Three Essays on Child Education

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Dedicated to my mother Senel Kale and my father Ibrahim Kale

ABSTRACT

The aim of this thesis is to examine and analyse three separate aspects of child education. Being a developing and a global country, Turkey can be affected easily by the recent trends in the world. In order to overcome the possible hardships and poverty, and continue to develop, education is the most important and effective tool. Given the importance of education, it is needed to pay attention to diminish the inequalities in the education system particularly at the primary level, and help the most disadvantaged children. In this way, the country can develop as a whole and achieve a sustainable socio-economic development. This provides the motivation for the empirical analysis presented in this thesis which examines how the education of children is influenced by their parents' decisions - whether the parents chose to migrate, who they chose to marry, and whether they choose to put their children to work - in detail and makes policy suggestions where needed.

The first empirical study, which is presented in Chapter 2 examines the effect of having a mother with a migration background on the educational attainment of children in Turkey. The results indicate that having a migrant mother increases the probability of starting high school and to continue to post compulsory education. However once the selective nature of migration is taken into account, results change dramatically. Chapter 3 investigates the effect of intermarriage on the educational attainment of children from those marriages in Germany. Since the results are mixed, the findings indicate that it is not easy to generalize the effect of intermarriages on the educational attainment of children. However findings show that what children experience in the school environment changes the effect of intermarriage. The third empirical study, which is presented in Chapter 4 aims to examine the determinants of Turkish children's participation in schooling and

alternate activities. The findings indicate that the parental education is the main determinant in deciding which activity the children participate in. Also, being older and female decreases the probability to attend school. Moreover, having very young children at home increases the probability that children engage in alternate activities other than schooling.

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ABBREVIATIONS

CDF: Cumulative Distribution Function

CPS: Current Population Survey

HLFS: Household Labour Force Survey

IAB: Institute for Employment Research

IIA: Independence of Irrelevant Alternatives

ILO: International Labour Organization

IPEC: International Programme for the Elimination of the Child Labour

IV: Instrumental Variable

LATE: Local Average Treatment Effect

MNL: Multinomial Logit Model

MNP: Multinomial Probit Model

NUTS: Nomenclature of Territorial Units for Statistics

OLS: Ordinary Least Square

PISA: Programme for International Student Assessment

SOEP: German Socio-Economic Panel

TBMM: Turkish Grand National Assembly

TDHS: Turkey Demographic and Health Survey

TMIDPS: Turkey Migration and Internally Displaced Population Survey

TURKSTAT: Turkish Statistical Institute

UN: United Nations

UNICEF: United Nations Children's Fund

WCS: Working Child Survey

2SLS: Two Stage Least Square

CHAPTER 1: INTRODUCTION

1.1. AIMS AND MOTIVATION OF THE THESIS

Education is one of the critical elements of growth and development. The importance of education in development stemming from the fact that it contributes to economic growth, and individual and social development. Reducing poverty and inequalities, and improving economic status, health and lifestyle are included in the long-term positive outcomes of education.

The role of education is undoubtedly critical in economic growth. Studies suggest that human capital is positively associated with economic development and growth and education enhances human capital formation (Nelson and Phelps, 1966; Barro, 2001). In addition to the direct effects, there are also indirect effects of education such as better public health, better parenting, lower crime, greater social cohesion, which in turn foster economic growth by stimulating the accumulation of productive inputs and by mitigating factors that impede economic growth (Sianesi and Reenen, 2003).

In terms of the effect of education and economic growth and development, it is found that countries at different development levels are affected differently by different educational levels. Petrakkis and Stamatakis (2002), for example, state that while higher education has more importance in developed countries, primary and secondary education are more important for the growth of developing countries.

Because of the importance of education, particularly in developing countries, participation in primary and secondary schools as a kind of human capital enhancement has attracted much interest and has been used widely in the academic literature as an indicator for human capital (Barro, 1991; Mankiw et al., 1992).

