Birth and employment transitions of women in Turkey: The emergence of role incompatibility

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Contents

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Abstract

BACKGROUND
The available evidence on the relationship between fertility and employment among women in developing countries paints an ambiguous picture. In Turkey there have been considerable structural changes since the 1960s, related to the incompatibility between women's roles as mother and worker.

OBJECTIVE
This study analyzes the two-way relationship between employment and fertility in Turkey over a 35-year period, including the correlates of the risks of first, second, third, and fourth and higher-order conceptions, and of the transitions from non-employment to employment and from employment to non-employment.

METHODS
The study adopts piecewise constant exponential event history modeling using data from the 2008 Turkey Demographic and Health Survey, mainly its event history data on ever-married women.

RESULTS
There is a two-way negative association between fertility and employment among women in Turkey. The characteristics of jobs that favor compatibility between worker and mother roles increase the risk of conception. Exiting employment is temporarily increased by fertility, due either to pregnancy or having an infant. Fertility in all its dimensions decreases the risk of entry into employment.

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CONCLUSIONS
Contextual changes related to the incompatibility of the roles of mother and worker have transformed the fertility–employment relationship in Turkey from being insignificant to being strongly negative, in line with the role incompatibility hypothesis.

CONTRIBUTION
This is the first study to use event history analysis to analyze the relationship between women's fertility and employment in a developing country. As regards Turkey, it is the first to follow a decadal approach to the issue, and has important policy implications for the country.

1. Introduction

The relationship between women's fertility and employment is a topic that requires further clarification, especially in developing countries where fertility is still in transition. The extensive literature on this relationship deals mostly with the experience of developed countries, focusing on the causes of fertility decline from the demographic transition perspective. In the developed world there is an apparent shift from a negative relationship to a less negative relationship (Ahn and Mira 2002; Engelhardt, Kögel, and Prskawetz 2004; Matysiak and Vignoli 2008), and even to a positive relationship at the macro level (Kögel 2004). The decreasing incompatibility of worker and mother roles resulting from changes in societal response and in the institutional context goes some way to explaining this shift (Brewster and Rindfuss 2000; Engelhardt, Kögel, and Prskawetz 2004). Macro evidence from developing countries, on the other hand, paints a more ambiguous picture, and one reason for this is the ongoing demographic transition in these countries (Hossain and Tisdell 2005). Micro-level studies, due to their less descriptive and more instrumental character, are better able to explain the complex mechanisms that underlie women's childbearing and employment decisions (Matysiak 2011b). At the micro level the relationship is generally negative; however, no clear pattern can be observed either in developed or in developing countries, mostly due to lack of comparability of the context, definitions, and methodology of the studies.

This study analyzes the possible existence of a two-way relationship between women's employment and fertility in Turkey using an event history analysis based on micro-level data from the 2008 Turkey Demographic and Health Survey, and this use of retrospective data ensures that the time dimension is taken into account. To the best of the authors' knowledge, this is the first time that event history analysis has been used to study this relationship in the context of a developing country. In addition to contributing to the field of micro-level studies on developing countries, there are two

main reasons for focusing on Turkey, the first of which is policy-oriented. The fertility rate has been declining in Turkey since the 1950s and has reached replacement level (2.10 in 2016 according to Turkish Statistical Institute (TURKSTAT 2016)). When the fertility rate stabilized around the replacement level, this drew attention to the risk that it might fall below replacement level in the near future, and policymakers became alarmed. Meanwhile, employment among women has always remained at low levels. The government has begun to encourage both fertility and employment among women, although public discourse seems to favor the former over the latter and effective reconciliation mechanisms have only recently been developed. Investigating the relationship between women's fertility and employment will elucidate the effect of prioritizing pronatalist over pro-employment policies on the employment status of women in Turkey.

The second reason for focusing on Turkey is the lack of research on women's work and maternity, despite the considerable structural changes in these life events that have taken place since the 1960s, which both resulted in and were a result of the demographic transformation. The sectoral shift in female employment from agriculture to the service sector is one such change, although structural changes have not been accompanied by cultural or institutional changes. The low institutionalization of childcare, the dominance of women's role as carer in the patriarchal family model, and the social norm that prioritizes motherhood over employment are all characteristics of the country's history that continue today, leading women to work in unpaid or non-wage jobs that offer no social security benefits or not to work at all. Accordingly, there is an apparent need to re-study the work–fertility relationship in Turkey within this new context using a methodology that makes a thorough analysis of women's entire work and fertility histories. Addressing this need, this study aims to contribute to the literature with an analysis of how employment in Turkey has been related to fertility, and vice versa, over a period of more than 35 years, taking into account both the timing and order of events.

This study analyzes the association of women's employment status with first, second, third, and fourth and higher-order conceptions, and studies separately the association of the various dimensions of fertility with entering and exiting employment. The association between job characteristics and progression to conception is also analyzed, in order to examine the effect of the organization of work on fertility outcomes. Finally, our study looks at the interaction effects of these variables and calendar periods to cast light on how contextual changes related to the incompatibility of women's roles as workers and mothers have affected the relationship between fertility and employment in Turkey.

2. Theoretical and empirical considerations

2.1 Theoretical framework

The two main theoretical frameworks that explain the relationship between fertility and female employment in sociodemographic literature are the (maternal) role incompatibility hypothesis and the societal response hypothesis (Narayan and Smyth 2006). The societal response hypothesis applies to industrialized countries and tries to find an explanation for the negative to positive change in the relationship between fertility and female employment after the 1980s (Brewster and Rindfuss 2000; Engelhardt, Kögel, and Prskawetz 2004). In the Turkish context, the role incompatibility hypothesis is the appropriate approach to studying the relationship between women's fertility and employment. This has already been verified in Stycos and Weller's (1967) study of Turkey, using data from a survey carried out in 1963.

The 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 and Palan 1981: 551). The roles of mother and worker are most incompatible when the job is outside the home, and in locations where people believe that mothers or close relatives should care for children (Dixon-Mueller 1994). On the other hand, when roles are compatible, no relationship is expected between fertility and women's employment.

In most specifications of this hypothesis there are two mechanisms determining the level of conflict between the two roles: (1) the organization of production (nature of the task), and (2) the (social) organization of childcare (Mason and Palan 1981; Stycos and Weller 1967). The former mechanism relies heavily on the level of industrialization in a society. In rural undeveloped countries, women are likely to work in places close to their children and may have a more flexible schedule than women living in industrialized societies. In industrial societies on the other hand, women tend to work in places that are distant from their children, such as factories, offices, or stores, and are more likely to have a relatively inflexible schedule (Mason and Palan 1981). Weller (1977) also notes this separation of the home and gainful employment and the relatively inflexible hours of employment in industrialized settings, and writes about the incompatibility of the roles of mother and worker. Lehrer and Nerlove (1986: 182) addressing this incompatibility in industrialized societies, claim that "the demands of working are in conflict with the demands of childcare." In other words, "there is a strain between the mother and worker roles."

It has been suggested that in the developing world, traditional social norms reduce the scale of the relationship between women's fertility and employment (Beguy 2009). Beguy (2009) explains traditional social norms in terms of gender roles and the

gendered division of household labor, in which the role of child-rearing is ascribed to women and the role of worker and breadwinner to men. This can result in women developing a negative attitude to work outside the home, and/or lead them to choose a job that is compatible with their role as a mother. In developing countries, various social norms may co-exist, depending on place of residence and region, and the macro outcomes could be a result of the dichotomy between traditional women choosing a motherhood role versus modern women choosing a career. Traditional/modern settings within a country can be accounted for by controlling for whether the place of residence or location is urban or rural, and by educational variables (parental as well as individual), which may differ depending on the level of development. Women's characteristics that Matysiak (2011b) defines as material aspirations and orientation towards family or paid work can to some extent be controlled for with these residential and educational variables.

The second mechanism that determines the level of conflict between the roles of worker and mother is the organization of childcare, based on the fact that it is easy to work outside the home if parental surrogates are cheaply available in the form of relatives, friends, or state agencies (Stycos and Weller 1967). It is expected that the decline of extended family households and the decreasing pool of domestic servants will result in an inverse relationship between fertility and employment.

This micro-level study of the female employment–fertility nexus in Turkey uses the contextual explanations of the role incompatibility hypothesis, as well as other possible mediating factors. The mechanisms affecting the degree of conflict between the roles of worker and mother are controlled for by contextual variables such as urban–rural place of residence, calendar effects, and the organization of work in time.

2.2 Previous empirical studies

While an inverse relationship between fertility and female labor force participation was identified in developed countries in the 1960s, cross-sectional data suggested that, it tended to be weak or absent in developing countries (Concepcion 1974). In his multi-country analysis, Caceres-Delpiano (2012) claims that fertility affected employment among women negatively in developing countries in the 1990s and 2000s. Studies of developing countries look predominantly at Latin America,[4] and a review of this literature has provided different conclusions. According to Schockaert (2005), the

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[4] Aguero and Marks (2008) on Peru, Guatemala, Colombia, Bolivia, Nicaragua, and the Dominican Republic; Cruces and Galiani (2007) on Mexico and Argentina; Gendell, Maraviglia, and Kreitner (1970) on Guatemala City; Gurak and Kritz (1982) on the Dominican Republic; Jaffe and Azumi (1960) on Puerto Rico; Stycos (1965) on Lima, Peru; and Weller (1968) on Puerto Rico.

findings are affected by contextual variables like developmental and fertility levels as well as the period of the study, but overall a weakening association can be identified in Latin America. Unlike in developed countries, this can be explained by the declining number of wage earners employed in modern jobs and increasing number of non-wage-earning females.

None of the studies of the relationship between fertility and employment in developing countries has employed event history analysis, mainly due to a lack of retrospective data. In developed countries most of the studies using event history analysis find a negative relationship between fertility and women's employment, albeit that some of the findings are contrary. Matysiak and Vignoli's (2008) important meta-analysis considers these different findings: it is restricted to longitudinal studies covering the period 1990–2006 and analyzes the transition of women to birth and to employment[5]. Their univariate analysis reveals 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 magnitude of the effect size is found to be influenced by controlling for partner characteristics, social background of the respondent, macro characteristics, and women's job characteristics. Finally, the influence of birth order in the negative effect of women's work on childbearing is much lower in the first parity than in higher-order parities.

The few studies that analyze the relationship between fertility and employment of women in Turkey are all unidirectional.[6] An early study by Stycos and Weller (1967) uses data from a survey carried out in 1963 in both rural and urban areas. After controlling for place of residence, employment status, education, and exposure to contraception within marriage, they find no relationship between employment status and fertility, but they do find a relationship with residence and education, which can be attributed to the compatibility of the roles of mother and worker in areas where women are mostly employed as unpaid workers in the agricultural sector. Özar and Günlük-Şenesen (1998) analyze the determinants of female non-participation in the urban labor force using a field survey in four Turkish cities: İstanbul, Ankara, İzmir, and Adana. The results of their logit analysis indicate no significant effect of existence, number, or

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[5] Covers 30 papers, 90 effects for transition of women to birth, and 29 papers, 58 effects of young children aged 0–6 for transition of women to employment.

[6] There is also a study by Farooq and Tuncer (1974) that analyzes this relationship indirectly, as a by-product of the analysis of the association between modernization and fertility transition in Turkey, linking economic and social development with fertility for the 1935–1965 period. They find a weak association between fertility and non-agricultural employment, but a strong link with changing attitudes and tastes. Moreover, there are two studies analyzing the long-run relationship between female labor force participation and fertility in Turkey using additional variables of interest in the models. Kutlar, Erdem, and Aydın (2012) find a two-way negative Granger causality between female labor force participation and fertility in their study covering the 1988–2009 period. Üçler and Kızılkaya (2014) find that women's employment affects fertility negatively, according to their full modified ordinary least squares method on panel data covering the 2004–2013 period.

age of children on female labor non-participation. The third study is that of Şengül and Kıral (2006), which analyzes the effect of decisions related to fertility on female labor force participation, using the sex of the first child as the instrumental variable. Basing their analysis on the Household Labor Force Survey from the first quarter of 2003, they find that having children, especially the presence of children aged below seven, decreases the probability of working among women in Turkey. Finally, Greulich, Dasre, and Inan (2016) analyze the determinants of fertility decline in Turkey, focusing on the birth of a third child and using data from the Survey of Income and Living Conditions (SILC) for the 2006–2011 period. Their findings indicate that stable[7] employment among women, especially in the formal sector, is negatively correlated with the birth of a third child, and that employment in the agricultural sector is also negatively associated with a third birth, albeit to a lesser degree.[8]

3. The context of Turkey: Structural, economic, cultural, and institutional dimensions

Today, with its declining levels of fertility and mortality, Turkey has entered the final stage of its demographic transition. The decline in fertility started in the 1950s and gained pace after the 1970s. According to the TDHS-2013 findings the fertility rate for 2010–2013 was just above the replacement level at 2.26, but the fertility transition in Turkey was not uniform. For the same period, regional differences in the country's fertility levels ranged between a total fertility rate of 1.93 in the Western region and 3.41 in the Eastern region (HUIPS 2014).

