each failure time. Women living in the Western region have longest median first conception interval (9.1 months) and women living in the Central region have the shortest interval (7.2 months). Parental education is also influential affecting transition to first conception at first glance. If both mother and father of the woman is educated, the median first conception interval is highest. Finally median durations by marital status differ. As we measure median duration between first marriage and first conception, women in later marriages of order two and higher have much higher first conception interval.

Table II.4.1.1.2. Median first conception intervals (in months)

Age at first marriage	
12-16	11.0
17-21	7.5
22-26	8.6
27-31	12.3
32-46	18.0
Calendar years	
1972-1980	8.5
1981-1987	7.9
1988-1994	7.7
1995-2001	7.8
2001-2008	10.4
Employment before marriage	
Non-employed before marriage	7.8
Employed before marriage	9.4
Educational level	
No educ. or primary incomplete	10.8
Primary level	6.9
Secondary level	7.6
High school or higher level	10.9
In education	15.1
Type of place of residence	
Urban	8.2
Rural	8.9
Region	
West	9.1
South	8.2
Central	7.2
North	8.8
East	8.9
Mother tongue	
Turkish	8.3
Kurdish	9.5
Other	7.0
Parental education	
Mother and father uneducated	8.4
Either of mother or father uneducated	6.9
Mother and father educated	10.4
Marital status	
First marriage	8.4
Later marriages	21.9
Separated	..

To sum up, first conception is universal in Turkey and takes place soon after first marriage overall (median duration 8.4 months). Although proportion of childless women (who never progress to first birth) is very low in all groups of women, survivor functions of groups of women of different employment status and jobs with various characteristics differentiate from each other.

II.4.1.2. The Multivariate Analysis: The Impact of Employment Status and Other Covariates on Transition to First Conception

In this section, determinants of progression from first marriage to first conception with multivariate event history models. With these models, we aim to understand the change in first birth intensity in almost four decades, to what extent the first conception risks differ according to employment status of women, and how these risks are affected by characteristics of women.

The series of models are constructed stepwise adding different groups of covariates to previous models. In the first model we construct a main effect model with three explanatory variables: *duration since first marriage* (baseline hazard), *age at first marriage* and *calendar year*. In the second model, we add employment variables, namely *employment before marriage* and time-varying *employment status* variables. In the third and latter models, we add socio-economic, residential, background and other control variables stepwise. Our main variables of interest are age at first marriage, calendar year and employment status.

The results of Model 1 presented in Table II.4.1.2.1 indicate that the risk of first conception is highest in the first year of first marriage. After first year of marriage, the risk declines constantly. This situation is the same for all six models. Considering the descriptive analyses presented by Kaplan-Meier estimates, this is an expected result. The risk of first birth with respect to age at first marriage shows and inverse U shape, peaking at the age at marriage at 17-21. After the age of 21, the risk declines constantly. This finding is valid in all six models. Another explanatory variable is the calendar year, which shows the influence of macro environment on

first birth intensities. In years prior to 2002, risk of first conception was higher. This is validated in all six models. The relative risks do not differ between calendar periods before 2002. However 2002-2008 period indicates a lower first birth intensity than before.

In the second model and onwards, we have our final explanatory variables related to employment status. It is observed that employment before marriage variable is insignificant and its categories do not indicate meaningful relative risks. However employment status is a significant variable explaining the change in risks of first conception: Non-employed women have 17 percent higher risk of first conception compared to employed women.

The third model adds *education* into the model as a socio-economic covariate. When compared to women with high school or higher education, women with primary level and secondary level education have higher first birth intensities. Moreover as expected, being in education decreases the risk of first conception by about 25 percent.

Model 4 extends the model by adding residential control variables, *type of place of residence* and *region*. Women living in rural areas have slightly lower risk of first conception with only 6 percent compared to women in urban areas. Moreover women living in Central and East regions have higher first conception risks compared to women in West region.

In Model 5, background control variables *mother tongue* and *parental education* are added into the model. Mother tongue is found to have an insignificant effect. Parental education is influential, on the other hand, if one or both of parents are uneducated, first birth intensity increases.

Model 6 is the final model where *marital status* background variable is included as a time-varying covariate. According to this model, being separated decreases the risk of first conception by 96 percent. Additionally first birth intensity

among women in later marriages is higher. This indicates that women who did not enter motherhood in their first marriages proceed to first conception faster in their later marriages. Relative risks of other variables do not differ much between the six models. Risk of first conception with respect to age at first marriage shows and inverse U pattern. Prior to 2002 the risk of first conception has been higher. Being non-employed increases the first conception risk by 13 percent compared to employed women.

Table II.4.1.2.1. Relative risks of first conception since first marriage, 1972-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Duration since first marriage (Baseline)						
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	0.74	0.75	0.75	0.76	0.76	0.77
2-3 years	0.50	0.51	0.51	0.51	0.52	0.54
3-4 years	0.42	0.43	0.43	0.43	0.43	0.46
4-5 years	0.32	0.32	0.33	0.33	0.33	0.36
5-7 years	0.19	0.20	0.20	0.20	0.20	0.22
7-10 years	0.11	0.11	0.12	0.12	0.12	0.13
10+ years	0.06	0.06	0.06	0.06	0.06	0.07
Age at first marriage						
12-16	0.81	0.81	0.82	0.81	0.82	0.81
17-21	*1*	*1*	*1*	*1*	*1*	*1*
22-26	0.90	0.93	0.94	0.95	0.95	0.95
27-31	0.71	0.74	0.76	0.77	0.76	0.74
32-46	0.50	0.52	0.53	0.55	0.53	0.55
Calendar year						
1972-1980	1.15	1.18	1.19	1.20	1.17	1.17
1981-1987	1.17	1.19	1.18	1.18	1.16	1.14
1988-1994	1.22	1.23	1.20	1.20	1.18	1.16
1995-2001	1.19	1.20	1.18	1.18	1.17	1.17
2002-2008	*1*	*1*	*1*	*1*	*1*	*1*
Employment before marriage (time fixed)						
Non-employed		1.00	1.00	0.99	0.99	1.00
Employed		*1*	*1*	*1*	*1*	*1*
Employment Status (time varying)						
Non-employed		1.17	1.17	1.15	1.13	1.13
Employed		*1*	*1*	*1*	*1*	*1*

(Table II.4.1.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Education						
No education or primary incomplete			0.95	0.96	0.92	0.91
Primary level			1.18	1.21	1.16	1.15
Secondary level			1.11	1.13	1.10	1.10
High school or higher level			*1*	*1*	*1*	
In education			0.75	0.75	0.76	0.76
Type of place of residence						
Urban				*1*	*1*	*1*
Rural				0.94	0.94	0.94
Region						
West				*1*	*1*	*1*
South				1.06	1.04	1.04
Central				1.16	1.16	1.15
North				1.03	1.01	1.02
East				1.11	1.09	1.10
Mother tongue						
Turkish					*1*	*1*
Kurdish					1.00	0.99
Other					1.10	1.09
Parental education						
Mother and father uneducated*					1.09	1.09
One educated other uneducated					1.16	1.15
Mother and father educated					*1*	*1*
Missing					1.03	1.03
Marital status						
Separated						0.04
First marriage						*1*
Later marriages						1.58
Constant	0.07	0.06	0.06	0.05	0.05	0.05
Number of women (weighted)	6956	6956	6956	6937	6937	6937
Number of first conceptions	6306	6306	6306	6292	6292	6292
Time at risk (months)	128926	128926	128926	128536	128536	128536
Log likelihood	-10825	-10809	-10779	-10740	-10729	-10611
LR chi2	973	1018	1078	1107	1155	1135
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Uneducated: None or primary incomplete; educated: Primary complete or above

Table II.4.1.2.2 presents the results of model 6 where employment status variable is replaced by job characteristics. In other words, the role of job characteristics on risk of first conception is analyzed in this model. This is carried out by constructing expanded models separately for each job characteristic. According to these models, sector of the job, wage status of the job and social security coverage of the job are related to first conception risks. Being employed in agricultural sector increases the risk of first conception by 32 percent compared to being employed in the non-agricultural sector. Employment in the agricultural sector is almost equivalent to being non-employed in terms of first birth intensities. Being employed as a non-wage earner (unpaid family worker or self-employed) or being employed in an uncovered job is similar to being non-employed in terms of first conception risks. They both increase the risk of first conception, separately.

Table II.4.1.2.2. Relative risks of first conception by job characteristics, Turkey 1972-2008

Sector	
Agriculture	1.34
Non-agriculture	*1*
Non-employed	1.32
Log likelihood	-10598.1
LR chi2	1148.13
Prob > chi2	0.0000
Public versus private	
Public	0.98
Private	*1*
Non-employed	1.13
Log likelihood	-10610.7
LR chi2	1135.71
Prob > chi2	0.0000
Status	
Wage earner	*1*
Non-wage earner	1.25
Other	1.00
Non-employed	1.27
Log likelihood	-10602.12
LR chi2	1142.88
Prob > chi2	0.0000
Social security	
Uncovered	1.40
Covered	*1*
Missing	0.99
Non-employed	1.42
Log likelihood	-10595.82
LR chi2	.
Prob > chi2	.
Number of women (weighted)	6937
Number of first conceptions	6292
Time at risk (months)	128536

II.4.1.3. Interactive Effect of Employment Statuses and Calendar Periods, First Conception

The interaction model with calendar year and employment status are shown in Figure II.4.1.3.1. It presents relative risks of first conception by employment status and calendar period. The relative risks of first conception is almost the same for non-employed and employed women until second half of 1990s. However starting with 1995, there appears to be a differentiation, albeit small, where relative risks are higher for non-employed women. The main reason seems to be declining relative risks for employed women since 1995.

Figure II.4.1.3.1. Interaction effect of employment status and calendar period on first conception, standardized for other factors, Turkey (reference category: employed, 2002-2008)

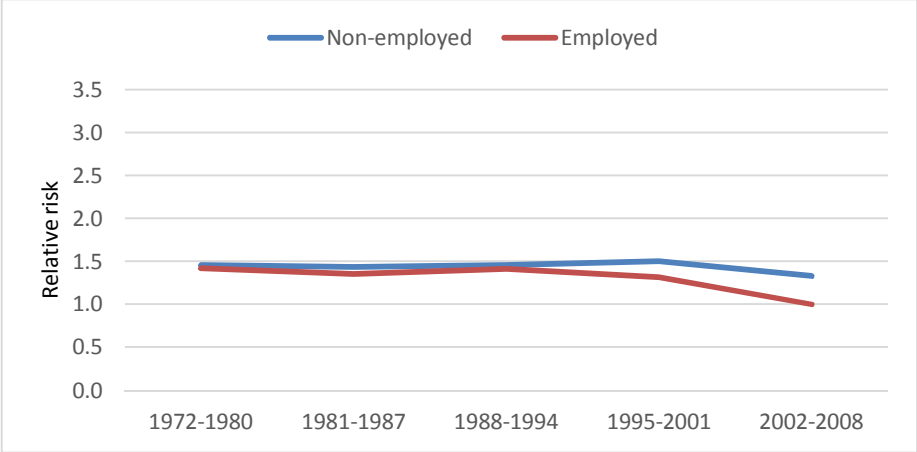


Figure II.4.1.3.2 presents the interactive effect of calendar period and employment sector on first conception risks. It is observed that relative risks of first conception for women working in the agricultural sector and non-employed women have been the same in almost four decades. Relative risk of first conception among women employed in non-agricultural sector, on the other hand, has been declining in time and this decline gained pace since 1995.

Figure II.4.1.3.2. Interaction effect of employment sector and calendar period on first conception, standardized for other factors, Turkey (reference category: non-agriculture, 2002-2008)

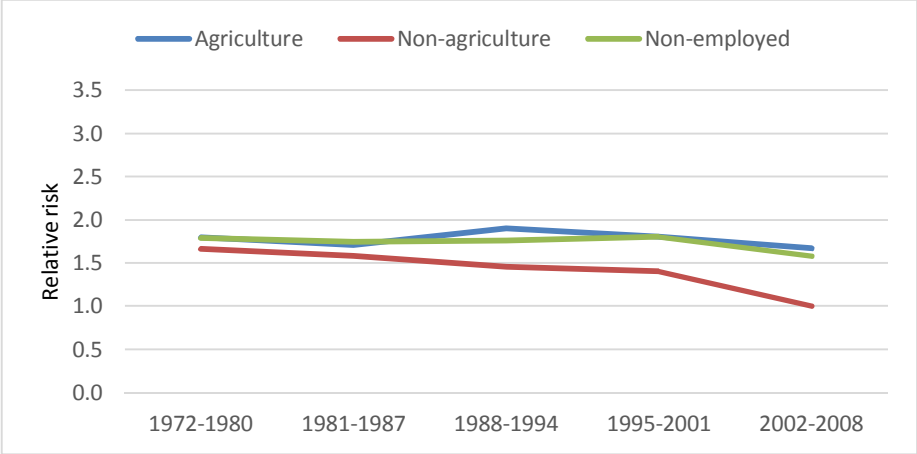


Figure II.4.1.3.3 shows interaction effect of public/private sector of employment and calendar period on first conception. The relative risks of first conception fluctuates for women employed in the public sector showing a decline between 1981 and 2001. However overall the changes are small and no clear pattern can be observed.

Figure II.4.1.3.3. Interaction effect of employment public/private sector and calendar period on first conception, standardized for other factors, Turkey (reference category: private, 2002-2008)

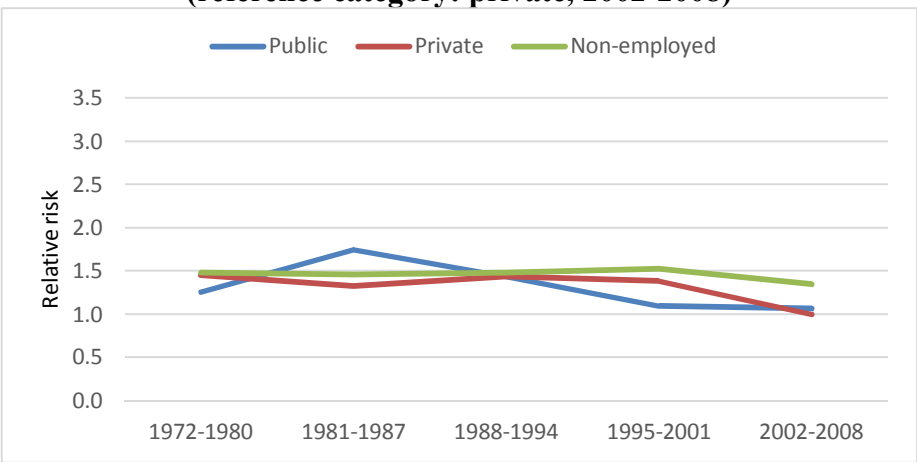
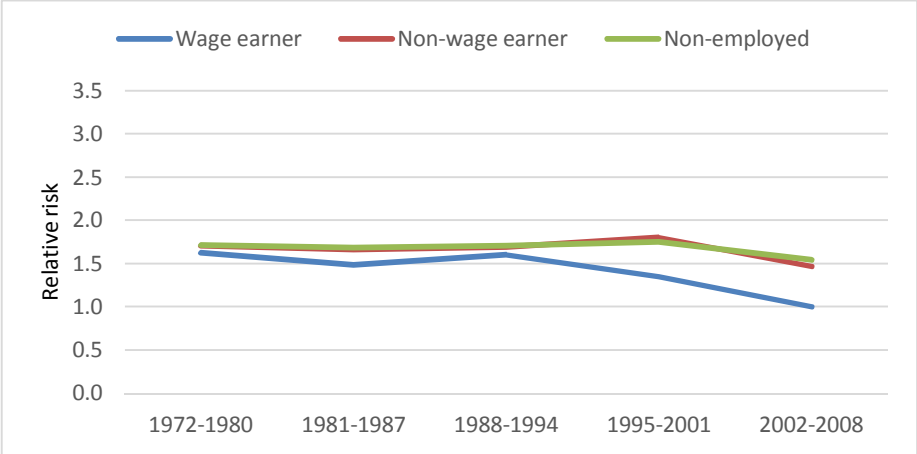


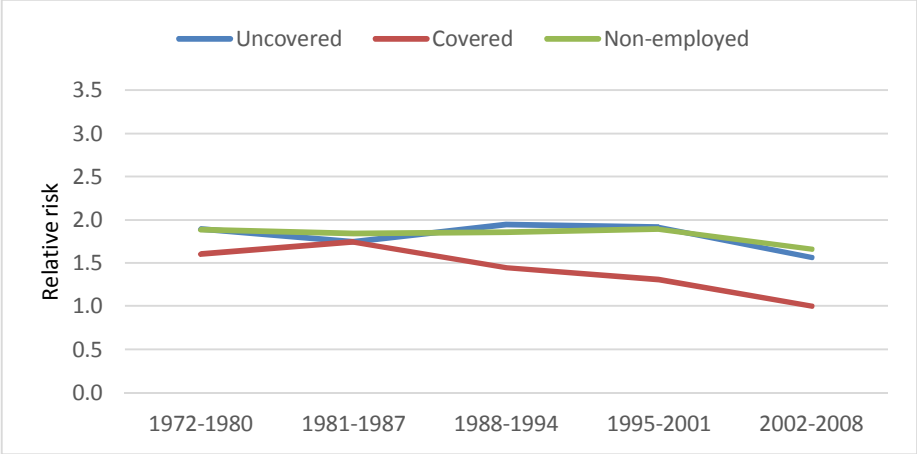
Figure II.4.1.3.4 presents the interaction effect of wage status of employment and calendar period on first conception risks. It is observed that a sharp decline in relative risk of first conception occurred among wage-earner women since 1995. On the other hand first conception intensities among non-wage earner employed women and non-employed women have been almost identical in four decades.

Figure II.4.1.3.4. Interaction effect of employment wage status and calendar period on first conception, standardized for other factors, Turkey (reference category: wage-earner, 2002-2008)



Finally Figure II.4.1.3.5 presents the interaction effect of social security coverage of the job and calendar period. The relative risks for women working in uncovered jobs and non-employed women have been almost identical. On the other hand relative risks of first conception among women employed with social security coverage had lower first conception intensities since 1987. The patterns was valid except for 1981-1987 period, where an increase in relative risk of first conception occurred among women employed in covered jobs.

Figure II.4.1.3.5. Interaction effect of social security coverage and calendar period on first conception, standardized for other factors, Turkey (reference category: covered, 2002-2008)



II.4.2. Progression to Second Birth

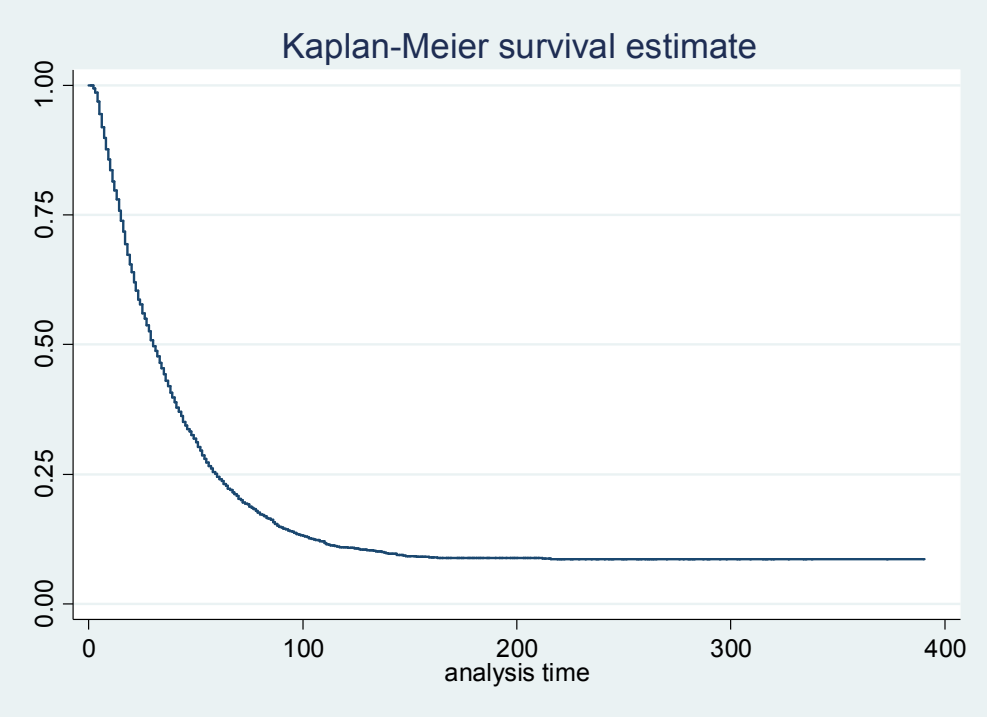
This section presents how employment status and other variables affect the transition from first to second conception. With a declining trend since 1998, total fertility rate reaches 2.16 in Turkey. According to TDHS-2008 results, fertility level reached 2.00 in urban areas and 2.68 in rural areas. Women in West, South and North regions already fertility levels below replacement level (HUIPS, 2009). However, in TDHS-2008, 51 percent of women mentioned their ideal number of children as two. This increases to 2.5 children among ever-married women. This level remains constant from 1993 to 2008 (HUIPS, 2009). These facts present the fact of "two-child norm" in Turkey. Hence studying progression to second birth is important within the context of Turkey.

II.4.2.1. Kaplan-Meier Survival Estimates: Differentials in the Transition to Second Birth

In this section, Kaplan-Meier survival curves for the transition from first birth to second conception by time-fixed explanatory and control variables and time-varying calendar period variable are presented. At the national level, 41 percent of

women with a child conceive their second child in a 2-year period after first birth (Figure II.4.2.1.1 and Table II.4.2.1.1). Seventy-five percent of mothers having only one child get pregnant for their second child in a 5-year period following the first birth. By the end of ten years after first birth, 89 percent of one-child women progresses to second conception in Turkey. The median interval in Turkey is 30 months for the second conception. These findings indicate that two-child norm translates into fertility behaviors as only 11 percent of women remain as one-child mothers after 10 years after first birth.

Figure II.4.2.1.1. Survival estimate of conceiving second child, Turkey 2008



Median duration of transition to first conception among employed women (29.7 months) do not differ from that of non-employed women (29.8 months) (Table II.4.2.1.1). Within ten years after first birth, only 13 percent of employed women and only 10 percent of non-employed women remain not having progressed to second conception.

Table II.4.2.1.1. Transition to second conception by employment status: Kaplan-Meier survival curve estimates

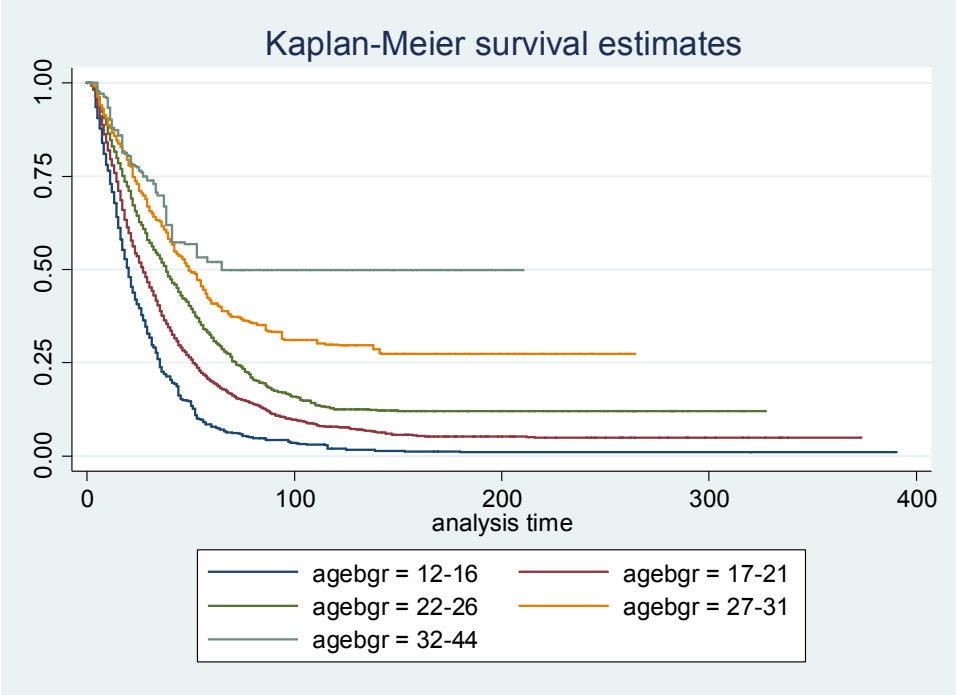
	Percentage of women who do not experience second conception within *2 years* after first birth	Percentage of women who do not experience second conception within *5 years* after first birth	Percentage of women who do not experience second conception within *10 years* after first birth	*Median* duration of transition from first birth to second conception (months)
Employed	56.8	28.8	13.0	29.7
Non-employed	59.4	23.4	10.0	29.8
Agriculture	43.8	16.9	6.3	20.4
Non-agriculture	78.5	47.9	23.6	54.8
Public	85.1	50.8	17.2	60.0
Private	52.3	25.4	12.3	25.0
Wage	69.7	41.8	21.1	47.8
Non-wage	48.3	20.1	7.5	22.3
Uncovered	47.6	19.9	8.2	21.8
Covered	83.8	55.2	27.1	69.1
Turkey	58.7	25.1	10.9	29.8

The median durations of groups differ according to job characteristics (Table II.4.2.1.1). Women employed in the agricultural sector progress to second conception faster than their non-employed counterparts or than women in the non-agricultural sector. Fifty percent of women with a child employed in the agricultural sector have their second conception in 20.4 months (1.7 years) after first birth, on the other hand women in the non-agricultural sector in 54.8 months (4.6 years) after first birth. Within two years after first birth, only 15 percent of women employed in the public sector progress to second conception. On the other hand this proportion is 48 percent among women employed in the private sector. However within ten years after first birth, 83 percent of women in public sector and 88 percent of women in private sector remain as one-child mothers. Median duration of transition from first birth to second conception is 60 months (5 years) for women employed in the public sector, and 25 months (2 years) for women employed in the private sector. Wage status and social security coverage of employment are job characteristics affecting survival estimates of proportion of conceiving second child significantly, separately. Summary measures of Kaplan-Meier survival estimates as proportion of women who

do not experience second conception are higher among women employed as wage-earners and employed in covered jobs at each analysis time. The median duration of transition from first birth to second conception is 48 months for wage-earner women and 22 months for non-wage earner women (unpaid family workers and self-employed women). The median duration of transition from first birth to second conception is 69 months for women working with social security and 22 months for women working without any social security.

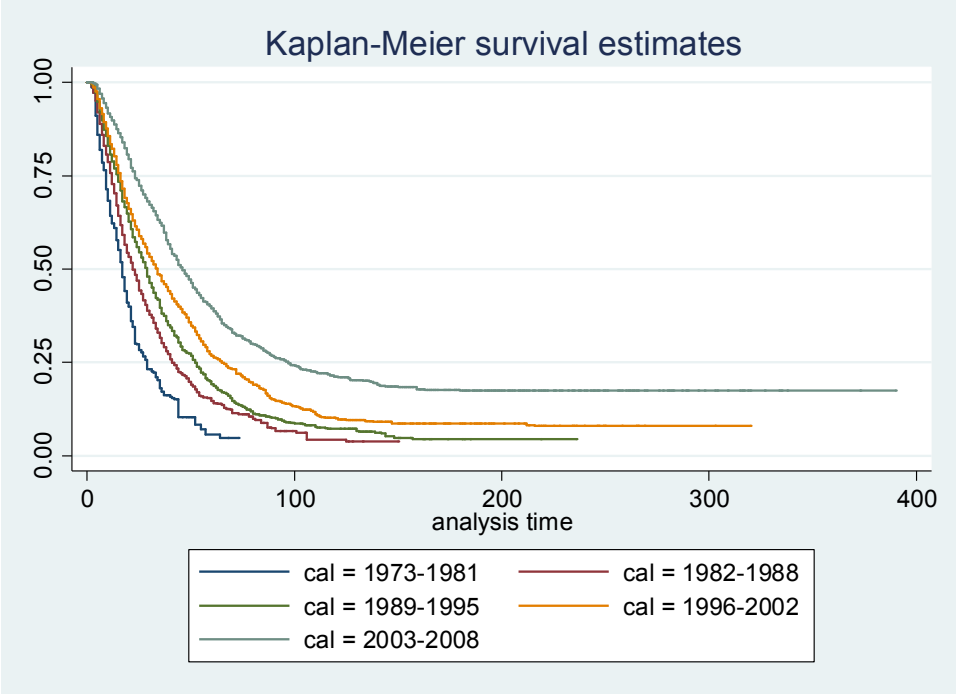
Below we present Kaplan-Meier survival estimates of transition to second conception by time-fixed explanatory and control variables, and time-varying calendar period variable.

Figure II.4.2.1.2. Survival estimate of conceiving second child, by age at first birth



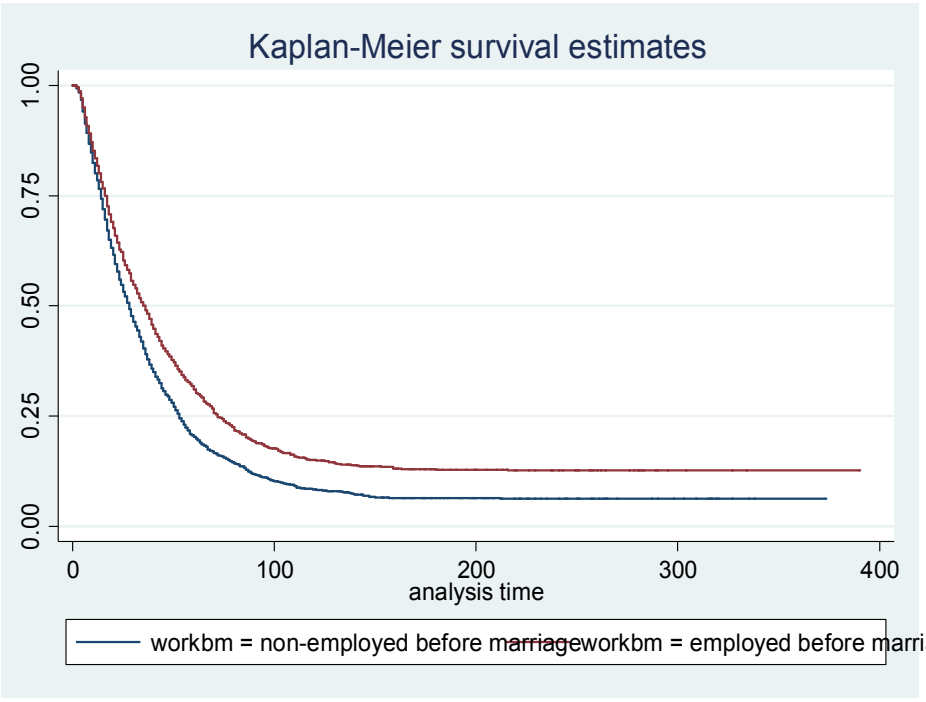
Log-rank test for equality of survival functions: Wald $Chi^2 = 234.61$, $Pr>chi^2 = 0.0000$

Figure II.4.2.1.3. Survival estimate of conceiving second child, by calendar period



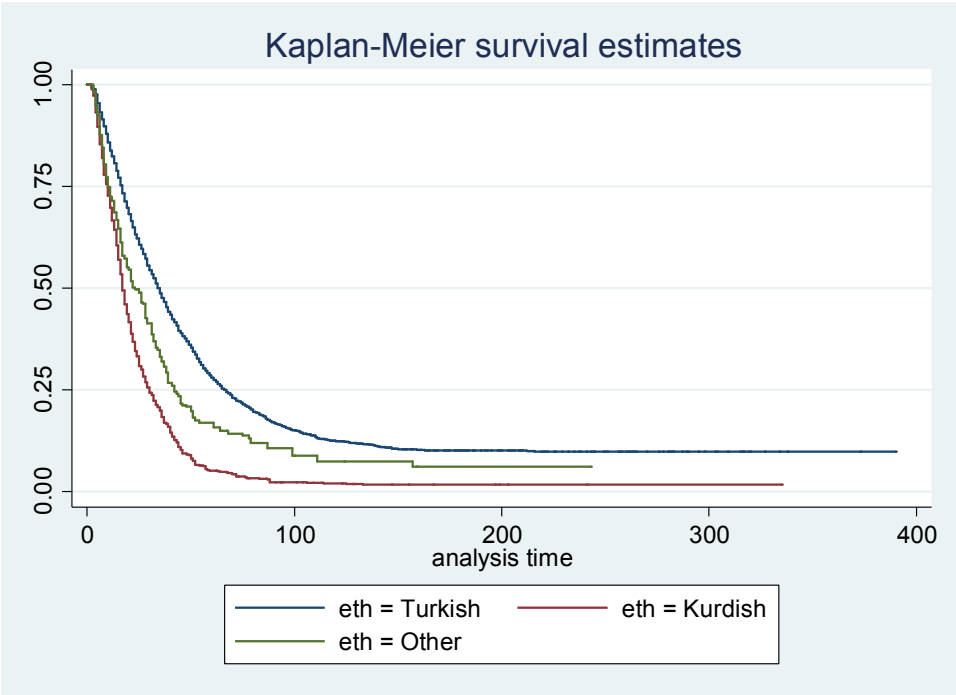
Log-rank test for equality of survival functions: Wald $Chi^2 = 316.77$, $Pr>chi^2 = 0.0000$

Figure II.4.2.1.4. Survival estimate of conceiving second child, by employment status before marriage



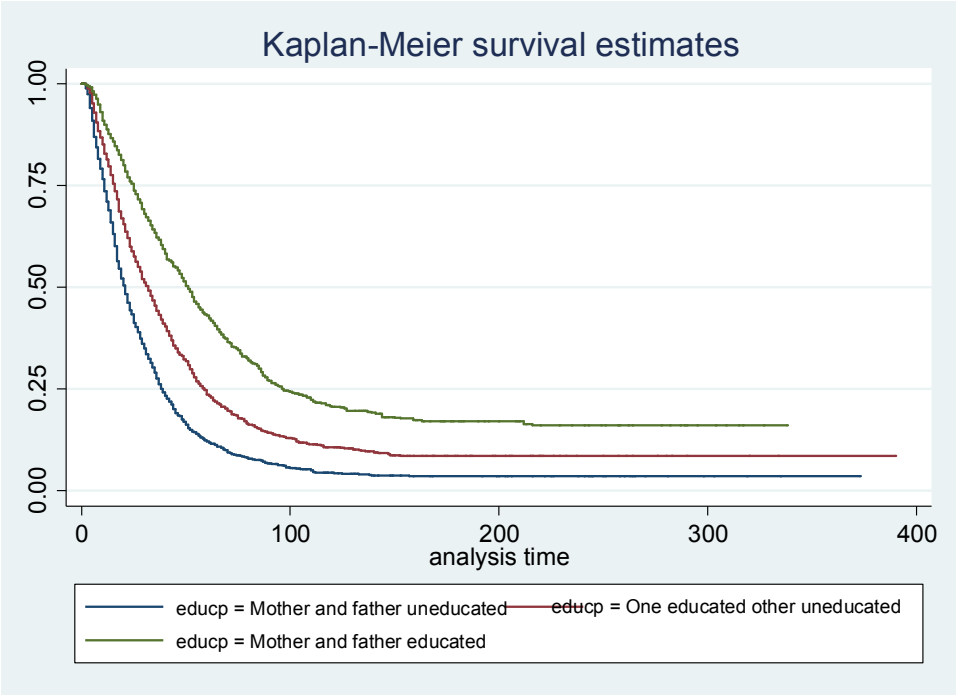
Log-rank test for equality of survival functions: Wald $Chi^2 = 50.04$, $Pr>chi^2 = 0.0000$

Figure II.4.2.1.5. Survival estimate of conceiving second child, by mother tongue



Log-rank test for equality of survival functions: Wald $Chi^2 = 336.28$, $Pr>chi^2 = 0.0000$

Figure II.4.2.1.6. Survival estimate of conceiving second child, by parental education



Log-rank test for equality of survival functions: Wald $Chi^2 = 337.97$, $Pr>chi^2 = 0.0000$

Survivor functions of categories of all time-fixed covariates and calendar period variable are found to be different from each other, separately. Differently from first conception estimates, log rank tests are significant for covariates of mother tongue among the second conception estimates. Additionally the gap between survival curves of categories of variables are larger indicating larger differentials in second conception risk than first conception risks. Both the level and timing of second conception seem to differentiate between these categories. If age at first birth is younger, second conception takes place sooner after first birth (Figure II.4.2.1.2). This is an expected result due to declining fecundity among older women. Moreover this finding indicates that women who enter motherhood at younger ages, progress to second conception earlier. For instance median second conception interval for women who entered motherhood at age of 17-21 is 26 months, whereas this interval rises to 65 months for women who became mothers at age of 32-44 (Table II.4.2.1.2). The survivor functions of the categories of the variable calendar years differ from each other significantly (Figure II.4.2.1.3). In the past years, the survival estimates were much lower indicating higher failure rates at each analysis time. However especially for the most recent calendar period, 2003-2008, the survival curve stands much higher than other curves, indicating higher percentages who do not proceed to second conception. The median second conception interval rose from 17 months to 46 months since 1973 (Table II.4.2.1.2). This indicates postponement of second birth in the last four decades in Turkey. A decline in both tempo and quantum of second births is visible. The timing and level of second conception differ according to employment before marriage as well (Figure II.4.2.1.4). Proportion of women having second conception is higher among women non-employed before marriage. Median duration of second conception is 35 months for women employed before marriage and 28 months for women non-employed before marriage (Table II.4.2.1.2). As expected there is an inverse relationship between second conception risks and educational level of women. The median second conception interval increases from 16 months to 65 months as educational level rises from no education/primary incomplete to high school or higher level. Median duration of transition from first birth to second conception is 16 months higher for women living in urban areas than women in rural areas. The median second conception interval for

women in the Western region is the highest with 42 months. The median value for women in the Eastern region is 18 months, on the other hand (Table II.4.2.1.2). The proportion of women who do not proceed to second conception is higher among Turkish women than among Kurdish women and women with other mother tongue (Arabic or other languages) (Figure II.4.2.1.5). The median duration between first birth and second conception is 34 months among Turkish women. This value falls to 17 months among Kurdish women and 22 months among women of other ethnicities (Table II.4.2.1.2). It is observed that if parental education increases both level and timing of second birth decreases. If both parents are uneducated, the survival estimates are lowest compared to cases where one of parent is uneducated or both of parents are educated (Figure II.4.2.1.6). Within categories of parental education, the median second conception interval is longest for women with educated mother and father with 50 months. If both are uneducated, the median duration declines to 20 months. Finally median second conception interval is 30 months for women in their first marriages and is 23 months for women in their later marriages. No median can be calculated for separated women as less than half of them progress to second conception (Table II.4.2.1.2).

Table II.4.2.1.2. Median second conception intervals (in months)

Age at first birth	
12-16	19.2
17-21	26.4
22-26	37.6
27-31	48.7
32-44	64.9
Calendar years	
1973-1981	16.5
1982-1988	21.9
1989-1995	28.1
1996-2002	33.2
2003-2008	45.7
Employment before marriage	
Non-employed before marriage	27.5
Employed before marriage	35.1
Educational level	
No educ. or primary incomplete	16.3
Primary level	27.9
Secondary level	40.2
High school or higher level	64.8
In education	..
Type of place of residence	
Urban	35.4
Rural	19.8
Region	
West	42.0
South	28.8
Central	29.0
North	26.1
East	17.8
Mother tongue	
Turkish	34.1
Kurdish	16.9
Other	22.4
Parental education	
Mother and father uneducated	20.2
Either of mother of father uneducated	31.3
Mother and father educated	50.4
Marital status	
First marriage	29.6
Later marriages	23.1
Separated	..

To sum up in line with the persistent two-child norm in Turkey, most of women progress to second conception in Turkey: within 10 years after first birth, only 11 percent of women remain as one-child mothers. The median duration between first birth and second conception is exactly 2.5 years. Descriptive analyses indicate that survival curves differ with respect to all time-fixed explanatory and control variables, and time-varying calendar period variable.

II.4.2.2. The Multivariate Analysis: The Impact of Employment Status and Other Covariates on Transition to Second Conception

In this section the determinants of transition to second conception are analyzed using multivariate event history models. The question we seek to answer are: (i) How did second birth intensities evolve in the last four decades?, (ii) How is employment status of women related to second birth intensities?, and (iii) How do control variables other than employment status affect second birth risks in Turkey?

Six models are constructed stepwise where groups of covariates are added group by group into the model. First model is the basic model where we only control for *duration since first birth* (baseline hazard), *age at first birth*, and *calendar year*. Second model adds remaining explanatory variables to the model: *employment before marriage* and *employment status*. Third model adds a socio-economic variable to the model, namely *education*. Fourth model includes residential control variables of type of place of residence and region in addition to previous variables. Fifth model has background control variables of mother tongue and parental education as well. Finally, our sixth model has marital status as the final covariate controlling for seven time-varying and four time-fixed explanatory and control variables including the baseline hazard. The results of the models are presented in Table II.4.2.2.1.

The first model includes the standard variables *duration since first birth* (baseline hazard), *age at first birth*, and *calendar year*. Second conception intensities with respect to duration since first birth indicate that the risk peaks in the age groups

of 4-5 years after first birth. Compared to first year since first birth, the risk of second conception is higher within 7 years since first birth. The risk declines after 7 years since first birth. Among young mothers second conception risk is higher. In other words, among women who entered motherhood at younger ages second conception risk is higher. Second conception risk is 27 percent higher among women who became mothers at the age of 12-16 compared to women who entered motherhood at the age of 17-21. The calendar year variable shows how the second conception intensities evolved in time. The risk of second conception has been declining since 1973.