As it is a developing country, education is important also for Turkey. In Turkey, an increase in the compulsory primary education from five to eight years in 1997 has

increased the net schooling ratio [1] for primary education (from 84.74% in the 1997/1998 academic year to 98.67% in the 2011/2012 academic year). However, boys have slightly higher net schooling ratio than girls (90.25% for boys and 78.97% for girls in the 1997/1998 academic year and 98.77% for boys and 98.56% for girls in the 2011/2012 academic year) (National Education Statistics, 2016). In 2012, compulsory education was extended to 12 years, and contrary to the previous uninterrupted eight years of primary education, this new reform splits the compulsory education into three levels (4+4+4). After four years of primary school, students stream into one of the different middle schools. Upon completing middle school, students continue to secondary schools. In first year of the new education system (2012/2013), the net schooling ratios were 98.86%, 93.09% and 70.06% for the primary school, middle school and secondary school, respectively. As of the 2015/2016 the net schooling ratios are 94.87% [2], 94.39% and 79.79%, for the primary school, middle school and secondary school, respectively. Moreover, girls have slightly higher net schooling ratio than boys. These figures indicate that the education reforms have been beneficial to increase the net schooling ratios and close the gender gap significantly in the net schooling ratios. The presented figures on the schooling ratios above, however, reflect the enrollment at the beginning of the academic year, not the completed education of individuals.

One of the main problems that most developing countries suffer is students' discontinuity and consequent dropout from the education system. The students who are absent and drop out of school are expected to be the most disadvantaged students. Disadvantaged students may refer to the poor, working children, ethnic

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[1] Net Schooling Ratio = (Number of students in the theoretical age group / Total population in the theoretical age group) x 100
[2] The reason for the considerable amount of decrease in the primary school net schooling ratio is enabling children who are at the age of primary school to enroll in the pre-primary school with the regulation in the law.

minorities, refugees, and so on. It should be countries' highest priority to diminish the inequalities in the education system so as to increase retention of children in school, decrease drop-out and improve completion and progression to secondary schooling.

There are several factors that affect the educational attainment and success of children: child characteristics, school factors and family characteristics. Among these factors, the family plays a central role. Fathers and mothers are the first teachers of their children, and the education of children starts with what they learn and see from their parents at home.

At certain decision points, parents take actions by evaluating the costs and benefits of the alternative choices. Any decision they made will impact their economic, cultural and social capitals. While building their own economic and non-monetary resources with their decisions, they will also shape their children's current and future human capital investments including their education. Because educational attainment of children is closely linked to the backgrounds of their parents in the human capital literature, the decisions are made by parents will certainly affect children's education.

Given the importance of education (particularly the education of disadvantaged children) and families' role in children's education, this thesis examines the influence of parent's decisions on the educational outcomes of children from different aspects with the aim of making suggestions for policy makers.

Firstly, the aim of the second chapter is to investigate whether there is a causal effect of having a mother with a migration history on the educational attainment of individuals. In Turkey, during the last sixty years a massive internal migration has taken place. Currently, every three people out of ten are living in a province which is

different from their birth province (TURKSTAT, 2016). While internal migration is common, there are only a few studies which examine the effect of migration on human capital. It is important to know what kind of relationship exists between migration and education to develop suitable policies to prevent negative consequences of migration on the educational attainment of children.

Like internal migration, migration flows across countries have also escalated significantly and has become one of the most significant issues in the world. Worldwide, the number of people who are living outside their countries of birth is estimated to be 243 million in 2015. In the last two decades, the rate of people who live in a country other than their countries of birth has increased from 2.7% in 1995 to 3.3% in 2015 (OECD, 2017). Since migration is a costly event (not only financial cost but also social and psychological), as the rate of migration increases, it brings potential problems. A lack of integration of immigrants, for example, will result in unrest in society. Therefore, one of the problems- maybe the most vital one- is how to integrate the immigrants and particularly the children of immigrants to the host society.

Due to its nature, intermarriage is assumed to be a good indicator to what extent immigrants are integrated to a host country. Intermarriage took place in many societies throughout the centuries and it is now very prevalent as an inevitable result of globalization and migration flows. As education is the key to the development of a country and there is evidence that intermarriages have a positive effect on the education of children, it is imperative to understand the impact of parent's marriage on the children's achievement for policy makers to design appropriate policies to promote ethnic minorities' educational achievement, and ultimately to contribute to development.