The structural factors most associated with the onset of fertility transition in Turkey were female education and urbanization rather than employment of women. The female labor force participation rate has always been low in Turkey and has not exceeded 36% since 1988 (Tansel 2001; TURKSTAT 2014). Turkey has the lowest female labor force participation rate among OECD member states (34% in 2013, OECD 2014); and half of employed women are non-wage earners (49.8% in 2008, according to TDHS). Furthermore, the number of unpaid female family workers in agriculture is still high (32.4%), and despite the decline over time, social security coverage is at a historic low among employed women.

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[7] Unchanged during the three-month observation period.
[8] Two descriptive studies find a negative association between employment of women and fertility in Turkey. Dayıoğlu and Kırdar (2010) find lower labor force participation rates by existence of children, especially in urban areas, using the 2003 Turkey Demographic and Health Survey. Similarly, Akgeyik (2017), presenting the recent increasing trend in female labor force participation in Turkey using descriptive data from TURKSTAT for the years 2007–2016, finds that the decline in the fertility of women age 15–24 appears to go hand in hand with increases in female labor force participation.

The share of women employed in the agriculture sector has been declining, while the number employed in the services sector has been steadily increasing (Tansel 2001). This sectoral shift in the female labor market has made it difficult for women to balance mother and worker roles, and the continuing patriarchal regime where childcare takes place in the country has made the problem worse. As Turkey has modernized and developed, the family care regime has become more patriarchal rather than more egalitarian in the country. During the financial liberalization and the economic downturns of 1994, 2001, and 2008–2009 there was a substantial increase in the number of women entering the labor market, due to the added-worker effect in response to husbands losing their jobs (Ayhan 2015; Değirmenci and İlkkaracan 2013). However, women's employment outcomes depended on their education level: Those with a low level of education tended to enter the labor market on a temporary basis as a secondary earner to the main 'breadwinner' to overcome the financial problems of the family. By contrast, educated women (high school or higher) left the labor market for family reasons such as marriage, because it was what the husband wanted, or to assume a bigger role in household duties. The lack of mechanisms for the reconciliation of family and work led to the continuation of the patriarchal family model (İlkkaracan 2010).

A number of cultural factors are embedded in the relationship between women's fertility and employment. Social values and norms in Turkey prioritize motherhood over work, although the societal role of woman includes both family responsibilities and work. In a survey on Family, Employment and Gender in Turkey, carried out in coordination with the International Social Survey Program (ISSP) (Çarkoğlu and Kalaycıoğlu 2013), 69% of respondents thought that "an ideal situation for the work–family life of a family with a pre-school-aged child is for the father to be full-time employed and the mother to stay at home." However, the working role of women is not completely discarded in Turkey: According to this ISSP Survey, 67% of the respondents agreed that both men and women should contribute to the household budget.

An effective work and family reconciliation mechanism in Turkey would lessen the incompatibility of the roles of worker and mother. However, until recently family policies have been passive, favoring civil servant women or poor families (Bozçağa 2013). In the 2015 ranking of paid maternity leave in OECD countries, Turkey (16.0 months) places slightly below the OECD average (17.7 months). Under the Civil Servants Law no. 657, mothers working in the civil service receive full pay during maternity leave, while under Labor Law no. 4857 working women receive two-thirds of their salary from the Social Security Institution after their maternity leave is over.[9] No

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[9] By contrast, paternal leave for male civil servants under Civil Servants Law no. 657 was increased from 3 to 10 days on February 25, 2011. Working fathers under Labor Law no. 4857 received no paternal leave until

regulation on parental leave exists in Turkey, although some flexible work schemes came into effect with Law no. 6663 of 10 February 2016. Only civil servants receive a cash transfer related to caregiving, in the form of a family allowance. In May 2015 a new regulation was passed giving a birth allowance to all women with Turkish citizenship,[10] but the cash transfers are too low to affect fertility or employment outcomes. There are also conditional cash transfers, which target only the poorest families.

The last but not the least of the reconciliation mechanisms, nursery provision for pre-school-age children, is minimal in Turkey. There is no provision for children under three, and since 2004 Turkey has ranked last in the participation of children aged three to five in pre-primary education or primary school (OECD 2016); the current rate is 30.9%, compared to the 2012 OECD average of 82.0%. Early childhood care takes place at home, and the main caregiver is the mother, even if she is working. According to the TDHS-2008, 30.4% of employed women with a child under six take care of their children themselves. The results of TDHS-1998, 2003, 2008, and 2013 indicate that the share of care given by relatives to children aged under six while the mother is working has remained stable at around 38%, showing that in the last four decades childcare has changed very little in Turkey.

4. Data and methods

4.1 Data

This study uses data from the 2008 Turkey Demographic and Health Survey (TDHS-2008), the fourth of the Turkish DHS series and the ninth national demographic study in the country since 1968. In the past the TDHS collected data on birth histories, along with summary data on the marriages, migrations, and employment histories of ever-married women. The TDHS-2008, was the first to include full histories of births, marriages, migration, and employment of ever-married women, and this study makes use of this rich retrospective information. In the TDHS-2008 the dates of each event were recorded in months and years, which were recoded into century month codes in the analyses. Month and year information of all live birth events of women and all marriages (and divorces) of women were collected independent of their age. Data on migration and employment events, on the other hand, corresponds to the period from

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they were given 5 days on April 23, 2015. It is notable that this is still lower than the 2015 OECD average of 6.3 days (OECD 2016).

[10] The By-Law on the Birth Allowance, dated 23 May 2015, states that every mother will get a lump sum cash payment for children born after 15th of May, 2015, based on the mother's total parity.

the age of twelve until the date of the interview. The migration history section of the TDHS-2008 covers information on the province (from which the region variable is constructed) and whether each place of residence was urban or rural, for places where the respondent lived for at least six months after age twelve. The employment history covers all jobs of women from the age of twelve that lasted for at least six months.[11] The start month and year, the sector, public–private differentiation, home–non-home place, social security coverage, and end month and year were recorded for all these jobs. This detailed information enabled construction of the various time-varying explanatory and control variables in this study.

The TDHS-2008 is based on 10,525 completed household interviews, and 7,405 completed individual interviews with ever-married women aged 15–49 years. The data required cleaning, and some cases had to be dropped due to missing information on dates that could not be imputed.[12] The final dataset for the analysis of conceptions comprised 6,977 ever-married women, and the data set for the analyses of transitions from/to employment and non-employment comprised 5,088 employment and 7,903 non-employment spells, respectively.

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[11] The current job was included in the history regardless of its duration.

[12] Employment history of 119 cases (1.6% of total, and 2.9% of ever-employed women) had to be rearranged so that at each time only one job existed. Additionally, some month entry and/or exit data was rearranged manually, looking at answers to the question: "How long have you worked in this job?" There were 240 of these cases, amounting to 3.3% of the total and 5.9% of ever-employed women. Imputations for the missing or unknown month data were carried out assuming the months were randomly distributed. For the start of jobs the percentages of month imputations are 16.1, 9.2, 7.8, 8.1, 7.9 for the first, second, third, fourth, and fifth job, respectively (corresponding unweighted numbers are 658, 103, 27, 9, 3). For the ending month of the job the percentages of imputed months are 13.0, 9.4, 6.5, 11.1 for the first, second, third, and fourth job, respectively (corresponding number of cases are 343, 60, 13, 7). As expected, the share of imputed months increases while moving backwards in history. After imputations, some adjustment still had to be carried out as some end months could be before the start of the next job. There were 47 of these cases, 0.6% 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. The migration histories of 27 cases were corrected. The years of 7 cases were derived from looking at other questions, such as "How long did you stay at this place?" and "What was the reason for your migration?" Month imputations related to migration history were carried out taking into account the question: "For how long did you live in …..?" (the percentages of imputed cases are 6.1, 5.9, 4.9, 4.6, 1.0, 2.6 for first, second, third, fourth, fifth, and sixth migration, corresponding to 253, 78, 26, 10, 1, 1 cases).

The marriage history data required the least cleaning. Year information was derived for 2 cases, and missing or unknown months for the start of first and second marriage were imputed for 0.4% and 4.9% respectively (28 and 9 cases); and for the end of first marriage for 9.0% (45 cases).

Finally, some cases had to be dropped: In fertility analyses, women who conceived before marriage (316 observations) and marriages that took place before the age of twelve (31 observations) were dropped. The event data used for employment and non-employment transitions was constructed excluding cases with missing information on year of event, cases of marriage before the age of 12, spells with start before age of 12, and spells when the place at the time of the start was abroad.

Retrospective survey data may suffer from recall errors. Inaccuracy in full employment history data may increase due to employment patterns being less salient and more complex, longer recall periods, and nonpresence of time-anchoring biographical details in respondents' lives (Shattuck and Rendall 2017). As part-time, irregular, or unpaid jobs are more complex and harder to recall, in the TDHS-2008 the respondent was given elaborate information at the beginning of the employment history module: "As you know, some women sell small things, sell goods at the market, work on the family farm or business, look after children, work as housemaids, etc. Please include these kinds of jobs as well." The survey's employment history data collection did not record jobs that lasted less than six months or overlapping jobs, which we believe decreased the complexity of the module. This was a drawback, since shorter spells of unemployment were ignored. Although irregular, seasonal, and unpaid jobs, which are mostly part-time, are recorded provided that they last over six months, the data does not distinguish between part-time and full-time employment, which is another limitation. The average length of the recall period is 15.5 years (the difference between the interview date and the start of the first job), and the mean length of the first job is 8.7 years. Maternity leave is not counted as a period of inactivity or unemployment for employed women. The first jobs started at early ages: 40.9% of first jobs started between the ages of 12 and 16, and 29.2% between 17 and 21. Additionally, 89.8% of ever-married women had at least one child by the date of the interview, which implies that women may have recalled the employment dates in relation to the dates of their marriage or first childbirth. These data figures and features indicate that recall errors are within an acceptable range, although they cannot be measured exactly.

4.2 Methodology

This study uses event history analyses to investigate the determinants of pregnancy, given non-pregnancy separately for different conception orders; entering employment, given non-employment; and exiting employment, given employment. To this end we use a hazard approach with piecewise constant exponential modeling.[13]

Our models of pooled conceptions of order four and higher, and employment and non-employment entries and exits, contain multi-episode data, which means more than one event for each individual. As Allison (2010) notes, if repeated events are observed for an individual, the standard strategy is to reset the clock to zero each time an event

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[13] Hazard models assume that the hazard rate (dependent variable) is dependent on duration since the onset of exposure, and on a set of independent variables. In piecewise constant proportional hazard models the basic time factor is partitioned into several segments, and while hazard rates are assumed to be constant within each of these segments they may differ from segment to segment.

occurs, and to treat the intervals between events as distinct observations. Our repeated-event models make two assumptions: (1) that the dependence of the hazard on time since the last event has the same form for each successive event, i.e., no stratification is applied, and (2) individuals are independent, while birth intervals for each individual are dependent.[14,15]

4.3 Variables

4.3.1 Dependent variable and baseline hazard

There are three main groups of models for analyzing the events of conception, employment exit, and employment entry. The observation window opens with the first marriage of the woman for the first conception model and employment models, and previous births for the models of second and higher-order conceptions. The observation window closes at interview date or migration abroad if emigration exists in the woman's life history.

