

CAUSAL ANALYSIS OF TIME TO FIRST BIRTH AND FIRST MARRIAGE IN TURKEY

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The rapid fertility decline witnessed in recent years is one of the major demographic issues in Turkey. The economic and social transformations had caused an accelerated and sustained decline in the level of current fertility. The fertility rate was estimated at 4.3 children per woman in 1978 survey, while the latest estimated fertility rate is 2.2 children in 2003 survey. In every society the decline in fertility often proceeds in two stages. The first stage is the decline in fertility due to an increase of age at first marriage (natural fertility control). The second stage involves the adoption of contraception and a change in the fertility behavior.

The fertility research in Turkey is mainly concentrated on static analysis of fertility models. However in order to understand the determinants of time interval passed until the event experienced, it is rather important to use dynamic approaches which incorporates the time dimension into the analysis. This study has a rationale to contribute to understanding of fertility in Turkey by studying the first stage of fertility transition, namely the age at first birth and in relation to this age at first marriage. In a methodological view, the main purpose of this study is to model the age at first marriage and first birth with demographic, social, economic and contextual characteristics of women and to estimate their effects on the transitions to first union and first birth.

In the data analysis of this study, the 2003 Turkey Demographic and Health Survey (TDHS-2003) is used as the principle data source. It is the latest one as a national level survey in population and health survey series that have been conducted by the Hacettepe University.

According to Cox model the hazard of giving the first birth is decreasing as the women ages. All of cohort (age groups) categories' hazards are significantly different. Regarding the regions, only the women living in the Central region is significantly different from the women in the West region and the hazard of giving the first birth in Central region is ten percent greater than the hazard of women in the West region. In the Cox model there is no differentiation among women living in urban or rural settlements. Moreover, there is no differentiation among women categorized according to their child place of residence. As expected, the education covariate is important in the hazard of first birth. As the education level of the women increases the hazard gradually decreases. Women completed at least high school have an hazard of first birth fifty percent less than the hazard of women with no education. Additionally, the education of mother is also important. Having a mother with at least secondary school education reduces the hazard of first birth to 82 percent of the hazard faced when having a mother with no education. On the contrary, the education level of husband has no effect on the hazard of the first birth. Contrary to the expectations, type of marriage has no effect on the transition to first birth.

According to exponential estimation results, all cohorts are significantly different at $p < 0.05$ level. Being in Cohort 3 (25-29 age group) and Cohort 6 (40-44 age group) has an accelerating effect on the transition to first birth. In the exponential model, the effects of region, type of place of residence, childhood place of residence and ethnicity on transition time to first birth are not significantly important. The effect of educational levels are all significant at 0.05 level and completing at least high school slow down the time to first birth by 30 percent compared to having no education. In the exponential model, the woman's mother's education has also a significant effect on the time to first birth. As the education level of mother

increases, the time to first birth is postponed. Women who have worked before marriage wait longer time period for first birth compared to women who have not worked.

According to Weibull estimation results, as in the previous models the cohort effect is important in the hazard of first birth. Being in an older cohort reduces the hazard of first birth compared to being in a younger cohort. The effect of living in Central and Eastern regions shows an increasing hazard of ten percent higher than living in the Western region. In the Weibull model, Kurdish speaking women are significantly different from Turkish speaking women with higher hazards of first birth. Women's mother's education has also direct effect on the hazard in this model. Working before marriage decreases the hazard by 22 percent compared to non-worked women. The effect of educational level of husbands on the hazard of first birth become significant in the Weibull model.

According to lognormal estimation results; all cohorts have a reducing effect on the hazard of transition to first birth. Women living in the Central and East regions have higher hazards compared to women in other regions while Kurdish speaking women also have higher hazards compared to Turkish speaking women. Hazard of first birth decreases as the educational level of women and husband increases, while only the women whose mothers had a high school education have lower hazards of first birth compared to other women. Having worked before marriage has also a decreasing effect on the hazard of first birth. The results of log-logistic model quietly resembles the log-normal distribution.

In the estimated Gompertz model, the effect of being in cohort 2 (20-24 age group) and cohort 3 (25-29 age group) on the hazard become insignificant. The effect of education of women and their husbands continues in the same way as in the other models.