Turkey, which has been a migrant giving country since the 1960s, is currently a migrant receiving country. In order for Turkey to continue and at least preserve the gains it made on education, policy makers should not focus only on the policies which design the immigration but also on the policies which design the integration of the immigrant population in the country. Although each country has its own dynamics, lessons and experiences of countries which have been migrant receiving countries for a long time, should be taken into account during the policy-making process. In this context, the aim of the third chapter is to examine the intermarriage theme and investigate its effect on child education in Germany with its largest migrant population in Europe, which serves as an example for Turkey. Germany has 10.7 million foreign-born individuals and this equals to 13.1 percent of its population in 2011 (Rica et. al., 2013).

Finally, the aim of the fourth chapter is to identify the relevant factors that determine the children's participation in different activities in Turkey. As mentioned above, increased enrollment rates do not guarantee that children are getting a proper education, since the enrollment rates reflect only the figures at the beginning of the academic year. Because of the available alternate activities such as child labour (both market and non-market), it is possible that many children may not be actually attending school. Even if these activities do not prevent children from going to school, they may hamper children's ability to do homework, play and rest. Despite the fact that Turkey having achieved increased enrollment rates and decreased child labour within the last two decades, there is still room for improvement. The share of children who are involved in market work dropped from 15% in 1994 to 10% in 1999, and to 6% in 2006 and 2012. While there is a gradual decrease in market work, the share of children who do domestic work increased. The share of children

engaged in household chores rose significantly from 28% in 1999 to 44% in 2006, and to 49% in 2012. As of 2012, 46% of the children aged 6–14 and 57% of the children aged 15–17 are engaged in household chores (TURKSTAT and ILO, 2007; and TURKSTAT and ILO, 2013).

Previous studies about child labour in Turkey considered child labour in the form of market work. Since the share of nonmarket work is much greater than the share of market work, however, this is an inappropriate approach in the context of Turkey. Excluding household chores from child labour studies does not adequately represent the situation in Turkey. Therefore, to understand child labour in its entirety, it is imperative that non-market work is also taken into consideration, and market and non-market work are disaggregated from each other in the empirical analysis. In this context, the fourth chapter identifies the factors underlying household decisions regarding the relevant determinants of participation in schooling and alternate activities by considering also non-market work as a form of child labour. In this way the findings may be informative for policy-makers and help to reduce the drop-out rate which are 10% at the primary school level (UNDP, 2016) and improve the completion and progression to secondary schooling.

1.2. STRUCTURE AND CONTENT OF THE THESIS

Chapters 2, 3 and 4, for which the aims and motivations are set out above, present the empirical studies of three separate studies on child education. Chapter 5 provides an overall conclusion of the thesis. The contents of Chapter 2, 3 and 4 are summarized below.

1.1.1. Chapter 2

Chapter 2 investigates the effects of having a mother with migration history on children's education in Turkey. The analysis in this study uses the Turkey

Demographic and Health Survey (TDHS) for the year 2008. It contains detailed information on both mothers and their children. The most important reason for using TDHS-2008 is that it differs from the other TDHSs by providing information on the migration history of the mothers since the age of 12. In order to explore the relationship between a mother's migration background and the education of her children, a standard OLS equation is estimated as a starting point. However, due to the selective nature of migration, it is not straightforward to estimate the casual effect of mothers' migration on child education. The migration decisions are correlated with individuals' observed and unobserved characteristics, and this may cause biased results. Therefore an instrumental variables model is also estimated to solve potential endogeneity problem and to further explore the robustness of the results.

The main finding of this chapter is that Turkish mothers' internal migration has an effect on their children's educational attainment. Having a migrant mother increases the probability of starting high school and to continue to post compulsory education. Another main finding relates to the econometric methodologies employed in this chapter since the results of the main interest variables are different, which highlights the importance of accounting for the selective nature of the migration.