In our conception models the dependent variables are transitions to first, second, third, and fourth and higher-order conceptions. Date of pregnancy is measured as seven months before the date of the live birth,[16] while the baseline is the period since the first marriage, the period since the first birth, the period since the second birth, and the period since the preceding birth, depending on the order of conception. Periods are measured in months, and the cut-off points are 12, 24, 36, 48, 60, 84, and 120 months, meaning eight segments.

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[14] In general, it is expected that people with short birth intervals will continue to give birth frequently. As long as the explanatory variables in the model account for the dependence, the assumption of independence will not be violated. In most cases, however, the independence assumption is false, at least to some degree. This leads to (1) still asymptotically unbiased coefficient estimates, but (2) standard error estimates biased downward (Allison 1984). In this regard, repeated events only affect the variance of the estimates, and not the means. There is a need to correct for standard errors in our multivariate analyses. 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. This provides a robust estimate of variance, as described in the context of the Cox regression of Lin and Wei (1989), with added adjustment for clustering.

[15] To minimize the effects of violations of the independence assumption, additional explanatory variables that represent the characteristics of the individual's prior event history can be used. The most basic of these variables are the number of prior events and the length of previous interval. Accordingly, we use the order of conception as an explanatory variable in our multi-episode conception model, and order of job/non-employment episode and years of employment/non-employment after marriage in the models of employment exit and employment entry.

[16] Our selection of seven months is based on the fact that in the TDHS, birth history intervals can be a minimum of seven months, and during the process of entry data is checked in that way.

In the employment exit and entry models the dependent variables are transition to non-employment and employment, respectively. The baseline is the period since entry into work in the employment exit model and the period since entry into non-employment (exit from previous job or first marriage if never worked before) in the employment entry model. The periods are segmented with the same cut-off points as in the fertility models.

4.3.2 Explanatory variables

The explanatory variables are employment status as a time-varying variable, and employment status before marriage as a time-fixed variable, which are constructed as dummy variables within the categories of 'non-employed' and 'employed.' Table 1 presents descriptive statistics of the explanatory variables as occurrence of conceptions and exposure times to the risks for each conception model, expanded based on the sector of employment (agriculture or non-agriculture), public versus private employment, wage status of employment,[17] and social security coverage of employment. In the TDHS the employed category includes both paid and unpaid workers. The category of non-employed was taken as synonymous with inactive rather than unemployed, in that that data contains no information on whether inactive women were seeking work or not.

Employment prior to marriage is a dummy variable that indicates whether or not the woman worked before marriage. Those who were employed before marriage may be more career- than family-oriented, although in Turkey marriage strongly influences women giving up work, and interrupts employment. According to TDHS-2008 data, marriage was the most frequently stated reason for leaving employment by ever-married women, accounting for 26.6% of all jobs ended (3,595 jobs), and so this time-fixed variable may not reveal conception intensities after marriage within the context of Turkey.

Table 2 presents descriptive statistics of the explanatory variables in the employment exit and entry models, in which three time-varying fertility variables, namely number of living children, age of youngest child, and a composite variable of the two, are used in the three separate models for each event. These variables are constructed in a similar way to the covariates in Andersson's (1997) model analyzing the impact of children on divorce risk among Swedish women. Parity is the number of

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[17] The wage earner category of the variable of wage status includes workers with the status of employer, waged worker (regular), salaried government officer (regular), and daily waged (seasonal); while the non-wage earner category includes workers with the status of self-employed (regular), self-employed (irregular), and unpaid family worker.

living children, and is divided into five levels from parity 0 to parity 4 and above. Although in empirical studies there is no consensus on the sign of the effect of parity on employment entry and exit, a negative relationship can be expected in Turkey due to the social norms associated with mothers in society, where mothers are seen as having primary responsibility for childcare. That said, higher parity might result in greater economic need in the family, causing women to enter the labor force as a second breadwinner and resulting in higher risks of employment entry and lower risks of employment exit. The age of the youngest child is another important fertility dimension affecting employment exit and entry, as shown in the previous section. Women may temporarily abstain from work during periods of pregnancy and for a couple of years after the birth of a child and may return to work once the youngest child comes of school age. The composite parity–age-of-child variable[18] is based on the interactions of parity and the age-of-youngest-child variable,[19] in which childless women fall into a separate category that cannot interact with age of the youngest child by definition.[20,21]

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[18] Descriptives of this variable are not presented in this paper, but available upon request. Relative risks of employment exit and entry by this variable 'ceteris paribus' are plotted in figures.
[19] 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.'
[20] These three fertility variables cannot be used in the same model, given that they have coinciding categories.
[21] The control variables used in the analyses are presented in Appendix A-2.

Table 1: **Women or non-pregnancies exposed to birth risk[(*)], descriptive statistics of explanatory variables**

	First conception model				Second conception model				Third conception model				Fourth and higher order conceptions model			
	Exposure Woman-months	%	Events First conceptions	Annual conception rate (%)	Exposure Woman-months	%	Events Second conceptions	Annual conception rate (%)	Exposure Woman-months	%	Events Third conceptions	Annual conception rate (%)	Exposure Non-pregnancy months	%	Events Fourth and higher order conceptions	Annual conception rate (%)
Employment status																
Agriculture	20,993	16	1,005	57	35,435	14	952	32	62,730	17	611	12	92,632	23	870	11
Non-agriculture	20,472	16	703	41	46,068	18	467	12	53,928	15	161	4	34,861	9	103	4
Non-employed	87,461	68	4,598	63	178,214	69	3,692	25	247,397	68	1,997	10	273,269	68	2,332	10
Public	6,283	5	233	45	14,815	6	158	13	15,668	4	27	2	3,447	1	12	4
Private	35,181	27	1,475	50	66,687	26	1,260	23	100,991	28	745	9	124,046	31	960	9
Non-employed	87,461	68	4,598	63	178,214	69	3,692	25	247,397	68	1,997	10	273,269	68	2,332	10
Wage earner	21,619	17	759	42	42,609	16	497	14	48,163	13	199	5	37,378	9	284	9
Non-wage earner	19,818	15	948	57	38,852	15	908	28	68,339	19	572	10	89,935	22	687	9
Other	28	0	1	43	41	0	1	29	157	0	1	8	179	0	2	13
Non-employed	87,461	68	4,598	63	178,214	69	3,692	25	247,397	68	1,997	10	273,269	68	2,332	10
Uncovered	25,382	20	1,189	56	47,858	18	1,125	28	86,994	24	706	10	114,595	29	948	10
Covered	16,047	12	517	39	33,610	13	291	10	29,651	8	64	3	12,810	3	23	2
Missing	36	0	2	67	34	0	2	71	14	0	2	171	88	0	2	27
Non-employed	87,461	68	4,598	63	178,214	69	3,692	25	247,397	68	1,997	10	273,269	68	2,332	10
Employment before marriage (time-fixed)																
Non-employed	72,595	56	3,684	61	144,306	56	3,195	27	224,953	62	1,856	10	269,812	67	2,342	10
Employed	56,331	44	2,621	56	115,410	44	1,916	20	139,102	38	912	8	130,950	33	963	9
Total	128,926	100	6,306	59	259,717	100	5,110	24	364,056	100	2,768	9	400,762	100	3,305	10

Note: (*) Conceptions leading to a live birth. The variables are time-varying unless otherwise stated. 'Woman-months' is the total number of months that women are exposed to the risk of becoming a mother. "Events" indicates the number of conceptions resulting in live births. Interpretation: Non-employed women were childless and not pregnant for 87,461 months. 4,598 non-employed women conceived their first live child. Their annual conception rate for a first live child was thus 63%.
Source: TDHS-2008.

Table 2: **Employment or non-employment spells exposed to exit risk$^{(*)}$, descriptive statistics of explanatory variables**

	Employment exit model				Employment entry model			
	Exposure		Events		Exposure		Events	
	Employment-months	%	Exiting employment	%	Non-employment months	%	Becoming employed	%
Parity								
0	46,429	13	441	26	120,048	14	470	22
1	82,004	23	436	26	198,782	23	585	28
2	107,656	31	424	25	257,883	30	579	28
3	56,665	16	210	12	145,201	17	283	14
4+	57,847	16	170	10	146,054	17	178	8
Age of youngest child								
No child	36,195	10	288	17	87,263	10	401	19
Pregnant	28,151	8	249	15	88,304	10	101	5
0 years old	40,863	12	132	8	130,457	15	190	9
1–2 years old	35,931	10	87	5	109,145	13	205	10
3–5 years old	73,709	21	260	15	195,813	23	421	20
6–8 years old	47,585	14	211	13	102,496	12	309	15
9+ years old	88,167	25	453	27	154,491	18	467	22
Total	350,600	100	1,680	100	867,970	100	2,095	100

Note: *Exit risk is exiting employment in employment model and exiting non-employment in non-employment model. The variables are time-varying.

5. Results and discussions

5.1 Descriptive findings

Although the employment status of women is not the main trigger of the onset of fertility decline in Turkey, the current fertility indicators differentiate between the employment statuses of women, as shown in Table 3. The total fertility rates (TFR) of non-employed women (2.50) were higher than the fertility rates of employed women (1.67) in 2005–2008, and there are also differences related to job characteristics. Women working in the agricultural sector have higher fertility rates (2.17) than those employed in other sectors. Considering that mother and worker roles are more compatible in the agricultural sector, this result should come as no surprise. The TFR is 2.33 for women working in the public sector and 1.59 for those employed in the private sector. This is to be expected as the public sector provides more stable and regular employment for women and consequently greater financial guarantees, allowing them to progress to higher-order births. The TFR of non-wage earners (1.92) is higher than that of wage earners (1.51), as most of the former are unpaid family workers operating in the agricultural sector. These findings indicate that job characteristics that favor

compatibility between the roles of worker and mother encourage fertility, aside from jobs in the public sector. Fertility peaked at 25–29 years in Turkey in 2008, but this is subject to change according to employment status and job characteristics: For non-employed women, those working in the agricultural sector, and those in the non-wage-earning group, fertility peaks at 20–24 years. By contrast, a delay in birth is observed among women working in the public sector.

For women aged 40–49 at the time of the interview, completed fertility measured by the mean number of children ever born (CEB) is higher for never-employed women (3.85) than that for employed women (3.09) and there are also differences related to job characteristics.[22]

Table 3: **Age-specific fertility rates per 1,000 women for the three years preceding the survey, and the mean number of children ever born 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 (women 15–49)	Mean CEB (women 40–49)
Employment	Never employed	38	146	146	100	43	16	5	2.46	3.85
	Non-employed	77	152	131	87	46	7	0	2.50	3.03
	Employed	29	93	111	64	25	11	1	1.67	3.09
Sector	Agriculture	30	138	137	81	32	15	1	2.17	3.64
	Industry	19	61	113	54	0	0	0	1.23	3.20
	Service	33	71	96	55	25	8	0	1.44	2.44
Public versus private	Public	40	101	116	138	69	0	0	2.33	1.97
	Private	29	92	110	55	20	12	1	1.59	3.20
Status	Wage-earner	27	66	103	70	26	7	2	1.51	2.85
	Non-wage earner	33	131	123	58	24	14	0	1.92	3.26
Social Security	Uncovered	29	113	115	54	23	13	1	1.74	3.37
	Covered	30	50	106	82	31	4	0	1.52	2.10
	Turkey	36	127	132	90	36	10	1	2.16	3.34

Note: *Non-employed: non-employed in last three years, employed: ever-employed in last three years.

5.2 Results of the multivariate analyses

In this section we present the results of the dynamic analyses of the transitions during all life course spells under observation, in three parts: (1) the relationship running from employment to fertility, (2) the relationship running from fertility to employment exit

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[22] The fertility decline over the last decades is reflected in the difference between TFR and the mean CEB, with the TFR being low when compared to the mean CEB. The greatest decline is observed among women employed in the industrial sector, those working in jobs not covered by social security, and those in the private sector. Within this comparison an increase in fertility is noted among women employed in the public sector.

and entry, and (3) interactions between employment status and conception. Results related to the associations of other covariates with the dependent variables are presented and discussed in the Appendix.