The second model has explanatory variables related to employment status. The relative risks for other explanatory variables do not differ much from the first model. However employment status variables indicate a different story than the one for the first conception model. Being employed before marriage seems to hinder second conception. Time varying employment status variable seems to not to have an effect on second conception risk. However these results change when more covariates are added into the model.

The variable of education has expected results as shown in Model 3 results. More education depresses the risk of second conception among one-child mothers.

The fourth model integrates residential control variables into the model. Residential control variables are vital in our analyses since spatial context is vital shaping the relationship between employment and fertility. In this model employment status before marriage loses its significance and time-varying employment status variable become influential as in the model of determinants of first conception. Non-employed women have 14 percent higher risk of second conception compared to their employed counterparts when we standardize for residential control variables. Women residing in rural areas (reference category: urban) and regions other than West have higher second conception intensities (reference category: West).

According to the results of the fifth model, background factors of mother tongue and parental education are influential determining the transition to second conception as well. Kurdish women and women of other ethnicities have higher risk of second conception compared to Turkish women. Women whose parents are not educated have higher risks of second conception.

Our final model controls for marital status as well. It is observed that in marriages later than the first one, transition to second conception is more likely. On the other hand, if the woman is separated, the risk is much lower. The relative risks of second conception since first birth indicate that the risk increases up to 4-5 years since first birth and declines afterwards steadily. The risk of second conception is less for women whose age at first birth is older than 21 years than women whose age at first birth is 17-21 years old. This indicates that when women enter motherhood at earlier ages, they tend to progress to second birth sooner as well. In the last four decades second conception risks have been declining constantly. In 1982-1988 period, the risk of second conception was 71 percent higher than in 2003-2008 period. Our final variable of interest is the employment status. Non-employed women have 12 percent higher risk of second conception than their employed counterparts. As expected as education increases the risk of second conception decreases. Residential variables are influential in occurrence of second conception as well. Women residing in rural areas have 16 percent higher risk of second conception compared to women in urban areas. Women living in regions other than West have higher risk of second conception. Kurdish and women with mother tongue other than Turkish have higher risks of second conception. Parental education affects second conception risk as well, decreasing the risk of second conception.

Table II.4.2.2.1. Relative risks of second conception since first birth, 1973-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Duration since first birth (Baseline)						
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	1.55	1.55	1.61	1.66	1.67	1.67
2-3 years	1.48	1.48	1.61	1.70	1.71	1.72
3-4 years	1.48	1.49	1.68	1.80	1.82	1.85
4-5 years	1.57	1.59	1.83	2.00	2.03	2.09
5-7 years	1.17	1.18	1.38	1.53	1.55	1.64
7-10 years	0.90	0.91	1.06	1.19	1.20	1.31
10+ years	0.18	0.19	0.22	0.25	0.25	0.30
Age at first birth						
12-16	1.27	1.26	1.07	1.03	1.00	1.02
17-21	*1*	*1*	*1*	*1*	*1*	*1*
22-26	0.79	0.80	0.90	0.93	0.93	0.93
27-31	0.57	0.59	0.66	0.68	0.68	0.69
32-44	0.43	0.44	0.43	0.47	0.46	0.45
Calendar year						
1973-1981	2.53	2.53	2.15	2.20	2.12	2.16
1982-1988	1.91	1.89	1.69	1.74	1.69	1.71
1989-1995	1.65	1.64	1.53	1.56	1.51	1.53
1996-2002	1.41	1.41	1.37	1.39	1.37	1.38
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*
Employment before marriage (time fixed)						
Non-employed		1.12	1.05	1.00	1.00	1.02
Employed		*1*	*1*	*1*	*1*	*1*
Employment Status (time varying)						
Non-employed		1.05	1.05	1.14	1.13	1.12
Employed		*1*	*1*	*1*	*1*	*1*
Education						
No education or primary incomplete			3.36	2.64	2.20	2.19
Primary level			2.01	1.90	1.74	1.71
Secondary level			1.37	1.30	1.26	1.27
High school or higher level			*1*	*1*	*1*	*1*
In education			1.10	1.01	1.07	1.10

(Table II.4.2.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Type of place of residence						
Urban				*1*	*1*	*1*
Rural				1.18	1.17	1.16
Region						
West				*1*	*1*	*1*
South				1.38	1.32	1.33
Central				1.32	1.34	1.34
North				1.35	1.36	1.36
East				1.78	1.56	1.56
Mother tongue						
Turkish					*1*	*1*
Kurdish					1.22	1.22
Other					1.29	1.28
Parental education						
Mother and father uneducated*					1.32	1.32
One educated other uneducated					1.17	1.18
Mother and father educated					*1*	*1*
Missing					1.26	1.23
Marital status						
Separated						0.06
First marriage						*1*
Later marriages						1.42
Constant	0.01	0.01	0.01	0.00	0.00	0.00
Number of women (weighted)	6598	6598	6598	6584	6584	6561
Number of second conceptions	5110	5110	5110	5096	5096	5073
Time at risk (months)	259717	259717	259717	258907	258907	257959
Log likelihood	-8646.24	-8635.21	-8325.58	-8188.58	-8155.11	-8001.17
LR chi2	669.97	690.26	1146.45	1276.14	1321.04	1337.1
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Uneducated: None or primary incomplete; educated: Primary complete or above

Table II.4.2.2.2 presents the results of model 6 where employment status variable is replaced by job characteristics. In other words, the role of job characteristics on risk of second conception is analyzed in this model. This is carried out by constructing expanded models separately for each job characteristic.

According to these models, public/private sector of the job is related to second conception risks. Working in the public sector increases the risk of second conception by 20 percent compared to working in the private sector. This seems to result from the protection by employment insurance and stable and regular jobs which guarantee future employment in the public sector.

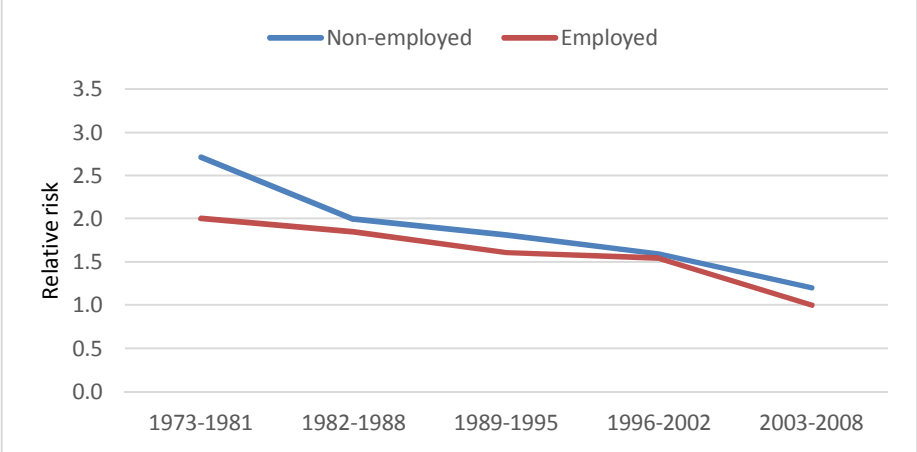
Table II.4.2.2.2. Relative risks of second conception by job characteristics, Turkey 1973-2008

Sector	
Agriculture	1.13
Non-agriculture	*1*
Non-employed	1.20
Log likelihood	-7999.29
LR chi2	1335.05
Prob > chi2	0.0000
Public versus private	
Public	1.20
Private	*1*
Non-employed	1.14
Log likelihood	-7999.38
LR chi2	1341.23
Prob > chi2	0.0000
Status	
Wage earner	*1*
Non-wage earner	1.06
Other	1.67
Non-employed	1.16
Log likelihood	-8000.56
LR chi2	1334.79
Prob > chi2	0.0000
Social security	
Uncovered	1.13
Covered	*1*
Missing	2.57
Non-employed	1.23
Log likelihood	-7999.21
LR chi2	..
Prob > chi2	..
Number of cases (weighted)	6561
Number of second conceptions	5073
Time at risk (months)	257959

II.4.2.3. Interactive Effect of Employment Statuses and Calendar Periods, Second Conception

The interaction model with calendar year and employment status are shown in Figure II.4.2.3.1. It presents relative risks of second conception by employment status and calendar period. The risk of second conception has been declining in time since 1973. The relative risks of second conception do not differ much from each other for non-employed and employed women. However relative risks are slightly higher for non-employed women.

Figure II.4.2.3.1. Interaction effect of employment status and calendar period on second conception, standardized for other factors, Turkey (reference category: employed, 2003-2008)



The interaction model with calendar year and employment sector indicates that women employed in agricultural sector had risk trend similar to non-employed women in time with higher relative risks for these women compared to women employed in the non-agricultural sector. However the relative risks of these three groups converged by 2003-2008 period.

Figure II.4.2.3.2. Interaction effect of employment sector and calendar period on second conception, standardized for other factors, Turkey (reference category: non-agriculture, 2003-2008)

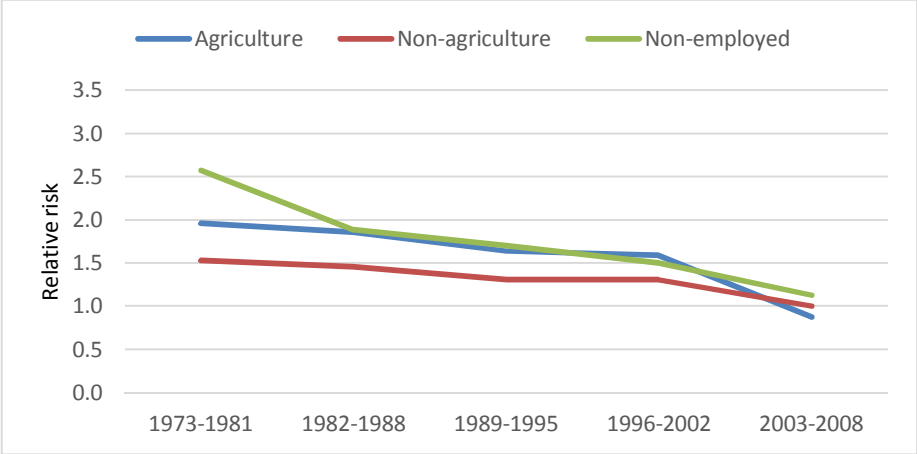


Figure II.4.2.3.3 shows interaction effect of public/private sector of employment and calendar period on second conception. The relative risks of second conception increases for women employed in the public sector. On the other hand declines in relative risks of second conception among women working in the private sector and non-employed women is observed. 2003-2008 period indicates a higher relative risk of second conception for women employed in the public sector.

Figure II.4.2.3.3. Interaction effect of employment public/private sector and calendar period on second conception, standardized for other factors, Turkey (reference category: private, 2003-2008)

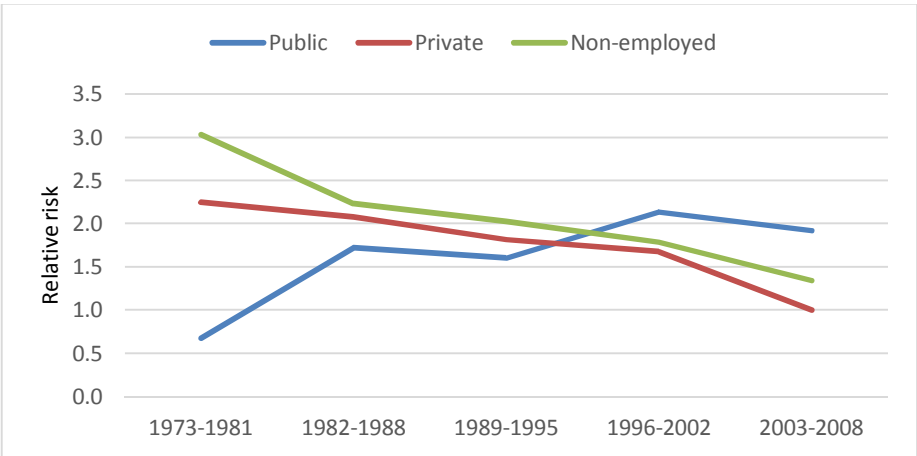
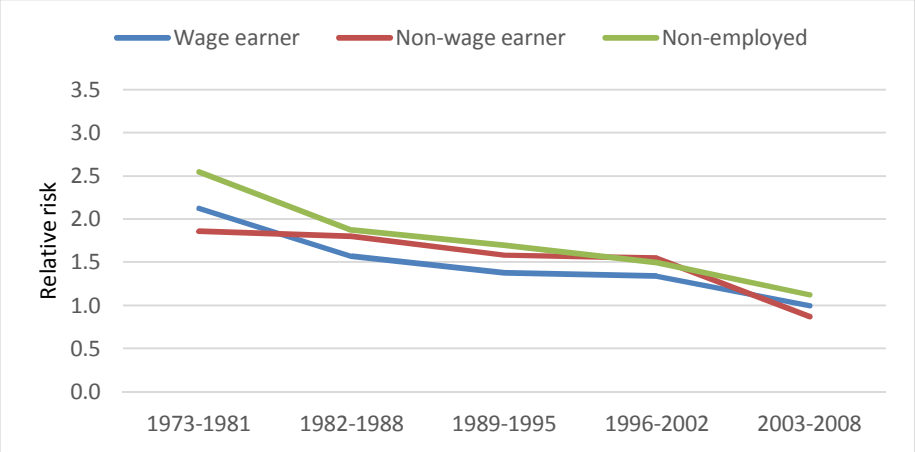


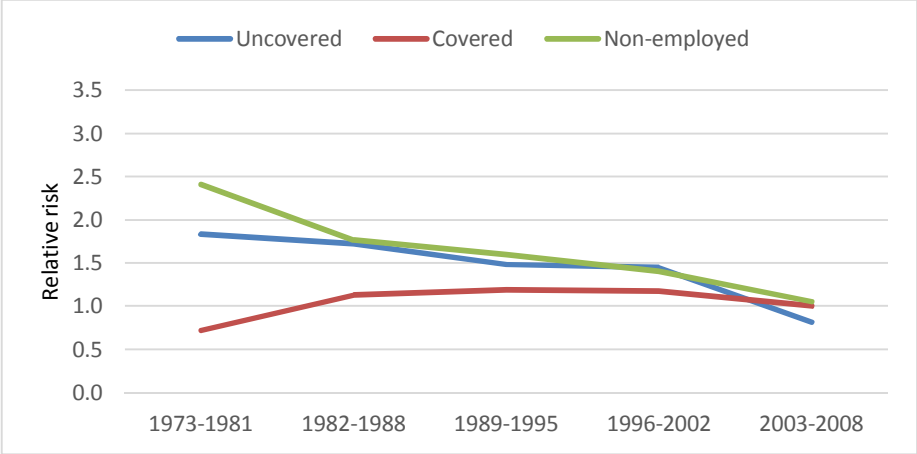
Figure II.4.2.3.4 presents the interaction effect of wage status of employment and calendar period on second conception risks. It is observed that a decline in relative risk of second conception occurred among all women in all wage statuses. There is not much difference in relative risks of second conception among the wage groups.

Figure II.4.2.3.4. Interaction effect of employment wage status and calendar period on second conception, standardized for other factors, Turkey (reference category: wage-earner, 2003-2008)



Finally Figure II.4.2.3.5 presents the interaction effect of social security coverage of the job and calendar period. The relative risks for women working in uncovered jobs and non-employed women have been higher in the past compared to women working in covered jobs. However relative risks for all three groups of women converged by 2003-2008 period and the gap appears to be vanished due to increases in relative risk in the group of women with covered jobs and declines in other groups of women.

Figure II.4.2.3.5. Interaction effect of social security coverage and calendar period on second conception, standardized for other factors, Turkey (reference category: covered, 2003-2008)



II.4.3. Progression to Third Birth

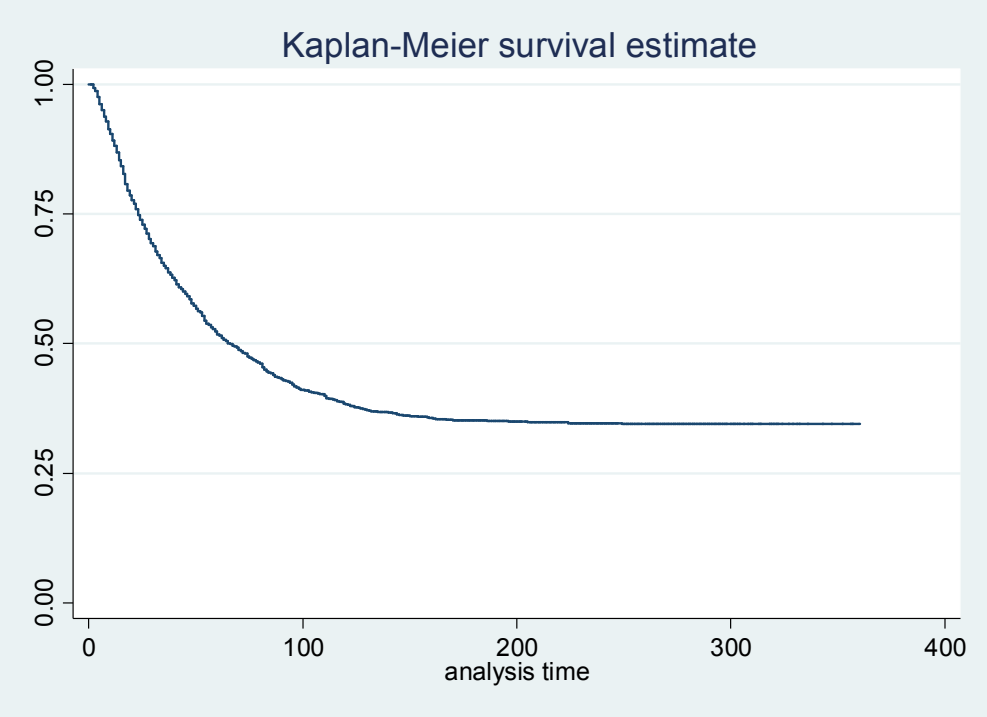
During the demographic transition process, the progression from second to third birth is crucial for fertility change. The reason is that the fertility decline is maintained by the reduction especially of third and higher-order births (Yavuz, 2006; Van de Kaa, 1987; Feeney & Wang, 1993). In Turkey 72 percent of women with two living children do not want to have another child, whereas this proportion is 28 percent among one-child mothers (HUIPS, 2009). Considering the two-child norm in Turkey, the women who proceed to third and higher order parities constitute a selected group of women. In our analyses of progression to third birth, we expect larger gaps in survival curves of different groups of women, and larger variations in relative risks of women belonging to different groups.

II.4.3.1. Kaplan-Meier Survival Estimates: Differentials in the Transition to Third Birth

Kaplan-Meier survival estimates show that one-fourth of women with two children conceive their third child in two years following the second birth at the national level (Figure II.4.3.1.1 and Table II.4.3.1.1). This proportion reaches 48

percent in a five-year period and 61 percent in ten years after second birth. The median interval is found to be 66 months for the third conception (5.5 years).

Figure II.4.3.1.1. Survival estimate of conceiving third child, Turkey 2008



Summary results of Kaplan-Meier survival estimates of third birth by employment status is shown in Table II.4.3.1.1. The proportion of women who do not experience third conception at different intervals for the two groups of women are close to each other. Within two years after second birth, 73 percent of employed women do not experience third conception. This percentage is 76 percent among non-employed women. By five years after second birth, 48 percent of women experience third conception among both employed and non-employed women in Turkey. By ten years after second birth, 58 percent of employed women and 63 percent of non-employed women progress to third conception. The median durations are close to each other as well: 66 months for employed women and 65 months for non-employed women.

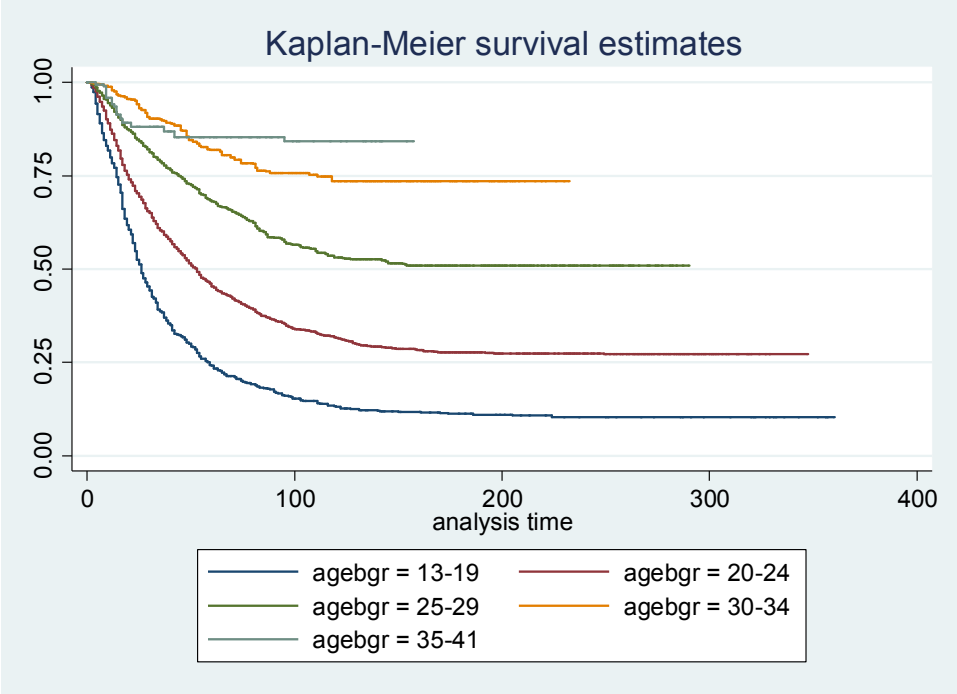
Table II.4.3.1.1. Transition to third conception by employment status: Kaplan-Meier survival curve estimates

	Percentage of women who do not experience third conception within *2 years* after second birth	Percentage of women who do not experience third conception within *5 years* after second birth	Percentage of women who do not experience third conception within *10 years* after second birth	*Median* duration of transition from second birth to third conception (months)
Employed	72.5	52.1	42.0	65.5
Non-employed	75.6	52.3	36.6	64.9
Agriculture	65.4	41.5	31.6	41.6
Non-agriculture	88.4	74.7	63.7	..
Public	97.5	90.7	79.9	..
Private	69.5	47.7	37.7	52.8
Wage	80.2	66.5	56.4	..
Non-wage	68.6	44.7	34.6	47.9
Uncovered	68.0	45.1	35.2	47.9
Covered	93.8	84.5	73.4	..
Turkey	74.8	52.3	38.5	65.5

Table II.4.3.1.1 displays Kaplan-Meier survival estimates of the proportion of conceiving third child since second birth by job characteristics. Percentage of women employed in the non-agricultural sector, who do not proceed to third conception is higher than percentage of women employed in the agricultural sector, or non-employed women who do not proceed to third conception at all times. The survival estimates of women employed in the public sector, of women working as wage-earners and of women working in covered jobs are higher than their counterparts employed in the private sector, working as non-wage earners and working in uncovered jobs, respectively. Median duration of transition from second birth to third conception cannot be calculated for the former groups of women since less than half of these women progress to third conception by the end of observation period.

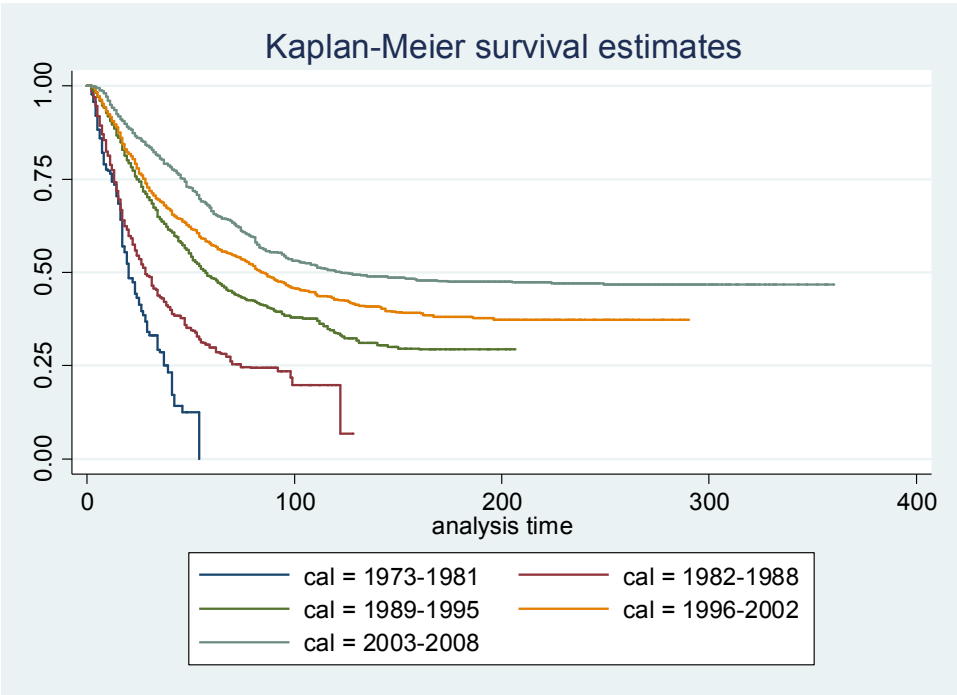
Kaplan-Meier survival estimates of the proportion of conceiving the third child since second child by time-fixed explanatory variables and covariates and time varying calendar period variable are presented below.

Figure II.4.3.1.2. Survival estimate of conceiving third child, by age at second birth



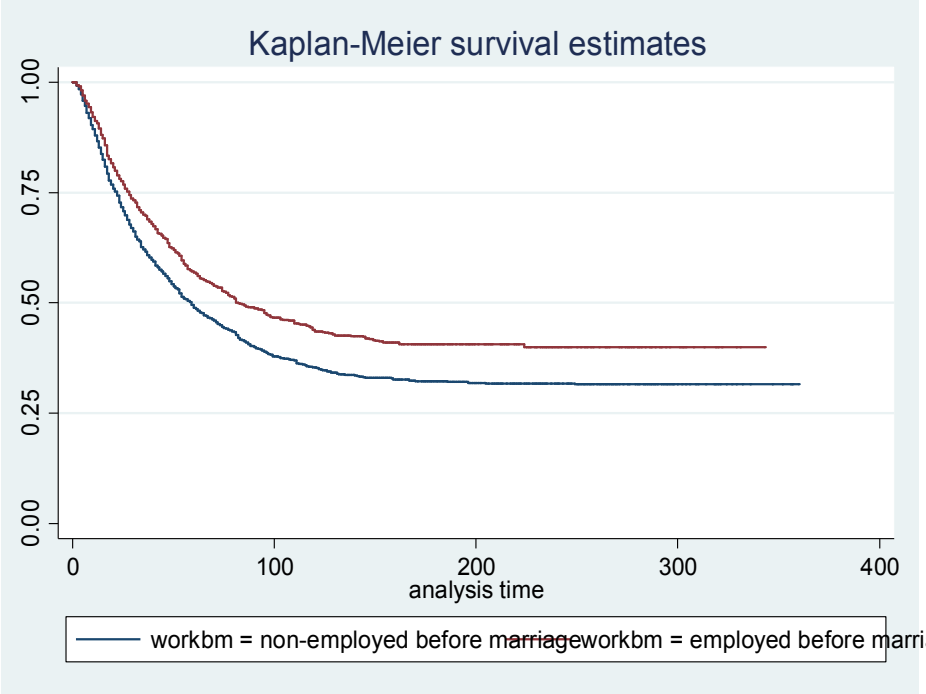
Log-rank test for equality of survival functions: Wald $Chi^2 = 443.39$, $Pr>chi^2 = 0.0000$

Figure II.4.3.1.3. Survival estimate of conceiving third child, by calendar period



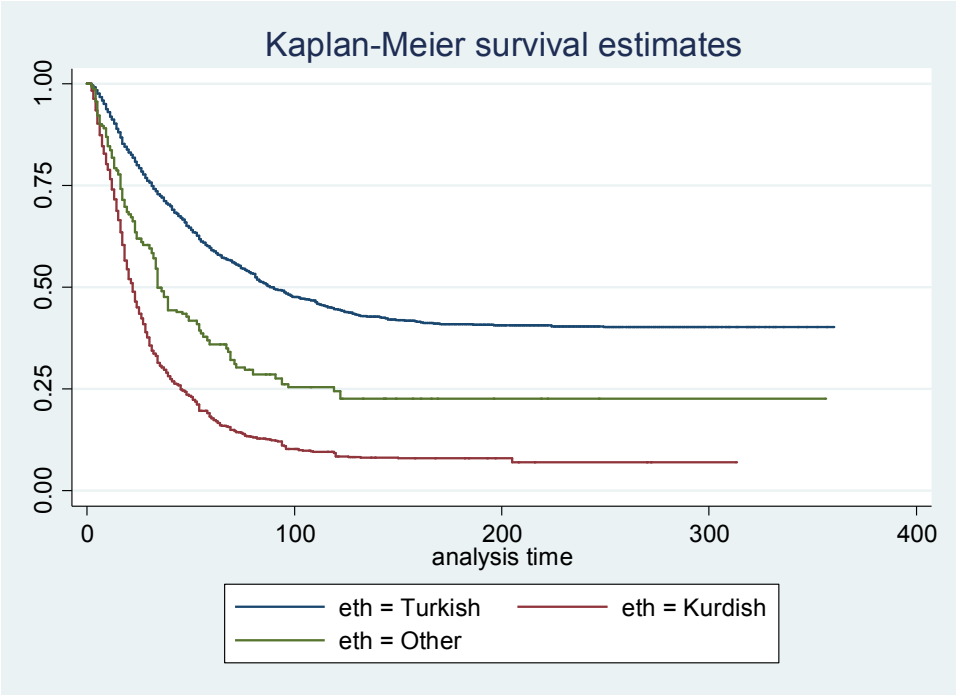
Log-rank test for equality of survival functions: Wald $Chi^2 = 322.44$, $Pr>chi^2 = 0.0000$

Figure II.4.3.1.4. Survival estimate of conceiving third child, by employment status before marriage



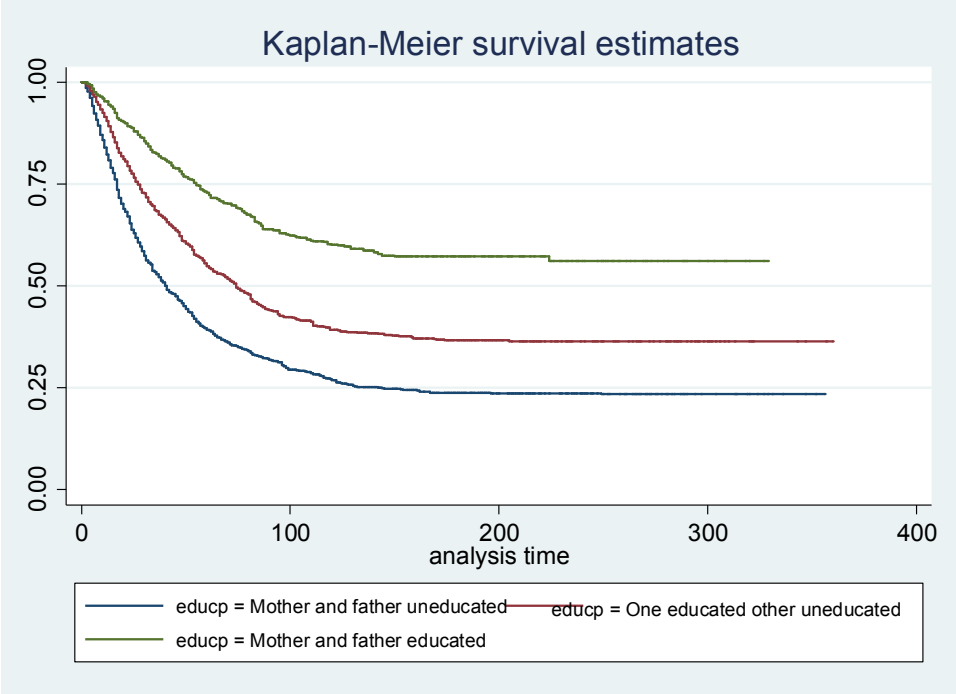
Log-rank test for equality of survival functions: Wald $Chi^2 = 24.91$, $Pr>chi^2 = 0.0000$

Figure II.4.3.1.5. Survival estimate of conceiving third child, by mother tongue



Log-rank test for equality of survival functions: Wald $Chi^2 = 431.27$, $Pr>chi^2 = 0.0000$

Figure II.4.3.1.6. Survival estimate of conceiving third child, by parental education



Log-rank test for equality of survival functions: Wald $Chi^2 = 202.09$, $Pr>chi^2 = 0.0000$

Survivor functions of all categories of presented explanatory and control variables differ from each other significantly. These variables are age at second birth, calendar year period, employment status before marriage, mother tongue and educational level of parents. If the age at second birth is younger, the survival estimates are lower indicating higher failure rates (Figure II.4.3.1.2). This implies that if the second birth takes place at younger ages, third birth takes place sooner. However more than half of two-child mothers do not proceed to third conception whose ages are over 25. Hence no median third conception interval could be computed for these groups of women (Table II.4.3.1.2). In older calendar years the median third conception interval was lower. The survival curves of more recent calendar periods are above the curves of older periods indicating survival estimates are higher in recent periods (Figure II.4.3.1.3). This is in line with declining fertility levels in time in Turkey and the increasing median third conception interval. The median interval increased from 20 months to 122 months in almost four decades (Table II.4.3.1.2). When we look at employment before marriage, it is observed that

women non-employed before marriage have lower survival estimates and median third conception interval is lower than that of women employed before marriage (Figure II.4.3.1.4 and Table II.4.3.1.2). Less education indicates lower survival estimates as well. Half of women with no education or primary incomplete level of education progress to third conception after just 23 months after second birth (Table II.4.3.1.2). Survivor functions of different residential categories differentiate from each other as well. Women living in rural areas and living in the Eastern region have lower survival estimates at each analysis time indicating lowest median third conception interval (Table II.4.3.1.2). For women living in the Western region, on the other hand, median interval for third conception cannot be computed since less than half of them proceed to third conception. Kurdish women and women of other ethnicities are more likely to progress to third conception and sooner than their Turkish counterparts (Figure II.4.3.1.5 and Table II.4.3.1.2). Survivor functions differ according to parental education categories as well. Women with uneducated parents (with education less than primary school) have lower survival estimates of third conception (Figure II.4.3.1.6). Finally median third conception interval is 64 months for women in their first marriages and is 82 months for women in their later marriages. No median can be calculated for separated women as less than half of them progress to third conception (Table II.4.3.1.2).

Table II.4.3.1.2. Median third conception intervals (in months)

Age at second birth	
13-19	25.6
20-24	52.2
25-29	..
30-34	..
35-41	..
Calendar years	
1973-1981	19.6
1982-1988	27.7
1989-1995	56.7
1996-2002	84.3
2003-2008	122.3
Employment before marriage	
Non-employed before marriage	58.2
Employed before marriage	81.6
Educational level	
No educ. or primary incomplete	22.8
Primary level	79.0
Secondary level	..
High school or higher level	..
In education	..
Type of place of residence	
Urban	86.8
Rural	36.3
Region	
West	..
South	59.8
Central	68.9
North	54.7
East	24.4
Mother tongue	
Turkish	88.8
Kurdish	21.5
Other	34.0
Parental education	
Mother and father uneducated	40.1
Either of mother of father uneducated	73.6
Mother and father educated	..
Marital status	
First marriage	63.8
Later marriages	81.5
Separated	..

To sum up in Turkey, within 10 years after second birth, 39 percent of women remain as two-child mothers. The median duration between second birth and third conception is 5.5 years.

II.4.3.2. The Multivariate Analysis: The Impact of Employment Status and Other Covariates on Transition to Third Conception

In this section the determinants of transition to third conception are analyzed using multivariate event history models. The question we seek to answer are: (i) How did third birth intensities evolve in the last four decades?, (ii) How is employment status of women related to third birth intensities?, and (iii) How do control variables other than employment status affect third birth risks in Turkey?

Six models are constructed stepwise where groups of covariates are added group by group into the model. First model is the basic model where we only control for *duration since second birth* (baseline hazard), *age at second birth*, and *calendar year*. Second model adds remaining explanatory variables to the model: *employment before marriage* and *employment status*. Third model adds a socio-economic variable to the model, namely *education*. Fourth model includes residential control variables of type of place of residence and region in addition to previous variables. Fifth model has background control variables of mother tongue and parental education as well. Finally, our sixth model has marital status as the final covariate controlling for seven time-varying and four time-fixed explanatory and control variables including the baseline hazard. The results of the models are presented in Table II.4.3.2.1.

The first model includes the standard variables *duration since second birth* (baseline hazard), *age at second birth*, and *calendar year*. Third conception intensities with respect to duration since second birth indicate that the risk peaks in the age groups of 1-2 years after second birth. As duration since second birth increases, the risk of third conception declines. The result appears to be valid in all six models except the fact that in 4-5 years after second birth, the risk of third conception increases again. As age at second birth increases, the risk of third

conception declines. The age interval 13-19 is the age group where the risk of third conception peaks. This implies that if second birth takes place at young ages, women progress to third conception at younger ages as well. The result is persistent in all six models. Intensities with respect to calendar year indicate that the risk of third conception declined constantly in the last four decades. During 1996-2002 period, the risk of third conception was 25 percent higher compared to 2003-2008 period according to the first model.

The second model has employment variables as additional explanatory variables. Employment before marriage variable seems to play no significant role in third birth intensities. In the second model, employment status seems to play no role, either.

The third model has educational level as a covariate. As educational level of the woman increases, the risk of third conception decreases. The situation is the same in all six models.

The fourth model has residential variables. Residential variables change outcomes and improve the model significantly. Employment status variable becomes significant and the effect of education variable declines when residential factors are controlled. Women living in rural areas and regions other than West have higher risks of third conception compared to women living in urban areas and regions other than West.

According to the results of the fifth model, background factors of mother tongue and parental education are influential determining the transition to third conception as well. Kurdish women and women of other ethnicities have higher risk of third conception compared to Turkish women. Women whose parents are not educated have higher risks of third conception.

Our final model has marital status as the last covariate. According to this model, variables except employment status before marriage are all influential

affecting third birth intensities in Turkey. Third birth intensities with respect to duration since second birth peak in 1-2 years after second birth, and declines onwards. However there is an increase once more in 4-5 years after second birth. Third birth intensities decline as age at second birth is increases. The risk of third conception declines constantly as time passes in the last four decades. Time-varying employment status become significant variable affecting third birth risks when residential factors are controlled. In the final model non-employed women have 10 percent higher risk of third conception compared to employed women. Lower educational level indicates higher third birth intensities. Women with no education or primary level incomplete education have 172 percent higher risk of third conception compared to women with high school or higher education. Women living in rural areas have 20 percent higher third birth intensities than their counterparts in urban areas. Women living in regions other than West have higher third birth risks. For instance the relative risk of third conception among women living in the East is 1.89 when the reference category is West. Women with mother tongue of Kurdish or other languages have higher third birth risks. Women with uneducated parents have higher third birth intensities. And finally women in later marriages are more likely to progress to third conception than separate women and women in their first marriages.

Table II.4.3.2.1. Relative risks of third conception since second birth, 1973-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Duration since second birth (Baseline)						
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	1.53	1.53	1.60	1.66	1.68	1.68
2-3 years	1.25	1.25	1.36	1.47	1.50	1.51
3-4 years	1.09	1.09	1.23	1.38	1.41	1.42
4-5 years	1.10	1.10	1.26	1.44	1.49	1.50
5-7 years	0.81	0.81	0.94	1.11	1.15	1.17
7-10 years	0.55	0.55	0.64	0.79	0.82	0.84
10+ years	0.13	0.13	0.16	0.20	0.21	0.23
Age at second birth						
13-19	1.54	1.54	1.31	1.21	1.18	1.20
20-24	*1*	*1*	*1*	*1*	*1*	*1*
25-29	0.57	0.57	0.65	0.69	0.70	0.70
30-34	0.28	0.29	0.33	0.37	0.37	0.38
35-41	0.25	0.26	0.31	0.35	0.36	0.38
Calendar year						
1973-1981	2.40	2.39	2.11	2.34	2.47	2.45
1982-1988	1.99	2.00	1.76	1.90	1.96	1.95
1989-1995	1.37	1.37	1.25	1.31	1.32	1.32
1996-2002	1.25	1.24	1.22	1.25	1.26	1.26
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*
Employment before marriage (time fixed)						
Non-employed		1.05	1.04	0.99	1.00	0.99
Employed		*1*	*1*	*1*	*1*	*1*
Employment Status (time varying)						
Non-employed		1.03	1.03	1.12	1.11	1.10
Employed		*1*	*1*	*1*	*1*	*1*
Education						
No education or primary incomplete			4.43	3.45	2.73	2.72
Primary level			1.88	1.84	1.69	1.68
Secondary level			1.22	1.18	1.15	1.14
High school or higher level			*1*	*1*	*1*	*1*
In education			0.00	0.00	0.00	0.00
Type of place of residence						
Urban				*1*	*1*	*1*
Rural				1.23	1.21	1.20

(Table II.4.3.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Region						
West				*1*	*1*	*1*
South				1.56	1.49	1.49
Central				1.50	1.57	1.57
North				1.47	1.50	1.49
East				2.40	1.89	1.89
Mother tongue						
Turkish					*1*	*1*
Kurdish					1.60	1.59
Other					1.45	1.44
Parental education						
Mother and father uneducated*					1.35	1.34
One educated other uneducated					1.29	1.28
Mother and father educated					*1*	*1*
Missing					1.35	1.37
Marital status						*1*
Separated						0.08
First marriage						*1*
Later marriages						1.12
Constant	0.01	0.01	0.00	0.00	0.00	0.00
Number of women (weighted)	5115	5115	5115	5107	5107	5105
Number of third conceptions	2768	2768	2768	2762	2762	2760
Time at risk (months)	364056	364056	364056	363352	363352	362961
Log likelihood	-6288	-6286	-6024	-5872	-5830	-5795
LR chi2	1003	1007	1724	2037	2022	2047
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000

*Uneducated: None or primary incomplete; educated: Primary complete or above

Table II.4.3.2.2 presents the results of model 6 where employment status variable is replaced by job characteristics. In other words, the role of job characteristics on risk of third conception is analyzed in this model. This is carried out by constructing expanded models separately for each job characteristic.