1.1.2. Chapter 3

The empirical analysis in Chapter 3 investigates the effect of intermarriage on the educational attainment of children using data from Germany. In this study intermarriage is defined as the marriage between any immigrant and a native. Thus, a non-intermarried (immigrant-immigrant married) individual is any immigrant who is not married to a native, and he/she does not have to share the same country of origin as his/her partner. For the purpose of this study, the German Socio-Economic

Panel (SOEP) is used. The SOEP is a nationally representative longitudinal survey, which started in 1984, and in this chapter the 2013 wave is used as a cross sectional data set. The most important reason for using the 2013 wave is that it introduced a new sample (IAB-SOEP Migration Sample) to the survey which oversamples immigrants and includes rich information on both first and second generation immigrants.

It is found that having intermarried parents does not have a significant effect on the educational attainment of children compared to having native-native and immigrant-immigrant married parents respectively. However, while there are no significant differences between having an immigrant mother-native father and having two immigrant parents; having an immigrant father-native mother has a significant and negative relationship with the education of children compared to having two immigrant parents. These findings indicate that it is hard to generalize the effect of intermarriages on the educational attainment of children since the results are mixed. Moreover since the results are different for each type of intermarriage, this indicates that the results are not stemming from the characteristics of intermarriage but the characteristics of the intermarried fathers and mothers. Another important finding is that school environment is a vital factor that affects the children's educational attainment. After additionally controlling for whether children had experienced any disadvantages in school due to country of origin, a positive effect of having intermarried parents compared to having native-native parents is found. This implies that policy makers should attach high importance to make institutions more aware about the potential discrimination against children with a migrant background and to make sure that all children have equal opportunities in education.

1.1.3. Chapter 4

Chapter 4 identifies the relevant determinants of the participation in different child activities in Turkey using the 2012 Household Labour Force Survey (HLFS-2012) and the 2012 Working Child Survey (WCS-2012). As a first step, a multinomial logit model (MNL) is estimated in order to analyze the determinants of child participation in different activities. However, MNL requires the independence of irrelevant alternatives (IIA) assumption, which may cause biased results when it is violated. Therefore, since the data set contains the children from the same households and these children are likely to share the same unobserved family characteristics, a random effects multinomial logit model is also estimated to relax the IIA assumption.

The results indicate that parental education is found to be a primary determinant of child activities for all age groups (6-14 and 15-17). As fathers and mothers become more educated, the probability of doing a higher amount of housework and working in the labour market decreases. The findings also indicate that a child who is older and female is less likely to attend school for all age groups. Moreover, the number of siblings aged 5 and younger creates a burden on girls and boys. Presence of very young children prevents both girls and boys from schooling by increasing the probabilities of working in the labour market for boys and of doing only housework for girls in the 15-17 age group. It also increases the probability of doing more hours of housework for girls in the 6-14 age group.

CHAPTER 2: EFFECT OF MOTHER'S MIGRATION ON THE CHILD EDUCATION

2.1. INTRODUCTION

Turkey has experienced a significant amount of internal migration over the past five decades. In particular, a large number of people migrated to urban areas from rural parts of Turkey. According to the last Census in 2000, 65% of the population is living in urban places and every three people out of ten are living in a province which is different from their birth provinces (Berker, 2011a).

While migration is common in Turkey, there are few studies about the effect of migration on individuals' human capital. The economic and social benefits of human capital are well known and its role for economic development cannot be denied. Therefore, an analysis of migration's effect on human capital, especially education which has a crucial role in human capital accumulation, is necessary.

In this context, the aim of this study is to examine the effect of having a mother with migration history on children's education in Turkey. However, due to the selective nature of migration, it is not easy to estimate the causal effect of mother's migration on child education. In order to address this problem caused by the selectivity of migration, the instrumental variables method is employed and risk of migration will be used as an exogenous variation in migration. The contribution of this study to the literature is two folded: there is no study that examines the impact of mother's migration on children's educational attainment using data from Turkey and this is the only study that uses risk of migration -measured by ever lived in a high conflict or migrant giving province- as an instrument to solve the endogeneity problem.

The plan of this chapter is as follows, Section II summarizes the theoretical background and existing literature on the relationship between migration and child education. Section III presents background information on Turkey. Section IV

outlines the data and methodology as well as variable definitions and constructions. Section V presents the results, and finally Section VI concludes the study.