5.2.1 The relationship running from employment to fertility

Table 4 presents the findings of the estimated piecewise constant proportional hazard models of births of different orders by employment variables when standardized for all covariates. The employment of women is negatively associated with family size, with non-employed women having 1.13 times more risk of having a first birth than employed women. For second, third, and fourth and higher-order births the hazard ratios are 1.12, 1.10, and 1.14 respectively for non-employed versus employed women. Employment status before marriage, on the other hand, appears to have no effect on the risk of giving birth in any order. This is an expected result, since exiting employment due to marriage and the likely prioritization of family roles over career after marriage is common. Employment after marriage, on the other hand, is an influential determinant of conception risk, and likely provides a better understanding of the differentiations in women's career and family orientations.

Table 4: **Relative risk of conception by employment variables, Turkey 1972–2008[a]**

	First conception	Second conception	Third conception	Fourth and higher conception
Employment status				
Non-employed	1.13***	1.12**	1.10*	1.14***
Employed	1	1	1	1
Employment before marriage (time-fixed)				
Non-employed	1.00	1.02	0.99	0.96
Employed	1	1	1	1
Constant	0.05	0.00	0.00	0.00
Number of cases (weighted)	6,937	6,561	5,105	6,056
Number of conceptions	6,292	5,073	2,760	3,296
Time at risk (months)	128,536	257,959	362,961	399,510
Log likelihood	−10,611	−8,001	−5,795	−7,210
LR chi2	1,135	1,337	2,047	3,112
Prob > chi2	0.0000	0.0000	0.000	0.0000

Note: 10 %; ** 5 %; *** 1 %. [a] Model where other covariates presented in Table A-2 are controlled for. The variables are time-varying unless otherwise stated.

Table 5 presents the results of the models in which the employment status variable is replaced by one of the variables related to job characteristics. Sector of employment has a crucial role in transition to motherhood or higher-order births, with employment in the agricultural sector increasing the risk of conception compared to employment in the non-agricultural sector. The risk ratios indicate that the non-employment effect is very similar to the agricultural sector effect, and this finding is in line with the role incompatibility hypothesis, which suggests that no relationship exists between women's employment and fertility in spheres in which the roles of worker and mother are compatible. The public–private sphere of employment is influential after first birth, with women employed in the public sector subject to higher risks of a second birth (20% higher than those working in the private sector), and lower risks of higher-order births. Working as a non-wage earner increases the risk of transition to first, second, and third births, but decreases that of higher-order births. For higher-order births, income constraints may come into play, in that non-wage earner women are employed mostly in unpaid or low-paying jobs. Working in a job that is not covered by social security is associated with a higher risk of birth than working in a job that is covered. In short, being employed compared to being non-employed is found to affect the transition to conception negatively,[23] and job characteristics such as working in the agricultural sector, working as a non-wage earner (unpaid or self-employed), which favor compatibility between women's roles as worker and mother, and working without any social security increase the risk of conception. This increased risk may also result from lower indirect costs of non-employment due to these women's lower stock of human capital. Being employed in the public sector, where the availability of employment insurance and stable jobs enables women to have as many births as they desire, is associated with a lower risk of conception except for second order births, confirming the presence of a two-child norm in Turkey.

The results presented above prevail provided that we control for the various factors presented in Section A-1. Among these factors, women's educational level requires further emphasis, as it has been a crucial determinant of the onset of fertility transition in Turkey (Behar 1995; Kağıtçıbaşı 1982; Shorter 1969). The multivariate results suggest the higher the woman's educational level, the lower the risk of having a birth of any order. Parental education is also negatively associated with fertility, in line with the view of intergenerational transmission of educational attainment.[24] According to the human capital approach, investment in education leads to higher productivity and higher earnings (Cohn and Geske 1990), which are reflected in job characteristics.

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[23] The only exception to this is that non-wage earning women have lower risks of fourth and higher-order conceptions.
[24] See, for instance, Patacchini and Zenou (2011) and Riphahn and Trübswetter (2011) for evidence on intergenerational transmission of education.

Educated women in our sample, who as wage earners are more inclined to choose jobs with social security in the non-agricultural sector and have a higher opportunity cost of non-employment, may choose to forego bearing children. Educated women in Turkey are also more career-oriented, have more egalitarian gender and family norms, and postpone or avoid marriage and fertility (Yüksel-Kaptanoğlu, Abbasoğlu Özgören, and Keskin 2015).

Table 5: **Relative risk of conception by type of employment, Turkey' 1972–2008[a]**

	First conception	Second conception	Third conception	Fourth and higher order conceptions
Sector				
Agriculture	1.34***	1.13	1.31**	1.37***
Non-agriculture	1	1	1	1
Non-employed	1.32***	1.20***	1.32***	1.47***
Public versus private				
Public	0.98	1.20*	0.57**	0.77
Private	1	1	1	1
Non-employed	1.13***	1.14***	1.07	1.13**
Status				
Wage earner	1	1	1	1
Non-wage earner	1.25***	1.06	1.29***	0.87*
Other	1.00	1.67	1.69	1.43*
Non-employed	1.27***	1.16**	1.31***	1.04
Social security				
Uncovered	1.40***	1.13	1.40*	1.68*
Covered	1	1	1	1
Non-employed	1.42***	1.23***	1.49**	1.88**
Number of cases (weighted)	6,937	6,561	5,105	6,056
Number of conceptions	6,292	5,073	2,760	3,296
Time at risk (months)	128,536	257,959	362,961	399,510

Note: * 10 %; ** 5 %; *** 1 %. [a] Each separate model in which other covariates and explanatory variables are controlled for. The variables are time -varying.

5.2.2 The relationship running from fertility to employment exit and entry

The results of the separate models of transition from employment to non-employment and non-employment to employment, based on three fertility variables, are presented in Table 6. Having two children decreases this risk when compared to having one child, while having no children (including women pregnant with their first child) increases the risk of exiting employment. The child-age model implies that pregnant women and women with no children are at greater risk of job exit than women with an infant child. For women whose youngest child is older than one year, the risk of exiting employment

is lower than for women with an infant. The age of the child has no effect on the risk of exiting employment once the youngest child completes the age of six.

The multivariate model with the composite fertility variable, which is the composite parity–age-of-child variable based on the interactions of parity and the age-of-youngest-child variables (Figure 1), shows that first pregnancy is the most influential factor in job exit. Women who are pregnant with their second or third child also demonstrate a higher risk of employment exit. For women with one or two children the risk of employment exit, which peaks in pregnancy, declines until the youngest child reaches the age of two. After that age the risk of exit from employment tends to remain stable. The fact that job exit intensity is highly dependent on the age of the youngest child rather than parity implies that it is temporarily increased by fertility due to pregnancy and having an infant.

The results of the models of employment entry are presented in the last two columns of Table 6, in which it can be seen that in contrast to the employment exit model, child parity is effective. Child parity decreases job entry intensity among non-employed women. Zero parity, which includes childless women as well as women pregnant with their first child, has no association with employment entry among women. This can be expected, as pregnancy decreases and being childless increases the risk of entry into employment, their net effect being nil. Pregnancy is strongly associated with fewer employment entries, as would be expected. On the other hand, having no child and/or having a child older than one year is associated with higher risks of entry into employment. As the age of the youngest child increases, the risk of job entry increases. The relative risks of job entry with respect to the composite fertility variable indicate that being childless and non-pregnant is associated with a higher risk of employment entry (Figure 2). Above all, pregnancy is associated with a lower risk of employment entry, and as the youngest child grows older the risk of entry increases for all parity groups. When the youngest child completes the age of nine the risk of employment entry declines, albeit slightly.

In brief, having more children implies fewer job entries, and pregnancy and having young children prevent women from entering employment. Education is also an important control variable in the employment models, associated with less risk of job exits and high risk of job entries, in line with the implications of human capital theory.

Table 6: **Relative risk of job exit and job entry by fertility variables, Turkey 1972–2008[a]**

Transition from	Employment to non-employment			Non-employment to employment		
	Parity model	**Child-age model**	**Parity + child-age model**	**Parity model**	**Child-age model**	**Parity + child-age model**
Explanatory fertility variables						
Parity						
0	1.73***			1.00		
1	1	1		1	1	
2	0.84*		Combination factor of parity and age of youngest child: see Figure 1. Baseline category: parity 4+, child aged 0 years.	0.82**		Combination factor of parity and age of youngest child: see Figure 2. Baseline category: parity 4+, child aged 0 years.
3	0.94			0.78**		
4+	0.98			0.60***		
Age of youngest child						
no child		1.40**			1.73***	
pregnant		2.55***			0.68***	
0 years		1			1	
1–2 years		0.68**			1.50***	
3–5 years		0.87			1.81***	
6–8 years		0.98			2.40***	
9+ years		1.06			1.89***	
Constant	0.01	0.02	0.01	0.01	0.01	0.01
Number of jobs/non-employment spells (weighted)	3,920	3,920	3,920	7,213	7,213	7,213
Number of job exits/entries	1,666	1,666	1,666	2,081	2,081	2,081
Time at risk (months)	349,288	349,288	349,288	865,878	865,878	865,878
Log likelihood	−3,677	−3,632	−3,612	−6,219	−6,150	−6,126
LR chi2	919	933	1,016	1,110	1,183	1,202
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: * 10 %; ** 5 %; *** 1 %. [a] Model in which other covariates presented in Table A-3 are controlled for. The variables are time-varying.

Figure 1: **Relative risk of non-employment, ever-married employed women, Turkey, 1972–2008, by parity and age of youngest child (composite fertility variable)**
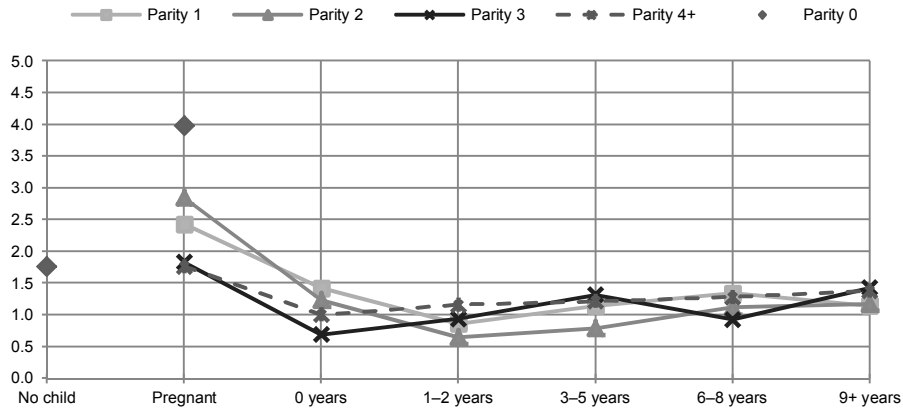
Note: Calendar year, age at start of job, education, type of place of residence, region, mother tongue, parental education, marital status, order of job, work experience after marriage, sector of job, and social security coverage of job are controlled for.

Figure 2: **Relative risk of employment, ever-married non-employed women, Turkey, 1973–2008, by parity and age of youngest child (composite fertility variable)**
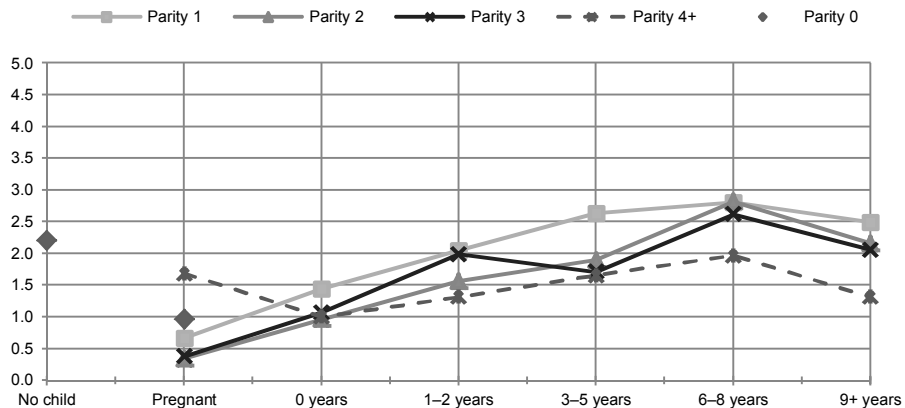
Note: Calendar year, age at start of non-employment, education, type of place of residence, region, mother tongue, parental education, marital status, order of non-employment episode, and years of non-employment after marriage are controlled for.