According to these models, all characteristics, namely sector of the job, public/private sector of the job, wage status of the job, social security coverage of the job are related to third conception risks. Being employed in agricultural sector increases the risk of third conception by 31 percent compared to being employed in the non-agricultural sector. Employment in the agricultural sector is almost equivalent to being non-employed in terms of third birth intensities. Working in the public sector decreases the risk of third conception compared to working in the private sector. Non-wage earners have higher risks of third conception compared to wage earners. Social security coverage is related to third conception risks where coverage decreases the risk of third conception. This seems to be associated with sectoral differences where women working in uncovered jobs usually work in the agricultural sector where incompatibility between working and mothering is less prevalent.

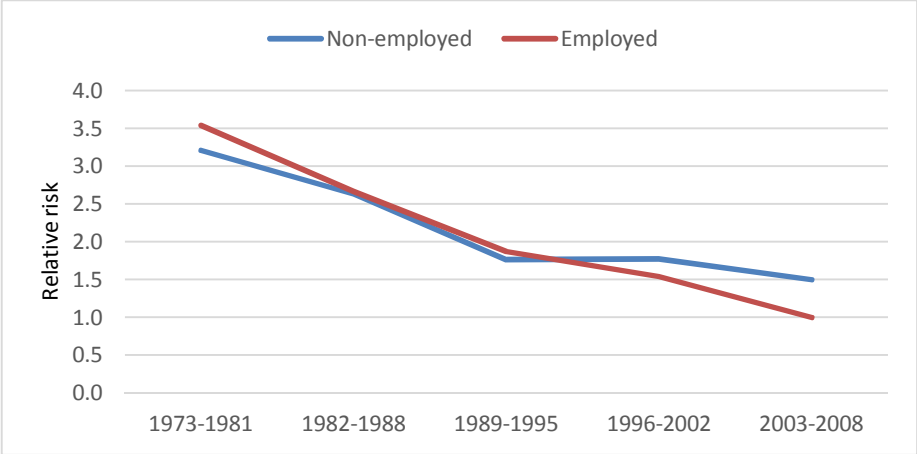
Table II.4.3.2.2. Relative risks of third conception by job characteristics, Turkey 1973-2008

Sector	
Agriculture	1.31
Non-agriculture	*1*
Non-employed	1.32
Log likelihood	-5790.61
LR chi2	2048.72
Prob > chi2	0.0000
Public versus private	
Public	0.57
Private	*1*
Non-employed	1.07
Log likelihood	-5790.86
LR chi2	2042.37
Prob > chi2	0.0000
Status	
Wage earner	*1*
Non-wage earner	1.29
Other	1.69
Non-employed	1.31
Log likelihood	-5790.05
LR chi2	2079.34
Prob > chi2	0.0000
Social security	
Uncovered	1.40
Covered	*1*
Missing	18.20
Non-employed	1.49
Log likelihood	-5788.24
LR chi2	14669.75
Prob > chi2	0.0000
Number of cases (weighted)	5105
Number of third conceptions	2760
Time at risk (months)	362961

II.4.3.3. Interactive Effect of Employment Statuses and Calendar Periods, Third Conception

The interaction model with calendar year and employment status are shown in Figure II.4.3.3.1. It presents relative risks of third conception by employment status and calendar period. The risk of third conception has been declining in time since 1973. The relative risks of third conception did not differ much from each other for non-employed and employed women until 1995. However relative risks have become higher for non-employed women after this period.

Figure II.4.3.3.1. Interaction effect of employment status and calendar period on third conception, standardized for other factors, Turkey (reference category: employed, 2003-2008)



The interaction model with calendar year and employment sector indicates that women of all groups had declining risk trend in time (Figure II.4.3.3.2). After 1996, non-employed women had higher relative risks compared to women employed in the non-agricultural sector.

Figure II.4.3.3.2. Interaction effect of employment sector and calendar period on third conception, standardized for other factors, Turkey (reference category: non-agriculture, 2003-2008)

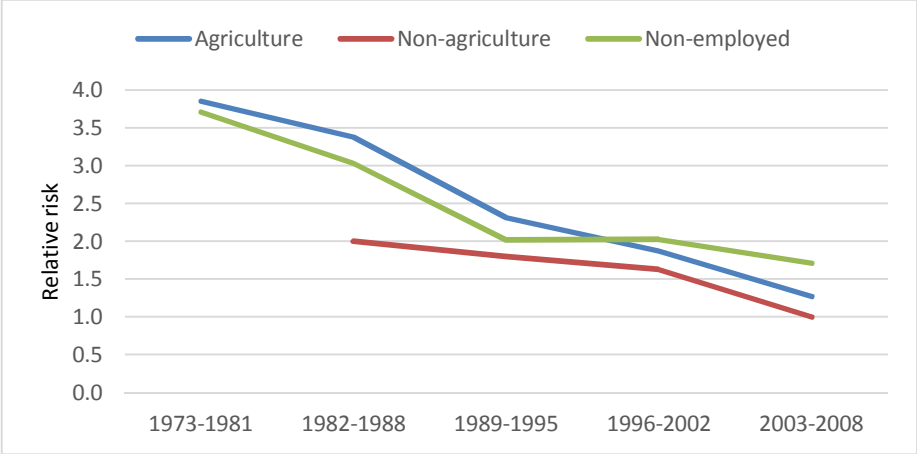


Figure II.4.3.3.3 shows interaction effect of public/private sector of employment and calendar period on third conception. Except for 1989-1995 period, the relative risks of third conception has been lower for women employed in the public sector. On the other hand relative risks of third conception has been similar among women working in the private sector and non-employed women at all times. 2003-2008 period indicates a higher relative risk of third conception for non-employed women followed by women employed in the public sector.

Figure II.4.3.3.3. Interaction effect of employment public/private sector and calendar period on third conception, standardized for other factors, Turkey (reference category: private, 2003-2008)

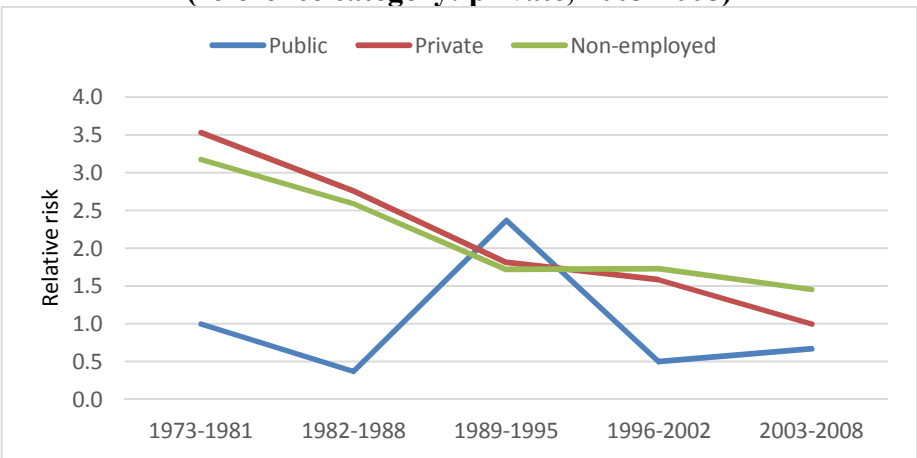
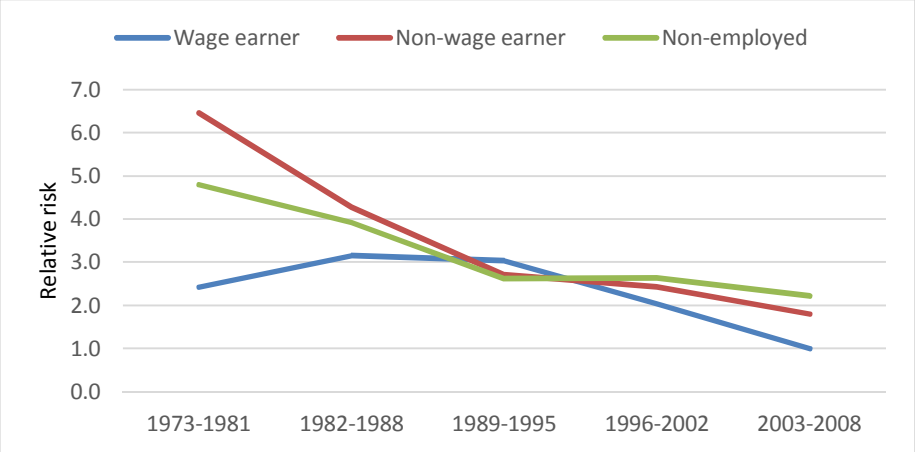


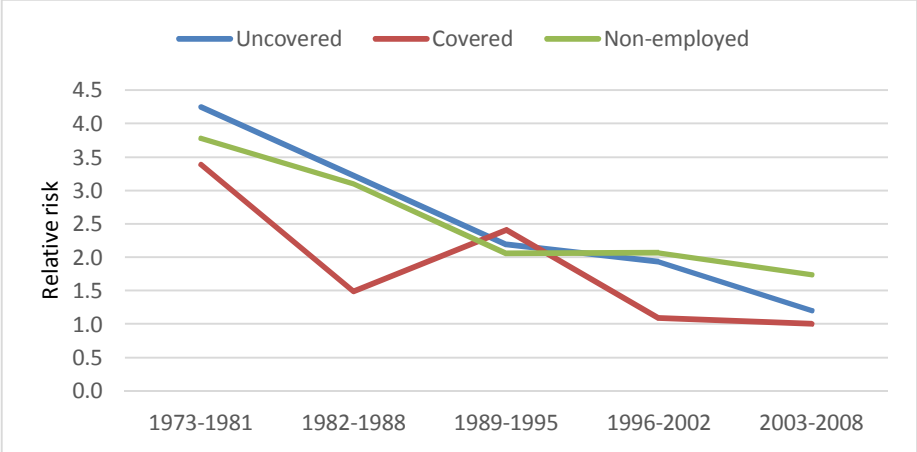
Figure II.4.3.3.4 presents the interaction effect of wage status of employment and calendar period on third conception risks. It is observed that a decline in relative risk of third conception occurred among all women in all wage statuses. By 2003-2008 period, relative risk of third conception was highest among non-employed women followed by non-wage earners and wage earners, respectively.

Figure II.4.3.3.4. Interaction effect of employment wage status and calendar period on third conception, standardized for other factors, Turkey (reference category: wage-earner, 2003-2008)



Finally Figure II.4.3.3.5 presents the interaction effect of social security coverage of the job and calendar period. The relative risks for women working in uncovered jobs and non-employed women have been similar to each other at all times. The relative risk among women in covered jobs were high in 1989-1995 period. In other periods the relative risks have always been lower among this group of women including 2003-2008 period.

Figure II.4.3.3.5. Interaction effect of social security coverage and calendar period on third conception, standardized for other factors, Turkey (reference category: covered, 2003-2008)



II.4.4. Progression to Fourth and Higher Order Births

According to the results of 2008 Turkey Demographic and Health Survey, only 6 percent of women with three children want to have another child in the future. As indicated by this figure, higher order births are mostly unintended or unwanted births.

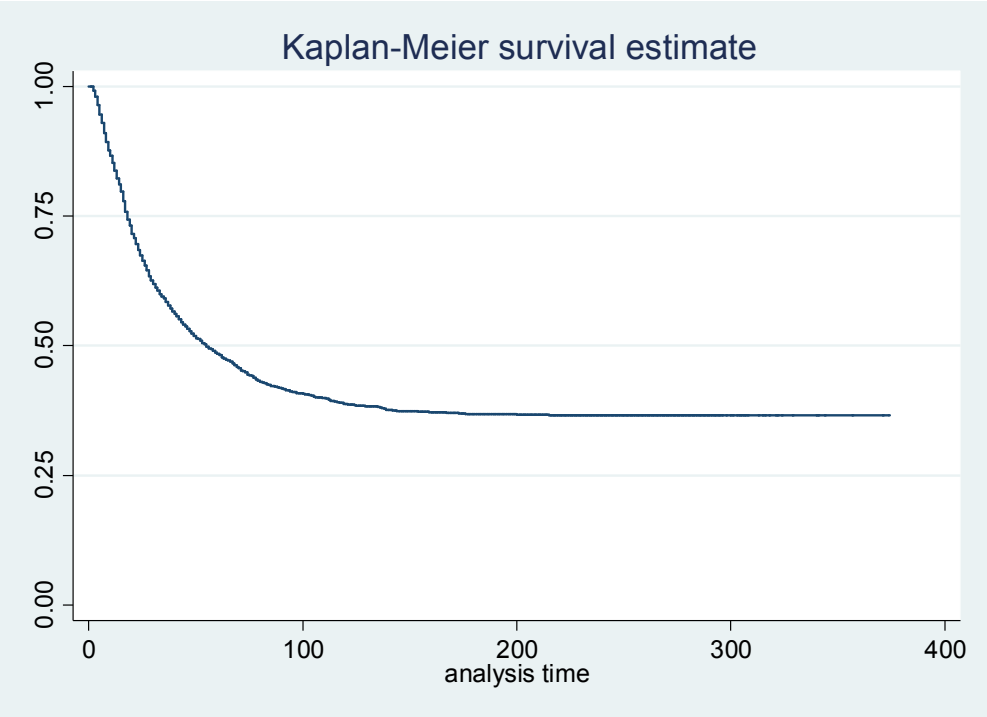
In this section, fourth and higher order births are analyzed with multi-episode models. In the section of descriptive analyses the conceptions of order four and above are pooled and analyses are carried out. In the multivariate analyses section, standard errors are corrected accordingly (see Section II.3.2.4. on repeated events for details).

II.4.4.1. Kaplan-Meier Survival Estimates: Differentials in the Transition to Fourth and Higher Order Births

In this section, Kaplan-Meier survival curves for the transition from previous birth to fourth or higher order conception by calendar period variable and time-fixed explanatory and control variables are presented. At the national level, 32

percent of mothers conceive their fourth or higher order child within two years after previous birth (Figure II.4.4.1.1 and Table II.4.4.1.1). Fifty-one percent of women have their fourth or higher order conception within five years after previous birth. By the end of ten years after first birth, 61 percent of women progress to fourth or higher order conception in Turkey. The median duration of transition from previous birth to fourth or higher order conception in Turkey is 55 months. In other words half of mothers with at least three children in Turkey conceive their next child within 4.6 years after previous birth.

Figure II.4.4.1.1. Survival estimate of conceiving fourth or higher order child, Turkey 2008



Median duration of transition to fourth or higher order conception among employed women (52.7 months) do not differ from that of non-employed women (55.2 months) (Table II.4.4.1.1). Within ten years after previous birth, 39 percent of employed women and non-employed women remain not having progressed to fourth or higher order conception.

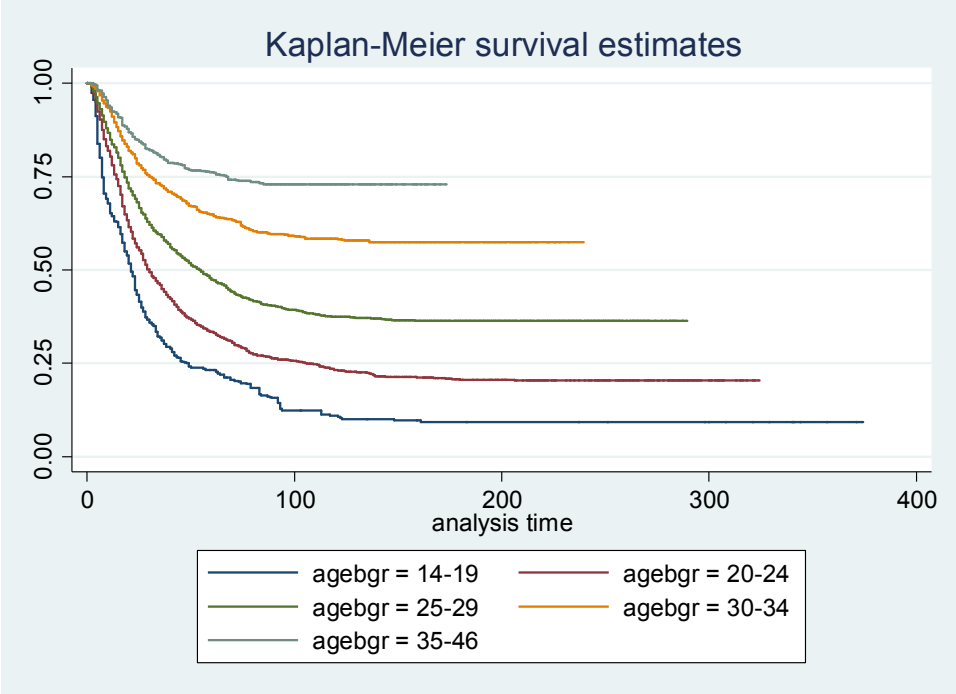
Table II.4.4.1.1. Transition to fourth or higher order conception by employment status: Kaplan-Meier survival curve estimates

	Percentage of non-pregnancy spells which do not end in fourth or higher order conception within *2 years* after previous birth	Percentage of non-pregnancy spells which do not end in fourth or higher conception within *5 years* after previous birth	Percentage of non-pregnancy spells which do not end in fourth or higher conception within *10 years* after previous birth	*Median* duration of transition from previous birth to fourth or higher order conception (months)
Employed	68.5	48.5	38.9	52.7
Non-employed	68.5	48.7	38.8	55.2
Agriculture	65.8	44.6	33.6	44.8
Non-agriculture	83.0	68.2	61.8	..
Public	78.9	70.5	64.8	..
Private	68.2	48.0	38.3	51.0
Wage	65.5	43.7	37.8	39.3
Non-wage	69.6	50.4	39.0	62.5
Uncovered	67.2	46.7	36.9	48.5
Covered	93.4	81.9	73.1	..
Turkey	68.5	48.6	38.8	54.6

The survivor functions of groups significantly differ according to job characteristics except for categories of wage status of employment (Table II.4.4.1.1). The transition to fourth or higher order conception takes place sooner among non-employed women or women working in the agricultural sector than among women employed in non-agricultural sector. Median duration of transition from previous birth to fourth or higher order conception is 44.8 months for women employed in the agricultural sector. On the other hand less than half of women employed in non-agricultural sector proceed to higher order conceptions. Within ten years after marriage, 35 percent of women employed in the public sector progress to higher order conceptions, this proportion is 62 percent among women employed in the private sector. Finally women employed in jobs with social security coverage have higher survival estimates and the median for this group of women cannot be computed.

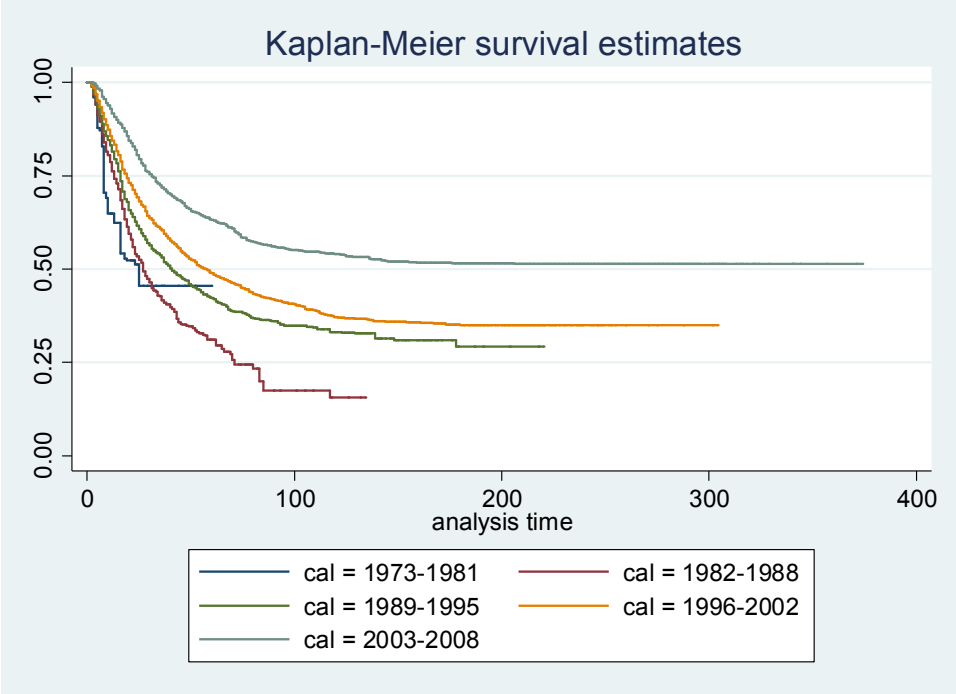
Kaplan-Meier survival estimates of the proportion of conceiving the fourth or higher order child since previous birth by calendar period and time-fixed explanatory variables and covariates are presented below.

Figure II.4.4.1.2. Survival estimate of conceiving fourth or higher order child, by age at previous birth



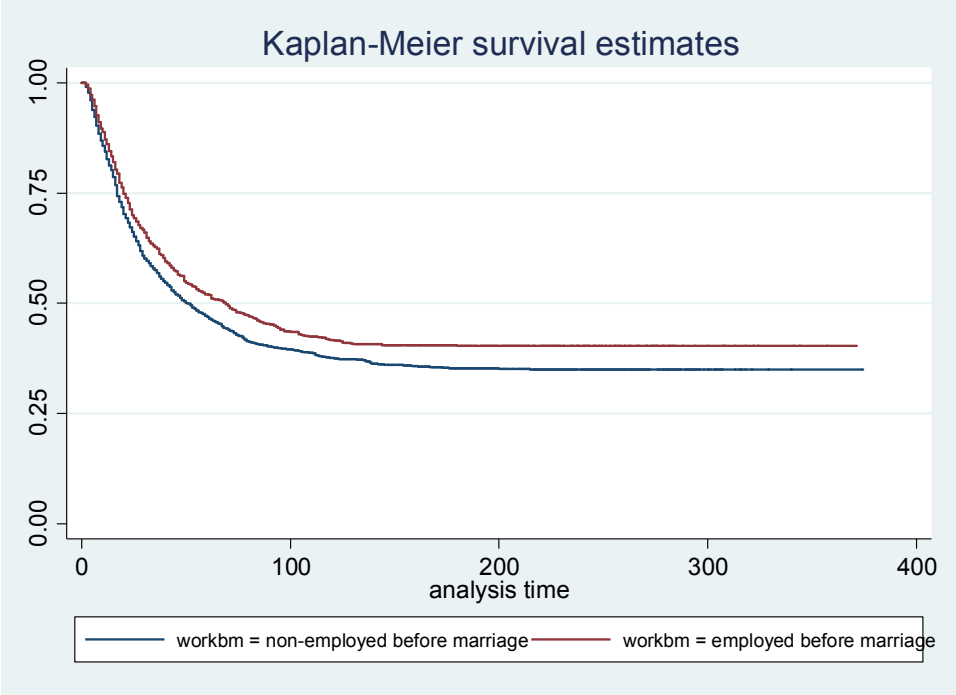
Log-rank test for equality of survival functions: Wald $Chi^2 = 468.81$, $Pr>chi^2 = 0.0000$

Figure II.4.4.1.3. Survival estimate of conceiving fourth or higher order child, by calendar period



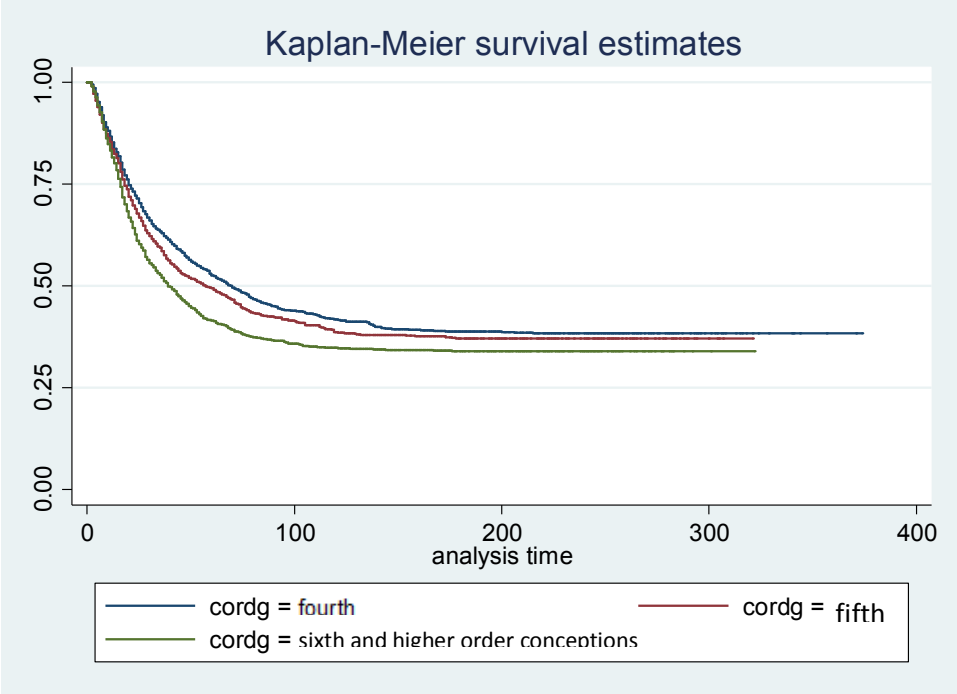
Log-rank test for equality of survival functions: Wald $Chi^2 = 227.12$, $Pr>chi^2 = 0.0000$

Figure II.4.4.1.4. Survival estimate of conceiving fourth or higher order child, by employment status before marriage



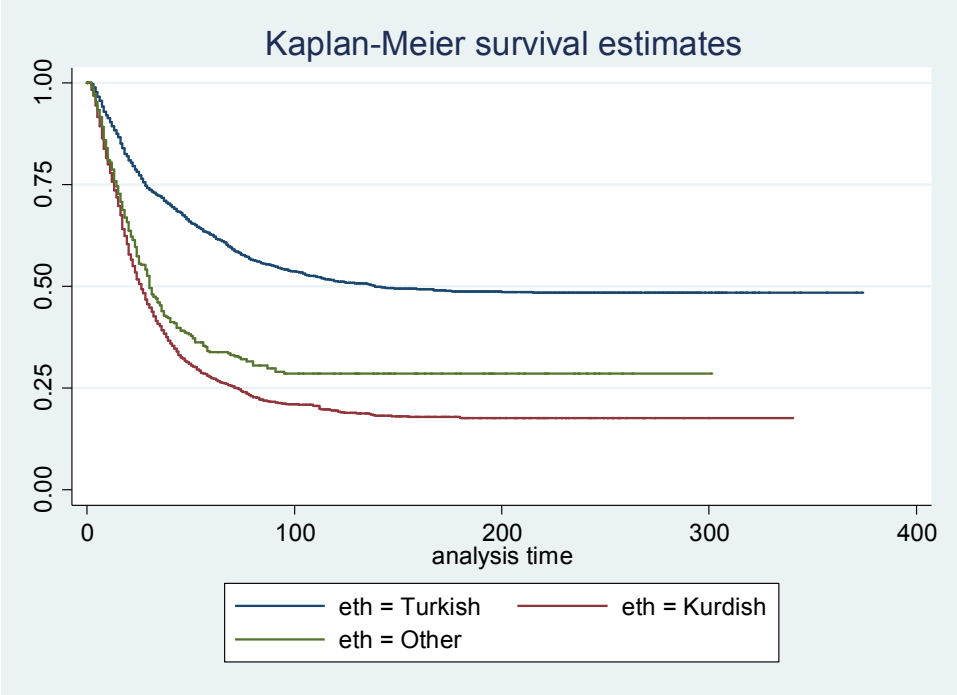
Log-rank test for equality of survival functions: Wald $Chi^2 = 11.82$, $Pr>chi^2 = 0.0006$

Figure II.4.4.1.5. Survival estimate of conceiving fourth or higher order child, by order of conception



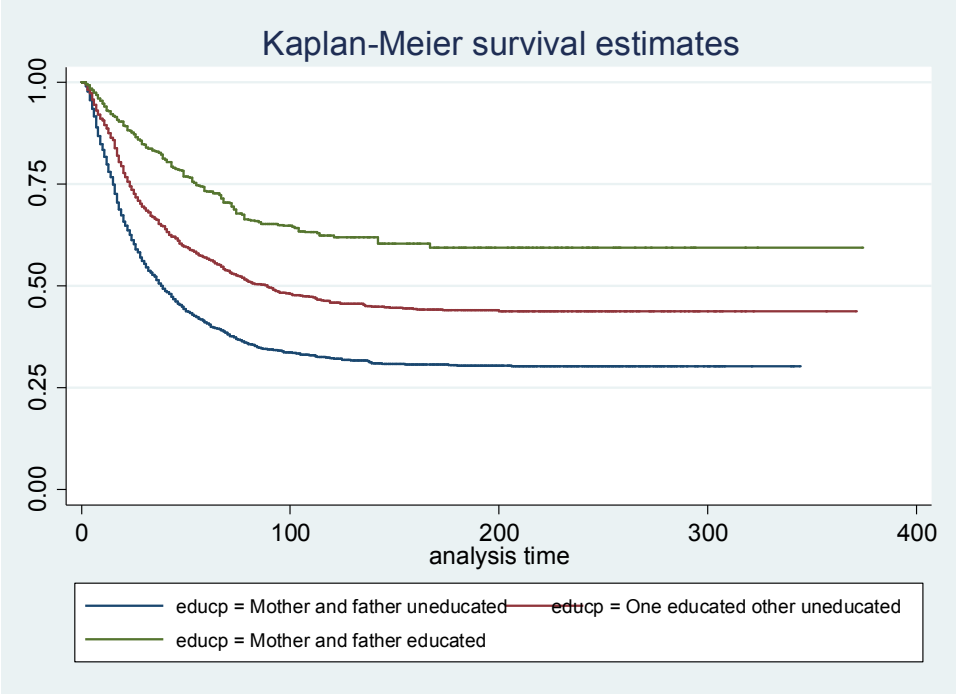
Log-rank test for equality of survival functions: Wald $Chi^2 = 29.06$, $Pr>chi^2 = 0.0000$

Figure II.4.4.1.6. Survival estimate of conceiving fourth or higher order child, by mother tongue



Log-rank test for equality of survival functions: Wald $Chi^2 = 520.97$, $Pr>chi^2 = 0.0000$

Figure II.4.4.1.7. Survival estimate of conceiving fourth or higher order child, by parental education



Log-rank test for equality of survival functions: Wald $Chi^2 = 160.51$, $Pr>chi^2 = 0.0000$

Survivor functions of all categories of presented explanatory and control variables differ from each other significantly. These variables are age at previous birth, calendar year period, employment status before marriage, order of conception, mother tongue, and educational level of parents. If the age at previous birth is younger, the survival estimates are lower indicating higher failure rates (Figure II.4.4.1.2). This implies that if the previous birth takes place at younger ages, fourth or higher order birth takes place sooner. The median conception interval for higher order births cannot be computed for women of ages 30 since less than half of these women progress to higher order conceptions (Table II.4.4.1.2). Survival curves of recent calendar periods are above older calendar periods (Figure II.4.4.1.3). This indicates survival estimates are higher for more recent calendar periods. Median fourth or higher order conception interval is 26.7 months for the period of 1982-1988; this interval has risen to 56.8 for 1996-2002 period (Table II.4.4.1.2). Women employed before marriage have lower failure rates compared to women non-employed before marriage (Figure II.4.4.1.4). The difference between median

interval for these two groups of women is 18.1 months, where interval is higher for women employed before marriage (Table II.4.4.1.2). Differently from previous models, order of conception is a variable which effects survival curves significantly. Higher order conceptions imply lower survival estimates (Figure II.4.4.1.5). Median fourth or higher order conception interval declines as order or conception increases (Table II.4.4.1.2). Median fourth or higher order conception interval can only be computed for women with primary level incomplete or no education and with primary level education. The difference is striking. The median interval is 29.1 months for women with no education or primary incomplete education, whereas it is 120 months for women with primary level education. The median conception interval is 52 months higher for women residing in urban areas. Median fourth or higher order conception interval is lowest for women in the Eastern region with 26 months followed by women in South, North and Central regions (Table II.4.4.1.2). Background variables of mother tongue and parental education are also influential affecting higher order birth intensities, as well, separately. Kurdish women or women of other ethnicities have higher birth intensities than Turkish women in terms of higher order births (Figure II.4.4.1.6). Median conception interval for Kurdish women and women of other ethnicities are low with 25 and 30 months compared to that of Turkish women with 139 months (Table II.4.4.1.2). Less parental education implies higher propensity for fourth or higher order conceptions with lower survival estimates (Figure II.4.4.1.7). Regarding marital status, results are similar to previous births. Median conception interval is slightly higher for women in their first marriages (54 months) compared to women in later marriages (49 months) (Table II.4.4.1.2)

Table II.4.4.1.2. Median fourth or higher order conception intervals (in months)

Age at previous birth	
14-19	20.8
20-24	29.2
25-29	54.0
30-34	..
35-41	..
Calendar years	
1973-1981	24.2
1982-1988	26.7
1989-1995	40.3
1996-2002	56.8
2003-2008	..
Employment before marriage	
Non-employed before marriage	50.4
Employed before marriage	68.5
Order of conception	
Fourth	68.9
Fifth	56.6
Sixth and higher order	38.9
Educational level	
No education or primary incomplete	29.1
Primary level	120.0
Secondary level	..
High school or higher level	..
In education	..
Type of place of residence	
Urban	85.3
Rural	33.6
Region	
West	..
South	72.3
Central	111.6
North	79.9
East	25.9
Mother tongue	
Turkish	138.7
Kurdish	25.4
Other	29.9

(Table II.4.4.1.2 continued)

Parental education	
Mother and father uneducated	38.1
Either of mother of father uneducated	88.4
Mother and father educated	..
Marital status	
First marriage	53.6
Later marriages	49.4
Separated	..

To sum up in Turkey, within 10 years after previous birth, 39 percent of women do not experience fourth or higher order conceptions. Median duration of transition from previous birth to fourth or higher order conception is 4.6 years.

II.4.4.2. The Multivariate Analysis: The Impact of Employment Status and Other Covariates on Transition to Fourth or Higher Order Conceptions

In this section the determinants of transition to fourth and higher order conceptions are analyzed using multivariate event history models. The question we seek to answer are: (i) How did fourth and higher order birth intensities evolve in the last four decades?, (ii) How is employment status of women related to fourth and higher order birth intensities?, and (iii) How do control variables other than employment status affect fourth and higher order birth risks in Turkey?

Seven models are constructed stepwise where groups of covariates are added group by group into the model. First model is the basic model where we only control for *duration since previous birth* (baseline hazard), *age at previous birth*, and *calendar year*. Second model adds remaining explanatory variables to the model: *employment before marriage* and *employment status*. Third model adds a different variable from previous conceptions models: *order of conception*. Fourth model adds a socio-economic variable to the model, namely *education*. Fifth model includes residential control variables of type of place of residence and region in addition to previous variables. Sixth model has background control variables of mother tongue

and parental education as well. Finally, our seventh model has marital status as the final covariate controlling for seven time-varying and five time-fixed explanatory and control variables including the baseline hazard. The results of the models are presented in Table II.4.4.2.1.

According to the results of the first model, the risk of fourth or higher order conception peaks within 1-2 years after previous birth. As duration since previous birth increases, the risk of fourth or higher order conception decreases. The result is prevalent in all seven models. Younger age at previous birth implies higher risks of fourth or higher order conceptions. This is an expected result due to higher exposure of these women -who had third birth at younger ages- to conception risks in their reproductive lives. Compared to 2003-2008 period, in the past calendar periods the risk of higher order conceptions was higher. This result does not change in all seven models.

In the second model, the employment explanatory variables are included in the model. Employment before marriage variable is insignificant. On the other hand, employment status variable becomes significant when spatial covariates are included in the model.

In the third model, order of conception is included as a covariate. As the order of conception increases, the risk of the conception increases. The risk for high order conception is 97 percent higher for conception order of six and above compared to conception order of four.

In the fourth model, educational level is included as a covariate explaining fourth and higher order conception intensities. The risk of higher order conception is higher among lower educated women and the difference is large. When other covariates are included in the model, this difference becomes smaller albeit still significant.

The fifth model has residential variables in the model. Women living in rural areas and Eastern region have higher risks for conceptions of higher order compared to women living in urban areas and in Western region. The risk of fourth or higher order conception is 50 percent higher among women living in rural areas compared to women living in urban areas. Women living in the Eastern region have 104 percent higher risk of conception of higher orders compared to their counterparts residing in West region.

The sixth model has background variables of mother tongue and parental education additionally. Women with mother tongue Kurdish and other languages other than Turkish have higher fourth and higher order birth risks than Turkish women. Having one or both of the parents uneducated (less than primary school education) increases the risk of higher order conception compared to having both parents educated.

The final model controls for marital status of the woman. According to this model in later marriages than the first one, higher order births are more likely. The results for explanatory variables remain almost the same. As duration since previous birth increases, the risk of higher order conceptions decreases, where the peak duration is 1-2 years after previous birth. As age at previous birth increases, the risk of conception declines. As calendar year increases, the risk of higher order conception declines. Employment before marriage is an insignificant variable which does not have an influential effect on fourth or higher order birth intensities. In the final model, employment status is an important variable indicating 14 percent higher risk of higher order conception for non-employed women compared to employed women. If the conception order is six or higher, the conception is more likely to occur compared to conception order four. Less educational level implies higher risks of conception. Women with no education or incomplete primary level education have 120 percent higher risk of high order conception compared to women with high school level or higher education. Living in rural areas or East region implies higher risks of high order conceptions for women compared to living in urban areas or West region. According to background factors, women with mother tongue of Kurdish or

other languages, women with low parental education and women in their later marriages have higher risks of fourth or higher order conception.

Table II.4.4.2.1. Relative risks of fourth or higher order conceptions since previous birth, 1973-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since previous birth (Baseline)							
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	1.29	1.29	1.31	1.34	1.42	1.43	1.44
2-3 years	0.88	0.88	0.91	0.95	1.05	1.07	1.09
3-4 years	0.70	0.70	0.73	0.78	0.90	0.93	0.95
4-5 years	0.50	0.50	0.53	0.57	0.67	0.70	0.72
5-7 years	0.44	0.44	0.46	0.50	0.61	0.65	0.67
7-10 years	0.19	0.19	0.20	0.22	0.29	0.30	0.32
10+ years	0.04	0.04	0.04	0.05	0.07	0.08	0.08
Age at previous birth							
14-19	1.42	1.41	1.51	1.39	1.25	1.20	1.21
20-24	*1*	*1*	*1*	*1*	*1*	*1*	*1*
25-29	0.70	0.70	0.61	0.68	0.72	0.74	0.74
30-34	0.42	0.43	0.33	0.38	0.41	0.43	0.43
35-46	0.28	0.29	0.21	0.22	0.24	0.25	0.25
Calendar year							
1973-1981	1.27	1.28	1.35	1.28	1.59	1.73	1.75
1982-1988	1.48	1.49	1.45	1.43	1.74	1.86	1.88
1989-1995	1.39	1.39	1.33	1.27	1.43	1.48	1.49
1996-2002	1.42	1.42	1.40	1.37	1.44	1.46	1.47
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Employment before marriage (time fixed)							
Non-employed		1.09	1.03	1.00	0.96	0.96	0.96
Employed		*1*	*1*	*1*	*1*	*1*	*1*
Employment Status (time varying)							
Non-employed		1.01	1.04	1.02	1.17	1.15	1.14
Employed		*1*	*1*	*1*	*1*	*1*	*1*
Order of conception							
Fourth			*1*	*1*	*1*	*1*	*1*
Fifth			1.23	1.05	1.02	0.99	1.00
Sixth or higher order			1.97	1.45	1.26	1.16	1.17

(Table II.4.4.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education							
No education or primary incomplete				4.05	2.76	2.19	2.20
Primary level				2.13	1.82	1.64	1.64
Secondary level				1.47	1.31	1.28	1.29
High school or higher level				*1*	*1*	*1*	*1*
Type of place of residence							
Urban					*1*	*1*	*1*
Rural					1.50	1.49	1.48
Region							
West					*1*	*1*	*1*
South					1.20	1.13	1.15
Central					1.01	1.11	1.11
North					1.07	1.17	1.15
East					2.04	1.63	1.63
Mother tongue							
Turkish						*1*	*1*
Kurdish						1.58	1.59
Other						1.56	1.55
Parental education							
Mother and father uneducated*						1.42	1.44
One educated other uneducated						1.26	1.26
Mother and father educated						*1*	*1*
Missing						1.28	1.28
Marital status							
Separated							0.07
First marriage							*1*
Later marriages							1.53
Constant	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Number of non-pregnancy spells (weighted)	6070	6070	6070	6070	6056	6056	6056
Number of conceptions	3305	3305	3305	3305	3296	3296	3296
Time at risk (months)	400762	400762	400762	400762	399574	399574	399510
Log likelihood	-7838	-7835	-7717	-7544	-7308	-7252	-7210
LR chi2	1640	1650	2048	2276	2851	3103	3112
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Uneducated: None or primary incomplete; educated: Primary complete or above

Table II.4.4.2.2 presents the results of model 7 where employment status variable is replaced by job characteristics. In other words, the role of job characteristics on risk of fourth and higher order conceptions is analyzed in this model. This is carried out by constructing expanded models separately for each job characteristic.