2.2. LITERATURE REVIEW

Migration has been a popular research topic among economists for a long time with the aim of identifying the determinants and consequences of migration. As stated in the migration literature, migrants are a group of people who do not represent the population in their area of origin. Rather, they may have a tendency to be positively selected based on their socioeconomic characteristics such as, high education, income, occupational skills, age marital status, and so on (Ssengonzi et. al., 2002). The human capital theory of migration, which is introduced by Sjaastad (1962) treats individuals as rational agents who make the cost-benefit analysis of migration and decide to migrate if the benefit from migration is higher than that of staying. Thus, this theory considers migration as an investment.

In these conditions it is expected that with migration better life conditions will be obtained. For example, urban areas are expected to have better infrastructure and public goods such as schools. This situation motivates individuals, who are seeking a way of improving their life outcomes, to migrate from rural areas to urban areas, the rural-urban migration. However, with rapid urbanization, developing countries may not be able to build enough infrastructure and houses for their new residents. As a result, migrants may not be better off than in their pre-migration situation due to increased unemployment and poverty levels. The motivation for migration differs among individuals and as a result the consequences of migration will differ depending on the type of migration.

Considering the aim of the study, there are several channels that mother's migration might affect the educational outcome of children (Onyango, 2011);

- Disruption: This mechanism comes from a social capital perspective. In Woolcook's (2001) study, social capital is defined as a person's family, friends and associates who can be asked for help in a bad situation or may be used to get an advantage. Since the structure and relations between individuals happen in a certain location, social capital is place-based (Lesage and Ha, 2012) and migration may harm one's social networks and relationship with their family and society, so that educational attainment/outcomes of children may be affected negatively from migration. There is a large amount of studies that show the positive relationship between social capital and educational outcomes (see for example Anderson, 2008). However, studies on the determinants of migration (Filiztekin and Gokhan, 2008) state that social networks available in the potential migration province increase the probability to migrate and reduce the adverse effects of migration. In this case, migration may have a positive effect on child education. Although there might be a positive effect of potential social networks, there might be still a disruption effect, because of accumulated social capital left behind.

- Selection: As stated earlier, migrants are a selected, generally positively, group of people based on certain characteristics which also will affect the educational outcome of children.

- Adaptation: After migration children may need some time to adapt to the new location and social environment. As a result, at least at the beginning, they may have different attitudes toward school participation. This is likely to happen in a country such as Turkey since there are high level geographic, economic and social differences among its regions (Filiztekin and Gokhan, 2008). For example, in 2000 the average completed years of schooling is 8.1 for the Istanbul, 7.5 for the Western Marmara, 7.4 for the Aegean, 7.6 for the Eastern Marmara, 8.3 for the Western

Anatolia, 7.3 for the Mediterranean, 7.1 for the Central Anatolia, 6.8 for the Western Black Sea, 7.1 for the Eastern Black Sea, 6.4 the North Eastern Anatolia, 6.1 for the Middle Eastern Anatolia and 5.4 for the South Eastern Anatolia regions in the year 2000 (Filiztekin, 2009)[3]. As can be seen from these figures, there are differences across regions of Turkey in terms of educational attainment. Especially, there is a clear difference between the west and east parts.

With regards to the effect of migration on child outcomes studies to date have mostly focused on health related variables such as height-for-age, weight-for-age (Escobal and Flores, 2009) and child mortality (Ssengonzi et. al., 2002; Konseiga et. al.,2009).

Without controlling for the selectivity of migration and explanatory variables, Onyango (2011) found that mother's migration status increases the probability of school enrolment. Once he controls for explanatory variables he found mixed results for the different type of migrations. According to his findings having a rural-urban migrant mother decreases the probability of enrolment in school.

The most relevant studies to the current study are the ones which are done by Aina et. al. (2008) for Italy and Valverde and Vila (2003) for Spain. Valverde and Vila (2003) found that the probability to enrol in higher education is lower for individuals whose parents are non-native. They also found that non-native children are more likely to stay in education for a shorter period. However, this negative effect is bigger for the first generation migrants and decreasing with the second generation migrants.