As a result of applying all the event history methods to the transition to first birth, it is found that according to the AIC values for the time to first birth Log-logistic parametric method is the best one to explain the time to event with selected covariates. Moreover, the log-logistic model has the largest log likelihood which indicates the best-fitting model is the log-logistic model.

According to Cox model the hazard of marrying for the first time decreases as the cohorts get older, compared to youngest cohort 1 (15-19 age group). All of cohort categories' hazards are significantly different. Regarding the regions, only the women living in the Central region is significantly different from the women in the West region and the hazard of being married in Central region is ten percent greater than the hazard of women in the West region. In the Cox model there is no significant differentiation among women living in urban or rural settlements with respect to first marriages. Moreover, there is no differentiation among women categorized according to their child place of residence. Kurdish speaking women have a risk of first marriage 12 percent higher than the Turkish speaking women. As it is found in the first birth case, the education covariate is also important in the hazard of first marriage. As the education level of the women increases the hazard gradually decreases. Women completed at least high school have an hazard of first marriage almost fifty percent less than the hazard of women with no education. The education of mother is found to be insignificant in the transition to first marriage. On the contrary, the education level of husband has an effect on the hazard of the first marriage. Contrary to the expectations, number of siblings has no effect on the transition to first birth. It is believed that women with high number of siblings have a greater tendency to marry. However, this is not proven here.

According to exponential estimation results, all cohorts are significantly different at $p < 0.05$ level. In the exponential model, as in the case of first birth, the effects of region, type of place of residence, childhood place of residence

an ethnicity on transition time to first birth are not significantly important. The effect of educational levels are all significant at 0.05 level and completing at least high school slow down the time to first marriage by 30 percent compared to having no education. In the exponential model, the woman's mother's education has no significant effect on the time to first marriage. Women who have worked before marriage wait shorter time period for first marriage compared to women who have not worked.

According to Weibull estimation results, as in the previous models the cohort effect is important in the hazard of first marriage. Being in an older cohort reduces the hazard of first marriage compared to being in a younger cohort. The effect of living in Central regions shows an increasing hazard of twelve percent higher than living in the Western region. In the Weibull model, Kurdish speaking women are significantly different from Turkish speaking women with eleven percent higher hazards of first marriage. The effect of number of siblings can be seen in this Weibull model. Women's education has also direct effect on the hazard in this model. Working before marriage decreases the hazard by 26 percent compared to non-worked women. The effect of educational level of husbands on the hazard of first marriage become significant only for husbands with high school education.

According to lognormal estimation results; all cohorts have a reducing effect on the hazard of transition to first marriage. Women living in the Central regions have higher hazards compared to women in other regions while Kurdish speaking women also have higher hazards compared to Turkish speaking women. Hazard of first marriage increases as the educational level of women and husband increases. Having worked before marriage has also a decreasing effect on the hazard of first marriage.

The log-logistic model's gamma value -less than one- shows that the log-logistic hazard increases and then decreases. According to Log-logistic estimation results, the gamma value less than one indicates that the hazard of first marriage first increases then decreases. The effect of covariates on the hazard are similar with those in the log-normal model, with one exception that in the log-logistic model the East region has become significant at 0.05 level.

In the Generalized Gamma distribution, the effects of the covariates on the hazard are the same with those in log-logistic model. In the estimated Gompertz model, the effect of cohorts and the education of women on the hazard continues in the same way as in the other models. The type of place of residence and number of siblings become significant in the hazard of first marriage. For age at first marriage Gamma Generalized model is selected according to AIC although this model has not the largest log likelihood which indicates the best-fitting model.

To sum up, both in age at first marriage and age at first birth analysis the most important covariates are age, education of women and ethnicity.

The TDHS-2003 is a cross-sectional survey with many severe inferential limitations. Longitudinal data are more effective in causal analysis and have less inferential limitations. The processes in the life course and their change in time can best be studied with longitudinal data. Therefore, in order to understand the social processes, the research design should be based on longitudinal data. Considering the importance of the event history methods, there should be a more explicit consideration of construction of event history data in Turkey. Data explicitly collected for the purposes of duration analysis will substantially improve the usage of event history models in Turkey's social science environment.