According to these models, sector of the job, wage status of the job and social security coverage of the job are related to higher order conception risks. Being employed in agricultural sector increases the risk of fourth and higher order conception by 37 percent compared to being employed in the non-agricultural sector. Employment in the agricultural sector is almost equivalent to being non-employed in terms of high order birth intensities. Non-wage earners have lower risks of fourth or higher order conception compared to wage earners. Social security coverage is related to high order conception risks where coverage decreases the risk of conception. This seems to be associated with sectoral differences where women working in uncovered jobs usually work in the agricultural sector where incompatibility between working and mothering is less prevalent.

Table II.4.4.2.2. Relative risks of fourth or higher order conception by job characteristics, Turkey 1973-2008

Sector	
Agriculture	1.37
Non-agriculture	*1*
Non-employed	1.47
Log likelihood	-7205.22
LR chi2	3088.31
Prob > chi2	0.0000
Public versus private	
Public	0.77
Private	*1*
Non-employed	1.13
Log likelihood	-7209.18
LR chi2	3113.53
Prob > chi2	0.0000
Status	
Wage earner	*1*
Non-wage earner	0.87
Other	1.43
Non-employed	1.04
Log likelihood	-7207.87
LR chi2	3178.82
Prob > chi2	0.0000
Social security	
Uncovered	1.68
Covered	*1*
Missing	3.61
Non-employed	1.88
Log likelihood	-7205.63
LR chi2	3128.31
Prob > chi2	0.0000
Number of cases (weighted)	6056
Number of fourth and higher order conceptions	3296
Time at risk (months)	399510

II.4.4.3. Interactive Effect of Employment Statuses and Calendar Periods, Fourth or Higher Order Conceptions

The interaction model with calendar year and employment status are shown in Figure II.4.4.3.1. It presents relative risks of fourth or higher order conception by employment status and calendar period. The risk of high order conception has been declining in time. The relative risks of fourth or higher order conception did not differ much from each other for non-employed and employed women.

Figure II.4.4.3.1. Interaction effect of employment status and calendar period on fourth or higher order conception, standardized for other factors, Turkey (reference category: employed, 2003-2008)

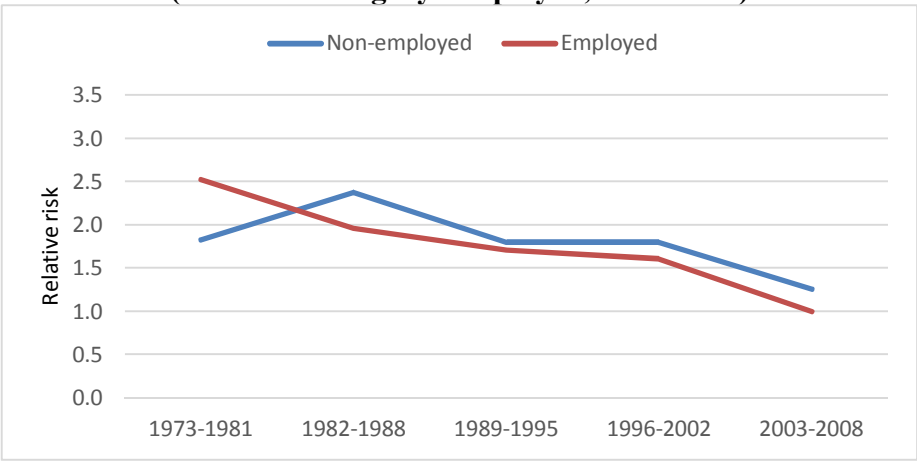


Figure II.4.4.3.2 presents relative risks of fourth or higher order conception by employment sector and calendar period. The risk of higher order conception among women employed in the non-agricultural sector has always been lower than that of women employed in the agricultural sector or non-employed women. The difference between these groups have been widening after the period of 1989-1995.

Figure II.4.4.3.2. Interaction effect of employment sector and calendar period on fourth or higher order conception, standardized for other factors, Turkey (reference category: non-agriculture, 2003-2008)

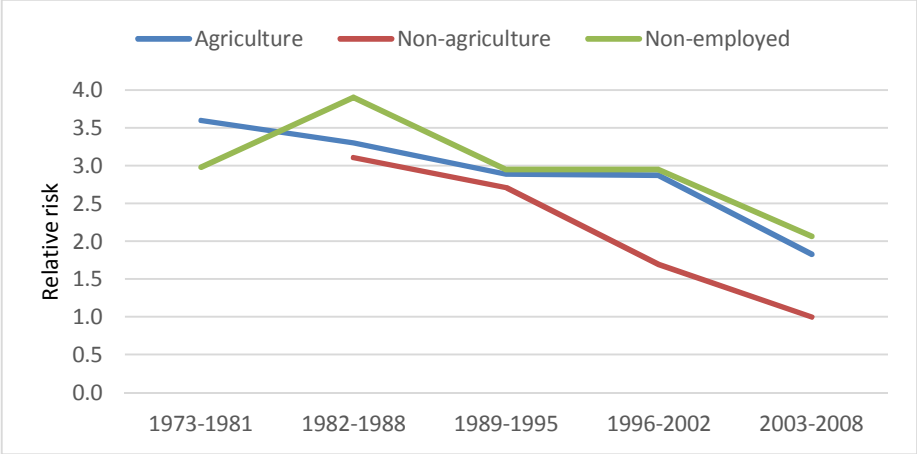


Figure II.4.4.3.3 presents relative risks of fourth or higher order conception by public/private sector of employment and calendar period. Except for 1989-1995 period, relative risks have been declining in time for all groups. However during 1989-1995 period women employed in the public sector have relatively higher conception risks. By 2003-2008 period, women employed in public sector have lower risks of high order conception compared to women employed in the private sector.

Figure II.4.4.3.3. Interaction effect of employment public/private sector and calendar period on fourth or higher order conception, standardized for other factors, Turkey (reference category: private, 2003-2008)

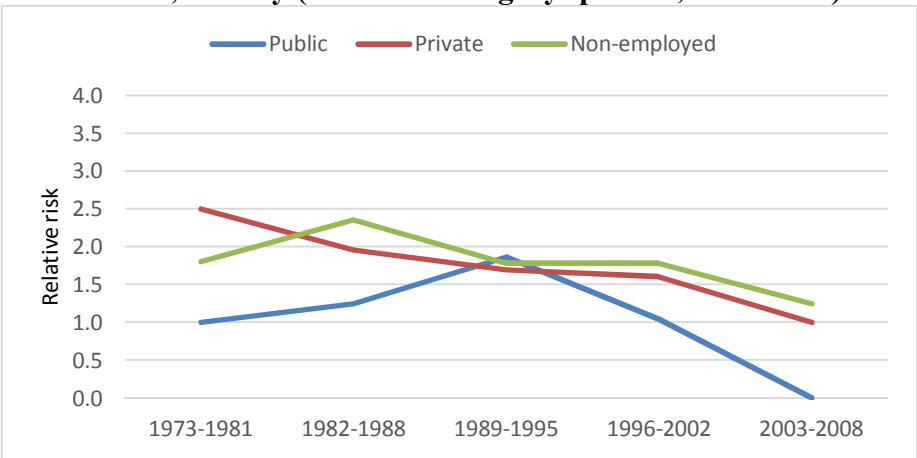


Figure II.4.4.3.4 presents relative risks of fourth or higher order conception by wage status of employment and calendar period. Except for 1973-1981 period, not much difference is observed in relative risks of groups of women with different wage statuses.

Figure II.4.4.3.4. Interaction effect of employment wage status and calendar period on fourth or higher order conception, standardized for other factors, Turkey (reference category: wage-earner, 2003-2008)

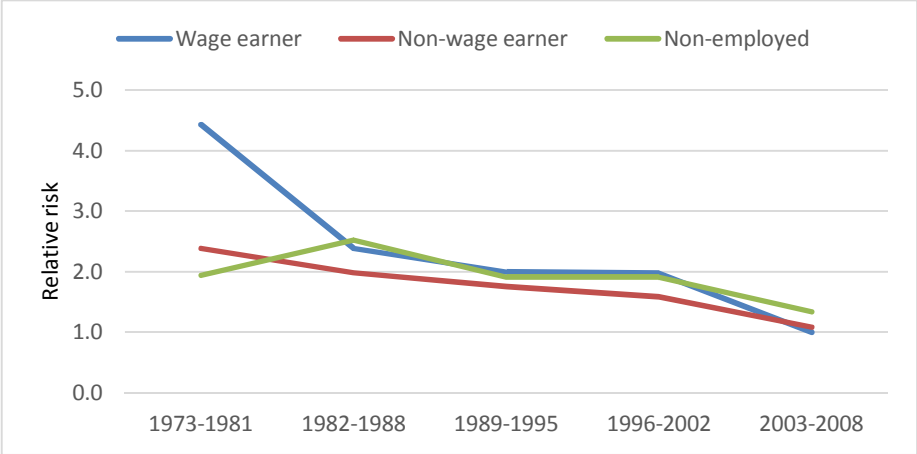
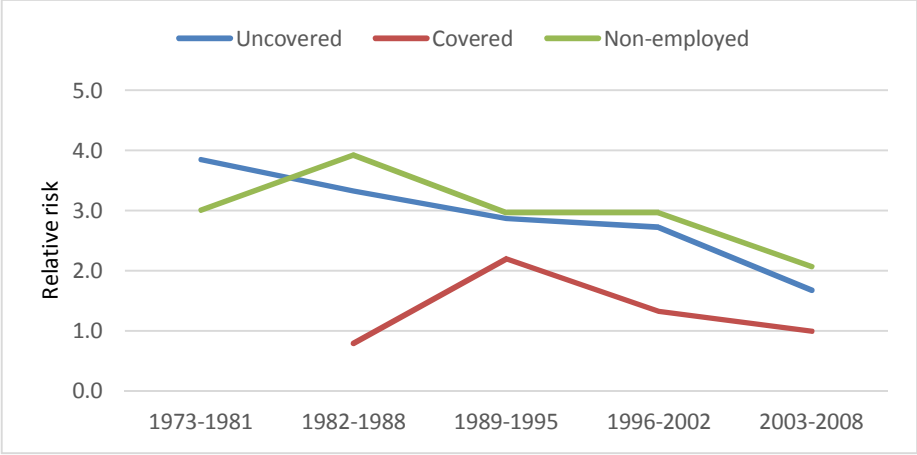


Figure II.4.4.3.5 presents relative risks of fourth or higher order conception by social security coverage of employment and calendar period. It is observed that at all calendar periods, the risk of higher order conception is lower among women employed in covered jobs.

Figure II.4.4.3.5. Interaction effect of social security coverage and calendar period on fourth or higher order conception, standardized for other factors, Turkey (reference category: covered, 2003-2008)



II.5. CONCLUSION

The linkages between women's employment and fertility have been studied mostly in developed country contexts within the frameworks of role incompatibility hypothesis and societal response hypothesis. The literature on this relationship in the developed world suggests a shift from a negative relationship to a weakening negative or even a positive relationship. This development was explained by the decreasing role incompatibility between working and mothering caused by changes in the societal response and institutional context, i.e. welfare state structure. The evidence from developing countries, on the other hand, indicates a less clear picture due to slow or ongoing demographic transition. In this paper, we examine the effect of employment of women on fertility in a developing country context: Turkey. In Turkey both the total fertility rate and the female labor force participation rate have been declining over time. *A priori* it is not possible to say whether or not the role incompatibility is supported in Turkey. There are two opposing forces. The passive family policies and male-breadwinner model widespread in Turkey suggest support for the role incompatibility. However women experience high unemployment rates and they work in inferior jobs with no wage and no social security. Thus the flexible working conditions and increased job turnover would favor the role compatibility on the other hand. This is supported by the values and norms in the country as well. In Turkey both men and women perceive men's employment as more important than women's. However these linkages are highly dependent on economic conditions, i.e. living standards. Thus, how the context is reflected in the mechanisms running from employment to fertility in Turkey is the question we sought to find an answer empirically. The research questions analyzed using multivariate event history analyses are as follows:

- What are the determinants of first, second, third, and fourth and higher order births focusing on employment status of women? How is women's employment status related to these fertility events?
- How are job characteristics related to transition to first, second, third, and fourth and higher order births?

- How do trend of births of different orders evolve over time? What may be the factors that shaped this trend?
- How do the findings provide support for role incompatibility hypothesis in Turkey taking into consideration the institutional context in Turkey?

In addition to these questions, descriptive analyses, namely Kaplan-Meier survival estimates of transitions to specific conception events (first, second, third, and fourth or higher order conception) at national level and with respect to time-fixed variables and time-varying calendar period variable were presented. The equality of survivor functions shown in graphs was tested using the *log-rank test*.

Basic descriptive findings indicated lower fertility rates for employed women. Women employed in compatible job categories, on the other hand, such as women employed in the agricultural sector, in uncovered jobs or as non-wage earners have higher fertility rates than other employed women. Differently from this finding, women employed in the public sector have higher fertility rate (2.33), even above average of Turkey (2.16) using TDHS-2008.

As a cumulative measure of fertility, children ever born to women age 40-49 figures for women of different employment status indicated higher fertility levels for never employed women. Different from period measure of fertility, women employed in public sector had lower number of children ever born (1.97) compared to women employed in private sector (3.20), where the mean number of children ever born at the national level was 3.34 using TDHS-2008. These results indicate a recent increase in fertility among women employed in the public sector.

Kaplan-Meier survival estimates reveal that in Turkey first conception takes place 8 months after first marriage, second conception takes place 2.5 years after first birth, third conception takes place 5.5 years after second birth, and higher order conceptions take place 4.6 years after previous birth. First birth is universal for ever-married women in Turkey. By 10 years after marriage, only 4 percent of women

remain childless. The survivor functions with respect to all explanatory and control variables differ except for type of place of residence and mother tongue for the first conception and employment status for third, and fourth or higher order conceptions. Although there is no significant difference between survivor functions of employed and non-employed women in terms of third and higher order conceptions, when job characteristics are taken into account the result changes. Women employed in the agricultural sector, in private sector, in uncovered jobs or as non-wage earners have higher birth intensities, separately. Survivor functions of wage status categories do not differ from each other significantly for births or order four and above.

These results, at first instance, provide support for role incompatibility hypothesis since when the nature of the task is taken into account; a negative relationship occurs between employment and fertility of women. In jobs where roles are expected to be more compatible, higher fertility risks prevail. On the other hand, among women who work in covered jobs or in non-agricultural jobs, birth intensities are lower. Even the finding of no relationship between employment status and third and higher order births supports role incompatibility hypothesis in the sense that the organization of production favored compatibility between working and mothering considering job histories of women who have mostly works in the agricultural sector.

In the multivariate analyses, stepwise multiplicative intensity regression models were estimated for each conception event, namely first conception, second conception, third conception, and fourth and higher order conceptions. The last model was a multi-episode model where each woman was observed until the date of interview or the date of emigration. In other words, after each failure event (conception of order four or above) the woman re-entered the analysis. We employed the strategy suggested by Allison (2010) and reset the clock to 0 each time an event occurs and treat the intervals between events as distinct observations. Further we assumed that the dependence of the hazard on time since last event has the same form for each successive event. Finally we assumed independence of individuals but relaxed the assumption that birth intervals within each individual were independent. As suggested in Cleves et al. (2008), we fit a standard piecewise constant exponential

model, adjusting the standard errors of the estimated parameters to account for the possible correlation. Finally we used the order of event as an explanatory variable in our multi-episode model, analyzing conceptions of order four and higher.

The event history analyses were realized in a step-wise fashion where different sets of variables were added to previous models. This method enables us to observe how the impact employment status of women, was conditioned by other characteristics. The explanatory variables used were a*ge at first marriage/previous birth, calendar year, employment before marriage (time fixed)* and *employment status (time-varying).* The control variables used were socio-economic control variables *(education),* residential control variables *(type of place of residence and region),* background control variables *(mother tongue, parental education and marital status),* and *other control variables (order of conception, sector of employment, public versus private sector, status and social security).* Among other control variables, order of conception was used in the multi-episode model. Variables of job characteristics, on the other hand, were used in expanded models where the category of employed women were expanded using one of these variables.

The time-varying employment status variable in multivariate analyses for models of second conception and higher, appear to be an important explanatory variable when residential variable are controlled for. Unless residential variables are controlled, employment status do not affect second or higher order conception intensities, significantly. According to the results of the final first conception model, non-employed women have 13 percent higher risk of first conception compared to employed women. Compared to employed women, relative risk of conception is 1.12, 1.10 and 1.14 for second, third and fourth and higher order conceptions for non-employed women.

The expanded models indicate that sector of employment has a crucial role in transition to motherhood or higher order births. Women working in agricultural sector have higher risks for conceptions compared to women working in non-agricultural sector. The risk ratios indicate that the non-employment effect is very

similar to agriculture sector effect. The public sector employment effects are statistically significant only for the second and third conception indicating higher and lower risks, respectively. Wage status is effective in transitions to first, third and higher order births, separately. Working as a non-wage earner increases the likelihood of transition to first and third births. Non-wage earners are 1.3 times more likely to enter motherhood than wage-earners. Social security coverage of the job is an important factor in all models. Working in an uncovered job is associated with higher risk of having births. The hazard ratio reaches 1.7 for uncovered women compared to their covered counterparts for fourth and higher order conceptions.

Findings related to women employed in the agricultural sector needs further emphasize. Women employed in the agricultural sector have conception risks similar to those of non-employed women. This indicates that there is no difference between being non-employed and working in the agricultural sector in terms of conception risks of all orders. This finding is also in line with the role incompatibility hypothesis, which suggests that there is no relationship between women's employment and fertility where roles of worker and mother are compatible. The findings of the expanded models in this thesis suggest risks of conceptions are higher for non-employed women and women employed in the agricultural sector suggesting no difference between working and not working related to fertility outcomes when only agricultural sector is considered.

It is observed that in past calendar periods the risks of conceiving a child have been higher. This even more pronounced for transitions to parities of two and over. The calendar effect includes changes in proximate determinants of fertility as well as population policies in Turkey such as Population Planning Law of 1965 and Family Planning Law of 1983, which are expected to play a role in declines in the risks of having second or higher births in time. The interactions effect of employment status and calendar period also give information on how relative risks have changed in time. The interaction effects for fertility models indicate that relative risks of conceptions declined considerably in time except for first conception. Relative risk of first conception has been similar between employed and non-

employed women. However after 1995, risk of entry to motherhood has been lower for employed women. By the end of calendar periods, the risk of first conception has been lower among women employed in the non-agricultural sector, in the public (although volatile in time) and private sector, among wage earners and among women with social security coverage. Relative second conception risks have been declining in time faster, indicating no significant difference between employed and non-employed women. No difference between sectors can be observed, either and relative risks for women employed in agriculture, and non-agriculture sector converge by the last period. Among women employed in the public sector second conception risk is relatively higher than that among women employed in the private sector or that among non-employed women after 1996. No difference in second conception risk is observed with respect to wage status in time. Risk among women employed with social security coverage increases in time and finally the risks converge with respect to coverage status of the job. For the third conception risks, interaction effects indicate that risks decline in time with less risk among employed women after 1996. Third conception risk is relatively lower among women employed in non-agricultural sector at all times. Relative third conception risk was higher among women employed in the public sector, employed as wage-earners and employed with social security in 1989-1995 period. However in other periods the risk was lower for those women. For conceptions of order four and above, the relative risks have been declining in time as well, however there is not much difference between employed and non-employed women in terms of conception risks. When we look at job characteristics, on the other hand, a decline in risks among women in non-agricultural sector is observed. As regards the fourth and higher order conception risk, relative risk was higher in 1989-1995 period for women employed in the public sector. However the risk for this group of women has been lower in other periods. Not big difference is observed with respect to wage status of women. Relative risks of higher order conceptions have been higher for women employed with social security coverage at all times. To sum up, except for the third conception during post-1996 period, relative risks did not differ much between employed and non-employed women. However interaction effects of calendar period and job characteristics indicated that a decline in risks among women employed in

non-agricultural sector occurred. When we look at women employed in the public sector, two-child norm is prevalent. Although relative risks among this group of women have been more volatile than other groups of women, risk of second conception is higher for women employed in the public sector than women employed in private sector or non-employed women after 1996. Higher order births were more likely among women employed in the public sector during 1989-1995 period, although this trend is not observed currently. Wage status does not seem to be influential in all conceptions, although the risk for wage earner women has been lower for first and third conception. Trend in social security coverage, on the other hand, goes parallel with trends in public sector of women; relative risks for covered women resemble those of women employed in the public sector.

When we look at other explanatory variables, first conception model indicates that age at marriage of 17-21 is the age group where the likelihood peaks for conceiving the first child. The result differs for higher order conceptions. Risks of having higher order births are higher in younger age groups compared to 17-21 or 20-24 age group. This implies once the woman has first birth at a young age, transition to the next one takes place at a young age as well. Employment before marriage does not seem to play an important role in likelihood of transition to first or higher order births. In Turkey, women's jobs before marriage has inferior characteristics such as being unpaid, and having no social security coverage, specifically being unpaid family worker. Moreover this employment is interrupted by marriage, i.e. marriage is a very influential factor of quitting job among women in Turkey. Hence the status before marriage is not expected to affect any future fertility behaviors. A socio-economic control variable, education, is another important factor affecting transition to motherhood and having higher order parities. Less education means higher risk of entering motherhood or having more births. This, as well, is more prevalent in transitions to higher order births. The spatial control factors are important in the context of studying the links running from employment status to fertility behaviors. In rural areas, women are 1.5 times more likely to have fourth or higher order birth compared to women in urban areas. Women living in regions other than West are more likely to have second or third births. However for fourth or

higher order births the region variable is not influential except the category of Eastern region. It is seen that ethnicity proxied by mother tongue is effective after first conception implying higher likelihoods of having second or higher order births for Kurdish women and women of other ethnicities compared to Turkish women. Parental education is a factor affecting all transitions to parities with higher likelihoods for uneducated parents compared to educated parents. The situation is more pronounced for higher order births. The multivariate results imply lower birth risks for separated women and higher birth risks for women in later marriages compared to women in first marriages. For births of orders higher than four, order of conception is also important. Higher order birth is more likely for sixth or higher order birth compared to fourth birth implying once a high order of birth is reached, transition to much higher orders is more likely.

Our findings imply support for role incompatibility theory in Turkey. Our multivariate event history analyses of fertility suggest that risks of all conceptions of different orders are higher for non-employed women compared to their employed counterparts. Our expanded fertility models indicate that working in the agricultural sector is almost equivalent to being non-employed in terms of its relation to the risk of childbearing. Working in the public sector is associated with higher risk of second conception but lower risk of third conception compared to working in the private sector. Being non-wage earner increases the risk of conception except for fourth and higher order. Finally working in a job without any social security increases the risk of conception. It is an important finding that employment status becomes influential when residential variables are controlled for. As suggested by the fact that spatial context is important in fertility-employment nexus, residential variables should be taken into consideration when analyzing this relationship. Although our univariate analyses indicated no difference in conception risks with respect to employment status, when job characteristics are taken into account, in jobs where roles are expected to be more compatible, higher fertility risks prevail.

It should be noted that our study does not aim at a direct test of the role incompatibility hypothesis. The reasons are as follows. In an event history setting, no

data are available for child care organization. This leaves one of the pillars of this hypothesis unanalyzed. However analyzing the institutional context in Turkey, we can find implicit support for the hypothesis. Passive family policies and male-breadwinner model being effective appear to cause role incompatibility. In addition to these factors, women's unemployment rate is high in Turkey. The impact of fertility on employment entry and exits would shed light on these issues, which are the subjects of the next section.

CHAPTER III

LINKAGES BETWEEN FERTILITY AND EMPLOYMENT OF WOMEN IN TURKEY: EMPLOYMENT MODELS USING DATA FROM TDHS-2008

III.1. INTRODUCTION

The relationship between fertility and employment of women was primarily studied to analyze fertility transition, where dependent variable was taken as fertility. However the relationship is a two-way relationship running from employment to fertility, and vice versa. This paper analyzes the effect of fertility on employment outcomes in detail employing event-history analyses.

Most of the theories explaining the linkage between fertility and employment of women suggest a negative relationship. Role incompatibility hypothesis is the oldest theory, which is applicable to the context of developing countries. According to (maternal) role incompatibility hypothesis, "an inverse relationship between women's work and fertility occurs only when the roles of worker and mother conflict" (Mason & Palan, 1981). There are two mechanisms determining the level of the conflict between the two roles: (1) the organization of production (the nature of the task), and (2) the social organization of childcare.

Although the aim of this study is to analyze association instead of causality, Weller's classification of linkages between the two events is important to stress. Weller (1977, p. 43) lists four possibilities of ways of causality between labor force participation and fertility:

1. Family size affects labor force participation;
2. Labor force participation affects family size;
3. Both family size and labor force participation affect each other; and

4. The observed negative relationship is spurious and is caused by common antecedents of both variables

Role incompatibility hypothesis does not suggest one way should be studied over the other. Indeed two events occupy symmetric positions in the hypothesis (Lehrer & Nerlove, 1986). Hence to analyze the relationship between employment and fertility, the mechanisms running from fertility to employment should be studied as well. This study aims to analyze the events of transition from employment to non-employment and of transition from non-employment to employment using fertility variables as explanatory variables employing event history analyses.

The literature on event history analyses on the relationship running from fertility to employment outcomes is wide. Some examples are Hoem (1993) on Sweden, Drobnič et al. (1999) and Drobnič (2000) on US and West Germany, Grimm and Bonneuil (2001) on France, Budig (2003) on US, Aassve et al. (2006) on Great Britain, Stier and Yaish (2008) on Israel, and Matysiak (2009) on Poland. As it is observed all of these studies in the field with event-history analyses are carried out in developed countries. The details of these studies are provided in Section I.2.5.4.2. To summarize the results of micro studies in the field, a study in the field should be emphasized: A meta-analysis by Matysiak and Vignoli (2008), which analyzes transition of women to birth (30 papers, 90 effects) and to employment (29 papers, 58 effects of young children aged 0-6). Univariate analysis of this study indicates that the effect of "young children" on mothers' entry into employment is negative and significant, whereas the effect of women's employment on childbearing is zero. The negative effect of young children on female employment entry is most pronounced in conservative welfare regime and lowest in social-democratic regime. In brief, the relationship running from fertility to employment in event history analyses is generally negative although exceptions to this rule occurred:

"... studies on entry into employment report an insignificant effect of young children on full-time employment (Drobnič 2000 for lone mothers

> *in the US; Giannelli 1996 for West Germany; Leth-Sorensen and Rohwer 2001 for Denmark), part-time employment (Drobnič et al. 1999 and Drobnič and Wittig 1997 for the US; Drobnič 2000 for West Germany) or employment in general (Corijn 2001 for Flanders; Felmlee 1993 for the US; Bernardi 2001 for Italy). Moreover, empirical evidence for the US (Hofmeister 2006; Grunow et al. 2006), Denmark (Grunow and Leth-Sørensen 2006) and, in the case of only one child, France (Grimm and Bonneuil 2001), even suggests that mothers of young children are more likely than other women to enter employment."* (Matysiak & Vignoli, 2008, p. 367).

In Turkey the (causal) negative effect of fertility on employment of women is emphasized by few studies. Şengül and Kıral (2006) analyze the effect of decisions of fertility (measured as total number of children and number of children younger than 7 years old) on female labor force participation using sex of first child as the instrument. They use data from Household Labor Force Survey from the first quarter of 2003. They find that children, especially presence of young children decrease the probability of working of women in Turkey. Another important study is by Sevinç (2011), which analyzes the effect of fertility on female labor supply using sex composition of children and twins at second birth, separately as instruments. Sevinç (2011) analyzes effects of sex of first, second and third children (female avoidance or male preference so as to say), and twin birth as proportion of twin births in total births (due to sample size restrictions) on fertility and hence labor force participation of women. Data used in this study come from TDHS surveys carried out by HUIPS of 1993, 1998 and 2003. Data are pooled due to high sample size needed to have sufficient number of twin birth observations. Ever-married women aged 20-44, and who live in urban areas constitute the sample of data used for analyses. Sevinç (2011) finds that female avoidance instrument give mixed results (no causal relationship), but twin-birth instrument implies negative and strong(er than OLS estimates suggest) causal effect of fertility on labor supply of women. He explains these contradictory findings by "heterogeneity of the effects across the subpopulations", emphasizing that female avoidance is more prevalent in Eastern or

small cities, or among people with low education; and the causal effect of fertility on employment of women is insignificant among such subgroups. Since twin per birth instrument is equally likely to affect all women, the 2SLS estimates using this instrumental variable could be used to interpret the causal linkage overall: On average, labor supply of women is affected negatively by more children in Turkey.

Some other studies implicitly found that fertility was negatively associated with labor force participation of women in Turkey. Using cross-sectional data Dayıoğlu, 2000; Dayıoğlu & Kasnakoğlu, 1997; Ercan & Tunalı, 1998; Tunalı, 1997 found years of schooling, age, marital status and number of children were important determinants of the participation decision of women.

Having an approach of role incompatibility hypothesis, the following research questions are analyzed in this study:

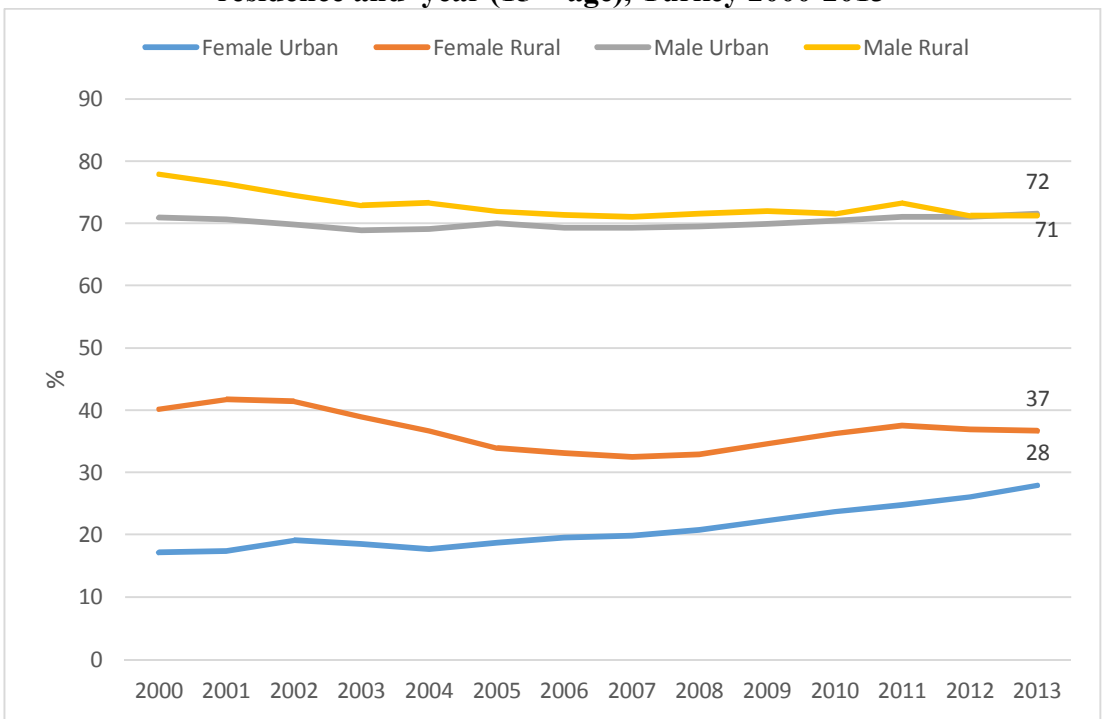
- What are the determinants of employment entries and employment exits focusing on fertility of women? How is women's fertility (child parity and age of children) related to these employment outcomes?
- How do trend of employment and non-employment evolve over time? What may be the factors that shaped this trend?
- How do the findings provide support for role incompatibility hypothesis in Turkey taking into consideration the institutional context in Turkey?

III.2. EMPLOYMENT AND JOB CHARACTERISTICS OF WOMEN IN TURKEY

The contextual framework is fundamental shaping the relationship between fertility and employment. As mentioned in previous paper, Turkey's labor market is characterized by low female labor force participation rates. In Turkey, three patterns regarding labor market are observed since 1988: (i) male labor force participation rates are higher than female rates, (ii) rural labor force participation rates are higher

than urban rates, and (iii) male-female differential is higher in urban areas than in rural areas (Tunalı, 2003). In addition to these patterns, since 2004, there has been slight improvement in labor force participation rate of women from 23 percent to 31 percent in Turkey although the underlying reasons are changes in the definitions of TURKSTAT (Figure I.3.2.2.1). According to Dayıoğlu and Kırdar (2010), one of the important reason for the fall in female labor force participation rate before 2004, is urbanization. Since 1988, increasing migration from rural to urban areas has been one of the factors of declining rates. As rural labor force participation rates are higher than urban rates; share of urban population pulled down labor force participation of women. However rates in rural areas were declining as well, especially among younger rural women until 2008. Since 2004, rates in urban areas and since 2008 rates in rural areas have been increasing indicating an upward trend. Until 2004, the decline in the labor force participation rates was explained by low participation rates in urban areas, and the downward pressure on the aggregate participation rate caused by urbanization.

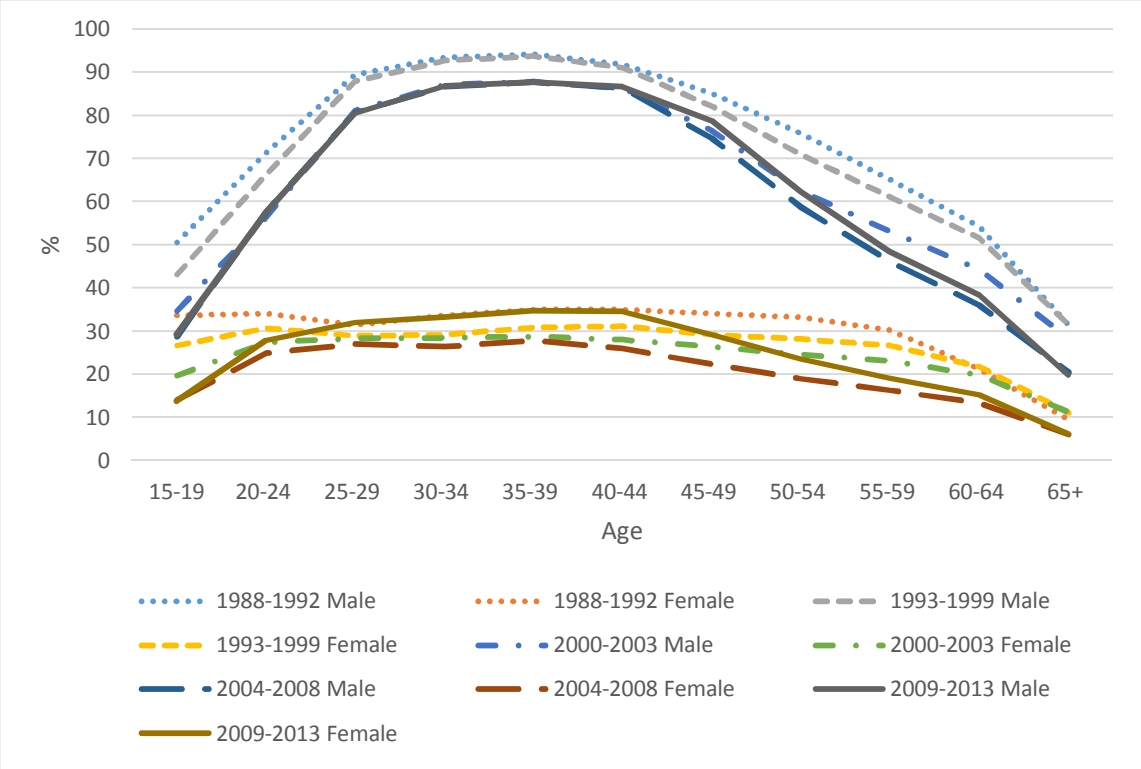
Figure III.2.1. Labor force participation rate by gender, type of place of residence and year (15 + age), Turkey 2000-2013



Source: Turkish Statistical Institute (TURKSTAT) (2014), Labor force statistics [isgucu istatistikleri] database

Male-female gap is the most striking feature of the labor market in Turkey, which has been persistent through time and independent of age (Figure III.2.1). In the last calendar period of 2009-2013, there has been a slight improvement in employment rates of women among working age group. However the gap between male and female rates is still large. Labor force participation rate for non-institutional population by year among aged over 15 for males is 72 percent compared to rate of females of 31 percent in 2013 (TURKSTAT, 2014).

Figure III.2.2. Employment rates by age group, calendar periods and sex, Turkey, 1988-2013



Source: Turkish Statistical Institute (TURKSTAT) labor force database (Household Labor Force Survey data)

According to ILO and WIEGO (2009) the informal employment shares for Turkey is 32.6 percent for females and 30.1 percent for males as share of informal

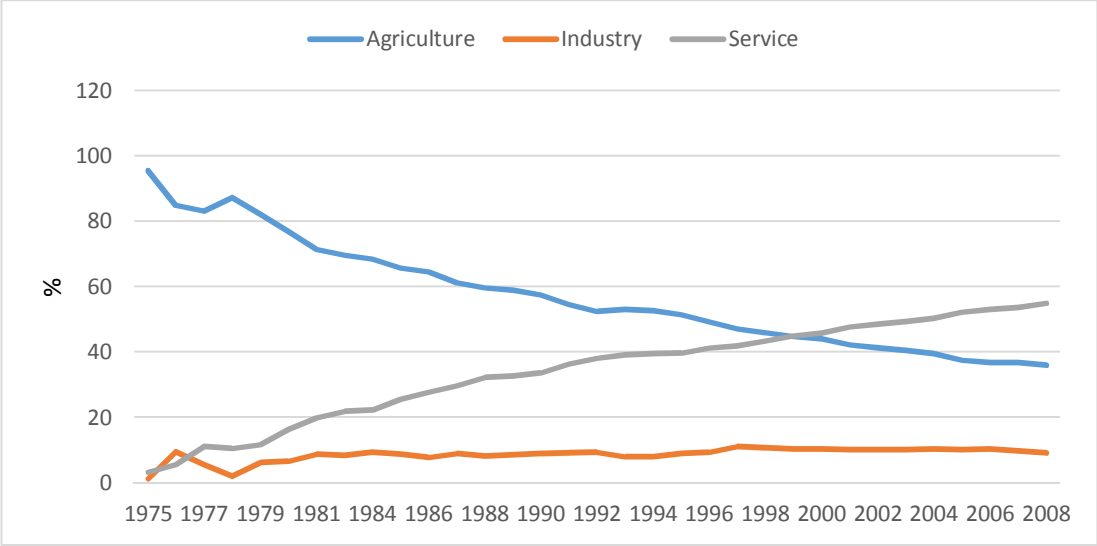
jobs in non-agricultural employment in 2009 in Turkey. 80.8 percent of total self-employment[17] are informal jobs among females (ILO & WIEGO, 2009).

Unregistered or uncovered employment can be used as a proxy for informal sector. Turkish Statistical Institute (TURKSTAT) Labor Force Surveys data suggest that in 2009 share of uncovered employment in non-agricultural employment was 31.3 percent for females (TURKSTAT, 2014). As it is observed, the difference between share of informal jobs and share of uncovered employment in non-agricultural employment for females is very small: 1.3 percentage points. When one observes the share of uncovered employment by year in Turkey since 2009, one pattern is clear: share of uncovered employment has been decreasing both for females and males. By 2013, this share was 26 percent for women for non-agricultural employment. The extent of uncoverage is much higher in the agricultural sector, as expected, especially among females.

When we look at job characteristics in time using TDHS-2008 data, it is observed that share of agricultural sector has been declining while share of services sector has been increasing. Year of 1999 is a turning point where share of services sector has exceeded share of agricultural sector for the first time. Considering the fact that the share of industrial sector has been stable over time, it can be concluded that the sectoral shift took place from agricultural to services in Turkey.

[17] Self-employment refer to the sum of employers, own-account workers, members of producers' cooperatives (if any), and contributing family workers.