5.2.3 Interaction effects of employment and fertility variables and calendar period on transitions

The interaction models with calendar year and employment status by order of conception show the relative risks of conception by employment status and calendar period (Figure 3) and the descriptive statistics of these interaction variables are presented in Table A-4. It can be observed that in past calendar periods the risk of conceiving a child of any order was higher, and that this is most pronounced for transitions to parities two and three. Antinatalist population policies in Turkey, such as the Population Planning Law of 1965 and the Family Planning Law of 1983, may have played a role in the decline of the risk of having a second or third birth. A comparison of the relative risks with respect to employment status reveals that non-employed women have a relatively higher risk of transition to a next birth compared to employed women in almost all calendar periods. The exceptions are the 1975–1995 period for the transition from second to third birth, and the period prior to 1981 for the transition to fourth and higher-order births. The relative risks of first and third conceptions are almost the same for non-employed and employed women until the second half of 1990s. However, beginning in 1995, which saw the start of a period of financial liberalization and crises and recoveries in Turkey,[25] a change occurs, with the relative risks of first and third conceptions for employed women going into decline and the relative risk among non-employed women remaining stable. The 1994 economic crisis may have caused employed women to postpone motherhood entry and having a third child, and this change in intention may have carried over into the post-1994 economic crisis period. The sectoral shift in the employment of women from agriculture to the service sector may have influenced these differentiations in birth intensities between employed and non-employed women. For conceptions of order two, and four and higher, on the other hand, the relative risks of employed and non-employed women have been converging over time, leading to almost no differentiation.

The interactive effects of parity or age of youngest child and calendar period are presented for the employment exit and entry models in Figure 4, and their descriptive statistics in Table A-5. Looking at how the trends of transition to employment and non-employment evolved over time, it is apparent that both job exit and job entry intensities increased in the period of financial liberalization. Except for the childless category, the parity variable appears to be associated with higher differentials in the relative risk of entering employment, but not that of leaving. The increase in the risk of job exit after the 1994 economic crisis is particularly valid for women with no children, including women pregnant with their first child. Women with one and two living children saw a

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[25] Severe economic crises were witnessed in 1994 and 2001, while 1998 and 1999 saw three less severe downturns (Boratav 2008).

high and increasing risk of job entry after the 1989–1995 period. Finally, a look at the age-of-youngest-child variable reveals that pregnant women have been the most negatively affected over time. The relative risk of transition to non-employment for pregnant women increased very rapidly after 1992, diverging from the other groups of women, while the relative risks are affected little by the age of the youngest child in any calendar period. The relative risk of entry into employment increased after 1992, except for pregnant women and those with infants.

Overall, the interaction models with calendar year and fertility variables for employment entry and exit indicate that the employment outcomes of pregnant women were affected the most by the macro context. For them, economic downturns seem to considerably increase the relative risk of transition to non-employment and to decrease their relative risk of transition to employment.

Figure 3:   Interaction effects of employment status and calendar period on birth events, standardized for other factors, Turkey

a) Transition from marriage to first conception

b) Transition from first birth to second conception

c) Transition from second birth to third conception

d) Transition from previous birth to next conception for fourth and higher-order conceptions
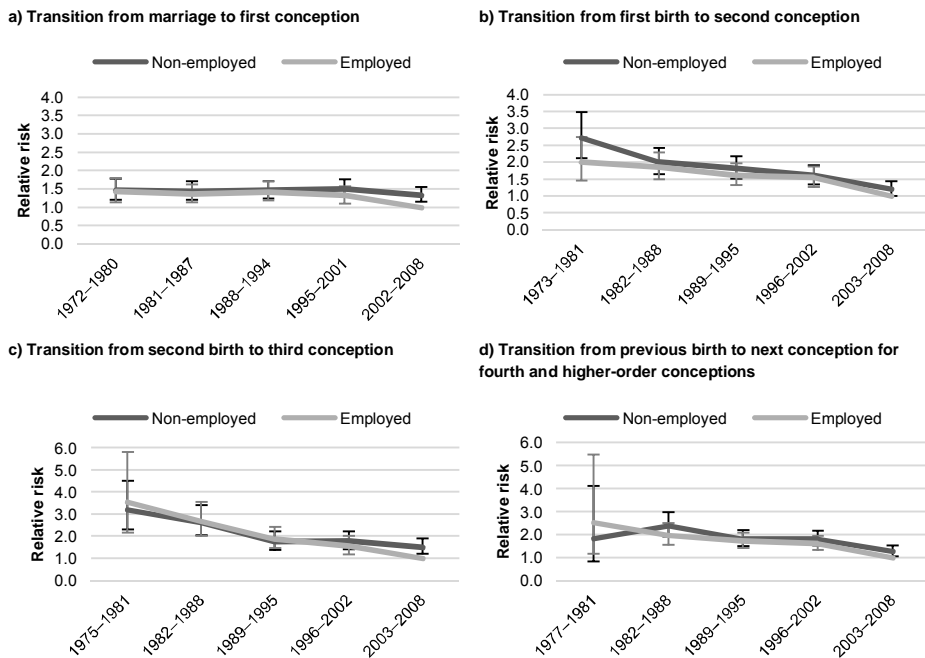
Note: Bars indicate 95% confidence intervals.

Figure 4: **Interaction effects of fertility variables and calendar period on events of employment exit and entry, standardized for other factors, Turkey**

a) Transition from employment to non-employment by parity

b) Transition from employment to non-employment by age of youngest child

c) Transition from non-employment to employment by parity

d) Transition from non-employment to employment by age of youngest child
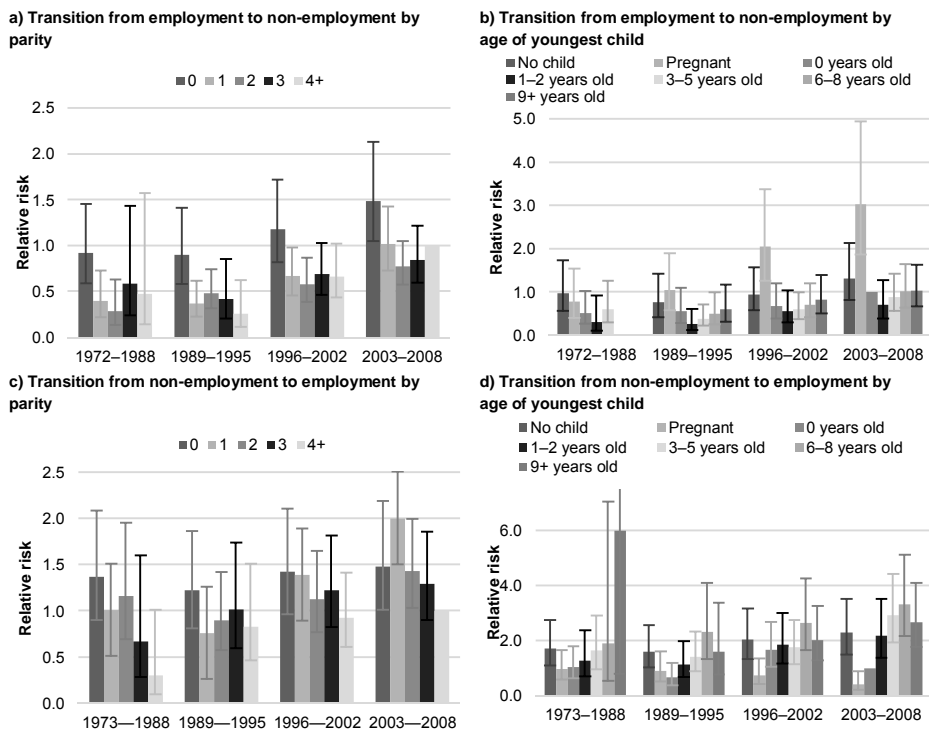
Note: Bars indicate 95% confidence intervals.

6. Conclusion and discussion

This study analyzes the two-way relationship between women's employment and fertility in Turkey using retrospective individual-level data. Specifically, we analyze the association of the employment status and job characteristics of women with the risk of first, second, third, and fourth and higher-order conceptions, and the association of fertility and its parity-age dimensions with exit from and entry into employment among women, using a hazard approach with piece-wise constant exponential modeling.

Our overall findings suggest a two-way negative association between fertility and employment among women in Turkey. Important contextual developments have taken place since Stycos and Weller's 1967 study, which found no change in employment

status relating to fertility due to compatibility of mother and worker roles in Turkey. In line with the role incompatibility hypothesis, the contextual evolution appears to have changed the association between employment and fertility among women in Turkey from insignificant to strongly negative by favoring the incompatibility of women's roles as worker and mother since the second half of the 1960s. The contextual changes that have taken place in Turkey are mainly in the nature of the jobs undertaken by women, and much of this can be attributed to the sectoral shift from agricultural jobs to service sector jobs. We controlled for this sectoral change through the use of retrospective information on job characteristics.

A limitation of this study is that the organization of childcare could not be included in the analyses due to a lack of data related to childcare in the family in an event history setting. Nonetheless, based on related macro-level variables and given that no opportunity exists to test for this at the micro level, it can be concluded that the sectoral change in jobs has not been accompanied by any apparent change in social organization in terms of the institutionalization of childcare in Turkey. A second limitation of the data has been the lack of information on part-time versus full-time differentiation of jobs. In studies employing event history analysis of women's employment–fertility nexus this differentiation is taken into account (Budig 2003; Drobnic 2000; Drobnic, Blossfeld, and Rohwer 1999). Women may prefer to switch to part-time work – an important characteristic of flexible employment schemes – to combine their mother and worker roles. In Europe, flexible work opportunities and strategies to combine the two roles have not developed equally. The highest rates of part-time employment among women with children are observed in Western European countries, while in Greece, Spain, Portugal, and Central and Eastern European (CEE) countries (except Estonia and Latvia) women rarely switch to part-time employment but rather leave work (Matysiak 2011a). In Turkey the part-time employment rate is close to the OECD average and has recently become an available option in legislation for civil servant mothers while their children are below school age.[26] This legislation helps women combine the responsibilities of worker and mother, but it also puts women at an economic disadvantage since while they are working part-time, wages and other benefits are paid in proportion to the time worked. Part-time work is not the only tool used as a labor market indicator of family–work reconciliation: the possibility of organizing working hours – another flexibility tool – and the magnitude of barriers to labor market entry are other determinants of the level of conflict between working and mothering (Matysiak 2011c), which in the case of Turkey could be used as other structural tools for the reconciliation of women's working and family lives.

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[26] The Law on the Amendment to the Income Tax Law, numbered 6663 and dated 29 January 2016, facilitates parents to take part in such flexible schemes as part-time employment.

The third limitation of the study is the impossibility of incorporating partner characteristics – especially employment and level of education – into the analyses due to the structure of the data. The TDHS-2008 includes only current or last partner's education and activity status at the time of the interview. On the other hand the event history data of women used involves historical information on all marriages of women, implying that at any specific time in the past, partner information is missing for divorced or widowed women, making a partner-merge impossible.

Our findings have important policy implications for Turkey. As the total fertility rate in Turkey has reached replacement level the transformation of the demographic structure from a young to an aged population has caused concern in administrative bodies. A traditional and pronatalist approach has been adopted, reflected in the introduction in public discourse since 2008 of the President's motto of "at least three children." The persistent low rates of employment among women have not been given equal priority in government discourse. Recently the reconciliation of work and family life has entered the government's agenda with the aim of creating family-oriented policies, although it is too early to label Turkey an active family policy adopter. The findings of this study indicate that fertility, in all its dimensions – pregnancy, age of children, and parity – decreases the risk of entry into employment among inactive women. Unless they are accompanied by reconciliation mechanisms, the effect of pronatalist policies will be to further deter the employment of women in Turkey.