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[3] Istanbul, Western Marmara, Aegean, Eastern Marmara, Western Anatolia, Mediterranean, Central Anatolia, Western Black Sea, Eastern Black Sea, North Eastern Anatolia, Middle Eastern Anatolia and South Eastern Anatolia are the regions of Turkey at NUTS (Nomenclature of Territorial Units for Statistics)-1 level.

In Turkey migration became an explanation for the increase in the number of urban residents (Berker, 2011a). Studies focused primarily on the determinants of internal migration in Turkey (Filiztekin and Gokhan, 2008) and labour market consequences of internal migration (Berker, 2011a). Berker (2009) studied the impact of migration on educational outcomes, although he examined its effect on only native (resident of migrant receiving province) children's school completion rates. To the best of my knowledge, there is no study that examines the impact of mother's migration on children's educational attainment using data from Turkey.

2.3. BACKGROUND INFORMATION ON TURKEY

2.3.1. Education System

The Basic Law of National Education, which was issued in 1973, determines the general framework of the Turkish National Education System. The Turkish National Education System consists of two main parts: formal education and informal education. Formal education can be defined as the regular education, which is being given in schools to individuals of a given age. Formal education includes pre-primary, primary, secondary and higher education institutions. Informal education covers all activities and organizations intended to satisfy the educational needs of every individual at any age level and educational background. Informal education activities are offered out-of-school. The aim of informal education is to improve individuals' standard of living by teaching them how to read and write and developing their current skills.

Before August 1997, the formal educational system consisted of primary school, middle school, high school and tertiary levels of schooling. Primary schools were providing five years of compulsory education. After five-year compulsory education, middle school took three years to complete. Finally, high schools follow

the middle schools and take three years (four years in case of technical high schools) to complete.

Between 1997 and 2012[4], the formal educational system consisted of pre-school, primary, secondary and higher education institutions. Primary education, which takes 8 years to complete, is compulsory for everybody and it is free of charge in public schools. With the extension of compulsory schooling, the terms "primary school" (5 years) and "middle school" (3 years) were removed and the term "primary education" (8 years) was introduced. Compulsory education starts at the year when children reach age 6 and it ends when they reach age 14. Finally, high schools, which follow the primary education, cover the education of children aged 14 to 16 (OECD, 2007).

2.3.2. Conflict-Induced Migration

In 1984, the PKK, which is an illegal armed group, attacked Turkish military establishments. This was the starting point of an armed conflict, which has taken place in the provinces located in the East and Southeast of Turkey for 25 years (see Figure A2.1). During the 1987-2002 time period, provinces which experienced intensive clashes were governed by state emergency law. Moreover, in order to cope with the activities of the PKK, the government introduced the 'village guard' system (Berker, 2011b). The aim of the village guard system was to prevent the local individuals from providing support to the PKK, and make use of the knowledge of local individuals who knows the region well. If individuals refused to serve as a village guard, they were forced to leave their residence. On the other side, if they accepted to be a village guard or continued to stay at their residence, they

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[4] In 2012, a new education system, which is called a '4+4+4' system, was introduced. This new system has extended the compulsory education from eight to twelve years and decreased the compulsory age of starting school from 72 to 60 months. However, as a result of the complaints of parents, the compulsory age of starting school was gradually increased to 69 months.

experienced pressure from the PKK to provide them with support (TBMM, 1998). Besides deaths and injuries of individuals, as a result of this long lasting armed conflict, several villages and hamlets were emptied. Eventually this armed conflict led Turkey to have conflict-induced migrants. Because of the security concerns, some of them left their residence voluntarily and others have been forced to displace. According to the estimates of the Turkey Migration and Internally Displaced Population Survey (TMIDPS, 2006), during the 1986-2005 time period the number of individuals who migrated for security reasons could be between 953,680 and 1,201,200, and 87 percent of migrants who migrated for security reasons left forcibly.