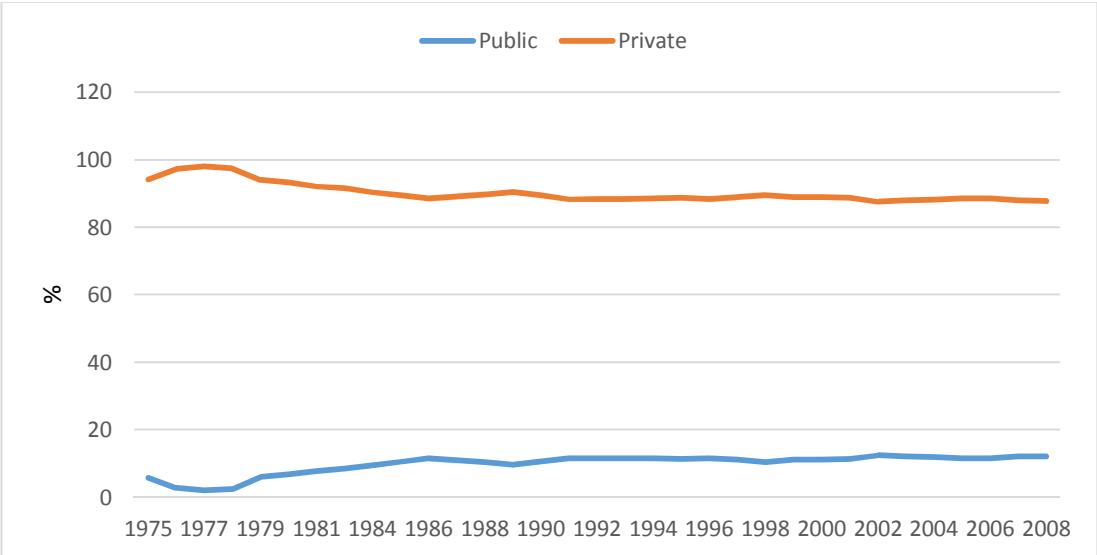
Figure III.2.3. Job characteristics by year and sector, Turkey, 1975-2008



Source: TDHS-2008

Share of private sector has always been well over public sector's share in Turkey. Although there has been a slight increase in the share of public sector in women's jobs; it remained at 12 percent by 2008. Share of private sector, on the other hand, has always been over 87 percent.

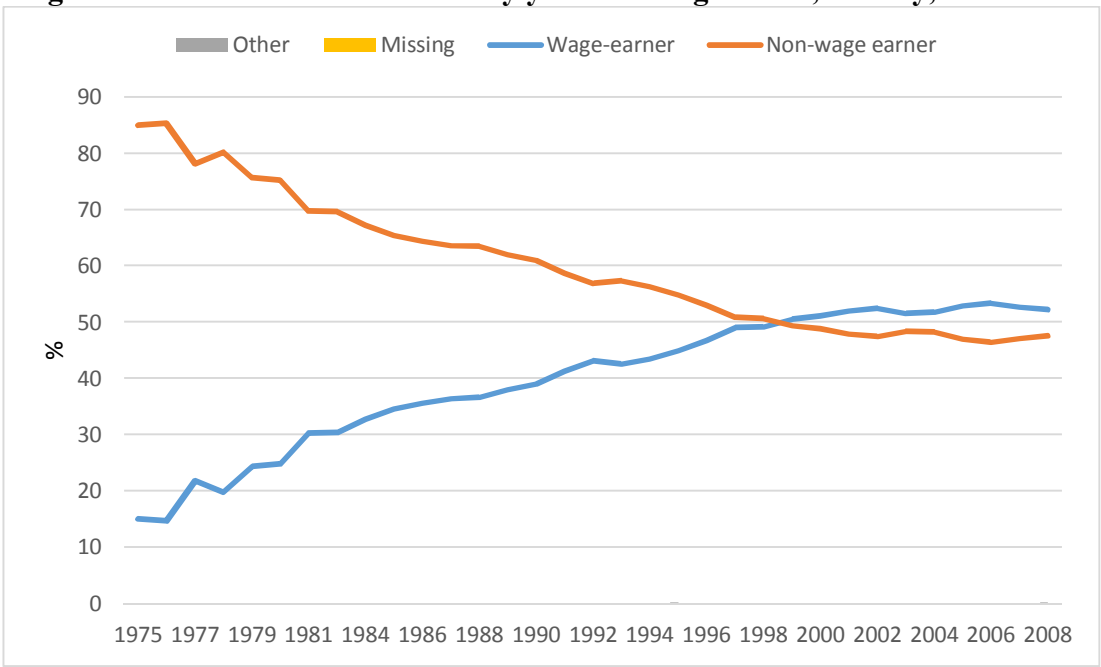
Figure III.2.4. Job characteristics by year and public/private sector, Turkey, 1975-2008



Source: TDHS-2008

Another important characteristic of jobs is wage status of the job. It is known that in Turkey share of non-wage jobs have been high in the past due to its agricultural structure. Share of being unpaid family worker, for that reason, has been high. Share of non-wage earners, which is composed of unpaid family workers and self-employed women has been declining in time in Turkey. Again year of 1999 has been a turning point, where share of wage-earner exceeded share of non-wage earners for the first time. Changes in sectoral distribution are the primary reason for this development certainly. By 2008 shares of wage-earners and non-wage earners are very close with 52 and 48 percent, respectively.

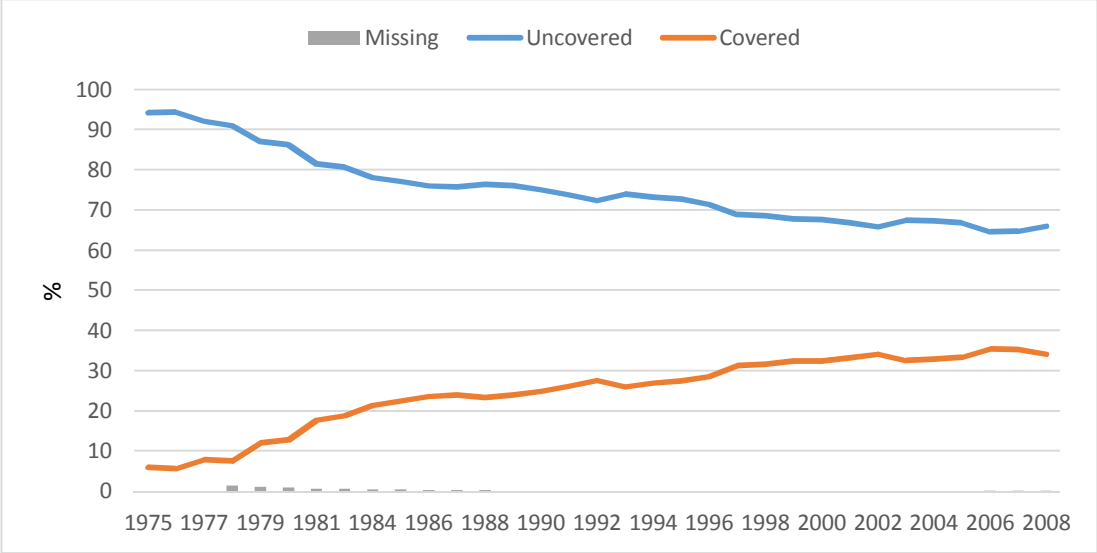
Figure III.2.5. Job characteristics by year and wage status, Turkey, 1975-2008



Source: TDHS-2008

Finally how social security coverage changed in time indicates that share of uncovered jobs has been declining. However it has still a very high percentage: 66 percent by 2008.

Figure III.2.6. Job characteristics by year and social security coverage, Turkey, 1975-2008



Source: TDHS-2008

To sum up female labor force participation is at a very low level with 31 percent in 2013 (TURKSTAT, 2014). Turkey ranks lowest among OECD countries in terms of female employment rate. Gender gap in employment is highest among OECD countries with 40 percent. Incidence of part-time employment is close to OECD average level with 25 percent for females in 2013. Part-time employment of females has been increasing in Turkey (OECD StatExtracts, 2014). Share of informal jobs among females in non-agricultural employment is 33 percent in 2009 (ILO & WIEGO, 2009). According to TURKSTAT share of uncovered employment in non-agricultural sector is 31 percent for females (TUSKTAT, 2014). Figures for part-time employment and informal employment of females indicate lower role incompatibility for women's employment and fertility. Additionally, most of women work in inferior jobs, with no social security coverage. Although shares of non-wage earners and workers in the agricultural sector have been decreasing, they still have high percentages. This, as well, suggests lower role incompatibility. However very low employment rates for women bring up the question "what keeps women away from the labor market?". Children and fertility may be some part of the explanation, which we will search answers in our analyses.

III.3. DATA AND METHODS

This chapter first presents the data source of this study including a section on data quality. Second the method of analyses, namely event history analysis will be introduced in detail. The methodology part includes the dependent and independent variables of analyses as well.

III.3.1. Data Source of the Study

The dataset utilized in this study belongs to 2008 Turkey Demographic and Health Survey (TDHS-2008). This survey is the fourth among DHS series in Turkey and ninth national demographic study since 1968 in Turkey. The fundamental goal of TDHS-2008 was to gather information on socioeconomic and sociodemographic components of households and ever-married women between 15 and 49.

TDHS-2008 is a household survey with weighted, multistage, stratified cluster design. The fieldwork of TDHS-2008 took place between October and December 2008d. TDHS-2008 covered 10,525 completed household interviews with a response rate of 88.4 percent, and 7,405 completed individual interviews with ever-married women who were 15-49 years old with a response rate of 92.5 percent.

The Household Questionnaire and the Individual Questionnaire are the questionnaires utilized in the survey. In the household questionnaire, information was gathered primarily on socio-demographic characteristics of household members such as age, sex and education in addition to the household facilities. In the Individual Questionnaire, which was applied to ever-married women between 15 and 49, questions about migration, marriage, contraception, pregnancy, birth, pre- and post-natal care and employment were included.

The event history modules were increased in number in this survey. Some other modules such as never-married women and elderly people are also new modules used in this survey.

This thesis makes use of mainly event history modules of TDHS-2008. Traditionally, histories of specific events of birth and marriage have been collected in DHSs. Migration histories were collected in some DHS in Turkey. TDHS-2008 was the first survey, which included employment histories of women in addition to all these information. This study makes use of that rich retrospective information on ever-married women.

III.3.1.1. Data Quality

Prior to analyses, considerable effort was spent on cleaning of the data. The imputations and re-arrangements of data were described in Section II.3.1.1. In this paper the event data used is employment and non-employment data sets, where former is composed of employment spells, and the latter non-employment spells. The unweighted number of employment spells of 7,405 women added up to 5,781 employment spells. Among these spells, some observations had to be dropped. The unweighted number of dropped cases is shown in Table III.3.1.1.1. After these deductions, total number of spells was 5,088.

Table III.3.1.1.1. Number of cases dropped from employment data

Deleted observations	Unweighted number
Start or end year of job is missing and cannot be derived	60
Date of marriage is before age of 12	17
Date of start of employment is before age of 12	519
Place at the time of start of employment is abroad	64
Year of migration is missing and cannot be derived	2
Year of marriage is missing or unknown	31

The unweighted number of non-employment spells of 7,405 women added up to 8,127 non-employment spells. Among these spells, some observations had to be dropped. The unweighted number of dropped cases are shown in Table III.3.1.1.2. After these deductions, total number of spells were 7,903.

Table III.3.1.1.2. Number of cases dropped from non-employment data

Deleted observations	Unweighted number
Start or end year of job is missing and cannot be derived	72
Date of marriage is before age of 12	42
Place at the time of start of non-employment is abroad	64
Year of migration is missing and cannot be derived	4
Year of marriage is missing or unknown	42

III.3.2. Methodology

Using event history analyses, we investigate determinants of exiting employment given employment and entering employment given non-employment, separately to analyze the linkages between women's employment and fertility decisions using event history analysis taking into account timing of events. The observation window opens with the start of first marriage. The observation window closes at the interview or emigration date if moving abroad exists in life history of the woman.

The methodology is hazard modeling where piece-wise constant exponential models are applied.

Specifically the model is:

$$h(t|x_j) = h_0(t)\exp(x_j\beta_x)$$

where $h_0(t)$ is the baseline hazard function, x_j is the vector of control variables and β_x is the corresponding vector of the regression parameters that shows the effects of the variables. Two groups of models are estimated where determinants of entering employment and exiting employment are analyzed. Employment and non-employment models include different models depending on the variable of

fertility (number of living children, age of youngest child or a composite variable of the two).

Detailed explanations regarding event history models, and specifically piecewise constant proportional hazard regression models are explained in Section II.2.2. Entering and exiting employment are repeated events in our models. In other words, one woman can experience more than one employment or non-employment episode. These models have assumptions. First assumption is that the dependence of the hazard on time since last event has the same form for each successive event. In proportional hazards model of employment exits, for instance, although the hazard function is unspecified, it must be the same function for the first exit, the second exit, and so on. Second assumption is that for each individual, the multiple intervals must be statistically independent. In most cases, independence assumption is false, at least to some degree. This leads to (i) still asymptotically unbiased coefficient estimates, but (ii) standard error estimates biased downward (Allison, 1984). Hence the repeated events only affect the variance of the estimates, not the means. To minimize the consequences of violating the independence assumption, additional explanatory variables that represent characteristics of individual's prior event history can be used. The simplest of such variables are number of prior events and length of previous interval.

In our model of employment exits and entries, we have multi-episode data and we need to correct for standard errors in our multivariate analysis. Multi-episode data contain information on more than one event for each individual and special methods are needed to take advantage of this additional information and to deal with the problems that may arise. As Allison (2010) notes, if repeated events are observed for an individual, the standard strategy is to reset the clock to 0 each time an event occurs and treat the intervals between events as distinct observations. Thus, if a person is observed to have two employment spells over a five-year interval, three observations would be created. The last observation would be a right-censored interval, extending from the second employment exit until the end of the observation period. In our model, we reset the clock to 0 at each time an event occurs.

Finally we assume independence of individuals and correct for standard errors but it is unreasonable to assume that intervals within each individual are independent. Hence we relax the assumption that intervals are independent within each individual. As suggested in Cleves et al. (2008), one solution would be to fit a standard piecewise constant exponential model, adjusting the standard errors of the estimated parameters to account for the possible correlation. This is done by specifying option vce(cluster CASEID) to streg setting the id variable as the employment or non-employment spell. Hence we obtain the robust estimate of variance as described in the context of Cox regression by Lin and Wei (1989), with an added adjustment for clustering. Finally we use the order of episode and years of employment or non-employment after marriage as explanatory variables in our multi-episode models, analyzing employment exits and entries.

Using piecewise constant proportional hazard model, we investigate determinants of exiting employment given employment and entering employment given non-employment to analyze the linkage running from fertility to women's employment using event history analysis taking into account timing of events. The dependent variables are transition to non-employment and employment. Due to structure of our data set composed of "ever-married" women; the observation window opens with the first marriage of the woman. The observation window closes at the interview date or migrating to abroad if emigration exists in life history of the woman.

The employment exit model analyzes job exit risk since start of employment, the employment entry model analyzed job entry risk since start of non-employment.

Duration since job start (or non-employment start): We have two different groups of models to analyze employment exits and entries. Respectively in these models, the baseline is the duration since job start and since non-employment start, respectively. The duration is measured in months and the cut-off points are 12, 24, 36, 48, 60, 84 and 120. These points refer to 1 year, 2 years, 3 years, 4 years, 5 years,

7 years, 10 years cut-off points. In total we have eight segments*: "<1 year"*, "1-2 years", "2-3 years", "3-4 years", "4-5 years", "5-7 years", "7-10 years", and "10+ years". The hazard rates are constant for these time segments, but can vary between them. The reference category is "*<1 year"* shown in italics.

For conception models, including the basic time factor (the baseline duration) we have seven time-varying and four time-fixed explanatory and control variables. In the multi-episode model with fourth and higher order conceptions, order of conception is added as a time-fixed covariate leading to five time-fixed explanatory and control variables in total. The reference categories for the variables are shown in italic.

Explanatory variables:

Age at start of employment/non-employment: Age at start of the episode is included as a time-fixed explanatory variable, which is the age at the onset of the risk. Generally this variable has five-year intervals. Four age categories are included: "12-16", "*17-21"*, "*22-26*", and "27-49".

Calendar year: Calendar year is a time-varying explanatory variable, which shows the influence of changes in the socio-economic and political environment on employment entries and exits. This variable shows the trend in the event of interest in time. It is constructed as 7-year intervals in general. Last calendar year is chosen as the reference category in our analyses since we would like to interpret the results relative to the most recent period. For the employment exit model, the categories are "1971-1988", "1989-1995", "1996-2002", "and "*2003-2008*". For the employment entry model the categories are "1973-1988", "1989-1995", "1996-2002", "and "*2003-2008*".

Parity (time-varying): This variable is the number of living children and has categories of "0", "*1*", "2", "3", and "4 and above".

Age of youngest child (time-varying): This variable is composed of categories of "*0 years*", "1-2 years", "3-5 years", "6-8 years", "9+ years", "pregnant", and "no child", where the reference category is the period of infancy. This variable cannot be used when parity variable is included in the model since they have coinciding categories.

Composite parity-age of child (time-varying): This variable is a composite variable constructed by interactions of parity and age of youngest child variable. It has categories of "no child", "no child pregnant", "one child pregnant", "one child 0 years old", "one child 1-2 years old", "one child 3-5 years old", "one child 6-8 years old", "one child 9+ years old", "two children pregnant", "two children 0 years old", "two children 1-2 years old", "two children 3-5 years old", "two children 6-8 years old", "two children 9+ years old", "three children pregnant", "three children 0 years old", "three children 1-2 years old", "three children 3-5 years old", "three children 6-8 years old", "three children 9+ years old", "four or above children pregnant", "*four or above children 0 years old*", "four or above children 1-2 years old", "four or above children 3-5 years old", "four or above children 6-8 years old", and "four or above children 9+ years old". This variable cannot be used with parity or age of youngest child variable in the same model.

Work-related control variables:

Work experience/years of non-employment after marriage: This variable is a cumulative human capital variable, where in the employment model it is years of employment after marriage, and in the non-employment model the variable is years of non-employment after marriage. It is composed of categories of "*0 years*", "1 year", "2-4 years", and "5+ years".

Sector of job: This time-fixed control variable is used in the employment exit model. This variable refers to sector of the job and it consists of categories of "agriculture", and "*non-agriculture*". Non-agriculture category includes industry and service sectors.

Social security coverage of job: This time-fixed control variable is used in the employment exit model as well. It consists of categories of "uncovered", and "*covered*". Uncovered employees are the workers working without any social security. Social security coverage of covered workers are under one of these: SSK (Social Security Authority), Emekli Sandığı (Retirement Fund), Bağ-Kur (Social Security Organization for Artisans and the Self-employed), SGK (Social Security Institution), private insurance or other insurance[18].

Order of job/non-employment episode: This time-fixed variable is the order of the spell. It has categories as "*first*", "second", "third", and "fourth and higher order".

Socio-economic control variables:

Education: This variable reflects the socio-economic profile of the individuals and is a time-varying control variable. This variable is formed based on the assumption that education starts at the age of 6 and continues with no interruptions until the level reported at interview is attained. By this way education variable includes the category of "in education". The categories of this variable are "no education/primary incomplete", "primary level", "secondary level", "*high school or higher level*" and "in education". The former four categories imply completed level of education (graduation) provided that the education is completed.

Residential control variables:

Type of place of residence: Based on event history data for events of migration, we can have time-varying control variable as urban/rural type of residence. The categories of this variable are "*urban*" and "rural". The category of

[18] Until May 2006, there were three separate social security institutions: SSK for private and public sector workers; Emekli Sandiği (ES) for civil servants; and Bağ-Kur for self-employed workers and farmers. In 2006 these were all merged into one institution, the Sosyal Güvenlik Kurumu (Social Security Institution, SGK).

abroad is excluded as cases were censored when they moved abroad. Additionally we excluded the ones who were abroad when the episode started.

Region: The same way type of place of residence was constructed, region variable as a time varying control variable is formed. The categories of this variable are "*West*", "South", "Central", "North" and "East".

Background control variables:

Mother tongue: Mother tongue is a proxy for ethnicity and involves categories of "*Turkish*", "Kurdish" and "Other". As expected it is a time-fixed covariate.

Parental education: This variable is a background variable that is time-fixed as well. It is composed of categories "mother and father uneducated", "one educated other uneducated", and "mother and father *educated*". Hereby educated means at least primary level of education and uneducated implies no education or primary incomplete.

Marital status: This time-varying control variable is formed using event history data on marriages. It is composed of categories of "separated", "*first marriage*", and "later marriages". Separated correspond to not living together, divorced or widowed.

The composition of our study population is presented in Appendix A, which contains exposure times, occurrences (events), and their distributions by each of the variables including the baseline.

III.4. ANALYSES OF EXITING AND ENTERING EMPLOYMENT

This section presents descriptive and multivariate findings of event history analyses on transition from employment to non-employment and from non-employment and employment with specific reference to fertility variables, namely parity, age of youngest child, and a composite variable of the two.

Descriptive results include Kaplan-Meier survival estimates of transition from employment to non-employment at national level as well as for each explanatory or control variables for the employment exit model. The employment entry model presents the Kaplan-Meier survival estimates of transition from non-employment to employment. The equality of survivor functions shown in graphs are tested using the *log-rank test*. Log-rank test is a nonparametric test appropriate for testing the equality of surviving functions across two or more groups. This test does not test the equality of survivor functions at a specific time point. Rather it is a global test that compares the overall survivor functions. The test works by comparing at each failure the expected versus the observed number of failures for each group and then combining these comparisons over all observed failure times. The relative survival experiences of distinct groups may be characterized by the groups' hazard functions. Thus the null hypothesis of tests computed may be expressed in hazards. The null hypothesis tested is that there is no difference in survival among the *r* groups:

$$H_0: h_1(t) = h_2(t) = \cdots = h_r(t)$$

The chi-squared test statistic is distributed as χ^2 with *r-1* degrees of freedom under the null and if there is a highly significant chi-squared value, the null hypothesis that the survivor functions of the two groups are the same is rejected (Cleves et al., 2008).

Additionally using the survival estimates, percentage of employment/non-employment spells which do not end within 2 years, within 5 years, within 10 years

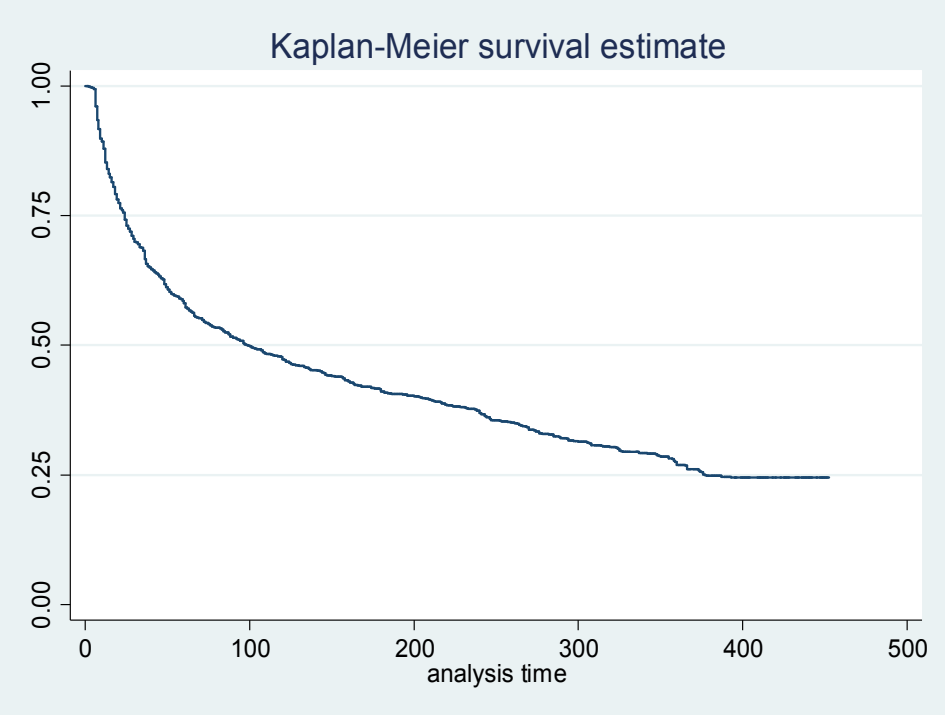
after start of episode and median duration of transition to non-employment/employment in months and years are presented according to the fertility variables. Median durations are presented for all covariates.

III.4.1. Employment Exits

III.4.1.1. Kaplan-Meier Survival Estimates: Differentials in the Transition from Employment to Non-employment

Kaplan-Meier survival estimates of transition from employment to non-employment at the national level indicate that more than half of jobs end by ten years after start of employment in Turkey (Figure III.4.1.1.1 and Table III.4.1.1.1). 24 percent of jobs end within two years, and 41 percent within five years after start. By ten years after initiation, 48 percent of jobs continue. The median duration of employment is estimated as 8.2 years overall.

Figure III.4.1.1.1. Survival estimate of exiting employment, Turkey 2008



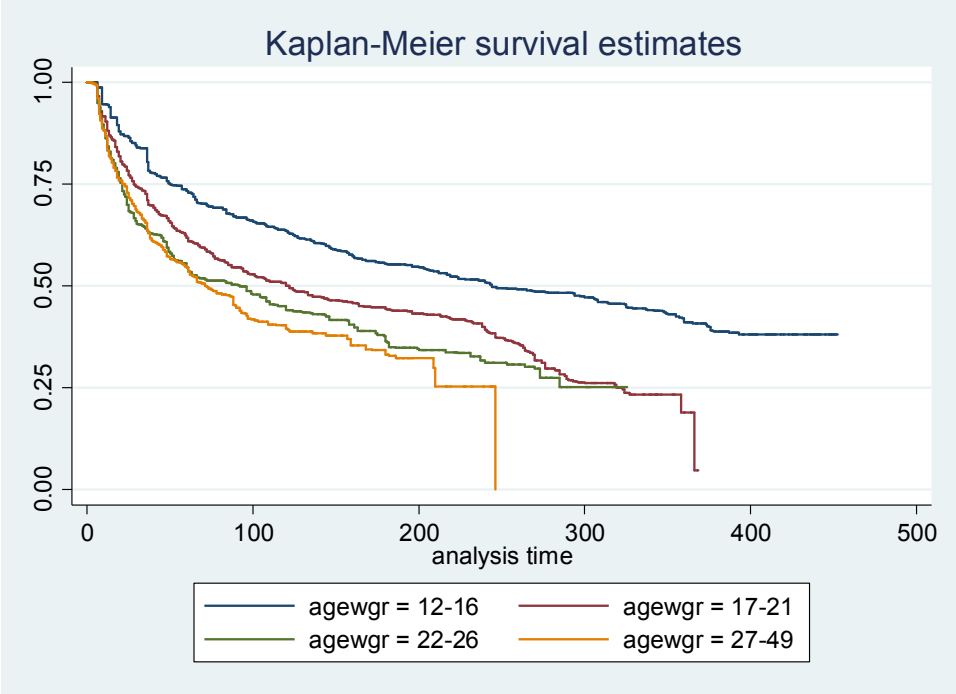
More parity implies shorter median durations of employment as expected although difference between survivor functions of three, and four and above parities is small. Median durations of employment spells of pregnant and childless categories are shortest among all, and their survival estimates are lower than those of other categories. Interestingly as child grows older, median duration of employment shortens (Table III.4.1.1.1).

Table III.4.1.1.1. Transition from employment to non-employment by fertility: Kaplan-Meier survival curve estimates

	Percentage of jobs which do not end within *2 years* after start of employment	Percentage of jobs which do not end within *5 years* after start of employment	Percentage of jobs which do not end within *10 years* after start of employment	*Median* duration of transition from employment to non-employment (months)	*Median* duration of transition from employment to non-employment (years)
Parity					
0	73.7	51.3	34.7	60.1	5.0
1	77.2	63.4	51.7	142.4	11.9
2	74.7	58.5	51.3	124.2	10.4
3	74.7	58.2	49.1	97.0	8.1
4+	78.1	58.9	49.1	108.8	9.1
Age of youngest child					
0	86.5	71.8	63.1	269.4	22.5
1-2	80.5	75.1	68.0	306.1	25.5
3-5	76.6	62.0	54.8	178.6	14.9
6-8	75.2	54.9	45.7	74.1	6.2
9+	71.4	51.3	36.8	60.5	5.0
Pregnant	67.1	44.6	32.5	44.1	3.7
No child	75.2	57.1	41.1	76.9	6.4
Turkey	75.6	58.6	47.8	98.5	8.2

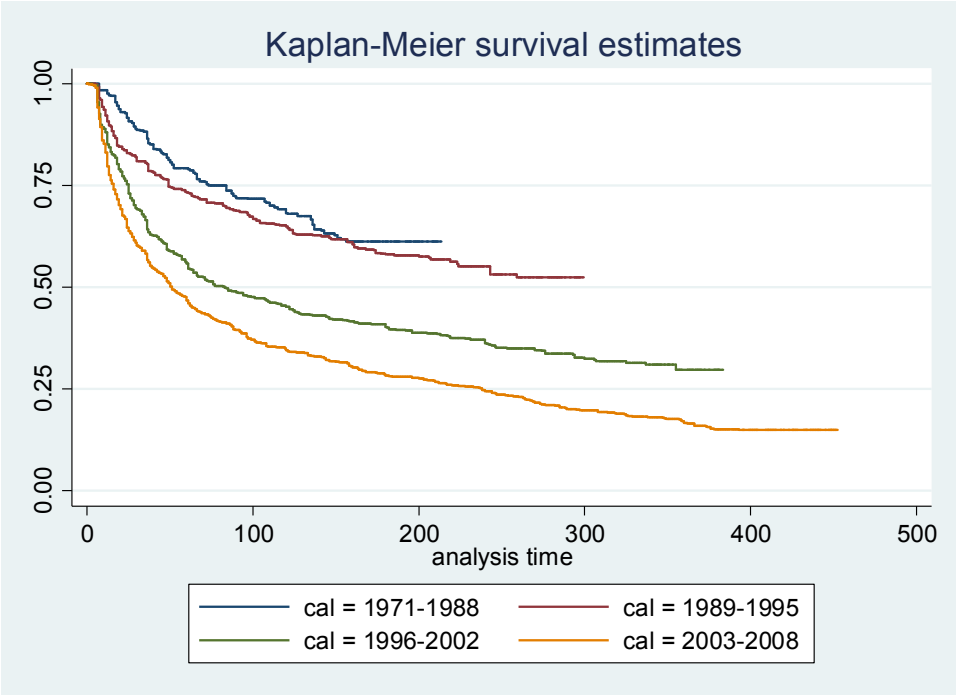
Kaplan-Meier survival estimates of transition from employment to non-employment by calendar period variable and time-fixed explanatory and control variables are presented below.

Figure III.4.1.1.2. Survival estimate of exiting employment, by age at start of employment



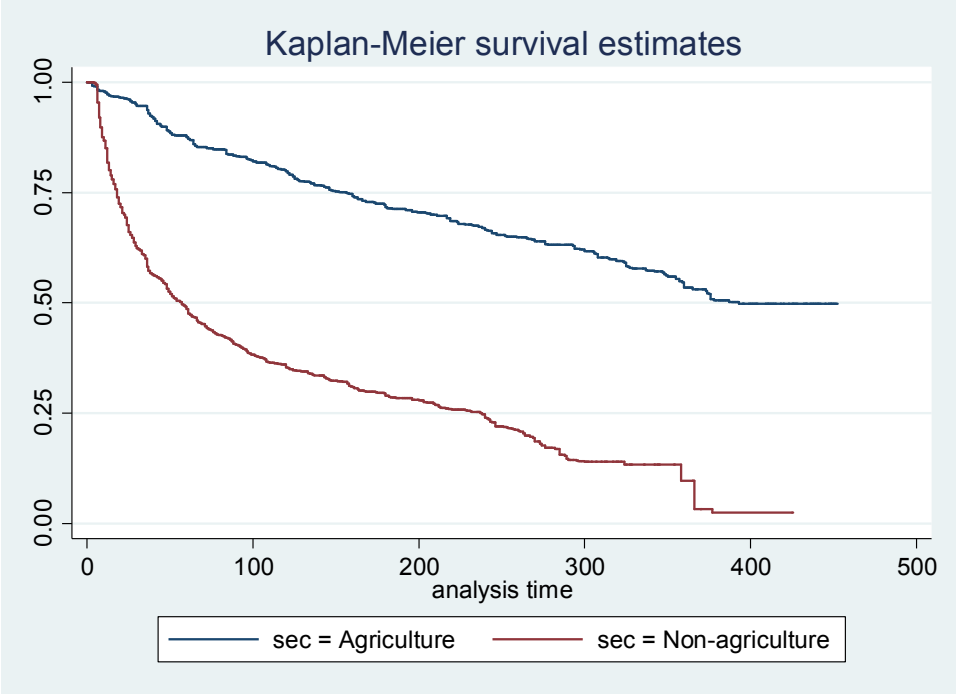
Log-rank test for equality of survival functions: Wald $Chi^2 = 38.90$, $Pr>chi^2= 0.0000$

Figure III.4.1.1.3. Survival estimate of exiting employment, by calendar period



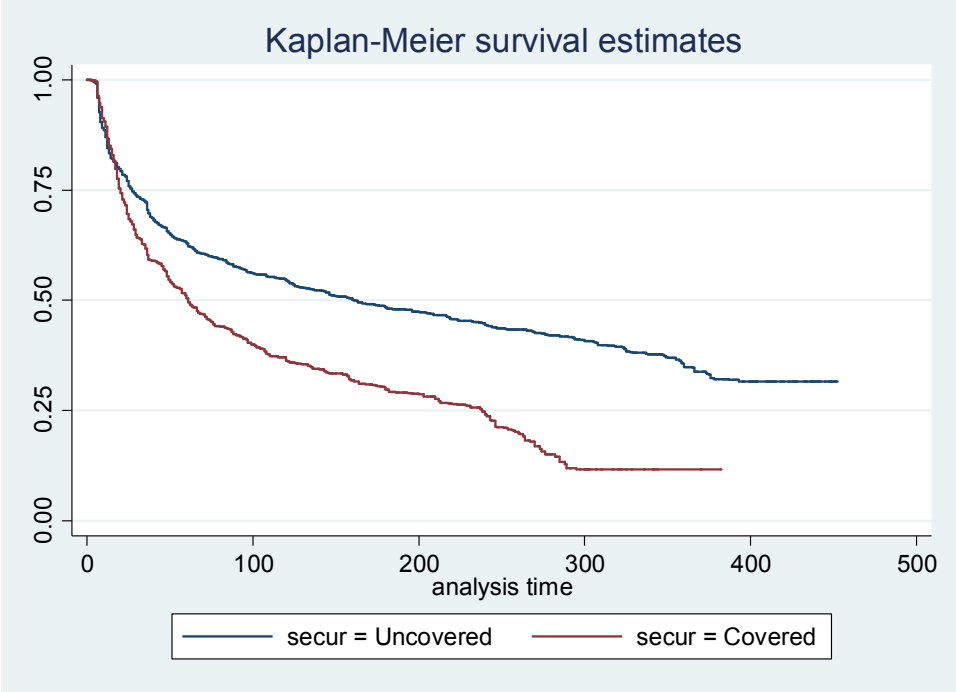
Log-rank test for equality of survival functions: Wald $Chi^2 = 111.02$, Pr>chi2= 0.0000

Figure III.4.1.1.4. Survival estimate of exiting employment, by sector of employment



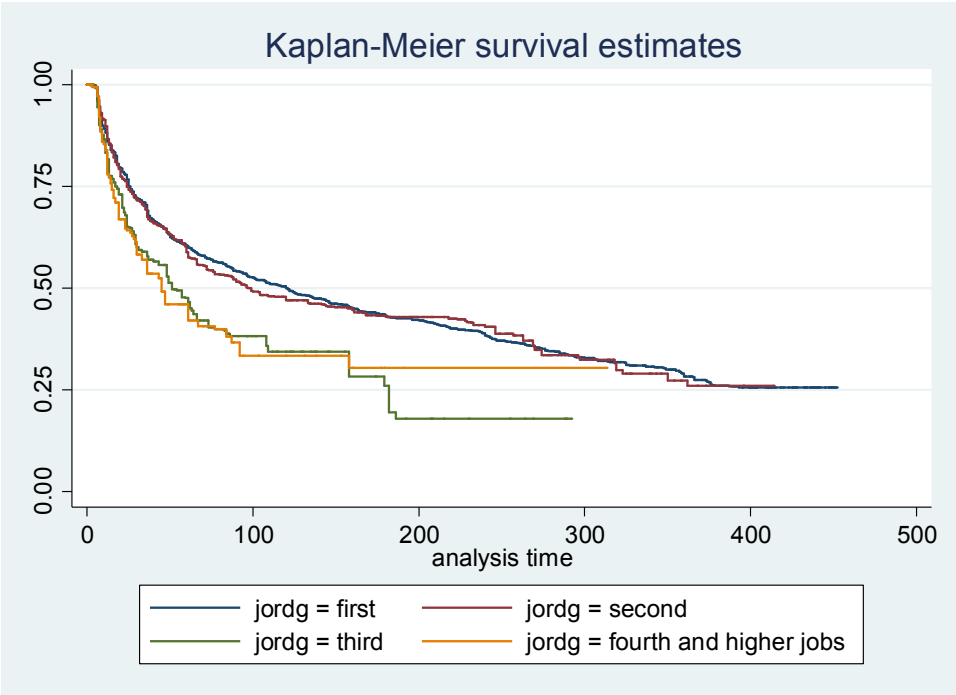
Log-rank test for equality of survival functions: Wald Chi^2 = 282.85, Pr>chi2= 0.0000

Figure III.4.1.1.5. Survival estimate of exiting employment, by social security coverage of employment



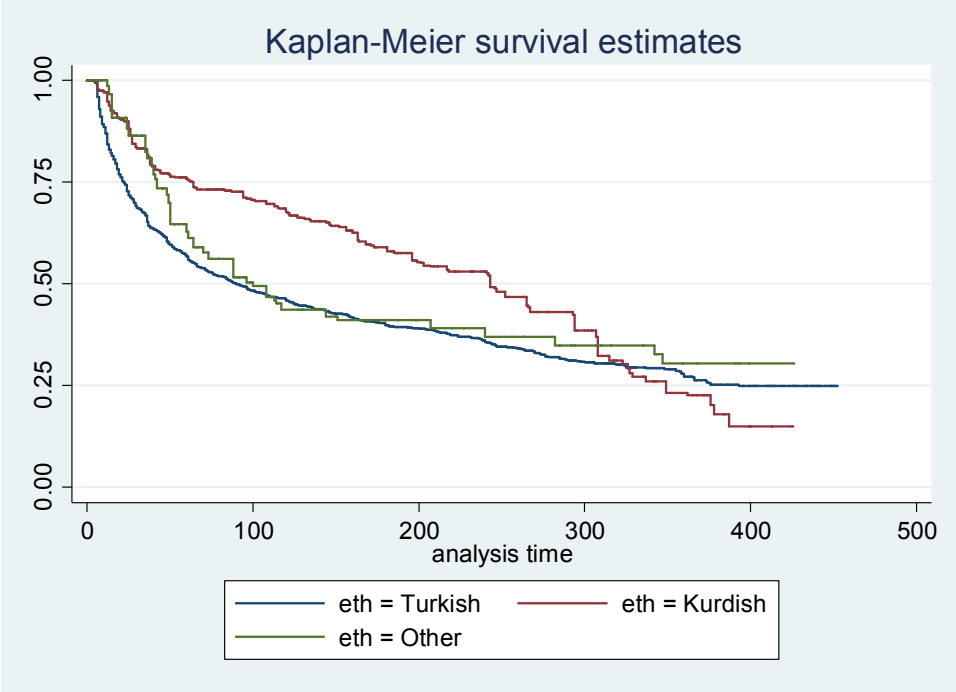
Log-rank test for equality of survival functions: Wald Chi^2 = 64.22, Pr>chi2= 0.0000

Figure III.4.1.1.6. Survival estimate of exiting employment, by order of job



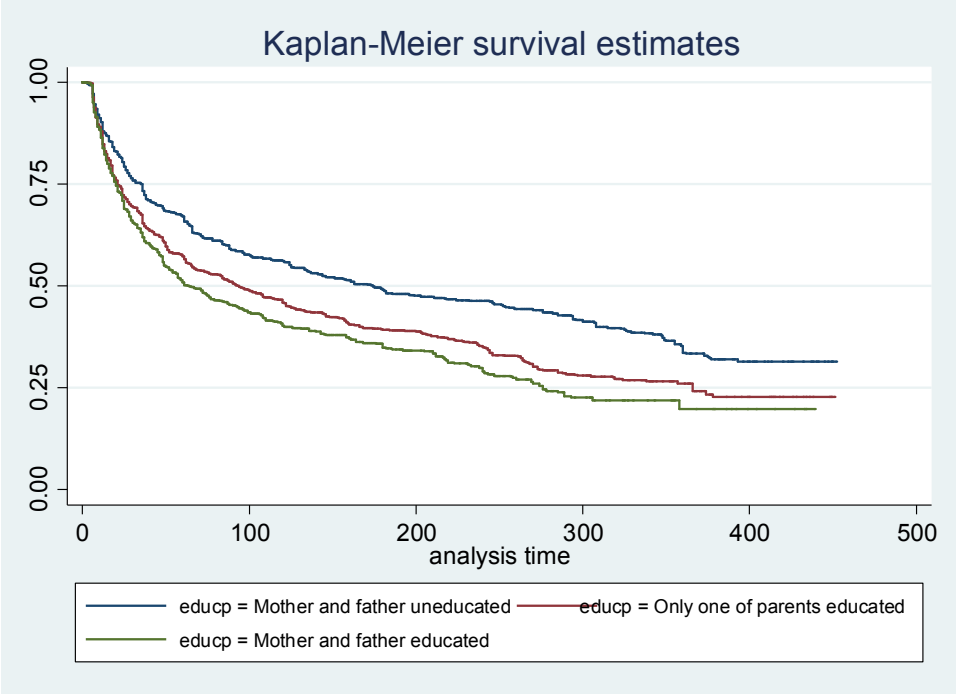
Log-rank test for equality of survival functions: Wald Chi^2 = 20.23, Pr>chi2= 0.0002

Figure III.4.1.1.7. Survival estimate of exiting employment, by mother tongue



Log-rank test for equality of survival functions: Wald Chi^2 = 11.36, Pr>chi2= 0.0034

Figure III.4.1.1.8. Survival estimate of exiting employment, by parental education



Log-rank test for equality of survival functions: Wald Chi^2 = 26.71, Pr>chi2= 0.0000

The survivor functions with respect to presented explanatory and control variables differ from each other according to log-rank test results. Higher age at start of employment implies higher risks for non-employment (Figure III.4.1.1.2). Median duration of employment is longest for the youngest age group (20.3 years) (Table III.4.1.1.2). Employment ends earlier as calendar period increases (Figure III.4.1.1.3). Compared to non-agricultural jobs, exit risk is lower among jobs in the agricultural sector (Figure III.4.1.1.4). Similarly, jobs with no social security have lower exit risk (Figure III.4.1.1.5). For jobs of order three and over, exit risk is higher (Figure III.4.1.1.6). In general job exit risk is lower for Kurdish women, but the survival curves converge after about 25 years of employment (Figure III.4.1.1.7). Higher parental education means higher risks of job exits for employment spells (Figure III.4.1.1.8).