Childcare arrangements play an essential role in facilitating the relationship between work and family (except in English-speaking countries (Luci-Greulich and Thevenon 2013). Considering the low childcare provision in Turkey, instituting childcare would constitute an efficient reconciliation policy. However, for family policies to be effective they have to comply with the norms and the social life in which the majority of the society want to live (Neyer and Andersson 2008). In Turkey the importance of motherhood in the social and political discourse is such that it may prevent mothers from sending their 0–3 aged children to crèches. To present homecare as the only childcare option has gender-biased implications such as withdrawal of mothers from the labor market. In 2017, in ten pilot cities in Turkey, childcare subsidies were introduced for Turkish citizens who were grandparents with grandchildren under the age of three. Although this pilot policy has not been expanded and was not applied in succeeding years, a childcare subsidy payment to grandmothers could be an effective reconciliation mechanism assisting women to combine their family and working lives.

Future research on Turkey could analyze the cause–effect relationship between women's fertility and employment using different assumptions based on the simultaneity or sequentiality of the two events. Studies examining cause–effect relationships between fertility and women's employment in Turkey using different analytical strategies would open up a new line of literature.

Another promising path would be comparative cross-country studies. The changing association between women's employment and fertility in Turkey from insignificant to strongly negative is similar to that experienced in developing countries (other than those in Latin America[27]), and the current situation is similar to developed countries in the pre-1985 period. The institutional context and the reconciliation of work and family in the experience of developed countries playing an important role in changing the way this relationship is presented. It will be interesting to see whether Turkey and other developing countries experience a similar change in contextual developments and the fertility–female employment relationship to that experienced by their developed counterparts. Accordingly, cross-country studies involving both developing and developed countries, taking into account the institutional context, will be of great interest in shedding light on the question of the linkages between women's fertility and employment.

7. Acknowledgments

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[27] As noted in Section 2.2, the relationship between fertility and female labor force participation was weak or nonexistent in developing countries in the 1960s (Concepcion 1974). However, in the 1990s and 2000s fertility was found to affect employment of women negatively (Caceres-Delpiano 2012). In Latin America, on the other hand, a weakening relationship has been observed recently due to a decline in wage-earner women and an increase in non-wage-earner women.

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Appendix: Control variables and their effects

A-1 Control variables

For models of conception we use five time-varying and three time-fixed control variables. In the multi-episode model with fourth and higher-order conceptions the order of conception is added as a time-fixed covariate, leading to four time-fixed control variables in total. Sample compositions of each of these control variables, including the baseline of the conception models, are provided in Table A-1a. The first group of control variables consists of the period and age variables, namely the calendar year and age at start of the episode, which is either age at first marriage or age at previous birth, depending on the order of conception. Calendar year is a time-varying explanatory variable that shows the influence of changes in the socioeconomic and political environment on birth intensities, as well as the trend in birth risks over time. It is generally constructed in seven-year intervals. The age categories at the start of the episode may change, depending on the conception model. As a control for socioeconomic characteristics, we control for education in our models. This variable is formed based on the assumption that education starts at the age of six and continues with no interruptions until the level reported in the interview is attained. In this way the education variable includes the category of "in education." The categories of this variable refer to completed levels of education (graduation). We also control for residential variables to standardize traditional/modern settings and other contextual factors. These variables are (1) urban/rural type of residence[28] and (2) region – relating to the five regions in Turkey, West, South, Central, North, and East, constructed using data related to the migration histories of women. Finally, we control for the background variables of mother tongue, parental education, and marital status. Mother tongue is a proxy for ethnicity and includes the categories Turkish, Kurdish, and Other, while parental education is defined by a combination of the educational levels of the mother and father, in which educated means having completed the primary level of education at minimum, while uneducated implies no education or incomplete primary education. The marital status variable is based on event history data on marriages. The separated category corresponds to not living together (through planned separation or divorce), divorced, or widowed. Finally, we control for the order of conception in the multi-episode model, analyzing fourth and higher-order conceptions as the order of the next conception or event.

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[28] The category of 'abroad' is excluded, as cases were censored when they moved abroad. Those who were abroad when the episode started are also excluded.

Descriptive statistics of the control variables and the baseline of multi-episode employment exit and entry models are presented in Table A-1b. The employment exit model includes six time-varying and six time-fixed control variables. In the employment entry model there are six time-varying and four time-fixed control variables. Age at start of the episode is the age at start of employment or non-employment, depending on the model. The other control variables are the same as in the conception models, except for the variable of order of conception. Instead of this variable, work-related control variables are used in the employment exit and entry models, work experience and order of job in the employment exit model, and years of non-employment after marriage and order of non-employment episode in the employment entry model. Work experience/years of non-employment are time-varying covariates that reflect cumulative human capital. The experience variables start from the first marriage, as does our observation period. The employment exit model has two additional work-related variables, sector of employment and social security coverage, which are time-fixed variables that are used as proxies for the organization and nature of work.

Table A-1a: Women or non-pregnancies exposed to birth risk, descriptive statistics of control variables

	First conception model				Second conception model				Third conception model				Fourth and higher order conceptions model			
	Exposure		Events		Exposure		Events		Exposure		Events		Exposure		Events	
	Woman-months	%	First con-ceptions	%	Woman-months	%	Second con-ceptions	%	Woman-months	%	Third con-ceptions	%	Non-pregnancy months	%	Fourth and higher order con-ceptions	%
Duration since start of episode (Baseline)																
year 1	54,785	42	4,048	64	71,868	28	1,303	26	57,403	16	592	21	66,656	17	964	29
year 2	23,017	18	1,242	20	50,779	20	1,355	27	46,479	13	685	25	51,530	13	927	28
year 3	12,554	10	454	7	35,153	14	851	17	37,682	10	419	15	40,476	10	479	15
year 4	7,831	6	236	4	24,531	9	567	11	31,466	9	292	11	33,863	8	312	9
year 5	5,412	4	123	2	17,386	7	410	8	26,584	7	240	9	28,899	7	188	6
years 6–7	7,158	6	100	2	21,957	8	369	7	42,729	12	271	10	46,733	12	261	8
years 6–10	6,789	5	56	1	16,975	7	207	4	45,390	12	189	7	49,913	12	123	4
10+ years	11,378	9	46	1	21,067	8	49	1	76,323	21	79	3	82,691	21	50	2
Control variables																
Age and period variables																
Calendar years																
1972–1980[a], 1973–1981[b], 1975–1981[c], 1977–1981[d]	8,167	6	478	8	8,514	3	359	7	4,104	1	131	5	1,373	0	35	1
1981–1987[a], 1982–1988[b,c,d]	19,351	15	1,116	18	29,831	11	898	18	25,600	7	532	19	24,072	6	525	16
1988–1994[a], 1989–1995[b,c,d]	27,412	21	1,518	24	58,911	23	1,416	28	70,492	19	716	26	73,427	18	928	28
1995–2001[a], 1996–2002[b,c,d]	34,571	27	1,700	27	76,758	30	1,414	28	122,692	34	823	30	136,796	34	1,147	35
2002–2008[a], 2003–2008[b,c,d]	39,425	31	1,493	24	85,703	33	1,023	20	141,168	39	567	20	165,093	41	670	20
Age at first marriage[a]/first birth[b]/second birth[c]/previous birth[d] (time-fixed)																
12–16[a, b], 13–19[c], 14–19[d]	30,520	24	1,292	20	15,467	6	529	10	39,436	11	664	24	12,445	3	218	7
17–21[a, b], 20–24[c, d]	60,157	47	3,326	53	120,816	47	2,778	54	162,507	45	1,458	53	105,297	26	1,248	38
22–26[a, b], 25–29[c, d]	28,561	22	1,379	22	88,779	34	1,450	28	116,773	32	542	20	155,351	39	1,236	37
27–31[a, b], 30–34[c, d]	7,202	6	257	4	27,409	11	299	6	39,488	11	91	3	92,901	23	475	14
32–46[a], 32–44[b], 35–41[c], 35–46[d]	2,485	2	53	1	7,246	3	55	1	5,853	2	13	0	34,768	9	129	4
Socioeconomic variables																
Education																
No education or primary incomplete	29,268	23	1,129	18	29,266	11	1,136	22	44,934	12	951	34	152,938	38	2,032	61
Primary level	62,443	48	3,446	55	133,002	51	2,965	58	232,418	64	1,561	56	219,533	55	1,199	36
Secondary level	8,856	7	476	8	21,263	8	304	6	24,778	7	104	4	12,546	3	41	1
High school or higher level	27,504	21	1,214	19	75,973	29	703	14	61,925	17	152	5	15,744	4	32	1
In education	855	1	41	1	212	0	2	0	1	0	0	0				

Table A-1a: (Continued)

	First conception model				Second conception model				Third conception model				Fourth and higher order conceptions model			
	Exposure		Events		Exposure		Events		Exposure		Events		Exposure		Events	
	Woman-months	%	First con-ceptions	%	Woman-months	%	Second con-ceptions	%	Woman-months	%	Third con-ceptions	%	Non-preg-nancy months	%	Fourth and higher order con-ceptions	%
Residential variables																
Type of place of residence																
Urban	87,557	68	4,315	69	198,570	77	3,392	67	273,207	75	1,694	61	263,387	66	1,633	50
Rural	40,979	32	1,977	31	60,336	23	1,704	33	90,145	25	1,067	39	136,187	34	1,663	50
Region																
West	21,441	17	978	16	53,283	21	692	14	61,902	17	256	9	36,975	9	167	5
South	7,403	6	364	6	13,786	5	324	6	20,395	6	180	6	24,988	6	170	5
Central	26,649	21	1,547	25	57,878	22	1,208	24	83,881	23	662	24	95,801	24	529	16
North	9,629	7	473	8	17,075	7	383	8	24,287	7	221	8	31,860	8	208	6
East	63,555	49	2,941	47	117,399	45	2,502	49	173,558	48	1,450	52	211,039	53	2,226	67
Background variables																
Mother tongue (time-fixed)																
Turkish	105,274	82	5,237	83	233,448	90	4,127	81	330,428	91	2,000	72	299,117	75	1,531	46
Kurdish	19,680	15	890	14	20,618	8	836	16	26,248	7	672	24	87,640	22	1,608	49
Other	3,971	3	178	3	5,650	2	147	3	7,379	2	96	3	14,005	3	167	5
Parental education (time-fixed)																
Mother and father uneducated[e]	40,945	32	1,934	31	62,806	24	1,861	36	118,253	32	1,288	47	198,173	49	2,074	63
One educated other uneducated	40,842	32	2,223	35	91,334	35	1,799	35	132,902	37	936	34	127,223	32	812	25
Mother and father educated	38,886	30	1,773	28	92,106	35	1,114	22	89,818	25	340	12	42,384	11	146	4
Missing	8,253	6	376	6	13,470	5	337	7	23,083	6	205	7	32,982	8	273	8
Marital status																
Separated	6,853	5	6	0	10,571	4	7	0	10,607	3	3	0	11,729	3	3	0
First marriage	120,472	93	6,257	99	244,717	95	5,003	98	345,556	95	2,719	98	382,128	95	3,249	98
Later marriages	1,601	1	43	1	3,470	1	78	2	7,502	2	45	2	6,842	2	52	2
Other variables																
Order of conception (time-fixed)																
Fourth													198,898	50	1,432	43
Fifth													97,129	24	779	24
Sixth or higher order													104,734	26	1,094	33
Total	128,926	100	6,306	100	259,717	100	5,110	100	364,056	100	2,768	100	400,762	100	3,305	100

Note: [a] First conception model, [b] Second conception model, [c] Third conception model, [d] Fourth and higher order conceptions model, [e] uneducated: None or primary incomplete; educated: Primary complete or above. The variables are time-varying unless otherwise stated. "Woman-months" is the total number of months that women are exposed to the risk of becoming a mother. "Events" indicates the number of conceptions resulting in live birth.