Median durations of transition from employment to non-employment by several covariates are presented in Table III.4.1.1.2. As age at start of employment is

younger, median duration of employment increases. This is an expected result due to higher exposure risks of women. Median durations of employment for calendar periods before 1996 cannot be computed since for more than half of jobs, the episode did not end in these periods. As work experience after marriage increases, median duration of employment increases except for work experience less than one year. In the agricultural sector median duration of employment is much higher (32.7 years) compared to non-agricultural sector (4.7 years). Among jobs without any social security, median duration of employment is higher (13.4 years) compared to jobs with social security (5.0 years). As order of job increases, median duration decreases. When we look at variable of education, education of primary level or less implies higher employment duration. In education category has shortest duration of employment with only 1.5 years. In urban areas and Western region, duration of employment is shorter compared to rural areas and other regions. Employed Kurdish women have higher median durations compared to women with other mother tongues. Women with less parental education have higher durations of employment. Finally separated women have lower median employment interval compared to married women.

Table III.4.1.1.2. Median duration of transition from employment to non-employment

	Months	Years
Age at start of employment		
12-16	243.5	20.3
17-21	121.1	10.1
22-26	91.6	7.6
27-49	71.2	5.9
Calendar year		
1971-1988	..	..
1989-1995	..	..
1996-2002	82.6	6.9
2003-2008	50.3	4.2
Work experience after marriage		
0	107.9	9.0
1	35.9	3.0
2-4	62.3	5.2
5+	85.1	7.1

(Table III.4.1.1.2 continued)

	Months	Years
Sector of job		
Agriculture	392.5	32.7
Non-agriculture	56.3	4.7
Social security coverage of job		
Uncovered	160.5	13.4
Covered	60.5	5.0
Order of job		
First	120.0	10.0
Second	98.0	8.2
Third	50.9	4.2
Fourth or higher order	44.8	3.7
Educational level		
No education or primary incomplete	274.5	22.9
Primary level	119.9	10.0
Secondary level	37.0	3.1
High school or higher level	62.2	5.2
In education	17.5	1.5
Type of place of residence		
Urban	61.5	5.1
Rural		
Region		
West	59.2	4.9
South	107.7	9.0
Central	216.7	18.1
North	374.3	31.2
East	264.6	22.1
Mother tongue		
Turkish	89.5	7.5
Kurdish	242.7	20.2
Other	99.4	8.3
Parental education		
Mother and father uneducated	173.5	14.5
Either of mother of father uneducated	93.1	7.8
Mother and father educated	63.0	5.3
Marital status		
Separated	56.8	4.7
First marriage	101.6	8.5
Later marriages	172.9	14.4

To sum up, in ten years after start of employment, 52 percent of jobs end. Median duration for employment is 8.2 years in Turkey. More parity implies shorter median durations except for "0" parity. For women with "0" parity, job exit risk is highest. Pregnant women and childless women have shortest median duration of employment. As child grows older median duration becomes shorter and job exit risk is higher. Descriptive analyses indicate that parity variable has expected results meaning higher parity implies shorter median durations, although the difference between parity groups are small.

III.4.1.2. The Multivariate Analysis: The Impact of Fertility Variables and Other Covariates on Transition from Employment to Non-employment

In this section, determinants of progression from employment to non-employment are analyzed with multivariate event history models. With these models, we aim to understand the change in job exit intensity in almost four decades, to what extent the job exit risks differ according to fertility of women, and how these risks are affected by characteristics of women.

The series of models are constructed stepwise adding different groups of covariates to previous models. In the first model we construct a main effects model with three explanatory variables: *duration since job start* (baseline hazard), *age at start of the job* and *calendar year*. In the second model, we add a fertility variable, namely *parity* or *age of youngest child* or a *composite variable of parity and age of youngest child*. Three separate models are estimated using different fertility variables. In the third and latter models, we add work-related, socio-economic, residential, and background variables stepwise. Our main variables of interest are age at start of the job, calendar year and fertility variable of interest.

Table III.4.1.2.1 presents results of multivariate analyses on job exits with the parity variable as one of the explanatory variables. According to the first model, as duration increases, risk of job exit declines. Until 2-3 years there is no significant difference on job exit risks compared to 0-1 year since start of the job. In the first

model 12-16 is the age at start of the job where the risk of employment exit is less compared to age group of 22-26. At older calendar periods, risk of job exit was lower.

According to the second model, if the age at start of the job is 12-16, the risk of job exit is less compared to age 22-26. Higher parity means less job exit risks although relative risk of parity of three is insignificant.

In the third model work-related variables are included in the model. Younger age at start of employment implies higher risk of job exits. All parity categories have insignificant risk ratios. All work-related variables have insignificant risks except sector of the job. Jobs in the agricultural sector have lower end risks compared to non-agricultural jobs.

The fourth model indicates that as duration since start of the job increases, the end risk declines. The parity variable indicates that women with no children have higher risks of job exits and women with two children have lower risks of job exits compared to women with one child. Less education is associated with higher risk of job exits compared to that of women with high school level education.

In the fifth model interpretations of relative risks of explanatory variables do not diverge from fourth model. Residential variables are included in the fifth model and jobs in rural areas compared to urban areas and jobs in regions of Central, North and East compared to West have lower risks of ending.

The sixth model has mother tongue and parental education as control variables. If mother or father of the woman is uneducated –has less education than primary level- the risk of job exit is higher compared to that of woman with both parents educated.

The seventh model has marital status as the final control variable, which has insignificant results. According to this model, employment spells where women have

"0" parity has higher risk of ending and spells where women have "2" children has lower risk of ending compared to spells where women have only one child.

Table III.4.1.2.1. Relative risks of job exits: parity model, 1971-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since job start (Baseline)							
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	0.94	0.97	0.98	0.99	0.97	0.97	0.97
2-3 years	0.75	0.80	0.82	0.84	0.82	0.83	0.83
3-4 years	0.53	0.58	0.59	0.61	0.62	0.62	0.62
4-5 years	0.44	0.49	0.51	0.53	0.53	0.53	0.53
5-7 years	0.36	0.42	0.43	0.45	0.45	0.45	0.45
7-10 years	0.27	0.34	0.35	0.37	0.37	0.37	0.37
10+ years	0.19	0.27	0.30	0.32	0.32	0.32	0.32
Age at start of the job							
12-16	0.73	0.69	1.50	1.36	1.41	1.42	1.42
17-21	0.99	0.97	1.19	1.15	1.15	1.14	1.14
22-26	*1*	*1*	*1*	*1*	*1*	*1*	*1*
27-49	0.92	1.15	1.09	1.06	1.01	1.00	0.99
Calendar year							
1971-1988	0.40	0.39	0.49	0.49	0.51	0.50	0.50
1989-1995	0.44	0.45	0.50	0.50	0.49	0.49	0.49
1996-2002	0.72	0.73	0.75	0.74	0.73	0.73	0.73
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Parity							
0		1.68	1.69	1.74	1.72	1.73	1.73
1		*1*	*1*	*1*	*1*	*1*	*1*
2		0.81	0.88	0.84	0.84	0.84	0.84
3		0.84	0.99	0.93	0.94	0.93	0.94
4+		0.78	0.97	0.95	0.98	0.97	0.98
Work experience after marriage							
0 years			*1*	*1*	*1*	*1*	*1*
1 year			1.13	1.13	1.10	1.09	1.09
2-4 years			1.08	1.09	1.03	1.01	1.00
5+ years			0.83	0.83	0.86	0.85	0.86
Sector of job							
Agriculture			0.26	0.26	0.41	0.41	0.41
Non-agriculture			*1*	*1*	*1*	*1*	*1*
Social security coverage of job							
Covered			*1*	*1*	*1*	*1*	*1*
Uncovered			1.11	1.00	1.05	1.05	1.05
Missing			4.52	4.02	5.19	5.35	5.36

(Table III.4.1.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Order of job							
First			*1*	*1*	*1*	*1*	*1*
Second			0.95	0.93	0.95	0.96	0.97
Third			1.20	1.19	1.17	1.18	1.18
Fourth and higher order			1.10	1.13	1.11	1.13	1.13
Education							
No education or primary incomplete				1.21	1.18	1.16	1.15
Primary level				1.34	1.32	1.28	1.28
Secondary level				1.69	1.78	1.75	1.74
High school or higher level				*1*	*1*	*1*	*1*
In education				1.64	1.60	1.64	1.64
Type of place of residence							
Urban					*1*	*1*	*1*
Rural					0.51	0.51	0.51
Region							
West					*1*	*1*	*1*
South					0.90	0.90	0.90
Central					0.74	0.74	0.73
North					0.59	0.58	0.58
East					0.79	0.78	0.78
Mother tongue							
Turkish						*1*	*1*
Kurdish						1.03	1.03
Other						1.06	1.06
Parental education							
Mother and father uneducated*						1.04	1.04
Mother or father educated						1.17	1.17
Mother and father educated						*1*	*1*
Missing						1.11	1.11

(Table III.4.1.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Marital status							
Separated							1.11
First marriage							*1*
Later marriages							0.87
Constant	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Number of jobs (weighted)	3942	3942	3942	3942	3920	3920	3920
Number of job exits	1680	1680	1680	1680	1666	1666	1666
Time at risk (months)	350600	350600	350600	350600	349288	349288	349288
Log likelihood	-4003	-3949	-3777	-3762	-3682	-3678	-3677
LR chi2	504	652	828	881	922	920	919
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Uneducated: None or primary incomplete; educated: Primary complete or above

Table III.4.1.2.2 presents results of the age of youngest child model. The relative risks with respect to variables other than fertility variables, do not differ much from those of the parity model. As duration increases, the risk of job exit declines. The risk of ending for a job is lower if the age at start of the job is 12-16 compared to age of 22-26. Jobs in the agricultural sector, in rural areas, and in Central, North and East regions have lower risk of ending compared to jobs in non-agricultural sector, in urban areas, and in Western region, respectively. Women with primary or secondary education have higher risk of job exits compared to women with high school or higher education. Background variables of mother tongue, parental education and marital status have insignificant relative risks. Not all categories of age of youngest child have significant risk ratios. However pregnant women or women with no children have higher risk of job exits compared to women with infant. Women with a child of age 1-2 have less risk of exiting employment compared to women with an infant.

Table III.4.1.2.2. Relative risks of job exits: age of youngest child model, 1971-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since job start (Baseline)							
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	0.94	0.95	0.96	0.97	0.94	0.94	0.94
2-3 years	0.75	0.78	0.79	0.81	0.80	0.80	0.80
3-4 years	0.53	0.56	0.57	0.59	0.60	0.60	0.60
4-5 years	0.44	0.47	0.48	0.50	0.50	0.50	0.50
5-7 years	0.36	0.39	0.41	0.43	0.43	0.43	0.43
7-10 years	0.27	0.31	0.32	0.34	0.34	0.34	0.34
10+ years	0.19	0.22	0.27	0.29	0.29	0.29	0.29
Age at start of the job							
12-16	0.73	0.67	1.51	1.38	1.44	1.44	1.44
17-21	0.99	0.96	1.18	1.14	1.15	1.14	1.14
22-26	*1*	*1*	*1*	*1*	*1*	*1*	*1*
27-49	0.92	0.97	0.98	0.97	0.93	0.93	0.92
Calendar year							
1971-1988	0.40	0.38	0.47	0.47	0.49	0.48	0.48
1989-1995	0.44	0.44	0.49	0.49	0.48	0.48	0.48
1996-2002	0.72	0.72	0.74	0.74	0.73	0.73	0.73
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Age of youngest child							
0 years		*1*	*1*	*1*	*1*	*1*	*1*
1-2 years		0.74	0.71	0.70	0.68	0.68	0.68
3-5 years		1.00	0.92	0.90	0.87	0.87	0.87
6-8 years		1.15	1.05	1.01	0.99	0.99	0.98
9+ years		1.27	1.19	1.11	1.08	1.07	1.06
Pregnant		2.62	2.58	2.59	2.55	2.55	2.55
No child		1.66	1.45	1.47	1.40	1.42	1.40
Work experience after marriage							
0 years			*1*	*1*	*1*	*1*	*1*
1 year			1.13	1.12	1.10	1.09	1.09
2-4 years			1.05	1.06	1.02	1.00	0.99
5+ years			0.78	0.79	0.82	0.82	0.83
Sector of job							
Agriculture			0.25	0.25	0.41	0.41	0.41
Non-agriculture			*1*	*1*	*1*	*1*	*1*
Social security coverage of job							
Covered			*1*	*1*	*1*	*1*	*1*
Uncovered			1.05	0.97	1.02	1.02	1.02
Missing			3.70	3.39	4.40	4.46	4.48

(Table III.4.1.2.2 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Order of job							
First			*1*	*1*	*1*	*1*	*1*
Second			0.94	0.92	0.95	0.96	0.96
Third			1.25	1.23	1.20	1.20	1.20
Fourth and higher order			1.16	1.18	1.15	1.17	1.16
Education							
No education or primary incomplete				1.12	1.12	1.11	1.10
Primary level				1.25	1.24	1.21	1.22
Secondary level				1.60	1.69	1.67	1.66
High school or higher level				*1*	*1*	*1*	*1*
In education				1.81	1.82	1.85	1.86
Type of place of residence							
Urban					*1*	*1*	*1*
Rural					0.51	0.51	0.51
Region							
West					*1*	*1*	*1*
South					0.89	0.89	0.88
Central					0.73	0.73	0.72
North					0.58	0.57	0.57
East					0.76	0.75	0.76
Mother tongue							
Turkish						*1*	*1*
Kurdish						1.03	1.03
Other						1.08	1.07
Parental education							
Mother and father uneducated*						1.01	1.02
Mother or father educated						1.14	1.14
Mother and father educated						*1*	*1*
Missing						1.09	1.09

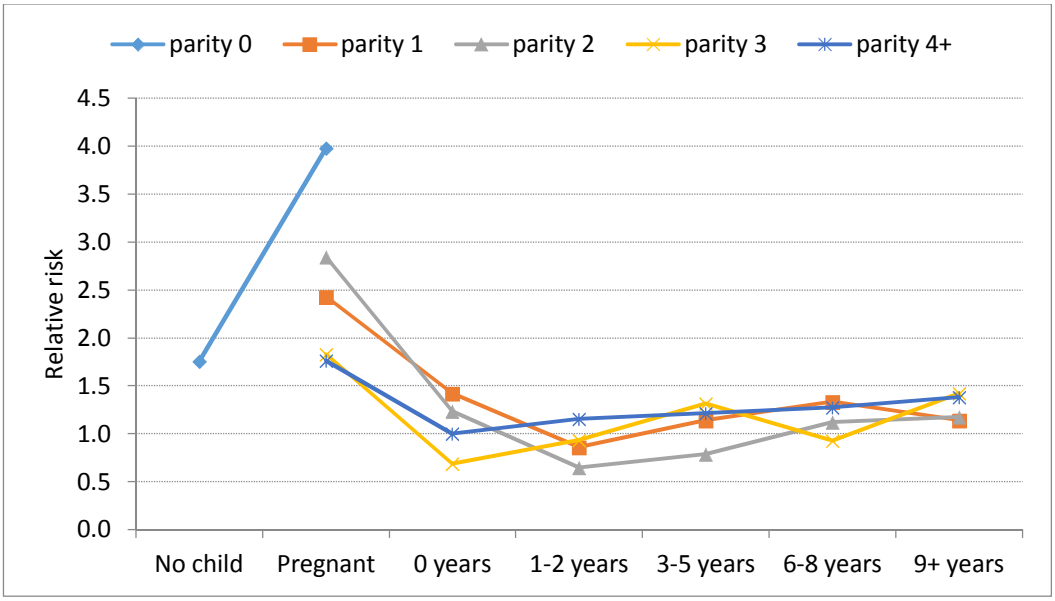
(Table III.4.1.2.2 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Marital status							
Separated							1.16
First marriage							*1*
Later marriages							0.87
Constant	0.02	0.01	0.01	0.01	0.02	0.02	0.02
Number of jobs (weighted)	3942	3942	3942	3942	3920	3920	3920
Number of job exits	1680	1680	1680	1680	1666	1666	1666
Time at risk (months)	350600	350600	350600	350600	349288	349288	349288
Log likelihood	-4003	-3916	-3730	-3718	-3637	-3634	-3632
LR chi2	504	651	850	883	933	931	933
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Uneducated: None or primary incomplete; educated: Primary complete or above

The final set of multivariate models is the ones with the final fertility variable, which is a composite variable of parity and age of youngest child. Not all results are presented in this section since the results do not differ from previous models for employment exits. The detailed results of this model are presented in the Appendix B. Figure III.4.1.2.1 presents the relative risks of job exits with respect to the composite fertility variable. According to this Figure, zero parity is associated with higher risks of job exits. Above all pregnancy is associated with job exits, specifically pregnancy with no child, i.e. conception of the first child. As the youngest child grows older, the risk of exit declines for parity one and two when the child reaches age 2. After that age, the risk of job exits does not change significantly although the risk tends to increase. These findings indicate that employed women do not exit jobs due to higher parity but they exit jobs due to pregnancy, or infant children.

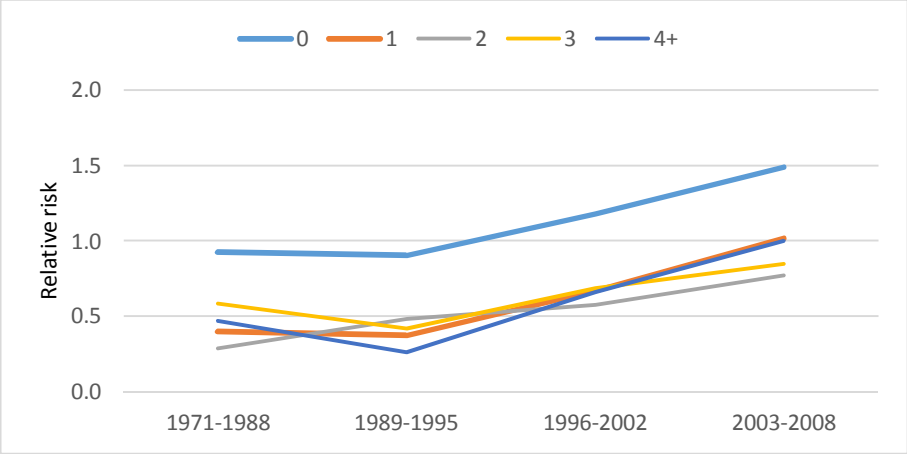
Figure III.4.1.2.1. Relative risks of job exits: composite model, 1971-2008, TDHS-2008



III.4.1.3. Interactive Effect of Fertility Variables and Calendar Periods, Employment Exit

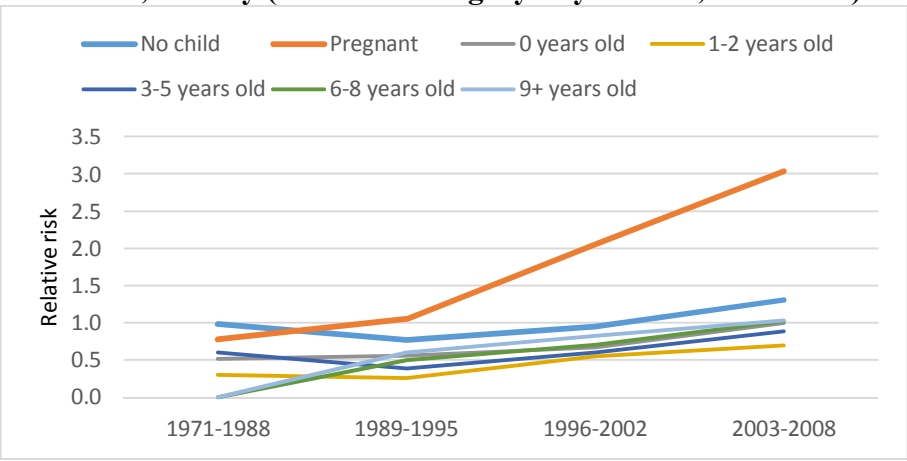
The interactive effects of parity and calendar period are presented for employment model in Figure III.4.1.3.1. It is observed that 1994 economic crisis has been effective in speeding up risks of transitions to non-employment in general. This is especially valid for women with no children. It should be noted that in parity models pregnant women are included in all parities including the category of childless women. In addition to women with no children, risks of transitions to non-employment has been increasing much faster for women with one or four or higher parities.

Figure III.4.1.3.1. Interaction effect of parity and calendar period on transition from employment to non-employment, standardized for other factors, Turkey (reference category: 4+, 2003-2008)



Finally when we look at the variable of age of youngest child, relative risk of transition to non-employment for pregnant women has been increasing very rapidly after 1992. The relative risk of exiting employment has always been higher for women with no children. On the other hand, not much change occurred for women with different ages of youngest child. Moreover relative risks do not differ much between groups of women with different ages of youngest child at all calendar periods.

Figure III.4.1.3.2. Interaction effect of age of youngest child and calendar period on transition from employment to non-employment, standardized for other factors, Turkey (reference category: 0 years old, 2003-2008)



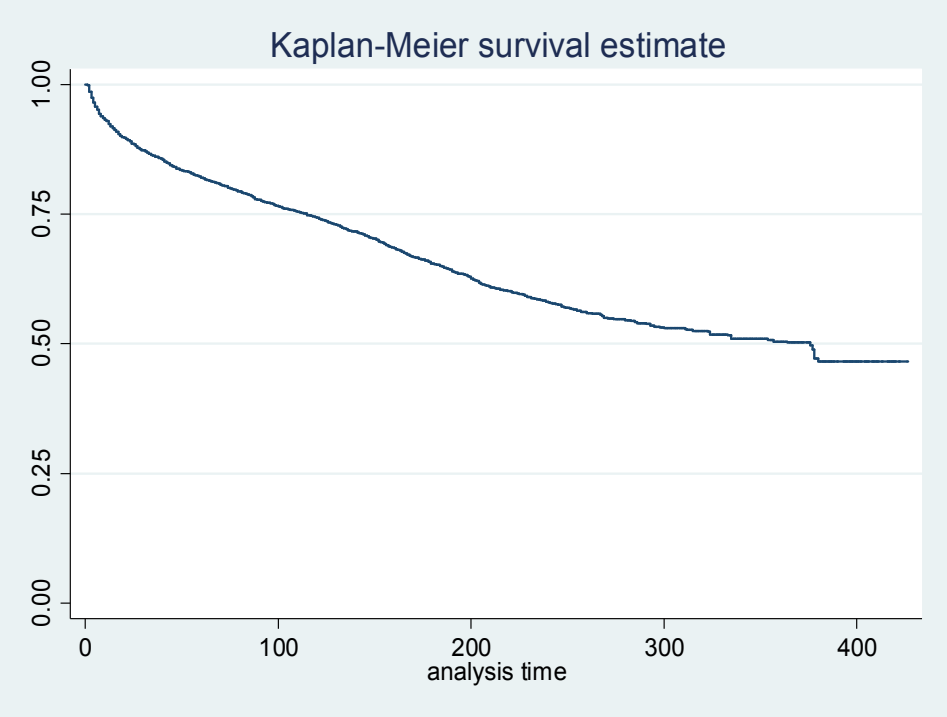
III.4.2. Employment Entries

In this section the association of transition from non-employment to employment with fertility and other covariates will be analyzed. The proportion of women non-employed in the last 12 months is high in Turkey. According to TDHS-2008 results, 62.2 percent of ever-married women were not employed in the last 12 months before the survey. This proportion increases as number of living children increases. Fifty-eight percent of childless women were non-employed in the last 12 years compared to 65 percent of women with five and higher number of living children (HUIPS, 2009).

III.4.2.1. Kaplan-Meier Survival Estimates: Differentials in the Transition from Non-employment to Employment

In this section, Kaplan-Meier survival curves for the transition from non-employment to employment by all explanatory and control variables are presented. At the national level, employment entry intensities are low and duration of non-employment is high for ever-married women. Within two years of non-employment 11 percent, within five years 18 percent and within ten years only 25 percent of non-employment spells end in employment (Figure III.4.2.1.1 and Table III.4.2.1.1). Median duration of transition from non-employment to employment is 31.3 years. In other words half of non-employment spells end in employment after 31 years.

Figure III.4.2.1.1. Survival estimate of entering employment, Turkey 2008



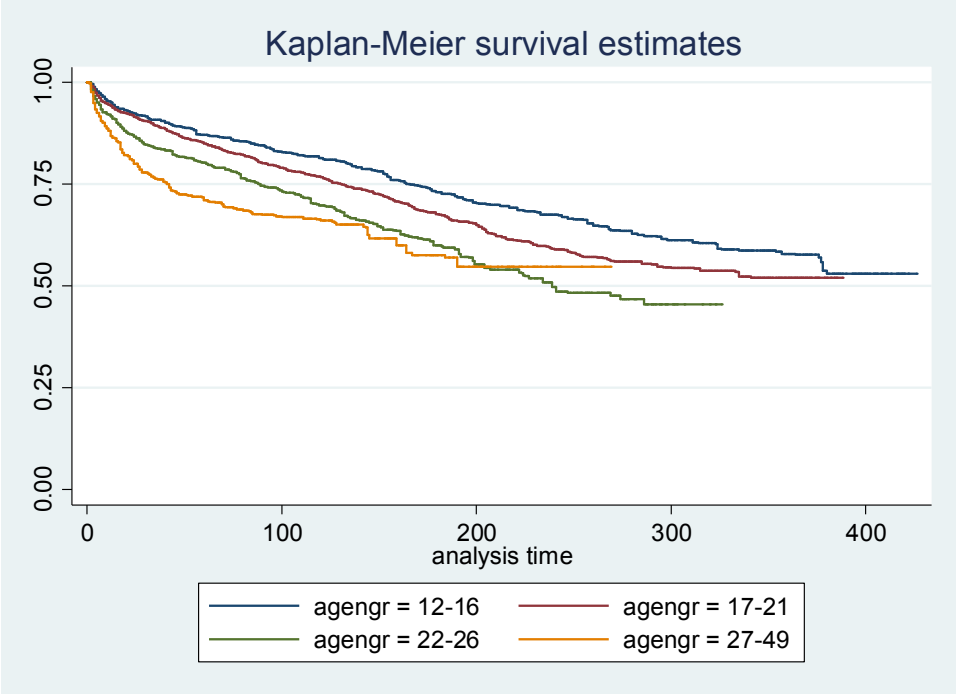
Non-employment duration is higher when parity number is higher. For non-employment spells with "0" and "4 and above" number of living children median duration cannot be computed since less than half of spells end in employment. Parity of "0" includes situations of first pregnancy as well. Pregnancy category is included in the variable of age of youngest child. Median duration of non-employment becomes lower when age of youngest child increases. The duration cannot be computed for pregnant women, women with children of age two and younger as more than half of these women remain non-employed by the end of the observation period (Table III.4.2.1.1).

Table III.4.2.1.1. Transition from non-employment to employment by fertility: Kaplan-Meier survival curve estimates

	Percentage of non-employment spells which do not end within *2 years* after start of non-employment	Percentage of non-employment spells which do not end within *5 years* after start of non-employment	Percentage of non-employment spells which do not end within *10 years* after start of non-employment	*Median* duration of transition from non-employment to employment (months)	*Median* duration of transition from non-employment to employment (years)
Parity					
0	91.1	82.2	68.4	..	..
1	84.7	77.9	66.2	201.3	16.8
2	79.3	74.4	67.9	230.1	19.2
3	81.7	71.3	67.0	273.0	22.8
4+	85.4	81.8	78.2	..	..
Age of youngest child					
0	92.3	87.4	83.9	..	..
1-2	86.2	80.1	73.2	..	..
3-5	76.1	67.3	60.7	243.2	20.3
6-8	72.3	57.8	48.9	106.0	8.8
9+	74.2	63.5	55.0	151.7	12.6
Pregnant	94.7	92.1	89.2	..	..
No child	89.0	79.0	65.6	223.5	18.6
Turkey	89.1	82.3	74.5	375.6	31.3

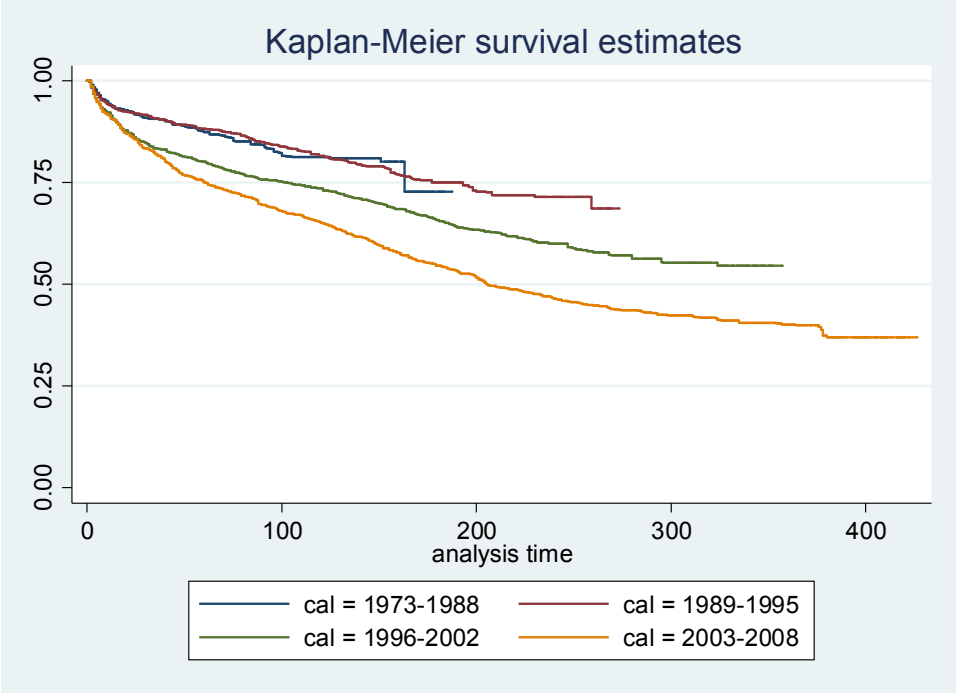
Kaplan-Meier survival estimates of transition from non-employment to employment by calendar period variable and time-fixed explanatory and control variables are presented below.

Figure III.4.2.1.2. Survival estimate of entering employment, by age at start of non-employment



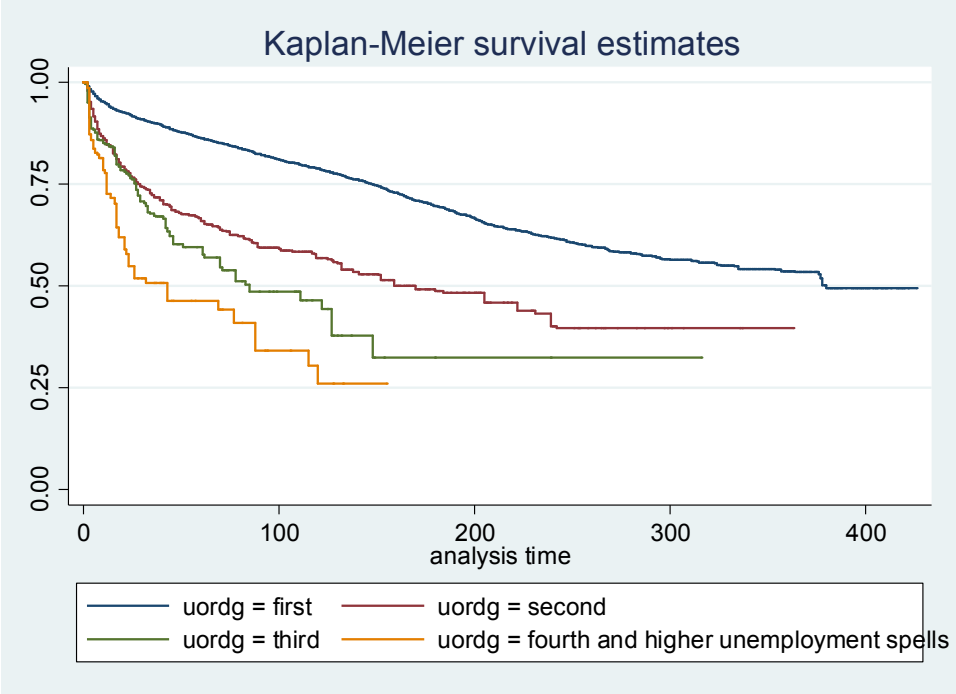
Log-rank test for equality of survival functions: Wald Chi^2 = 70.20, Pr>chi2= 0.0000

Figure III.4.2.1.3. Survival estimate of entering employment, by calendar period



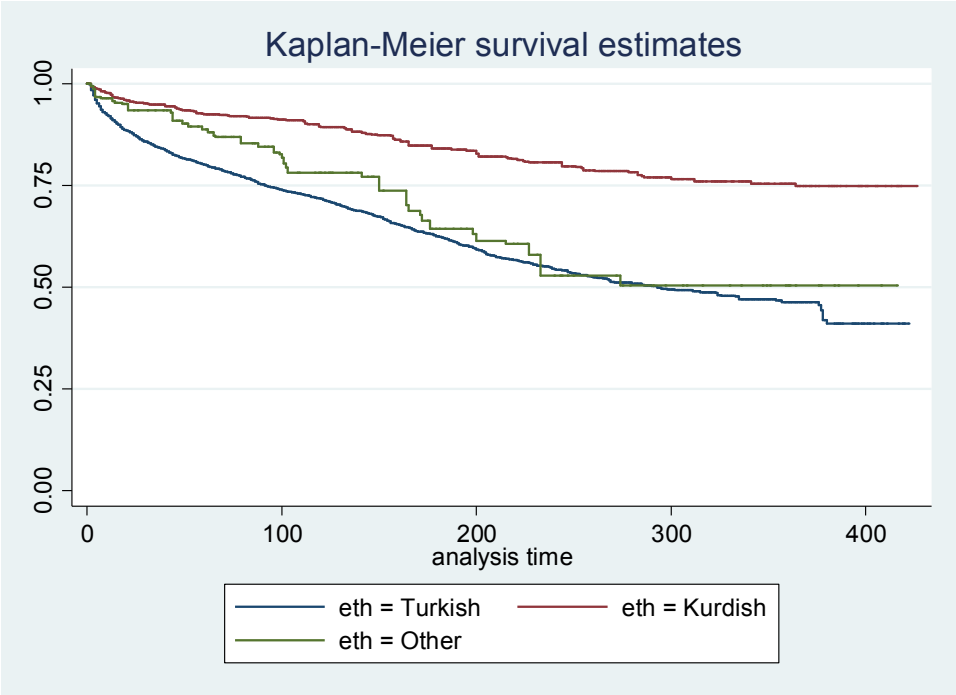
Log-rank test for equality of survival functions: Wald Chi^2 = 114.93, Pr>chi2= 0.0000

Figure III.4.2.1.4. Survival estimate of entering employment, by order of non-employment episode



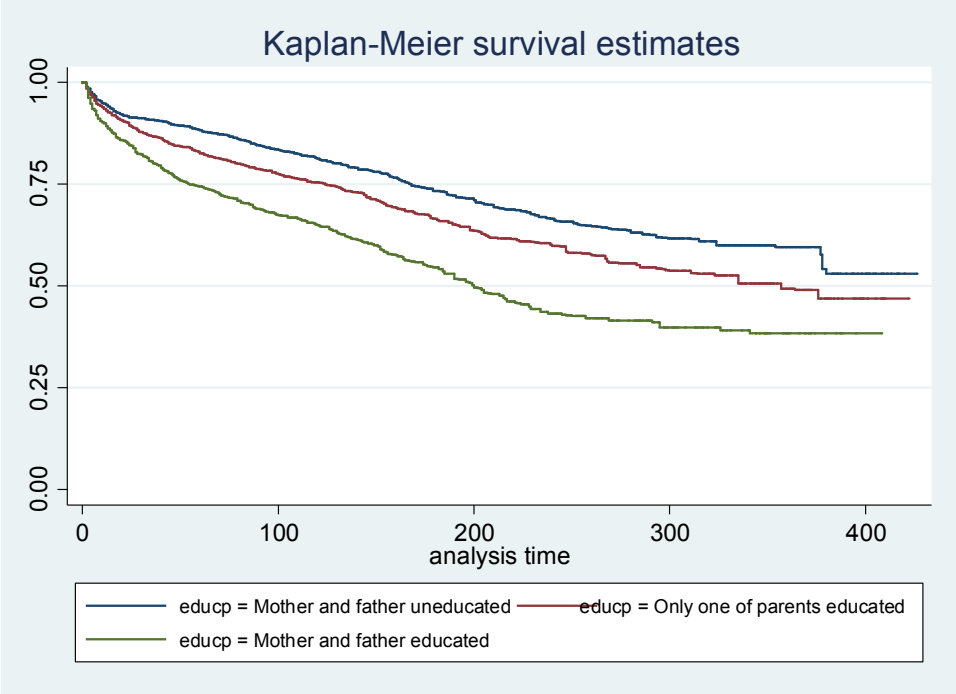
Log-rank test for equality of survival functions: Wald Chi^2 = 219.93, Pr>chi2= 0.0000

Figure III.4.2.1.5. Survival estimate of entering employment, by mother tongue



Log-rank test for equality of survival functions: Wald Chi^2 = 106.29, Pr>chi2= 0.0000

Figure III.4.2.1.6. Survival estimate of entering employment, by parental education



Log-rank test for equality of survival functions: Wald Chi^2 = 97.55, Pr>chi2= 0.0000

Survivor functions with respect to all presented explanatory and control variables in addition to fertility variables differ from each other according to log-rank test results. If age at start of non-employment is younger, duration of non-employment is longer and intensity of employment entry is lower (Figure III.4.2.1.2). In recent calendar periods, especially for spells in 2003-2008 period, employment entry intensity is higher compared to older periods (Figure III.4.2.1.3). As order of unemployment spell increases, employment intensity is higher, i.e. survival estimates are lower (Figure III.4.2.1.4). Women with mother tongue of Turkish or another language have higher employment entry intensity compared to Kurdish women (Figure III.4.2.1.5). More educated parents is associated with higher employment entry risks (Figure III.4.2.1.6).

Median duration of transition from non-employment to employment cannot be computed for several categories of non-employment spells as less than half of these spells end in employment. However according to median durations with respect

to the variables for which such comparisons can be made; median duration of non-employment is shorter for spells with more years of non-employment after marriage, higher order of episodes, with more educational level, with educated parents, in Western region and spells spent not in union (Table III.4.2.1.2).

Table III.4.2.1.2. Median duration of transition from non-employment to employment

	Months	Years
Age at start of non-employment episode		
12-16	..	..
17-21	..	..
22-26	238.8	19.9
27-49	..	..
Calendar year		
1973-1988	..	..
1989-1995	..	..
1996-2002	..	..
2003-2008	205.0	17.1
Years of non-employment after marriage		
0	377.4	31.5
1	..	..
2-4	231.1	19.3
5+	74.8	6.2
Order of non-employment episode		
First	379.2	31.6
Second	169.0	14.1
Third	83.4	7.0
Fourth or higher order	41.3	3.4
Educational level		
No education or primary incomplete	..	..
Primary level	356.2	29.7
Secondary level	251.1	20.9
High school or higher level	160.2	13.4
In education	..	..
Type of place of residence		
Urban	325.7	27.1
Rural	..	..

(Table III.4.2.1.2 continued)

	Months	Years
Region		
West	205.0	17.1
South	..	..
Central	..	..
North	253.6	21.1
East	..	..
Mother tongue		
Turkish	292.8	24.4
Kurdish	..	..
Other	..	..
Parental education		
Mother and father uneducated	..	..
Either of mother or father uneducated	355.9	29.7
Mother and father educated	199.3	16.6
Marital status		
Separated	61.6	5.1
First marriage	377.6	31.5
Later marriages	256.4	21.4

To sum up, in ten years after start of non-employment, only 25 percent of spells end in employment. Median duration for non-employment is 31 years in Turkey. Survivor functions of groups of non-employment spells differ with respect to calendar period and all time-fixed explanatory and control variables. These variables are age at start of non-employment, calendar period, order of non-employment spell, mother tongue, and parental education. Non-employment rate and duration is higher when parity number is higher. Median duration of non-employment becomes lower when age of youngest child increases.

III.4.2.2. The Multivariate Analysis: The Impact of Fertility Variables and Other Covariates on Transition from Non-employment to Employment

In this section, determinants of progression from non-employment to employment are analyzed with multivariate event history models. With these models, we aim to understand the change in job entry intensity in almost four decades, to what extent the job entry risks differ according to fertility of women, and how these risks are affected by characteristics of women.

The series of models are constructed stepwise adding different groups of covariates to previous models. In the first model we construct a main effects model with three explanatory variables: *duration since non-employment start* (baseline hazard), *age at start of non-employment* and *calendar year*. In the second model, we add a fertility variable, namely *parity* or *age of youngest child* or a *composite variable of parity and age of youngest child*. Three separate models are estimated using different fertility variables. In the third and latter models, we add non-employment-episode-related, socio-economic, residential, and background variables stepwise. Our main variables of interest are age at start of non-employment, calendar year and fertility variable of interest.