Table A-1b: **Employment or non-employment spells exposed to exit risk, descriptive statistics of control variables**

	Employment exit model				Employment entry model			
	Exposure		Events		Exposure		Events	
	Employment-months	%	Exiting employment	%	Non-employment months	%	Becoming employed	%
Duration since start of episode (Baseline)								
year 1	28,776	8	367	22	73,440	8	483	23
year 2	23,526	7	270	16	68,654	8	239	11
year 3	21,152	6	190	11	64,014	7	156	7
year 4	19,562	6	122	7	59,568	7	138	7
year 5	18,658	5	95	6	55,788	6	93	4
years 6–7	35,790	10	147	9	100,808	12	170	8
years 8–10	49,126	14	147	9	126,523	15	206	10
10+ years	154,010	44	342	20	319,174	37	611	29
Control variables								
Age and period variables								
Calendar years								
1972–1988[a] 1973–1988[b]	40,126	11	121	7	100,599	12	210	10
1989–1995	69,700	20	193	11	179,816	21	297	14
1996–2002	112,312	32	514	31	278,210	32	637	30
2003–2008	128,462	37	851	51	309,345	36	951	45
Age at start of employment[a]/start of non-employment[b] (time-fixed)								
12–16	134,964	38	295	18	215,820	25	359	17
17–21	97,999	28	456	27	428,879	49	936	45
22–26	57,073	16	371	22	148,277	17	461	22
27–49	60,564	17	559	33	74,993	9	339	16
Socioeconomic variables								
Education								
No education or primary incomplete	63,636	18	184	11	205,549	24	255	12
Primary level	197,419	56	820	49	481,293	55	1,117	53
Secondary level	12,491	4	136	8	62,439	7	164	8
High school or higher level	76,851	22	534	32	117,617	14	546	26
In education	204	0	5	0	1,072	0	12	1
Residential variables								
Type of place of residence								
Urban	189,750	54	1,403	84	691,560	80	1,707	82
Rural	159,538	46	263	16	174,318	20	374	18
Region								
West	52,789	15	386	23	126,878	15	405	19
South	19,575	6	63	4	49,676	6	79	4
Central	83,534	24	283	17	196,200	23	363	17
North	41,796	12	89	5	43,120	5	135	6
East	152,739	44	857	51	451,528	52	1,111	53

Table A-1b: (Continued)

	Employment exit model				Employment entry model			
	Exposure		Events		Exposure		Events	
	Employment-months	%	Exiting employment	%	Non-employment months	%	Becoming employed	%
Background variables								
Mother tongue (time-fixed)								
Turkish	309,981	88	1,540	92	705,527	81	1,918	92
Kurdish	31,289	9	103	6	140,048	16	130	6
Other	9,330	3	37	2	22,395	3	47	2
Parental education (time-fixed)								
Mother and father uneducated[c]	114,549	33	402	24	328,795	38	557	27
One educated other uneducated	117,684	34	593	35	296,853	34	697	33
Mother and father educated	91,996	26	589	35	188,112	22	713	34
Missing	26,371	8	96	6	54,209	6	129	6
Marital status								
Separated	16,070	5	126	7	23,363	3	149	7
First marriage	326,826	93	1,523	91	831,841	96	1,910	91
Later marriages	7,703	2	32	2	12,766	1	37	2
Other variables								
Order of job[a]/Order of non-employment[b] (time-fixed)								
First	262,265	75	1,066	63	788,443	91	1,583	76
Second	67,747	19	385	23	63,331	7	347	17
Third	14,166	4	149	9	12,046	1	105	5
Fourth and higher order	6,422	2	80	5	4,149	0	60	3
Work experience after marriage[a]/Non-employment experience after marriage[b]								
0 years	325,434	93	1,440	86	826,661	95	1,784	85
1 year	5,814	2	69	4	5,958	1	26	1
2–4 years	9,443	3	94	6	14,092	2	72	3
5+ years	9,908	3	78	5	21,259	2	213	10
Employment status (time-fixed)								
Sector								
Agriculture	187,445	53	313	19				
Non-agriculture	163,155	47	1,367	81				
Public versus private								
Public	42,786	12	130	8				
Private	307,814	88	1,550	92				
Status								
Wage earner	149,813	43	1,244	74				
Non-wage earner	200,540	57	432	26				
Other	247	0	4	0				
Social security								
Uncovered	252,181	72	930	55				
Covered	98,188	28	748	45				
Missing	231	0	2	0				
Total	350,600	100	1,680	100	867,970	100	2,095	100

Note: [a] Employment to non-employment model, [b] non-employment to employment model, [c] uneducated: None or primary incomplete; educated: Primary complete or above. The variables are time-varying unless otherwise stated.

A-2 Associations of other covariates with fertility

Table A-2 details the effects on fertility in Turkey of age and period, socioeconomic background, and other control variables. The results indicate that the risk of first conception is highest in the first year of first marriage, and after the first year within marriage the risk declines constantly. The second conception risk peaks 4–5 years after the first birth. In earlier calendar periods the risk of conceiving a child is higher, and is more pronounced in the transition to the parities of two and over. The macro environment, and population policies in Turkey such as the Population Planning Law of 1965 and Family Planning Law of 1983, may have played a role in the decline in the risk of having second or higher births. The risk of first birth with respect to age within the first marriage shows an inverse U-shape, peaking among women who married aged 17–21 and steadily declining after the age of 21. The results differ for third and higher-order conceptions, with the risk being higher among the younger age groups than the 20–24 age group. This may be because when a woman gives birth at a young age, the transition to the next birth also occurs at a young age. As a socioeconomic factor, education affects transition to motherhood and having higher-order parities. The lower the level of education, the higher the risk of entering motherhood or having more births. The spatial control factors of urban/rural place of residence and region have no effect on transition to motherhood but come into play after the first birth. In rural areas, women have 20% higher second and third birth intensities and 50% higher high-order birth intensities than their counterparts in urban areas. Women living in the South, Central, North, and East regions of Turkey have higher second and higher-order birth risks than women in the Western region. Mother tongue and the spatial variables are effective after the first conception. Kurdish women and women of other ethnicities have higher second and higher-order births risks than Turkish women. This finding is consistent with Yavuz's (2006) finding that the third-birth risk is 1.5 times higher among Kurdish women than among Turkish women, based on TDHS-2003 data. Parental education is a factor affecting all transitions to parities, with higher risks for uneducated parents than educated parents. Lower birth risks are prevalent among separated women, while women in later marriages have a higher birth risk than women in their first marriage. Finally, higher-order births are more likely among sixth or higher-order births than fourth births, implying that once a high order of birth is reached, transition to much higher orders is more likely.

Table A-2: **Relative risk of conception by control variables, standardized for employment status and employment before marriage, Turkey 1972-2008**

	First conception	Second conception	Third conception	Fourth and higher conception
Duration since start of episode (Baseline)				
year 1	1	1	1	1
year 2	0.77***	1.67***	1.68***	1.44***
year 3	0.54***	1.72***	1.51***	1.09
year 4	0.46***	1.85***	1.42***	0.95
year 5	0.36***	2.09***	1.50***	0.72***
years 6–7	0.22***	1.64***	1.17*	0.67***
years 8–10	0.13***	1.31***	0.84	0.32***
10+ years	0.07***	0.30***	0.23***	0.08***
Age and period variables				
Calendar years				
1972–1980[a], 1973–1981[b], 1975–1981[c], 1977–1981[d]	1.17**	2.16***	2.45***	1.75*
1981–1987[a], 1982–1988[b,c,d]	1.14***	1.71***	1.95***	1.88***
1988–1994[a], 1989–1995[b,c,d]	1.16***	1.53***	1.32***	1.49***
1995–2001[a], 1996–2002[b,c,d]	1.17***	1.38***	1.26***	1.47***
2002–2008[a], 2003–2008[b,c,d]	1	1	1	1
Age at start of episode (time-fixed)				
12–16[a,b], 13–19[c], 14–19[d]	0.81***	1.02	1.20***	1.21**
17–21[a,b], 20–24[c,d]	1	1	1	1
22–26[a,b], 25–29[c,d]	0.95	0.93**	0.70***	0.74***
27–31[a,b], 30–34[c,d]	0.74***	0.69***	0.38***	0.43***
32–46[a], 32–44[b], 35–41[c], 35–46[d]	0.55***	0.45***	0.38***	0.25***
Socioeconomic variables				
Education				
No education or primary incomplete	0.91	2.19***	2.72***	2.20***
Primary level	1.15***	1.71***	1.68***	1.64***
Secondary level	1.10	1.27***	1.14	1.29
High school or higher level	1	1	1	1
In education	0.76	1.10	0.00***	
Residential variables				
Type of place of residence				
Urban	1	1	1	1
Rural	0.94*	1.16***	1.20***	1.48***
Region				
West	1	1	1	1
South	1.04	1.33***	1.49***	1.15
Central	1.15***	1.34***	1.57***	1.11
North	1.02	1.36***	1.49***	1.15
East	1.10*	1.56***	1.89***	1.63***
Background variables				
Mother tongue (time-fixed)				
Turkish	1	1	1	1
Kurdish	0.99	1.22***	1.59***	1.59***
Other	1.09	1.28***	1.44***	1.55***

Table A-2:   (Continued)

	First conception	Second conception	Third conception	Fourth and higher conception
Parental education (time-fixed)				
Mother and father uneducated[e]	1.09*	1.32***	1.34***	1.44***
One educated other uneducated	1.15***	1.18***	1.28***	1.26**
Mother and father educated	1	1	1	1
Marital status				
Separated	0.04***	0.06***	0.08***	0.07***
First marriage	1	1	1	1
Later marriages	1.58*	1.42***	1.12	1.53***
Other variables				
Order of conception (time-fixed)				
Fourth				1
Fifth				1.00
Sixth or higher order				1.17***
Constant	0.05	0.00	0.00	0.00
Number of cases (weighted)	6,937	6,561	5,105	6,056
Number of conceptions	6,292	5,073	2,760	3,296
Time at risk (months)	128,536	257,959	362,961	399,510
Log likelihood	−10,611	−8,001	−5,795	−7,210
LR chi2	1,135	1,337	2,047	3,112
Prob > chi2	0.0000	0.0000	0.000	0.000

Note: * 10 %; ** 5 %; *** 1 %. [a] First conception model, [b] Second conception model, [c] Third conception model, [d] Fourth and higher-order conceptions model, [e] Uneducated: None or primary incomplete; educated: Primary complete or above. The variables are time-varying unless otherwise stated.

A-3 Associations of other covariates with employment exit and entry

The findings of the employment exit models in Table A-3 indicate that after the first two years of employment the risk of job exit declines as the duration of employment increases. An analysis of the age and period variables reveals that in the most recent calendar period there were more job exits than in the past. As expected, jobs started by the younger age groups who work during education and/or before marriage are more likely to end than those started in the 22–26 age group. Lower education levels are associated with a higher risk of job exit, and dismissals or inferior working conditions among the less-educated group of women may result in relatively more job exits. The "in education" category is also associated with higher job exits compared to those in high school or in higher education, as would be expected. Relative risks associated with residential control variables indicate that women living in rural areas record a lower risk of job exit than those living in urban areas, and women living in regions other than the West also have a lower risk of job exit than those living in the West. The background variables of mother tongue and marital status are not associated with job exit. Having

one rather than two educated parents is associated with an increased risk of exiting employment, according to the parity and composite models. Among the employment variables, job sector appears to be the most correlated with employment exit risk. In the agricultural sector the risk of exiting employment is lower than in the industrial and services sectors, as would be expected. Social security coverage seems to play no role in the risk of exiting employment. Third and higher-order jobs are associated with a higher risk of job exit, and, finally, having five years or more work experience after the first marriage is related to a lower risk of exiting employment.

The results of the employment entry model are presented in the last three columns of Table A-3. As duration increases the risk of entering employment declines, and becomes stable after five years of continuous non-employment. Looking at the age and period variables, in the most recent calendar period there were more job exits and job entries, implying that turnover in Turkey is currently increasing compared with the past. An age of 27–49 years at start of non-employment implies less risk of job entry, since at later ages a non-employment episode may begin as a result of retirement. A lower educational level is an influential variable and means less risk of job entry, as implied by human capital theory, which states that investment in education leads to higher productivity and higher earnings. Residential variables are also correlated with employment entry among women, in that living in rural rather than urban areas increases the intensity of job entry, and the risk of entering employment is higher among women living in regions other than the West of Turkey. Unlike in the employment exit models, the background variables are effective in the employment entry models. Kurdish women have a lower risk of job entry than Turkish women, and a lower level of education in the parents implies a lower intensity of employment entry. As regards marital status, being separated increases the risk of entry into employment when compared to being in the first marriage. Looking at the non-employment variables, as the order of the episode increases the risk of entering employment increases when compared to women in their first episode of non-employment since marriage. When we look at the persistence of non-employment, interestingly, women in non-employment for five years or more after marriage are more likely to enter employment than women with less than one year of non-employment. This indicates that when women spend time as non-employed a saturation point exists, and after that point is reached they are more likely to enter employment, preventing them from being persistently non-employed.[29]

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[29] Although 39.4% of women never worked in their lifetime according to TDHS-2008, the share of non-employment months is more than twice that of employment months in our event data.