Table III.4.2.2.1 presents results of multivariate analyses on employment entries with the parity variable as one of the explanatory variables. According to the results of the first model, as duration since non-employment start increases, hazard of job entry declines. However after some time, the risk of employment entry increases again. This turning point is ten years of non-employment in the first model. If age at start of non-employment is less than 21 years, risk of job entry is lower compared to the age group of 22-26. These results change when non-employment-related variables are added in the model. Intensity of employment entry has been lower in past calendar periods compared to 2003-2008.

In the second model number of living children is added into the analysis. Compared to women with one child, women with other numbers of living children

have lower risks of entering employment. As parity increases, job entry intensity declines.

The third model has non-employment-episode-related variables. If years of non-employment after marriage exceed five years, there is higher risk of entering employment. As number of non-employment spells increases; risk of entering employment increases. This indicates high turnover in the labor market.

The fourth model has the educational level as a covariate. Less educational attainment is associated with lower risk of entering employment.

The fifth model has residential control variables as covariates. According to the results of this model, job entry intensity with respect to duration has U shape. At first risk of entering employment declines, and after five years of continuous non-employment risk of job entry increases. If age at start of non-employment is 27-49 years, risk of job entry is lower. In rural areas, risk of entering employment is higher compared to urban areas. In regions of South, Central and East, risk of entering employment is lower compared to Western region.

The sixth model additionally has mother tongue and parental education as covariates. Kurdish women have lower risks of job entry compared to Turkish women. Less parental education implies less intensity of employment entry.

The seventh or the final model additionally has marital status as a covariate. Separated women have higher risk of entering employment compared to married women. The results are similar to the results of Model 5, where residential variables are controlled for. As number of living children increases, risk of entering employment declines for non-employed women.

Table III.4.2.2.1. Relative risks of job entries: parity model, 1973-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since non-employment start (Baseline)							
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	0.54	0.50	0.55	0.57	0.57	0.57	0.56
2-3 years	0.38	0.35	0.41	0.42	0.42	0.42	0.42
3-4 years	0.37	0.34	0.42	0.43	0.43	0.43	0.42
4-5 years	0.26	0.25	0.32	0.33	0.33	0.33	0.32
5-7 years	0.26	0.26	0.35	0.36	0.35	0.35	0.34
7-10 years	0.25	0.27	0.39	0.39	0.37	0.37	0.36
10+ years	0.28	0.35	0.53	0.53	0.49	0.48	0.45
Age at start of non-employment							
12-16	0.67	0.73	0.85	0.99	1.11	1.12	1.11
17-21	0.80	0.81	0.93	0.96	1.01	1.01	1.02
22-26	*1*	*1*	*1*	*1*	*1*	*1*	*1*
27-49	1.15	1.28	0.77	0.74	0.71	0.71	0.70
Calendar year							
1973-1988	0.59	0.59	0.67	0.74	0.69	0.69	0.69
1989-1995	0.54	0.54	0.61	0.64	0.61	0.61	0.61
1996-2002	0.76	0.76	0.82	0.83	0.81	0.82	0.82
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Parity							
0		0.82	0.98	1.02	1.02	1.02	1.00
1		*1*	*1*	*1*	*1*	*1*	*1*
2		0.82	0.71	0.76	0.77	0.79	0.82
3		0.70	0.59	0.69	0.73	0.75	0.78
4+		0.43	0.37	0.49	0.56	0.59	0.60
Years of non-employment after marriage							
0 years			*1*	*1*	*1*	*1*	*1*
1 year			0.74	0.79	0.77	0.78	0.75
2-4 years			1.14	1.21	1.24	1.26	1.15
5+ years			2.14	2.51	2.52	2.53	2.35
Order of non-employment episode							
First			*1*	*1*	*1*	*1*	*1*
Second			1.97	1.77	1.61	1.58	1.56
Third			2.54	2.15	1.92	1.87	1.87
Fourth and higher order			4.09	3.59	3.08	3.03	2.89

(Table III.4.2.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education							
No education or primary incomplete				0.41	0.48	0.56	0.56
Primary level				0.62	0.60	0.64	0.64
Secondary level				0.61	0.61	0.63	0.63
High school or higher level				*1*	*1*	*1*	*1*
In education				1.60	1.57	1.53	1.55
Type of place of residence							
Urban					*1*	*1*	*1*
Rural					1.28	1.27	1.27
Region							
West					*1*	*1*	*1*
South					0.70	0.70	0.70
Central					0.59	0.59	0.58
North					1.01	1.01	1.00
East					0.35	0.40	0.41
Mother tongue							
Turkish						*1*	*1*
Kurdish						0.73	0.73
Other						1.04	1.05
Parental education							
Mother and father uneducated*						0.83	0.83
Mother or father educated						0.87	0.87
Mother and father educated						*1*	*1*
Missing						0.99	1.00

(Table III.4.2.2.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Marital status							
Separated							2.05
First marriage							*1*
Later marriages							0.93
Constant	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Number of non-employment spells (weighted)	7232	7232	7232	7232	7213	7213	7213
Number of job entries	2095	2095	2095	2095	2081	2081	2081
Time at risk (months)	867970	867970	867970	867970	865878	865878	865878
Log likelihood	-6652	-6608	-6475	-6409	-6257	-6247	-6219
LR chi2	491	545	772	865	1038	1053	1110
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Uneducated: None or primary incomplete; educated: Primary complete or above

Table III.4.2.2.2 presents results of the age of youngest child model. The relative risks with respect to variables other than fertility variables, do not differ much from those of the parity model. As duration increases, risk of entering employment declines and becomes stable after five years of continuous non-employment. Age at start of non-employment of 27-49 years, implies less risk of job entry compared to 22-26 age group. In past calendar periods, risk of job entry was lower compared to 2003-2008 period. After five years of non-employment after marriage, risk of entering employment is higher. As order of non-employment episode increases risk of employment entry increases. Less education implies lower entry risks. In rural areas job entry intensity is higher. Regions of South, Central and East have lower entry risks compared to Western region. Kurdish women and women with less parental education have lower risks of entry. Separated women have higher risks of entry compared to women in their first marriages. As age of youngest child

increases, risk of job entry increases. If woman is pregnant, risk of job entry is lower compared to women with infants. If woman has no child, risk of entering employment is higher compared to women with infants.

Table III.4.2.2.2. Relative risks of job entries: age of youngest child model, 1973-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since non-employment start (Baseline)							
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	0.54	0.59	0.62	0.62	0.62	0.62	0.61
2-3 years	0.38	0.38	0.42	0.43	0.43	0.43	0.42
3-4 years	0.37	0.34	0.39	0.40	0.40	0.40	0.39
4-5 years	0.26	0.23	0.28	0.29	0.28	0.28	0.28
5-7 years	0.26	0.22	0.27	0.28	0.28	0.28	0.27
7-10 years	0.25	0.18	0.23	0.25	0.25	0.25	0.25
10+ years	0.28	0.16	0.23	0.26	0.27	0.27	0.26
Age at start of non-employment							
12-16	0.67	0.73	0.83	1.00	1.13	1.14	1.13
17-21	0.80	0.84	0.95	0.99	1.03	1.03	1.05
22-26	*1*	*1*	*1*	*1*	*1*	*1*	*1*
27-49	1.15	0.79	0.57	0.59	0.59	0.59	0.60
Calendar year							
1973-1988	0.59	0.65	0.71	0.79	0.73	0.73	0.73
1989-1995	0.54	0.58	0.62	0.66	0.62	0.62	0.62
1996-2002	0.76	0.80	0.83	0.85	0.82	0.83	0.83
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Age of youngest child							
0 years		*1*	*1*	*1*	*1*	*1*	*1*
1-2 years		1.62	1.55	1.52	1.50	1.50	1.50
3-5 years		2.24	1.99	1.90	1.83	1.82	1.81
6-8 years		3.43	2.83	2.63	2.48	2.45	2.40
9+ years		3.08	2.36	2.23	2.03	2.00	1.89
Pregnant		0.64	0.67	0.67	0.68	0.68	0.68
No child		1.79	1.95	1.90	1.82	1.80	1.73
Years of non-employment after marriage							
0 years			*1*	*1*	*1*	*1*	*1*
1 year			0.67	0.71	0.70	0.71	0.69
2-4 years			0.96	1.03	1.06	1.09	1.00
5+ years			1.45	1.81	1.88	1.91	1.84

(Table III.4.2.2.2 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Order of non-employment episode							
First			*1*	*1*	*1*	*1*	*1*
Second			1.87	1.70	1.56	1.53	1.51
Third			2.43	2.05	1.85	1.81	1.80
Fourth and higher order			3.65	3.25	2.82	2.79	2.64
Education							
No education or primary incomplete				0.38	0.44	0.52	0.52
Primary level				0.59	0.58	0.62	0.63
Secondary level				0.59	0.60	0.61	0.62
High school or higher level				*1*	*1*	*1*	*1*
In education				1.45	1.45	1.41	1.44
Type of place of residence							
Urban					*1*	*1*	*1*
Rural					1.28	1.27	1.27
Region							
West					*1*	*1*	*1*
South					0.70	0.71	0.70
Central					0.59	0.58	0.58
North					1.00	1.01	1.00
East					0.36	0.41	0.41
Mother tongue							
Turkish						*1*	*1*
Kurdish						0.75	0.74
Other						1.07	1.06
Parental education							
Mother and father uneducated*						0.81	0.82
Mother or father educated						0.87	0.87
Mother and father educated						*1*	*1*
Missing						0.97	0.98

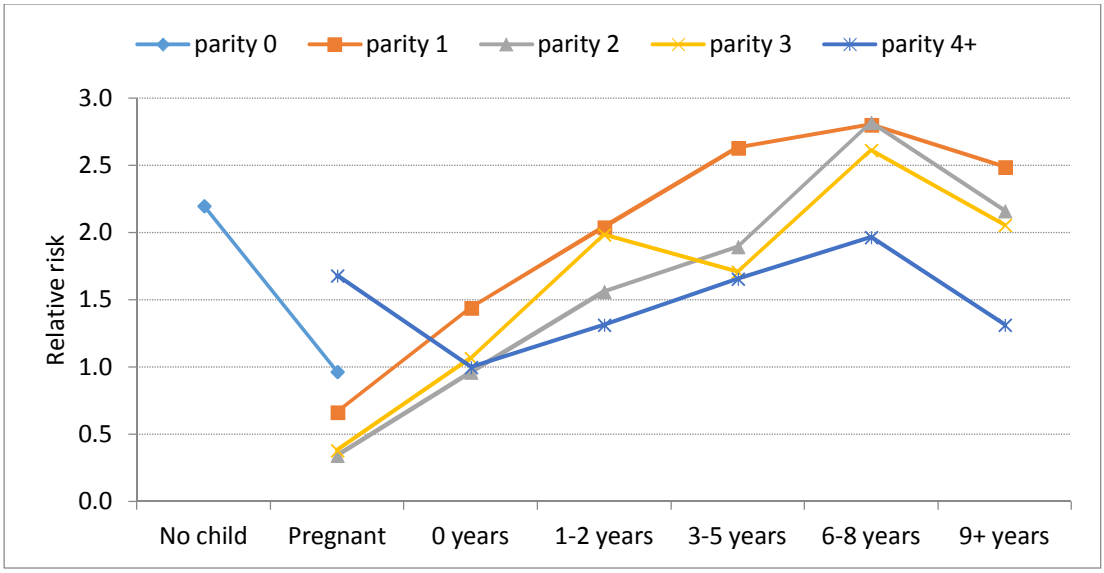
(Table III.4.2.2.2 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Marital status							
Separated							1.96
First marriage							*1*
Later marriages							0.99
Constant	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Number of non-employment spells (weighted)	7232	7232	7232	7232	7213	7213	7213
Number of job entries	2095	2095	2095	2095	2081	2081	2081
Time at risk (months)	867970	867970	867970	867970	865878	865878	865878
Log likelihood	-6652	-6497	-6417	-6333	-6185	-6174	-6150
LR chi2	491	620	837	960	1118	1131	1183
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Uneducated: None or primary incomplete; educated: Primary complete or above

The final set of multivariate models is the ones with the final fertility variable, which is a composite variable of parity and age of youngest child. Not all results are presented in this section since the results do not differ from previous models for employment entries. The detailed results of this model are presented in the Appendix B. Figure III.4.2.2.1 presents the relative risks of job entries with respect to the composite fertility variable. According to this Figure, zero parity is associated with high risks of job entries. Above all pregnancy is associated with low intensity of employment entry. As the youngest child grows older, the risk of entry increases for all parity groups. When the youngest child reaches age 9, the risk of employment entry declines, albeit slightly. These findings indicate that non-employed women do not enter jobs due to pregnancy, young children and higher parities. As the youngest child grows, risk of entering employment increases.

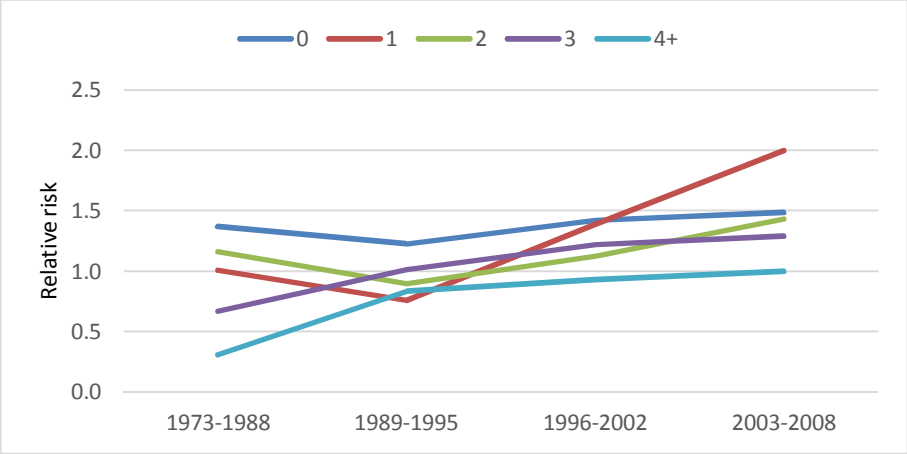
Figure III.4.2.2.1. Relative risks of job entries: composite model, 1973-2008, TDHS-2008



III.4.2.3. Interactive Effect of Fertility Variables and Calendar Periods, Employment Entry

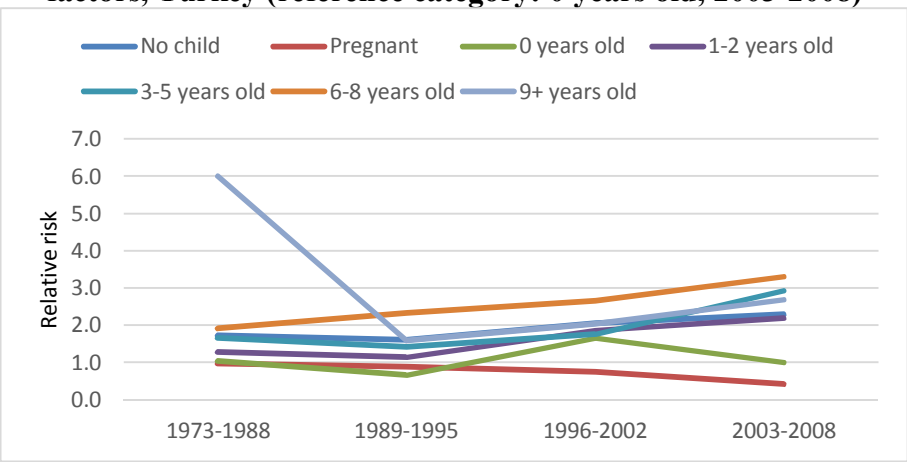
The interactive effects of parity and calendar period are presented for non-employment model in Figure III.4.2.3.1. 1994 crisis appears to be influential increasing the slope of relative risk lines especially for women with one and two living children. Economic crisis appear to increase relative risks of women's transition to employment as well as transition to non-employment. However these seem to affect mainly different subgroups of women relative to parity.

Figure III.4.2.3.1. Interaction effect of parity and calendar period on transition from non-employment to employment, standardized for other factors, Turkey (reference category: 4+, 2003-2008)



Finally when we look at the variable of age of youngest child, pregnant women are affected the most in time. Relative risks of entering employment increased after 1992 except for pregnant women and women with infants. It is also noteworthy to mention high relative risk of transition to employment for women with youngest age as 9 years old and older during 1973-1988 period.

Figure III.4.2.3.2. Interaction effect of age of youngest child and calendar period on transition from non-employment to employment, standardized for other factors, Turkey (reference category: 0 years old, 2003-2008)



III.5. CONCLUSION

The contextual framework is fundamental shaping the relationship between fertility and employment. Labor market in Turkey is characterized by low female labor force participation rates. Turkey ranks lowest among OECD countries in terms of female employment rate. Gender gap in employment is highest among OECD countries with 40 percent. Most of employed women work in inferior jobs, with no social security coverage. Although shares of non-wage earners and workers in the agricultural sector have been decreasing, they still have high percentages. This suggests lower role incompatibility according to the mechanism running through nature of the task. However low participation rates of women brings the question of incompatibility between working and mothering again.

The main purpose of this paper was to analyze the determinants of employment entries and employment exits focusing on fertility of women in Turkey using event history analyses. Such studies were carried out in the developed countries. Due to authors' knowledge, this is the first study, which analyzes employment outcomes related to fertility variables employing event history analyses in a developing country.

With our multivariate analyses we tried to find answers to research questions of the following:

- What are the determinants of employment entries and employment exits in Turkey using event history analyses? How is women's fertility (child parity and age of children) related to these employment outcomes?
- How do trend of employment and non-employment evolve over time? What may be the factors that shaped this trend?
- How do the findings provide support for role incompatibility hypothesis in Turkey taking into consideration the institutional context in Turkey?

In addition to these questions, descriptive analyses, namely Kaplan-Meier survival estimates of transitions to employment and non-employment events at national level and with respect to calendar period variable and each time-fixed explanatory or control variable were presented. The equality of survivor functions shown in graphs was tested using the log-rank test.

Basic descriptive findings for the job-exit model indicated that more than half of jobs end by ten years after start of employment in Turkey. The median duration of employment is estimated as 8.2 years overall. When we look at survivor functions with respect to fertility variables, more parity implies shorter median durations of employment as expected except for "0" parity. For women with "0" parity, job exit risk is highest. Pregnant women and childless women have shortest median duration of employment. As child grows older median duration becomes shorter and job exit risk is higher. Descriptive analyses indicate that parity variable has expected results meaning higher parity implies shorter median durations.

Descriptive findings of job-entry model indicated that employment entry intensities are low and duration of non-employment is high for ever-married women in Turkey. In ten years after start of non-employment, only 25 percent of spells end in employment. Median duration of transition from non-employment to employment is 31.3 years. Survival estimates are higher when parity number is higher. In other words, non-employment rate and duration is higher when parity number is higher. As age of youngest child increases, survival estimates become lower indicating higher job entry intensities. Median duration of non-employment becomes lower when age of youngest child increases. These descriptive results provide support for role incompatibility hypothesis in general. It appears to be the fact that fertility affects employment outcome, especially by keeping women away from the labor market.

In the multivariate analyses, stepwise multiplicative intensity regression models were estimated for events of employment exit and entry. These models were multi-episode models where each woman was observed until the date of interview or the date of emigration. In other words, after each failure event (exit or entry) the

woman re-entered the analysis. We employed the strategy suggested by Allison (2010) and reset the clock to 0 each time an event occurs and treat the intervals between events as distinct observations. Further we assumed that the dependence of the hazard on time since last event has the same form for each successive event. Finally we assumed independence of individuals but relaxed the assumption that intervals within each individual were independent. As suggested in Cleves et al. (2008), we fit a standard piecewise constant exponential model, adjusting the standard errors of the estimated parameters to account for the possible correlation. Finally we used the order of event and cumulative duration of employment or non-employment as explanatory variables in our multi-episode models, analyzing job exits and entries.

The event history analyses were realized in a step-wise fashion where different sets of variables were added to previous models. This method enables us to observe how the impact fertility of women, was conditioned by other characteristics. The explanatory variables used were a*ge at start of the episode, calendar year,* and *parity (number of living children)* or *age of youngest child* or *composite variable of parity and age of youngest child.* The control variables used in models were episode-related control variables (*years of employment/non-employment after marriage* and *order of episode),* socio-economic control variables *(educational level),* residential control variables *(type of place of residence, region),* and background control variables *(mother tongue, parental education* and *marital status)*. Furthermore s*ector of job* and *social security coverage of job* were included in the model of job exit as work-related covariates.

The final job-exit model provided mixed results with respect to fertility variables. According to this model, employment spells where women have “0” parity has higher risk of ending and spells where women have “2” children has lower risk of ending compared to spells where women have only one child. Not all categories of age of youngest child had significant risk ratios. Pregnant women or women with no children have higher risk of job exits compared to women with infant. Women with a child of age 1-2 have less risk of exiting employment compared to women with an

infant. This implies once women establish themselves in the labor market, even if they have more kids, they do not exit the labor market. Put differently having more kids do not imply higher risk of job exits. However pregnant women have higher risks of job exits compared to women with infants. When the child reached age one, the risk becomes lower compared to women with infants. Hence job exit intensity increase appears to be a temporary phenomenon restricted to pregnancy period and infant-child period of women. Employed women do not exit jobs due to higher parity but they exit jobs due to pregnancy, or infant children.

However the mechanism running from fertility to employment entry provides a different story. The final job-entry model indicated that as number of living children (parity) increases, risk of entering employment declines for non-employed women. Moreover as age of youngest child increases, risk of job entry increases. If woman is pregnant, risk of job entry is lower compared to women with infants. If woman has no child, risk of entering employment is higher compared to women with infants. These findings indicate that non-employed women do not enter jobs due to pregnancy, young children and higher parities. As the youngest child grows older; risk of entering employment increases.

When we look at how trend of employment and non-employment evolved over time, we see that both job exit and job entry intensities have been increasing in time, especially the former since 1989-1995 period. Increase in risk of job exits, is especially valid for women with no children. Moreover relative risk of transition to non-employment for pregnant women has been increasing very rapidly since 1989-1995 period. The interactive effects of parity and calendar period for job-entry model indicated that women with one and two living children had increasing risks of job entry since 1989-1995 period. Risk of job entry for childless women has always been higher than women with parities more than zero at all calendar periods. Finally when we look at the variable of age of youngest child, pregnant women are affected the most in time. Relative risks of entering employment increased after 1989-1995 period except for pregnant women and women with infants.

These findings imply support for role incompatibility theory in Turkey. The linkages running from fertility to employment status show that not all fertility variables provide support for a relationship between fertility and employment. Having no child increases the risk of exiting employment and having two or more children decrease the risk compared to having one child. The age of the youngest child dimension, on the other hand, provides support for a negative relationship between working and mothering. Pregnant women or women with infants have higher risks of employment exits. According to the non-employment (job entry) model, parity also affects the risk of transition. More children implies less job entries. Number of children, pregnancy and presence of young children prevent women from entering employment. The calendar period variable implies less employment barriers in the labor market for women. The low employment rate of women in Turkey is an important issue to address. Policies should aim non-employed women's participation in the labor market. The conditions of labor demand should aim employment of these women. Results for groups of pregnant women and childless women need further attention. Childless women have the highest rates of job turnover that is risk of job entry and exit. Pregnant women are the most disadvantaged group. If they are employed, the risk of job exit is the highest for them and if non-employed the risk of job entry is the lowest for them. We can conclude that our study finds evidence for the role incompatibility hypothesis in Turkey. Employment decreases the risk of childbearing. On the other hand, not parity but pregnancy increases the risk of exiting employment. Finally both parity and young children keep women away from the labor market in Turkey.

It should be noted that our study does not aim at a direct test of the role incompatibility hypothesis. The reasons are as follows. In an event history setting, no data are available for child care organization. This leaves one of the pillars of this hypothesis unanalyzed. However analyzing the institutional context in Turkey, we can find implicit support for the hypothesis. One of the reasons for high non-employment rates of women appears to be fertility levels of women. Moreover policies aiming at periods with pregnancy and infant child should be developed in order to prevent women from exiting employment.

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APPENDIX A:

SAMPLE COMPOSITION FOR THE EVENT HISTORY ANALYSES

Table A.1. Sample composition for the analysis of first conception risks in Turkey, TDHS-2008

	Exposure		Events	
	Woman-months	%	First conceptions	%
Duration since first marriage (Baseline)				
0-1 years	54785	42.5	4048	64.2
1-2 years	23017	17.9	1242	19.7
2-3 years	12554	9.7	454	7.2
3-4 years	7831	6.1	236	3.7
4-5 years	5412	4.2	123	2.0
5-7 years	7158	5.6	100	1.6
7-10 years	6789	5.3	56	0.9
10+ years	11378	8.8	46	0.7
Age at first marriage				
12-16	30520	23.7	1292	20.5
17-21	60157	46.7	3326	52.7
22-26	28561	22.2	1379	21.9
27-31	7202	5.6	257	4.1
32-46	2485	1.9	53	0.8
Calendar year				
1972-1980	8167	6.3	478	7.6
1981-1987	19351	15.0	1116	17.7
1988-1994	27412	21.3	1518	24.1
1995-2001	34571	26.8	1700	27.0
2002-2008	39425	30.6	1493	23.7
Employment before marriage (time fixed)				
Non-employed	72595	56.3	3684	58.4
Employed	56331	43.7	2621	41.6
Employment Status (time varying)				
Non-employed	87461	67.8	4598	72.9
Employed	41465	32.2	1708	27.1
Education				
No education or primary incomplete	29268	22.7	1129	17.9
Primary level	62443	48.4	3446	54.7
Secondary level	8856	6.9	476	7.6
High school or higher level	27504	21.3	1214	19.2
In education	855	0.7	41	0.6

(Table A.1 continued)

	Exposure		Events	
	Woman-months	%	First conceptions	%
Type of place of residence				
Urban	87557	68.1	4315	68.6
Rural	40979	31.9	1977	31.4
Region				
West	52797	41.0	2360	37.4
South	15654	12.2	755	12.0
Central	26649	20.7	1547	24.5
North	10249	8.0	505	8.0
East	23328	18.1	1136	18.0
Mother tongue				
Turkish	105274	81.7	5237	83.1
Kurdish	19680	15.3	890	14.1
Other	3971	3.1	178	2.8
Parental education				
Mother and father uneducated	40945	31.8	1934	30.7
One educated other uneducated	40842	31.7	2223	35.3
Mother and father educated	38886	30.2	1773	28.1
Missing	8253	6.4	376	6.0
Marital status				
Separated	6853	5.3	6	0.1
First marriage	120472	93.4	6257	99.2
Later marriages	1601	1.2	43	0.7
Sector				
Agriculture	20993	16.3	1005	15.9
Non-agriculture	20472	15.9	703	11.1
Non-employed	87461	67.8	4598	72.9
Public versus private				
Public	6283	4.9	233	3.7
Private	35181	27.3	1475	23.4
Non-employed	87461	67.8	4598	72.9
Status				
Wage earner	21619	16.8	759	12.0
Non-wage earner	19818	15.4	948	15.0
Other	28	0.0	1	0.0
Non-employed	87461	67.8	4598	72.9
Social security				
Uncovered	25382	19.7	1189	18.8
Covered	16047	12.4	517	8.2
Missing	36	0.0	2	0.0
Non-employed	87461	67.8	4598	72.9
Total	128926	100.0	6306	100.0

Table A.2. Sample composition for the analysis of second conception risks in Turkey, TDHS-2008

	Exposure		Events	
	Non-pregnancy months	%	Second conceptions	%
Duration since first birth (Baseline)				
0-1 years	71868	27.7	1303	25.5
1-2 years	50779	19.6	1355	26.5
2-3 years	35153	13.5	851	16.7
3-4 years	24531	9.4	567	11.1
4-5 years	17386	6.7	410	8.0
5-7 years	21957	8.5	369	7.2
7-10 years	16975	6.5	207	4.0
10+ years	21067	8.1	49	1.0
Age at first birth				
12-16	15467	6.0	529	10.4
17-21	120816	46.5	2778	54.4
22-26	88779	34.2	1450	28.4
27-31	27409	10.6	299	5.8
32-44	7246	2.8	55	1.1
Calendar year				
1973-1981	8514	3.3	359	7.0
1982-1988	29831	11.5	898	17.6
1989-1995	58911	22.7	1416	27.7
1996-2002	76758	29.6	1414	27.7
2003-2008	85703	33.0	1023	20.0
Employment before marriage (time fixed)				
Non-employed	144306	55.6	3195	62.5
Employed	115410	44.4	1916	37.5
Employment Status (time varying)				
Non-employed	178214	68.6	3692	72.2
Employed	81502	31.4	1418	27.8
Education				
No education or primary incomplete	29266	11.3	1136	22.2
Primary level	133002	51.2	2965	58.0
Secondary level	21263	8.2	304	5.9
High school or higher level	75973	29.3	703	13.8
In education	212	0.1	2	0.0
Type of place of residence				
Urban	198570	76.7	3392	66.6
Rural	60336	23.3	1704	33.4

(Table A.2 continued)

	Exposure		Events	
	Non-pregnancy months	%	Second conceptions	%
Region				
West	127108	49.0	1800	35.2
South	27996	10.8	652	12.8
Central	57878	22.3	1208	23.6
North	18215	7.0	408	8.0
East	28223	10.9	1042	20.4
Mother tongue				
Turkish	233448	89.9	4127	80.8
Kurdish	20618	7.9	836	16.4
Other	5650	2.2	147	2.9
Parental education				
Mother and father uneducated	62806	24.2	1861	36.4
One educated other uneducated	91334	35.2	1799	35.2
Mother and father educated	92106	35.5	1114	21.8
Missing	13470	5.2	337	6.6
Marital status				
Separated	10571	4.1	7	0.1
First marriage	244717	94.6	5003	98.3
Later marriages	3470	1.3	78	1.5
Sector				
Agriculture	35435	13.6	952	18.6
Non-agriculture	46068	17.7	467	9.1
Non-employed	178214	68.6	3692	72.2
Public versus private				
Public	14815	5.7	158	3.1
Private	66687	25.7	1260	24.7
Non-employed	178214	68.6	3692	72.2
Status				
Wage earner	42609	16.4	510	10.0
Non-wage earner	38852	15.0	908	17.8
Other	41	0.0	1	0.0
Non-employed	178214	68.6	3692	72.2
Social security				
Uncovered	47858	18.4	1125	22.0
Covered	33610	12.9	291	5.7
Missing	34	0.0	2	0.0
Non-employed	178214	68.6	3692	72.2
Total	259717	100.0	5110	100.0

Table A.3. Sample composition for the analysis of third conception risks in Turkey, TDHS-2008

	Exposure		Events	
	Non-pregnancy months	%	Third conceptions	%
Duration since second birth (Baseline)				
0-1 years	57403	15.8	592	21.4
1-2 years	46479	12.8	685	24.8
2-3 years	37682	10.4	419	15.1
3-4 years	31466	8.6	292	10.6
4-5 years	26584	7.3	240	8.7
5-7 years	42729	11.7	271	9.8
7-10 years	45390	12.5	189	6.8
10+ years	76323	21.0	79	2.9
Age at second birth				
13-19	39436	10.8	664	24.0
20-24	162507	44.6	1458	52.7
25-29	116773	32.1	542	19.6
30-34	39488	10.8	91	3.3
35-41	5853	1.6	13	0.5
Calendar year				
1973-1981	4104	1.1	131	4.7
1982-1988	25600	7.0	532	19.2
1989-1995	70492	19.4	716	25.9
1996-2002	122692	33.7	823	29.7
2003-2008	141168	38.8	567	20.5
Employment before marriage (time fixed)				
Non-employed	224953	61.8	1856	67.0
Employed	139102	38.2	912	33.0
Employment Status (time varying)				
Non-employed	247397	68.0	1997	72.1
Employed	116659	32.0	772	27.9
Education				
No education or primary incomplete	44934	12.3	951	34.3
Primary level	232418	63.8	1561	56.4
Secondary level	24778	6.8	104	3.8
High school or higher level	61925	17.0	152	5.5
In education	1	0.0	0	0.0
Type of place of residence				
Urban	273207	75.2	1694	61.4
Rural	90145	24.8	1067	38.6

(Table A.3 continued)

	Exposure		Events	
	Non-pregnancy months	%	Third conceptions	%
Region				
West	175885	48.3	754	27.2
South	43831	12.0	355	12.8
Central	83881	23.0	662	23.9
North	26134	7.2	229	8.3
East	34291	9.4	768	27.8
Mother tongue				
Turkish	330428	90.8	2000	72.2
Kurdish	26248	7.2	672	24.3
Other	7379	2.0	96	3.5
Parental education				
Mother and father uneducated	118253	32.5	1288	46.5
One educated other uneducated	132902	36.5	936	33.8
Mother and father educated	89818	24.7	340	12.3
Missing	23083	6.3	205	7.4
Marital status				
Separated	10607	2.9	3	0.1
First marriage	345556	95.0	2719	98.3
Later marriages	7502	2.1	45	1.6
Sector				
Agriculture	62730	17.2	611	22.1
Non-agriculture	53928	14.8	161	5.8
Non-employed	247397	68.0	1997	72.1
Public versus private				
Public	15668	4.3	27	1.0
Private	100991	27.7	745	26.9
Non-employed	247397	68.0	1997	72.1
Status				
Wage earner	48163	13.2	199	7.2
Non-wage earner	68339	18.8	572	20.7
Other	157	0.0	1	0.0
Non-employed	247397	68.0	1997	72.1
Social security				
Uncovered	86994	23.9	706	25.5
Covered	29651	8.1	64	2.3
Missing	14	0.0	2	0.1
Non-employed	247397	68.0	1997	72.1
Total	364056	100.0	2768	100.0

Table A.4. Sample composition for the analysis of fourth and higher order conception risks in Turkey, TDHS-2008

	Exposure		Events	
	Non-pregnancy months	%	Fourth and higher order conceptions	%
Duration since previous birth (Baseline)				
0-1 years	66656	16.6	964	29.2
1-2 years	51530	12.9	927	28.0
2-3 years	40476	10.1	479	14.5
3-4 years	33863	8.4	312	9.5
4-5 years	28899	7.2	188	5.7
5-7 years	46733	11.7	261	7.9
7-10 years	49913	12.5	123	3.7
10+ years	82691	20.6	50	1.5
Age at previous birth				
14-19	12445	3.1	218	6.6
20-24	105297	26.3	1248	37.8
25-29	155351	38.8	1236	37.4
30-34	92901	23.2	475	14.4
35-46	34768	8.7	129	3.9
Calendar year				
1973-1981	1373	0.3	35	1.0
1982-1988	24072	6.0	525	15.9
1989-1995	73427	18.3	928	28.1
1996-2002	136796	34.1	1147	34.7
2003-2008	165093	41.2	670	20.3
Employment before marriage (time fixed)				
Non-employed	269812	67.3	2342	70.9
Employed	130950	32.7	963	29.1
Employment Status (time varying)				
Non-employed	273269	68.2	2332	70.6
Employed	127493	31.8	973	29.4
Order of conception				
Fourth	198898	49.6	1432	43.3
Fifth	97129	24.2	779	23.6
Sixth or higher order	104734	26.1	1094	33.1
Education				
No education or primary incomplete	152938	38.2	2032	61.5
Primary level	219533	54.8	1199	36.3
Secondary level	12546	3.1	41	1.2
High school or higher level	15744	3.9	32	1.0

(Table A.4 continued)

	Exposure		Events	
	Non-pregnancy months	%	Fourth and higher order conceptions	%
Type of place of residence				
Urban	263387	65.9	1633	49.5
Rural	136187	34.1	1663	50.5
Region				
West	126445	31.6	542	16.4
South	49744	12.4	345	10.5
Central	95801	23.9	529	16.0
North	32487	8.1	209	6.3
East	96185	24.0	1676	50.8
Mother tongue				
Turkish	299117	74.6	1531	46.3
Kurdish	87640	21.9	1608	48.6
Other	14005	3.5	167	5.0
Parental education				
Mother and father uneducated	198173	49.4	2074	62.7
One educated other uneducated	127223	31.7	812	24.6
Mother and father educated	42384	10.6	146	4.4
Missing	32982	8.2	273	8.2
Marital status				
Separated	11729	2.9	3	0.1
First marriage	382128	95.4	3249	98.3
Later marriages	6842	1.7	52	1.6
Sector				
Agriculture	92632	23.1	870	26.3
Non-agriculture	34861	8.7	103	3.1
Non-employed	273269	68.2	2332	70.6
Public versus private				
Public	3447	0.9	12	0.4
Private	124046	31.0	960	29.1
Non-employed	273269	68.2	2332	70.6
Status				
Wage earner	37378	9.3	284	8.6
Non-wage earner	89935	22.4	687	20.8
Other	179	0.0	2	0.1
Missing	0	0.0	0	0.0
Non-employed	273269	68.2	2332	70.6

(Table A.4 continued)

	Exposure		Events	
	Non-pregnancy months	%	Fourth and higher order conceptions	%
Social security				
Uncovered	114595	28.6	948	28.7
Covered	12810	3.2	23	0.7
Missing	88	0.0	2	0.1
Non-employed	273269	68.2	2332	70.6
Total	400762	100.0	3305	100.0

Table A.5. Sample composition for the analysis of employment exit risks in Turkey, TDHS-2008

	Exposure		Events	
	Employment-months	%	Exiting employment	%
Duration since job start (Baseline)				
0-1 years	28776	8.2	367	21.8
1-2 years	23526	6.7	270	16.1
2-3 years	21152	6.0	190	11.3
3-4 years	19562	5.6	122	7.3
4-5 years	18658	5.3	95	5.7
5-7 years	35790	10.2	147	8.7
7-10 years	49126	14.0	147	8.7
10+ years	154010	43.9	342	20.4
Age at start of the job				
12-16	134964	38.5	295	17.5
17-21	97999	28.0	456	27.1
22-26	57073	16.3	371	22.1
27-49	60564	17.3	559	33.3
Calendar year				
1971-1988	40126	11.4	121	7.2
1989-1995	69700	19.9	193	11.5
1996-2002	112312	32.0	514	30.6
2003-2008	128462	36.6	851	50.7
Parity				
0	46429	13.2	441	26.2
1	82004	23.4	436	25.9
2	107656	30.7	424	25.3
3	56665	16.2	210	12.5
4+	57847	16.5	170	10.1

(Table A.5 continued)

	Exposure		Events	
	Employment-months	%	Exiting employment	%
Age of youngest child				
0 years	40863	11.7	132	7.9
1-2 years	35931	10.2	87	5.2
3-5 years	73709	21.0	260	15.4
6-8 years	47585	13.6	211	12.5
9+ years	88167	25.1	453	27.0
Pregnant	28151	8.0	249	14.8
No child	36195	10.3	288	17.1
Work experience after marriage				
0 years	325434	92.8	1440	85.7
1 year	5814	1.7	69	4.1
2-4 years	9443	2.7	94	5.6
5+ years	9908	2.8	78	4.6
Sector of job				
Agriculture	187445	53.5	313	18.6
Non-agriculture	163155	46.5	1367	81.4
Social security coverage of job				
Uncovered	252181	71.9	930	55.3
Covered	98188	28.0	748	44.5
Missing	231	0.1	2	0.1
Order of job				
First	262265	74.8	1066	63.5
Second	67747	19.3	385	22.9
Third	14166	4.0	149	8.9
Fourth and higher order	6422	1.8	80	4.8
Education				
No education or primary incomplete	63636	18.2	184	11.0
Primary level	197419	56.3	820	48.8
Secondary level	12491	3.6	136	8.1
High school or higher level	76851	21.9	534	31.8
In education	204	0.1	5	0.3
Type of place of residence				
Urban	189750	54.3	1403	84.2
Rural	159538	45.7	263	15.8

(Table A.5 continued)

	Exposure		Events	
	Employment-months	%	Exiting employment	%
Region				
West	147026	42.0	1020	60.8
South	37997	10.8	163	9.7
Central	83534	23.8	283	16.9
North	44277	12.6	94	5.6
East	37600	10.7	117	7.0
Mother tongue				
Turkish	309981	88.4	1540	91.7
Kurdish	31289	8.9	103	6.1
Other	9330	2.7	37	2.2
Parental education				
Mother and father uneducated	114549	32.7	402	23.9
Mother or father educated	117684	33.6	593	35.3
Mother and father educated	91996	26.2	589	35.1
Missing	26371	7.5	96	5.7
Marital status				
Separated	16070	4.6	126	7.5
First marriage	326826	93.2	1523	90.6
Later marriages	7703	2.2	32	1.9
Total	350600	100.0	1680	100.0

Table A.6. Sample composition for the analysis of employment entry risks in Turkey, TDHS-2008