Table A-3: **Relative risk of job exit and job entry by control variables, standardized for fertility variables, Turkey 1972–2008**

Transition from	Employment to non-employment			Non-employment to employment		
	Parity model	Child-age model	Parity + child-age model	Parity model	Child-age model	Parity + child-age model
Duration since start of episode (Baseline)						
year 1	1	1	1	1	1	1
year 2	0.97	0.94	0.95	0.56***	0.61***	0.60***
year 3	0.83	0.80*	0.81*	0.42***	0.42***	0.41***
year 4	0.62***	0.60***	0.61***	0.42***	0.39***	0.39***
year 5	0.53***	0.50***	0.51***	0.32***	0.28***	0.29***
years 6–7	0.45***	0.43***	0.45***	0.34***	0.27***	0.30***
years 8–10	0.37***	0.34***	0.36***	0.36***	0.25***	0.28***
10+ years	0.32***	0.29***	0.31***	0.45***	0.26***	0.32***
Age and period variables						
Calendar year						
1972–1988[a]; 1973–1988[b]	0.50***	0.48***	0.48***	0.69***	0.73***	0.73***
1989–1995	0.49***	0.48***	0.48***	0.61***	0.62***	0.62***
1996–2002	0.73***	0.73***	0.73***	0.82***	0.83***	0.82***
2003–2008	1	1	1	1	1	1
Age at start of episode (time-fixed)						
12–16	1.42***	1.44***	1.38**	1.11	1.13	1.14
17–21	1.14	1.14	1.10	1.02	1.05	1.04
22–26	1	1	1	1	1	1
27–49	0.99	0.92	0.95	0.70***	0.60***	0.63***
Socioeconomic variables						
Education						
No education or primary incomplete	1.15	1.10	1.11	0.56***	0.52***	0.57***
Primary level	1.28**	1.22*	1.25**	0.64***	0.63***	0.65***
Secondary level	1.74***	1.66***	1.69***	0.63***	0.62***	0.63***
High school or higher level	1	1	1	1	1	1
In education	1.64	1.86	1.92	1.55	1.44	1.50
Residential variables						
Type of place of residence						
Urban	1	1	1	1	1	1
Rural	0.51***	0.51***	0.51***	1.27***	1.27***	1.27***
Region						
West	1	1	1	1	1	1
South	0.90	0.88	0.89	0.70***	0.70***	0.72***
Central	0.73***	0.72***	0.72***	0.58***	0.58***	0.59***
North	0.58***	0.57***	0.57***	1.00	1.00	1.01
East	0.78**	0.76**	0.76**	0.41***	0.41***	0.42***

Table A-3: (Continued)

Transition from	Employment to non-employment			Non-employment to employment		
	Parity model	Child-age model	Parity + child-age model	Parity model	Child-age model	Parity + child-age model
Background variables						
Mother tongue (time-fixed)						
Turkish	1	1	1	1	1	1
Kurdish	1.03	1.03	1.05	0.73**	0.74**	0.75**
Other	1.06	1.07	1.06	1.05	1.06	1.08
Parental education (time-fixed)						
Mother and father uneducated[c]	1.04	1.02	1.02	0.83**	0.82**	0.84**
Mother or father educated	1.17*	1.14	1.15	0.87*	0.87*	0.88
Mother and father educated	1	1	1	1	1	1
Marital status						
Separated	1.11	1.16	1.17	2.05***	1.96***	1.94***
First marriage	1	1	1	1	1	1
Later marriages	0.87	0.87	0.89	0.93	0.99	0.99
Other variables						
Order of job[a] or order of non-employment episode[b] (time-fixed)						
First	1	1	1	1	1	1
Second	0.97	0.96	0.96	1.56***	1.51***	1.54***
Third	1.18	1.20	1.18	1.87***	1.80***	1.83***
Fourth and higher order	1.13	1.16	1.16	2.89***	2.64***	2.77***
Work experience[a] or years of non-employment[b] after marriage						
0 years	1	1	1	1	1	1
1 year	1.09	1.09	1.11	0.75	0.69	0.69
2–4 years	1.00	0.99	1.02	1.15	1.00	1.04
5+ years	0.86	0.83	0.84	2.35***	1.84***	1.98***
Sector of job (time-fixed)						
Agriculture	0.41***	0.41***	0.41***			
Non-agriculture	1	1	1			
Social security coverage of job (time-fixed)						
Covered	1	1	1			
Uncovered	1.05	1.02	1.03			
Constant	0.01	0.02	0.01	0.01	0.01	0.01
Number of jobs/non-employment spells (weighted)	3,920	3,920	3,920	7,213	7,213	7,213
Number of job exits/entries	1,666	1,666	1,666	2,081	2,081	2,081
Time at risk (months)	349,288	349,288	349,288	865,878	865,878	865,878
Log likelihood	–3,677	–3,632	–3,612	–6,219	–6,150	–6,126
LR chi2	919	933	1,016	1,110	1,183	1,202
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: * 10 %; ** 5 %; *** 1 %. [a] Employment to non-employment model, [b] non-employment to employment model, [c] uneducated: None or primary incomplete; educated: Primary complete or above. The variables are time-varying unless otherwise stated.

Table A-4: **Women or non-pregnancies exposed to birth risk, descriptive statistics of interaction variables**

	First conception model				Second conception model				Third conception model				Fourth and higher order conceptions model			
	Exposure		Events		Exposure		Events		Exposure		Events		Exposure		Events	
	Woman-months	%	First con-ceptions	%	Woman-months	%	Second con-ceptions	%	Woman-months	%	Third con-ceptions	%	Non-preg-nancy months	%	Fourth and higher order con-ceptions	%
Interaction variables																
Calendar years																
Non-employed																
1972–1980[a], 1973–1981[b], 1975–1981[c], 1977–1981[d]	5,249	4	314	5	5,565	2	249	5	2,911	1	84	3	864	0	21	1
1981–1987[a] 1982–1988[b,c,d]	13,194	10	785	12	20,289	8	622	12	17,567	5	357	13	15,429	4	349	11
1988–1994[a] 1989–1995[b,c,d]	19,926	15	1,122	18	40,458	16	1,017	20	48,272	13	493	18	48,971	12	632	19
1995–2001[a], 1996–2002[b,c,d]	23,175	18	1,221	19	53,191	20	1,021	20	84,729	23	615	22	92,704	23	820	25
2002–2008[a], 2003–2008[b,c,d]	25,917	20	1,155	18	58,711	23	784	15	93,918	26	448	16	115,300	29	510	15
Employed																
1972–1980[a], 1973–1981[b], 1975–1981[c], 1977–1981[d]	2,917	2	164	3	2,949	1	110	2	1,193	0	47	2	509	0	14	0
1981–1987[a] 1982–1988[b,c,d]	6,156	5	331	5	9,541	4	276	5	8,033	2	175	6	8,643	2	176	5
1988–1994[a] 1989–1995[b,c,d]	7,486	6	396	6	18,453	7	399	8	22,220	6	223	8	24,456	6	296	9
1995–2001[a], 1996–2002[b,c,d]	11,396	9	479	8	23,567	9	393	8	37,963	10	208	8	44,092	11	327	10
2002–2008[a], 2003–2008[b,c,d]	13,509	10	338	5	26,992	10	239	5	47,250	13	119	4	49,793	12	160	5
Total	128,926	100	6,306	100	259,717	100	5,110	100	364,056	100	2,768	100	400,762	100	3,305	100

Note: [a] First conception model, [b] Second conception model, [c] Third conception model, [d] Fourth and higher-order conceptions model. The variables are time-varying.

Table A-5: **Employment or non-employment spells exposed to exit risk, descriptive statistics of interaction variables**

		Employment exit model				Employment entry model			
		Exposure		Events		Exposure		Events	
		Employment-months	%	Exiting employment	%	Non-employment months	%	Becoming employed	%
	Interaction variables								
	Parity*calendar years								
	Calendar years								
Childless	1972–1988[a] 1973–1988[b]	10,830	3	66	4	28,911	3	105	5
	1989–1995	9,025	3	62	4	28,948	3	92	4
	1996–2002	13,669	4	144	9	32,289	4	133	6
	2003–2008	12,904	4	169	10	29,901	3	140	7
Parity 1	1972–1988[a] 1973–1988[b]	12,657	4	30	2	30,524	4	57	3
	1989–1995	18,462	5	45	3	46,425	5	68	3
	1996–2002	24,434	7	127	8	58,703	7	169	8
	2003–2008	26,451	8	234	14	63,130	7	291	14
Parity 2	1972–1988[a] 1973–1988[b]	8,615	2	11	1	22,547	3	35	2
	1989–1995	20,510	6	56	3	51,028	6	70	3
	1996–2002	34,374	10	120	7	88,145	10	177	8
	2003–2008	44,156	13	237	14	96,164	11	296	14
Parity 3	1972–1988[a] 1973–1988[b]	4,761	1	10	1	11,832	1	10	0
	1989–1995	10,505	3	20	1	27,329	3	41	2
	1996–2002	19,413	6	70	4	48,503	6	96	5
	2003–2008	21,986	6	109	7	57,537	7	136	6
Parity 4+	1972–1988[a] 1973–1988[b]	3,263	1	5	0	6,784	1	2	0
	1989–1995	11,198	3	9	1	26,087	3	26	1
	1996–2002	20,421	6	54	3	50,570	6	62	3
	2003–2008	22,964	7	102	6	62,614	7	88	4

Table A-5: (Continued)

	Employment exit model				Employment entry model			
	Exposure		Events		Exposure		Events	
	Employment-months	%	Exiting employment	%	Non-employment months	%	Becoming employed	%
Age of the youngest child*calendar years								
Calendar years								
Pregnant 1972–1988[a] 1973–1988[b]	7,240	2	25	1	19,067	2	31	1
1989–1995	7,492	2	37	2	22,784	3	28	1
1996–2002	8,336	2	94	6	26,137	3	28	1
2003–2008	5,082	1	94	6	20,316	2	13	1
Childless 1972–1988[a] 1973–1988[b]	7,721	2	46	3	20,571	2	80	4
1989–1995	6,602	2	36	2	20,780	2	73	3
1996–2002	10,844	3	85	5	23,371	3	115	5
2003–2008	11,027	3	120	7	22,541	3	133	6
0 years 1972–1988[a] 1973–1988[b]	9,413	3	21	1	24,775	3	35	2
1989–1995	11,090	3	26	2	33,346	4	28	1
1996–2002	12,369	4	42	3	39,492	5	81	4
2003–2008	7,991	2	43	3	32,844	4	46	2
1–2 years 1972–1988[a] 1973–1988[b]	6,253	2	8	0	16,208	2	24	1
1989–1995	9,497	3	12	1	27,446	3	33	2
1996–2002	11,684	3	34	2	34,573	4	71	3
2003–2008	8,497	2	33	2	30,917	4	76	4
3–5 years 1972–1988[a] 1973–1988[b]	7,390	2	21	1	16,664	2	31	1
1989–1995	18,388	5	34	2	45,873	5	64	3
1996–2002	24,221	7	78	5	66,672	8	117	6
2003–2008	23,710	7	126	8	66,604	8	210	10
6–8 years 1972–1988[a] 1973–1988[b]	1,730	0	0	0	2,862	0	6	0
1989–1995	9,253	3	23	1	19,208	2	48	2
1996–2002	16,704	5	63	4	38,028	4	101	5
2003–2008	19,897	6	124	7	42,398	5	154	7
9+ years 1972–1988[a] 1973–1988[b]	378	0	0	0	450	0	3	0
1989–1995	7,379	2	24	1	10,378	1	21	1
1996–2002	28,152	8	118	7	49,936	6	125	6
2003–2008	52,258	15	311	19	93,727	11	318	15
Total	350,600	100	1,680	100	867,970	100	2,095	100

Note: [a] Employment to non-employment model, [b] non-employment to employment model. The variables are time-varying.