	Exposure		Events	
	Non-employment months	%	Becoming employed	%
Duration since non-employment start (Baseline)				
0-1 years	73440	8.5	483	23.0
1-2 years	68654	7.9	239	11.4
2-3 years	64014	7.4	156	7.4
3-4 years	59568	6.9	138	6.6
4-5 years	55788	6.4	93	4.4
5-7 years	100808	11.6	170	8.1
7-10 years	126523	14.6	206	9.9
10+ years	319174	36.8	611	29.2
Age at start of non-employment				
12-16	215820	24.9	359	17.2
17-21	428879	49.4	936	44.7
22-26	148277	17.1	461	22.0
27-49	74993	8.6	339	16.2
Calendar year				
1959-1988	100599	11.6	210	10.0
1989-1995	179816	20.7	297	14.2
1996-2002	278210	32.1	637	30.4
2003-2008	309345	35.6	951	45.4
Parity				
0	120048	13.8	470	22.5
1	198782	22.9	585	27.9
2	257883	29.7	579	27.6
3	145201	16.7	283	13.5
4+	146054	16.8	178	8.5
Age of youngest child				
0 years	130457	15.0	190	9.1
1-2 years	109145	12.6	205	9.8
3-5 years	195813	22.6	421	20.1
6-8 years	102496	11.8	309	14.7
9+ years	154491	17.8	467	22.3
Pregnant	88304	10.2	101	4.8
No child	87263	10.1	401	19.2
Years of non-employment after marriage				
0 years	826661	95.2	1784	85.1
1 year	5958	0.7	26	1.2
2-4 years	14092	1.6	72	3.4
5+ years	21259	2.4	213	10.2

(Table A.6 continued)

	Exposure		Events	
	Non-employment months	%	Becoming employed	%
Order of non-employment episode				
First	788443	90.8	1583	75.6
Second	63331	7.3	347	16.6
Third	12046	1.4	105	5.0
Fourth and higher order	4149	0.5	60	2.9
Education				
No education or primary incomplete	205549	23.7	255	12.2
Primary level	481293	55.5	1117	53.3
Secondary level	62439	7.2	164	7.8
High school or higher level	117617	13.6	546	26.1
In education	1072	0.1	12	0.6
Type of place of residence				
Urban	691560	79.9	1707	82.0
Rural	174318	20.1	374	18.0
Region				
West	356013	41.0	1224	58.5
South	105201	12.1	214	10.2
Central	196200	22.6	363	17.4
North	45118	5.2	147	7.0
East	164870	19.0	144	6.9
Mother tongue				
Turkish	705527	81.3	1918	91.5
Kurdish	140048	16.1	130	6.2
Other	22395	2.6	47	2.3
Parental education				
Mother and father uneducated	328795	37.9	557	26.6
Mother or father educated	296853	34.2	697	33.3
Mother and father educated	188112	21.7	713	34.0
Missing	54209	6.2	129	6.1
Marital status				
Separated	23363	2.7	149	7.1
First marriage	831841	95.8	1910	91.2
Later marriages	12766	1.5	37	1.8
Total	867970	100.0	2095	100.0

APPENDIX B:

RESULTS OF EMPLOYMENT EXIT AND ENTRY MODELS USING COMPOSITE FERTILITY VARIABLE

Table B.1. Relative risks of job exits: composite model, 1971-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since job start (Baseline)							
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	0.94	0.96	0.96	0.97	0.95	0.95	0.95
2-3 years	0.75	0.80	0.80	0.82	0.81	0.81	0.81
3-4 years	0.53	0.58	0.58	0.60	0.60	0.61	0.61
4-5 years	0.44	0.49	0.49	0.51	0.51	0.52	0.51
5-7 years	0.36	0.42	0.42	0.44	0.44	0.44	0.45
7-10 years	0.27	0.34	0.35	0.36	0.36	0.36	0.36
10+ years	0.19	0.26	0.29	0.32	0.31	0.31	0.31
Age at start of the job							
12-16	0.73	0.66	1.45	1.31	1.37	1.38	1.38
17-21	0.99	0.93	1.15	1.10	1.11	1.10	1.10
22-26	*1*	*1*	*1*	*1*	*1*	*1*	*1*
27-49	0.92	1.08	1.02	1.01	0.96	0.96	0.95
Calendar year							
1971-1988	0.40	0.38	0.47	0.47	0.49	0.48	0.48
1989-1995	0.44	0.45	0.50	0.50	0.49	0.49	0.48
1996-2002	0.72	0.73	0.74	0.74	0.73	0.73	0.73
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Composite parity-age of child variable							
No child		2.62	1.88	1.95	1.76	1.79	1.76
No child pregnant		5.52	4.17	4.33	3.98	3.99	3.98
One child pregnant		3.29	2.65	2.67	2.44	2.44	2.43
One child 0 years old		1.92	1.47	1.53	1.42	1.43	1.42
One child 1-2 years old		1.25	0.91	0.94	0.86	0.87	0.86
One child 3-5 years old		1.85	1.26	1.27	1.15	1.15	1.14
One child 6-8 years old		2.20	1.48	1.49	1.36	1.37	1.34
One child 9+ years old		1.74	1.28	1.25	1.18	1.18	1.14
Two children pregnant		3.26	2.93	2.90	2.85	2.85	2.85

(Table B.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Two children 0 years old		1.59	1.30	1.30	1.24	1.24	1.23
Two children 1-2 years old		0.90	0.70	0.69	0.65	0.65	0.65
Two children 3-5 years old		1.17	0.89	0.87	0.79	0.79	0.79
Two children 6-8 years old		1.62	1.24	1.21	1.13	1.13	1.12
Two children 9+ years old		1.79	1.41	1.31	1.19	1.19	1.18
Three children pregnant		1.97	1.88	1.88	1.83	1.83	1.83
Three children 0 years old		0.80	0.72	0.70	0.69	0.69	0.69
Three children 1-2 years old		1.28	1.13	1.10	0.94	0.94	0.93
Three children 3-5 years old		1.68	1.43	1.38	1.33	1.32	1.32
Three children 6-8 years old		1.27	1.05	1.00	0.92	0.93	0.93
Three children 9+ years old		1.97	1.68	1.55	1.43	1.43	1.43
Four or above children pregnant		1.72	1.70	1.72	1.77	1.76	1.76
Four or above children 0 years old		*1*	*1*	*1*	*1*	*1*	*1*
Four or above children 1-2 years old		1.19	1.19	1.18	1.16	1.16	1.16
Four or above children 3-5 years old		1.37	1.31	1.29	1.23	1.22	1.21
Four or above children 6-8 years old		1.61	1.44	1.41	1.30	1.30	1.28
Four or above children 9+ years old		1.81	1.55	1.48	1.40	1.40	1.38
Work experience after marriage							
0 years			*1*	*1*	*1*	*1*	*1*
1 year			1.15	1.14	1.12	1.12	1.11
2-4 years			1.09	1.11	1.05	1.03	1.02
5+ years			0.80	0.81	0.83	0.83	0.84

(Table B.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Sector of job							
Agriculture			0.25	0.25	0.41	0.41	0.41
Non-agriculture			*1*	*1*	*1*	*1*	*1*
Social security coverage of job							
Covered			*1*	*1*	*1*	*1*	*1*
Uncovered			1.08	0.98	1.04	1.03	1.03
Missing			4.27	3.86	4.91	5.04	5.07
Order of job							
First			*1*	*1*	*1*	*1*	*1*
Second			0.95	0.93	0.95	0.96	0.96
Third			1.22	1.20	1.18	1.19	1.18
Fourth and higher order			1.15	1.16	1.14	1.16	1.16
Education							
No education or primary incomplete				1.16	1.14	1.12	1.11
Primary level				1.29	1.28	1.25	1.25
Secondary level				1.64	1.73	1.70	1.69
High school or higher level				*1*	*1*	*1*	*1*
In education				1.86	1.87	1.91	1.92
Type of place of residence							
Urban					*1*	*1*	*1*
Rural					0.52	0.51	0.51
Region							
West					*1*	*1*	*1*
South					0.89	0.89	0.89
Central					0.73	0.73	0.72
North					0.58	0.57	0.57
East					0.78	0.76	0.76
Mother tongue							
Turkish						*1*	*1*
Kurdish						1.05	1.05
Other						1.06	1.06

(Table B.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Parental education							
Mother and father uneducated						1.02	1.02
Mother or father educated						1.15	1.15
Mother and father educated						*1*	*1*
Missing						1.09	1.08
Marital status							
Separated							1.17
First marriage							*1*
Later marriages							0.89
Constant	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Number of jobs (weighted)	3942	3942	3942	3942	3920	3920	3920
Number of job exits	1680	1680	1680	1680	1666	1666	1666
Time at risk (months)	350600	350600	350600	350600	349288	349288	349288
Log likelihood	-4003	-3889	-3710	-3697	-3616	-3613	-3612
LR chi2	504	756	938	980	1023	1016	1016
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table B.2. Relative risks of job entries: composite model, 1973-2008, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since non-employment start (Baseline)							
0-1 years	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1-2 years	0.54	0.58	0.60	0.60	0.60	0.60	0.60
2-3 years	0.38	0.37	0.41	0.42	0.42	0.42	0.41
3-4 years	0.37	0.32	0.39	0.40	0.40	0.40	0.39
4-5 years	0.26	0.23	0.29	0.30	0.30	0.30	0.29
5-7 years	0.26	0.23	0.31	0.31	0.31	0.31	0.30
7-10 years	0.25	0.20	0.29	0.30	0.29	0.29	0.28
10+ years	0.28	0.21	0.35	0.35	0.33	0.33	0.32
Age at start of non-employment							
12-16	0.67	0.79	0.89	1.02	1.14	1.15	1.14
17-21	0.80	0.85	0.95	0.98	1.03	1.03	1.04
22-26	*1*	*1*	*1*	*1*	*1*	*1*	*1*
27-49	1.15	0.92	0.67	0.65	0.63	0.63	0.63
Calendar year							
1973-1988	0.59	0.65	0.71	0.78	0.72	0.72	0.73
1989-1995	0.54	0.58	0.63	0.66	0.62	0.62	0.62
1996-2002	0.76	0.79	0.83	0.84	0.82	0.82	0.82
2003-2008	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Composite parity-age of child variable							
No child		2.61	3.75	3.02	2.47	2.34	2.20
No child pregnant		1.03	1.54	1.23	1.05	0.99	0.97
One child pregnant		0.78	0.99	0.81	0.70	0.67	0.67
One child 0 years old		1.66	2.36	1.87	1.56	1.48	1.44
One child 1-2 years old		2.58	3.45	2.67	2.22	2.10	2.04
One child 3-5 years old		4.03	4.80	3.56	2.89	2.71	2.63
One child 6-8 years old		5.16	5.35	3.95	3.17	2.96	2.81
One child 9+ years old		5.70	5.08	3.76	3.00	2.83	2.49
Two children pregnant		0.40	0.44	0.39	0.35	0.34	0.34
Two children 0 years old		1.20	1.45	1.18	1.02	0.97	0.96
Two children 1-2 years old		2.15	2.47	1.99	1.65	1.57	1.56
Two children 3-5 years old		2.87	3.02	2.41	2.01	1.92	1.89

(Table B.2 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Two children 6-8 years old		4.89	4.59	3.67	3.02	2.87	2.82
Two children 9+ years old		4.02	3.49	2.90	2.33	2.23	2.16
Three children pregnant		0.40	0.42	0.40	0.39	0.38	0.38
Three children 0 years old		1.28	1.39	1.23	1.11	1.07	1.07
Three children 1-2 years old		2.51	2.64	2.32	2.07	2.00	1.99
Three children 3-5 years old		2.36	2.34	2.04	1.79	1.72	1.71
Three children 6-8 years old		3.89	3.63	3.13	2.74	2.63	2.61
Three children 9+ years old		3.55	3.05	2.71	2.24	2.14	2.06
Four or above children pregnant		1.53	1.50	1.57	1.64	1.67	1.68
Four or above children 0 years old		*1*	*1*	*1*	*1*	*1*	*1*
Four or above children 1-2 years old		1.36	1.36	1.36	1.32	1.32	1.32
Four or above children 3-5 years old		1.87	1.82	1.80	1.69	1.67	1.65
Four or above children 6-8 years old		2.40	2.28	2.25	2.05	2.01	1.97
Four or above children 9+ years old		1.97	1.77	1.73	1.50	1.43	1.32
Years of non-employment after marriage							
0 years			*1*	*1*	*1*	*1*	*1*
1 year			0.68	0.73	0.71	0.72	0.69
2-4 years			1.01	1.08	1.11	1.13	1.04
5+ years			1.74	2.03	2.08	2.09	1.98
Order of non-employment episode							
First			*1*	*1*	*1*	*1*	*1*
Second			1.90	1.74	1.59	1.56	1.54
Third			2.38	2.05	1.86	1.82	1.83
Fourth and higher order			3.72	3.36	2.91	2.86	2.77

(Table B.2 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education							
No education or primary incomplete				0.44	0.50	0.57	0.57
Primary level				0.63	0.61	0.65	0.65
Secondary level				0.61	0.61	0.63	0.63
High school or higher level				*1*	*1*	*1*	*1*
In education				1.54	1.52	1.48	1.50
Type of place of residence							
Urban					*1*	*1*	*1*
Rural					1.28	1.27	1.27
Region							
West					*1*	*1*	*1*
South					0.71	0.72	0.72
Central					0.60	0.60	0.59
North					1.03	1.03	1.01
East					0.37	0.42	0.42
Mother tongue							
Turkish						*1*	*1*
Kurdish						0.75	0.75
Other						1.08	1.08
Parental education							
Mother and father uneducated						0.84	0.84
Mother or father educated						0.88	0.88
Mother and father educated						*1*	*1*
Missing						1.00	1.01
Marital status							
Separated							1.94
First marriage							*1*
Later marriages							0.99
Constant	0.01	0.00	0.00	0.00	0.01	0.01	0.01

(Table B.2 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Number of non-employment spells (weighted)	7232	7232	7232	7232	7213	7213	7213
Number of job entries	2095	2095	2095	2095	2081	2081	2081
Time at risk (months)	867970	867970	867970	867970	865878	865878	865878
Log likelihood	-6652	-6448	-6356	-6299	-6158	-6150	-6126
LR chi2	491	671	890	978	1128	1143	1202
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

APPENDIX C:

P VALUES OF EVENT HISTORY ANALYSES

Table C.1. P-values of model of transition to first conception in Turkey, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Duration since first marriage (Baseline)						
0-1 years						
1-2 years	0.000	0.000	0.000	0.000	0.000	0.000
2-3 years	0.000	0.000	0.000	0.000	0.000	0.000
3-4 years	0.000	0.000	0.000	0.000	0.000	0.000
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000
Age at first marriage						
12-16	0.000	0.000	0.000	0.000	0.000	0.000
17-21						
22-26	0.017	0.069	0.192	0.236	0.213	0.247
27-31	0.000	0.000	0.001	0.002	0.001	0.001
32-46	0.000	0.000	0.001	0.001	0.001	0.001
Calendar year						
1972-1980	0.037	0.014	0.011	0.008	0.019	0.017
1981-1987	0.002	0.001	0.002	0.002	0.004	0.014
1988-1994	0.000	0.000	0.000	0.000	0.000	0.001
1995-2001	0.000	0.000	0.000	0.000	0.000	0.000
2002-2008						
Employment before marriage (time fixed)						
Non-employed		0.966	0.966	0.721	0.851	0.923
Employed						
Employment Status (time varying)						
Non-employed		0.000	0.000	0.002	0.004	0.005
Employed						
Education						
No education or primary incomplete			0.315	0.477	0.188	0.139
Primary level			0.000	0.000	0.003	0.005
Secondary level			0.156	0.099	0.187	0.191
High school or higher level						
In education			0.144	0.141	0.141	0.144
Type of place of residence						
Urban						
Rural				0.051	0.053	0.072

(Table C.1 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Region						
West						
South				0.237	0.456	0.378
Central				0.001	0.001	0.001
North				0.545	0.811	0.699
East				0.015	0.087	0.063
Mother tongue						
Turkish						
Kurdish					0.963	0.899
Other					0.276	0.314
Parental education						
Mother and father uneducated					0.072	0.089
One educated other uneducated					0.001	0.001
Mother and father educated						
Missing					0.716	0.694
Marital status						
Separated						0.000
First marriage						
Later marriages						0.094

Table C.2. P-values of variables of job characteristics in separate expanded models of transition to first conception in Turkey, TDHS-2008

Sector	
Agriculture	0.000
Non-agriculture	
Non-employed	0.000
Public versus private	
Public	0.849
Private	
Non-employed	0.008
Status	
Wage earner	
Non-wage earner	0.000
Other	0.998
Non-employed	0.000
Social security	
Uncovered	0.000
Covered	
Missing	0.921
Non-employed	0.000

Table C.3. P-values of model of transition to second conception in Turkey, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Duration since first birth (Baseline)						
0-1 years						
1-2 years	0.000	0.000	0.000	0.000	0.000	0.000
2-3 years	0.000	0.000	0.000	0.000	0.000	0.000
3-4 years	0.000	0.000	0.000	0.000	0.000	0.000
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.041	0.029	0.000	0.000	0.000	0.000
7-10 years	0.269	0.324	0.553	0.095	0.079	0.008
10+ years	0.000	0.000	0.000	0.000	0.000	0.000
Age at first birth						
12-16	0.000	0.000	0.209	0.649	0.948	0.768
17-21						
22-26	0.000	0.000	0.015	0.074	0.081	0.052
27-31	0.000	0.000	0.000	0.000	0.000	0.000
32-44	0.000	0.000	0.000	0.000	0.000	0.000
Calendar year						
1973-1981	0.000	0.000	0.000	0.000	0.000	0.000
1982-1988	0.000	0.000	0.000	0.000	0.000	0.000
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.000	0.000	0.000	0.000	0.000
2003-2008						
Employment before marriage (time fixed)						
Non-employed		0.008	0.226	0.907	0.960	0.638
Employed						
Employment Status (time varying)						
Non-employed		0.281	0.231	0.005	0.009	0.015
Employed						
Education						
No education or primary incomplete			0.000	0.000	0.000	0.000
Primary level			0.000	0.000	0.000	0.000
Secondary level			0.000	0.001	0.004	0.003
High school or higher level						
In education			0.881	0.989	0.917	0.880
Type of place of residence						
Urban						
Rural				0.000	0.000	0.000

(Table C.3 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Region						
West						
South				0.000	0.000	0.000
Central				0.000	0.000	0.000
North				0.000	0.000	0.000
East				0.000	0.000	0.000
Mother tongue						
Turkish						
Kurdish					0.002	0.003
Other					0.005	0.008
Parental education						
Mother and father uneducated					0.000	0.000
One educated other uneducated					0.001	0.001
Mother and father educated						
Missing					0.003	0.008
Marital status						
Separated						0.000
First marriage						
Later marriages						0.014

Table C.4. P-values of variables of job characteristics in separate expanded models of transition to second conception in Turkey, TDHS-2008

Sector	
Agriculture	0.119
Non-agriculture	
Non-employed	0.006
Public versus private	
Public	0.084
Private	
Non-employed	0.006
Status	
Wage earner	
Non-wage earner	0.398
Other	0.483
Non-employed	0.020
Social security	
Uncovered	0.175
Covered	
Missing	0.000
Non-employed	0.014

Table C.5. P-values of model of transition to third conception in Turkey, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Duration since second birth (Baseline)						
0-1 years						
1-2 years	0.000	0.000	0.000	0.000	0.000	0.000
2-3 years	0.003	0.003	0.000	0.000	0.000	0.000
3-4 years	0.304	0.305	0.015	0.000	0.000	0.000
4-5 years	0.286	0.284	0.011	0.000	0.000	0.000
5-7 years	0.015	0.015	0.456	0.251	0.125	0.079
7-10 years	0.000	0.000	0.000	0.024	0.060	0.106
10+ years	0.000	0.000	0.000	0.000	0.000	0.000
Age at second birth						
13-19	0.000	0.000	0.000	0.001	0.005	0.002
20-24						
25-29	0.000	0.000	0.000	0.000	0.000	0.000
30-34	0.000	0.000	0.000	0.000	0.000	0.000
35-41	0.000	0.000	0.001	0.004	0.004	0.006
Calendar year						
1973-1981	0.000	0.000	0.000	0.000	0.000	0.000
1982-1988	0.000	0.000	0.000	0.000	0.000	0.000
1989-1995	0.000	0.000	0.001	0.000	0.000	0.000
1996-2002	0.001	0.001	0.002	0.000	0.000	0.001
2003-2008						
Employment before marriage (time fixed)						
Non-employed		0.420	0.496	0.895	0.951	0.832
Employed						
Employment Status (time varying)						
Non-employed		0.547	0.558	0.051	0.081	0.101
Employed						
Education						
No education or primary incomplete			0.000	0.000	0.000	0.000
Primary level			0.000	0.000	0.000	0.000
Secondary level			0.206	0.277	0.356	0.401
High school or higher level						
In education			0.000	0.000	0.000	0.000
Type of place of residence						
Urban						
Rural				0.000	0.000	0.000

(Table C.5 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Region						
West						
South				0.000	0.000	0.000
Central				0.000	0.000	0.000
North				0.000	0.000	0.000
East				0.000	0.000	0.000
Mother tongue						
Turkish						
Kurdish					0.000	0.000
Other					0.001	0.001
Parental education						
Mother and father uneducated					0.000	0.000
One educated other uneducated					0.002	0.002
Mother and father educated						
Missing					0.006	0.004
Marital status						
Separated						0.000
First marriage						
Later marriages						0.607

Table C.6. P-values of variables of job characteristics in separate expanded models of transition to third conception in Turkey, TDHS-2008

Sector	
Agriculture	0.022
Non-agriculture	
Non-employed	0.009
Public versus private	
Public	0.044
Private	
Non-employed	0.256
Status	
Wage earner	
Non-wage earner	0.012
Other	0.157
Non-employed	0.004
Social security	
Uncovered	0.058
Covered	
Missing	0.000
Non-employed	0.021

Table C.7. P-values of model of transition to fourth and higher order conceptions in Turkey, TDHS-2008

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since previous birth (Baseline)							
0-1 years							
1-2 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-3 years	0.040	0.043	0.129	0.404	0.474	0.258	0.184
3-4 years	0.000	0.000	0.000	0.000	0.145	0.347	0.496
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age at previous birth							
14-19	0.000	0.000	0.000	0.000	0.012	0.039	0.037
20-24							
25-29	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30-34	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35-46	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calendar year							
1973-1981	0.351	0.342	0.237	0.349	0.105	0.073	0.070
1982-1988	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2003-2008							
Employment before marriage (time fixed)							
Non-employed		0.121	0.497	0.983	0.367	0.454	0.423
Employed							
Employment Status (time varying)							
Non-employed		0.885	0.452	0.688	0.003	0.010	0.013
Employed							
Order of conception							
Fourth							
Fifth			0.000	0.368	0.709	0.808	0.968
Sixth or higher order			0.000	0.000	0.000	0.005	0.002
Education							
No education or primary incomplete				0.000	0.000	0.000	0.000
Primary level				0.000	0.002	0.013	0.013
Secondary level				0.132	0.325	0.368	0.354
High school or higher level							
Type of place of residence							
Urban							
Rural					0.000	0.000	0.000

(Table C.7 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Region							
West							
South					0.040	0.174	0.127
Central					0.918	0.292	0.255
North					0.549	0.167	0.213
East					0.000	0.000	0.000
Mother tongue							
Turkish							
Kurdish						0.000	0.000
Other						0.000	0.000
Parental education							
Mother and father uneducated						0.001	0.000
One educated other uneducated						0.025	0.023
Mother and father educated							
Missing						0.048	0.044
Marital status							
Separated							0.000
First marriage							
Later marriages							0.009

Table C.8. P-values of variables of job characteristics in separate expanded models of transition to fourth and higher order conceptions in Turkey, TDHS-2008

Sector	
Agriculture	0.012
Non-agriculture	
Non-employed	0.001
Public versus private	
Public	0.189
Private	
Non-employed	0.018
Status	
Wage earner	
Non-wage earner	0.066
Other	0.068
Non-employed	0.536
Social security	
Uncovered	0.070
Covered	
Missing	0.000
Non-employed	0.026

Table C.9. P-values of model of transition from employment to non-employment in Turkey, TDHS-2008: parity model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since job start (Baseline)							
0-1 years							
1-2 years	0.568	0.777	0.883	0.964	0.780	0.781	0.782
2-3 years	0.025	0.091	0.119	0.162	0.132	0.133	0.134
3-4 years	0.000	0.000	0.000	0.001	0.001	0.001	0.001
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age at start of the job							
12-16	0.007	0.001	0.002	0.021	0.012	0.011	0.011
17-21	0.952	0.723	0.066	0.150	0.140	0.170	0.171
22-26							
27-49	0.394	0.169	0.402	0.592	0.950	0.979	0.946
Calendar year							
1971-1988	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2003-2008							
Parity							
0		0.000	0.000	0.000	0.000	0.000	0.000
1							
2		0.041	0.204	0.086	0.096	0.086	0.095
3		0.140	0.914	0.555	0.611	0.596	0.647
4+		0.045	0.836	0.691	0.883	0.846	0.878
Work experience after marriage							
0 years							
1 year			0.462	0.497	0.596	0.608	0.621
2-4 years			0.662	0.631	0.856	0.953	0.984
5+ years			0.323	0.313	0.429	0.400	0.425
Sector of job							
Agriculture			0.000	0.000	0.000	0.000	0.000
Non-agriculture							
Social security coverage of job							
Covered							
Uncovered			0.208	0.963	0.586	0.637	0.620
Missing			0.000	0.000	0.000	0.000	0.000

(Table C.9 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Order of job							
First							
Second			0.525	0.366	0.586	0.674	0.693
Third			0.184	0.201	0.243	0.237	0.242
Fourth and higher order			0.690	0.599	0.672	0.611	0.621
Education							
No educ. or primary incomplete				0.214	0.279	0.377	0.397
Primary level				0.004	0.007	0.019	0.019
Secondary level				0.000	0.000	0.000	0.000
High school or higher level							
In education				0.396	0.420	0.393	0.394
Type of place of residence							
Urban							
Rural					0.000	0.000	0.000
Region							
West							
South					0.261	0.235	0.228
Central					0.001	0.001	0.001
North					0.000	0.000	0.000
East					0.036	0.044	0.045
Mother tongue							
Turkish							
Kurdish						0.844	0.849
Other						0.734	0.757
Parental education							
Mother and father uneducated						0.746	0.732
Mother or father educated						0.068	0.067
Mother and father educated							
Missing						0.459	0.478
Marital status							
Separated							0.465
First marriage							
Later marriages							0.514

Table C.10. P-values of model of transition from employment to non-employment in Turkey, TDHS-2008: age of youngest child model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since job start (Baseline)							
0-1 years							
1-2 years	0.568	0.647	0.694	0.773	0.603	0.603	0.604
2-3 years	0.025	0.056	0.066	0.092	0.078	0.079	0.080
3-4 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age at start of the job							
12-16	0.007	0.001	0.002	0.016	0.009	0.008	0.008
17-21	0.952	0.629	0.084	0.169	0.154	0.181	0.185
22-26							
27-49	0.394	0.787	0.855	0.742	0.490	0.478	0.438
Calendar year							
1971-1988	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2003-2008							
Age of youngest child							
0 years							
1-2 years		0.100	0.063	0.055	0.040	0.040	0.039
3-5 years		0.974	0.566	0.462	0.340	0.336	0.324
6-8 years		0.361	0.768	0.927	0.927	0.925	0.878
9+ years		0.115	0.252	0.479	0.629	0.644	0.708
Pregnant		0.000	0.000	0.000	0.000	0.000	0.000
No child		0.000	0.011	0.008	0.019	0.016	0.019
Work experience after marriage							
0 years							
1 year			0.478	0.524	0.585	0.601	0.624
2-4 years			0.761	0.711	0.911	0.988	0.941
5+ years			0.165	0.179	0.291	0.276	0.300
Sector of job							
Agriculture			0.000	0.000	0.000	0.000	0.000
Non-agriculture							
Social security coverage of job							
Covered							
Uncovered			0.515	0.715	0.795	0.832	0.800
Missing			0.000	0.000	0.000	0.000	0.000

(Table C.10 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Order of job							
First							
Second			0.494	0.346	0.539	0.616	0.641
Third			0.102	0.127	0.182	0.177	0.183
Fourth and higher order			0.509	0.471	0.558	0.505	0.523
Education							
No educ. or primary incomplete				0.427	0.436	0.518	0.541
Primary level				0.023	0.033	0.063	0.062
Secondary level				0.001	0.000	0.000	0.000
High school or higher level							
In education				0.301	0.302	0.284	0.281
Type of place of residence							
Urban							
Rural					0.000	0.000	0.000
Region							
West							
South					0.198	0.179	0.173
Central					0.001	0.001	0.001
North					0.000	0.000	0.000
East					0.017	0.025	0.026
Mother tongue							
Turkish							
Kurdish						0.862	0.864
Other						0.658	0.687
Parental education							
Mother and father uneducated						0.908	0.874
Mother or father educated						0.125	0.121
Mother and father educated							
Missing						0.541	0.568
Marital status							
Separated							0.266
First marriage							
Later marriages							0.503

Table C.11. P-values of model of transition from employment to non-employment in Turkey, TDHS-2008: composite model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since job start (Baseline)							
0-1 years							
1-2 years	0.568	0.694	0.735	0.820	0.647	0.648	0.648
2-3 years	0.025	0.083	0.076	0.110	0.089	0.092	0.093
3-4 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age at start of the job							
12-16	0.007	0.000	0.005	0.042	0.022	0.021	0.021
17-21	0.952	0.465	0.150	0.305	0.263	0.306	0.309
22-26							
27-49	0.394	0.480	0.876	0.947	0.738	0.725	0.662
Calendar year							
1971-1988	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2003-2008							
Composite parity-age of child variable							
No child		0.012	0.104	0.085	0.146	0.136	0.147
No child pregnant		0.000	0.000	0.000	0.000	0.000	0.000
One child pregnant		0.004	0.019	0.018	0.033	0.033	0.033
One child 0 years old		0.113	0.346	0.303	0.396	0.392	0.397
One child 1-2 years old		0.609	0.837	0.880	0.739	0.744	0.737
One child 3-5 years old		0.119	0.558	0.553	0.733	0.724	0.742
One child 6-8 years old		0.052	0.336	0.328	0.450	0.446	0.477
One child 9+ years old		0.167	0.544	0.578	0.681	0.679	0.745
Two children pregnant		0.010	0.018	0.019	0.022	0.022	0.022
Two children 0 years old		0.278	0.544	0.539	0.625	0.623	0.627

(Table C.11 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Two children 1-2 years old		0.805	0.431	0.415	0.341	0.339	0.336
Two children 3-5 years old		0.701	0.772	0.738	0.572	0.569	0.566
Two children 6-8 years old		0.235	0.596	0.644	0.762	0.768	0.780
Two children 9+ years old		0.140	0.388	0.498	0.659	0.662	0.684
Three children pregnant		0.178	0.209	0.208	0.228	0.229	0.228
Three children 0 years old		0.669	0.528	0.504	0.483	0.480	0.478
Three children 1-2 years old		0.650	0.822	0.858	0.917	0.911	0.904
Three children 3-5 years old		0.219	0.398	0.442	0.502	0.509	0.516
Three children 6-8 years old		0.594	0.910	0.994	0.852	0.865	0.864
Three children 9+ years old		0.087	0.191	0.271	0.372	0.373	0.378
Four or above children pregnant		0.386	0.408	0.394	0.375	0.380	0.379
Four or above children 0 years old							
Four or above children 1-2 years old		0.731	0.728	0.742	0.766	0.764	0.768

(Table C.11 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Four or above children 3-5 years old		0.459	0.531	0.551	0.637	0.646	0.656
Four or above children 6-8 years old		0.267	0.400	0.426	0.545	0.548	0.571
Four or above children 9+ years old		0.145	0.284	0.333	0.406	0.415	0.428
Work experience after marriage							
0 years							
1 year			0.418	0.445	0.503	0.517	0.538
2-4 years			0.598	0.553	0.774	0.864	0.910
5+ years			0.219	0.236	0.337	0.321	0.343
Sector of job							
Agriculture			0.000	0.000	0.000	0.000	0.000
Non-agriculture							
Social security coverage of job							
Covered							
Uncovered			0.368	0.853	0.707	0.748	0.726
Missing			0.000	0.000	0.000	0.000	0.000
Order of job							
First							
Second			0.520	0.363	0.581	0.656	0.679
Third			0.138	0.170	0.221	0.218	0.224
Fourth and higher order			0.563	0.529	0.584	0.535	0.551
Education							
No education or primary incomplete				0.341	0.410	0.495	0.533
Primary level				0.010	0.016	0.033	0.034
Secondary level				0.001	0.000	0.000	0.000
High school or higher level							
In education				0.282	0.280	0.262	0.260

(Table C.11 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Type of place of residence							
Urban							
Rural					0.000	0.000	0.000
Region							
West							
South					0.208	0.193	0.187
Central					0.001	0.001	0.000
North					0.000	0.000	0.000
East					0.026	0.032	0.033
Mother tongue							
Turkish							
Kurdish						0.777	0.774
Other						0.725	0.748
Parental education							
Mother and father uneducated						0.867	0.838
Mother or father educated						0.111	0.110
Mother and father educated							
Missing						0.567	0.599
Marital status							
Separated							0.265
First marriage							
Later marriages							0.581

Table C.12. P-values of model of transition from non-employment to employment in Turkey, TDHS-2008: parity model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since non-employment start (Baseline)							
0-1 years							
1-2 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-3 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3-4 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age at start of non-employment							
12-16	0.000	0.001	0.096	0.915	0.297	0.249	0.293
17-21	0.002	0.004	0.338	0.622	0.913	0.914	0.806
22-26							
27-49	0.214	0.023	0.027	0.013	0.005	0.005	0.003
Calendar year							
1959-1988	0.000	0.000	0.000	0.003	0.000	0.000	0.001
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.000	0.004	0.008	0.003	0.003	0.005
2003-2008							
Parity							
0		0.050	0.780	0.804	0.820	0.801	0.969
1							
2		0.056	0.000	0.003	0.006	0.009	0.025
3		0.003	0.000	0.001	0.008	0.013	0.036
4+		0.000	0.000	0.000	0.000	0.000	0.000
Years of non-employment after marriage							
0 years							
1 year			0.289	0.427	0.388	0.403	0.352
2-4 years			0.522	0.341	0.299	0.254	0.510
5+ years			0.000	0.000	0.000	0.000	0.000
Order of non-employment episode							
First							
Second			0.000	0.000	0.000	0.000	0.000
Third			0.000	0.000	0.000	0.001	0.001
Fourth and higher order			0.000	0.000	0.000	0.000	0.000

(Table C.12 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education							
No education or primary incomplete				0.000	0.000	0.000	0.000
Primary level				0.000	0.000	0.000	0.000
Secondary level				0.000	0.000	0.000	0.000
High school or higher level							
In education				0.238	0.255	0.284	0.270
Type of place of residence							
Urban							
Rural					0.000	0.001	0.001
Region							
West							
South					0.000	0.000	0.000
Central					0.000	0.000	0.000
North					0.915	0.875	0.972
East					0.000	0.000	0.000
Mother tongue							
Turkish							
Kurdish						0.020	0.021
Other						0.806	0.802
Parental education							
Mother and father uneducated						0.022	0.027
Mother or father educated						0.088	0.078
Mother and father educated							
Missing						0.918	0.970
Marital status							
Separated							0.000
First marriage							
Later marriages							0.755

Table C.13. P-values of model of transition from non-employment to employment in Turkey, TDHS-2008: age of youngest child model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since non-employment start (Baseline)							
0-1 years							
1-2 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-3 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3-4 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age at start of non-employment							
12-16	0.000	0.001	0.053	0.986	0.235	0.202	0.226
17-21	0.002	0.017	0.482	0.861	0.673	0.692	0.578
22-26							
27-49	0.214	0.039	0.000	0.000	0.000	0.000	0.000
Calendar year							
1959-1988	0.000	0.000	0.001	0.021	0.002	0.003	0.004
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.001	0.007	0.017	0.006	0.006	0.007
2003-2008							
Age of youngest child							
0 years							
1-2 years		0.000	0.001	0.001	0.002	0.002	0.003
3-5 years		0.000	0.000	0.000	0.000	0.000	0.000
6-8 years		0.000	0.000	0.000	0.000	0.000	0.000
9+ years		0.000	0.000	0.000	0.000	0.000	0.000
Pregnant		0.004	0.008	0.009	0.012	0.012	0.011
No child		0.000	0.000	0.000	0.000	0.000	0.000
Years of non-employment after marriage							
0 years							
1 year			0.158	0.244	0.241	0.264	0.221
2-4 years			0.834	0.870	0.763	0.681	0.997
5+ years			0.021	0.000	0.000	0.000	0.000
Order of non-employment episode							
First							
Second			0.000	0.000	0.000	0.000	0.001
Third			0.000	0.000	0.000	0.001	0.001
Fourth and higher order			0.000	0.000	0.000	0.000	0.000

(Table C.13 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education							
No education or primary incomplete				0.000	0.000	0.000	0.000
Primary level				0.000	0.000	0.000	0.000
Secondary level				0.000	0.000	0.000	0.000
High school or higher level							
In education				0.355	0.366	0.399	0.375
Type of place of residence							
Urban							
Rural					0.000	0.001	0.001
Region							
West							
South					0.000	0.000	0.000
Central					0.000	0.000	0.000
North					0.969	0.887	0.969
East					0.000	0.000	0.000
Mother tongue							
Turkish							
Kurdish						0.033	0.031
Other						0.712	0.732
Parental education							
Mother and father uneducated						0.011	0.015
Mother or father educated						0.081	0.075
Mother and father educated							
Missing						0.812	0.854
Marital status							
Separated							0.000
First marriage							
Later marriages							0.950

Table C.14. P-values of model of transition from non-employment to employment in Turkey, TDHS-2008: composite model

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Duration since non-employment start (Baseline)							
0-1 years							
1-2 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-3 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3-4 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-5 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-7 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-10 years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10+ years	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age at start of non-employment							
12-16	0.000	0.012	0.249	0.826	0.195	0.166	0.198
17-21	0.002	0.024	0.512	0.799	0.756	0.758	0.660
22-26							
27-49	0.214	0.472	0.001	0.000	0.000	0.000	0.000
Calendar year							
1959-1988	0.000	0.000	0.001	0.014	0.002	0.002	0.003
1989-1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996-2002	0.000	0.001	0.007	0.013	0.005	0.005	0.005
2003-2008							
Composite parity-age of child variable							
No child		0.004	0.000	0.001	0.007	0.012	0.019
No child pregnant		0.926	0.226	0.560	0.896	0.988	0.924
One child pregnant		0.567	0.980	0.630	0.415	0.355	0.344
One child 0 years old		0.152	0.015	0.077	0.211	0.273	0.303
One child 1-2 years old		0.008	0.001	0.007	0.028	0.041	0.049
One child 3-5 years old		0.000	0.000	0.000	0.002	0.004	0.005
One child 6-8 years old		0.000	0.000	0.000	0.001	0.003	0.004
One child 9+ years old		0.000	0.000	0.000	0.003	0.005	0.012
Two children pregnant		0.084	0.125	0.078	0.051	0.045	0.044
Two children 0 years old		0.626	0.325	0.656	0.965	0.936	0.918

(Table C.14 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Two children 1-2 years old		0.040	0.014	0.063	0.182	0.228	0.236
Two children 3-5 years old		0.002	0.001	0.010	0.040	0.056	0.061
Two children 6-8 years old		0.000	0.000	0.000	0.001	0.002	0.003
Two children 9+ years old		0.000	0.000	0.002	0.013	0.019	0.025
Three children pregnant		0.322	0.355	0.323	0.305	0.295	0.296
Three children 0 years old		0.553	0.423	0.621	0.807	0.871	0.874
Three children 1-2 years old		0.025	0.017	0.040	0.075	0.091	0.094
Three children 3-5 years old		0.019	0.020	0.051	0.112	0.139	0.146
Three children 6-8 years old		0.000	0.000	0.002	0.006	0.008	0.009
Three children 9+ years old		0.000	0.001	0.004	0.023	0.033	0.043
Four or above children pregnant		0.486	0.505	0.464	0.418	0.400	0.397
Four or above children 0 years old							
Four or above children 1-2 years old		0.476	0.477	0.476	0.518	0.521	0.525

(Table C.14 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Four or above children 3-5 years old		0.094	0.111	0.115	0.162	0.172	0.179
Four or above children 6-8 years old		0.021	0.030	0.033	0.060	0.067	0.076
Four or above children 9+ years old		0.067	0.123	0.137	0.275	0.330	0.462
Years of non-employment after marriage							
0 years							
1 year			0.177	0.272	0.265	0.279	0.230
2-4 years			0.946	0.700	0.605	0.536	0.867
5+ years			0.001	0.000	0.000	0.000	0.000
Order of non-employment episode							
First							
Second			0.000	0.000	0.000	0.000	0.000
Third			0.000	0.000	0.001	0.001	0.001
Fourth and higher order			0.000	0.000	0.000	0.000	0.000
Education							
No education or primary incomplete				0.000	0.000	0.000	0.000
Primary level				0.000	0.000	0.000	0.000
Secondary level				0.000	0.000	0.000	0.000
High school or higher level							
In education				0.285	0.306	0.338	0.316
Type of place of residence							
Urban							
Rural					0.001	0.001	0.001

(Table C.14 continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Region							
West							
South					0.000	0.000	0.000
Central					0.000	0.000	0.000
North					0.781	0.735	0.886
East					0.000	0.000	0.000
Mother tongue							
Turkish							
Kurdish						0.043	0.042
Other						0.673	0.658
Parental education							
Mother and father uneducated						0.036	0.040
Mother or father educated						0.121	0.103
Mother and father educated							
Missing						0.992	0.960
Marital status							
Separated							0.000
First marriage							
Later marriages							0.954

APPENDIX D:

THESIS/DISSERTATION ORIGINALITY REPORT

HACETTEPE UNIVERSITY
INSTITUTE OF POPULATION STUDIES
THESIS/DISSERTATION ORIGINALITY REPORT

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INSTITUTE OF POPULATION STUDIES
TO THE DEPARTMENT OF DEMOGRAPHY

Date: 21/12/2015

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