2.4. DATA AND METHODOLOGY

2.4.1. Data

The Turkey Demographic and Health Survey (TDHS) for 2008 is used in this study. The survey was administered to 40,054 individuals in 10,525 households, 7,405 of whom are ever-married women. The surveyed households were located in 81 provinces of Turkey. The survey is nationally representative with 2,659 households from rural and 7,866 households from urban areas.

TDHS contains two types of questionnaires: the household questionnaire and the individual questionnaire for ever-married women. The household questionnaire lists all members of and visitors to the selected household and contains information on the age, sex, educational attainment, marital status and relationship to the household head. The ever-married women questionnaire is designed for women, who are listed in the household schedule, between ages 15 and 49 and have been married at least once. This questionnaire contains information on their age, educational attainment,

native language, migration history, marriage history, work history and the husband's background characteristics.

This survey is suited to the analysis because it contains detailed information on both mothers and their children, which constitutes a crucial part in examining the effects of mothers' characteristics on educational attainment of their children.

Another reason for using this data set is that the TDHS-2008 differs from the other TDHSs by providing information on the migration history of women. Migration history data of ever-married women was collected for the first time in TDHS-2008. A history of all migrations, since the age of 12, is recorded for each woman.

This study makes use of this survey by merging the household and ever-married woman data sets. Since the aim is to examine the effect of maternal migration on the educational attainment of children, it is necessary to have information on both mothers and their children in one data set. In order to merge household-level household data set and individual-level ever-married woman data sets, 1:m option of STATA is used, since more than one woman from a unique household may be enlisted in the woman data set. After obtaining one household-level data set, it is reshaped from wide to long. As a result we end up with an individual level data set. Later, by keeping only those whose mother's line number (this variable comes from household data set) is equal to line number (this variable comes from woman data set) of woman, a new data set is created, where each child in the household is matched with their mothers.

As will be explained in the variable definitions section below, whether the child started high school or not and whether the child continued to post-compulsory education or not were used as dependent variables. In order to end up with children who should have completed compulsory education and primary education, children

who are younger than 14, are dropped from the sample. As a result, the final sample includes 2,251 girls and 3,052 boys.

2.4.2. Variable Construction and Definition

Table A2.1 gives an overview of the dependent and independent variables used in this estimating model. However it is important to explain some of them in more detail to have an understanding about their construction.

2.4.2.1. Dependent Variables

Started high school (14-34): This dependent variable takes the value of one if the highest number of years obtained in education (years of schooling ranges between 0-17) or the number of years in education including current school year is higher than 8. It takes the value of zero otherwise. This kind of coding is necessary. If we consider only the highest number of years obtained, the results may be biased since this coding excludes the children who have just started high school. Likewise, considering only the number of years in education including current school year excludes those who have already finished the high school, since if a child is not currently enrolled in school, this variable coded as zero. This dependent variable includes every person older than 13 and younger than 35 who should have finished eight-year primary education and potentially started high school.

Started high school (14-21): This dependent variable takes the value of one if the highest number of years obtained in education or the number of years in education including current school year is higher than 8. It is constructed in the same way as the previous dependent variable, except that it is restricted to individuals aged 14-21. Since elder children may leave their family for higher education or marriage reasons, they may not be represented in the sample, As a result, it may leave an unrepresentative sample if including elder children in the analysis.

Continued to post compulsory education (14-34): If the child is older than 21 at the time of survey, compulsory education is 5 years for them. However if the child is 21 and younger at the time of survey, compulsory education is 8 years. Therefore, this dependent variable takes the value of one if education in single years or education in single years for current school year is higher than 8 for younger children, and for older children it takes the value of one, if education in single years or education in single years for current school year is higher than 5.

2.4.2.2. Independent Variables

Mother's reason of migration: This categorical variable consists of three different categories: forced migration, any reason migration and never migrated. The women were asked to list all their migrations along with the reasons for migration. Dummy variables are created by using the information on the last migration of the women. So that, the 'forced migration' dummy is equal to 1 if the last migration of the woman was for security reasons, and 0 otherwise. The 'any reason' migration dummy is equal to 1 if the last migration of the woman was for any reasons other than the security reasons, and 0 otherwise. The 'never migrated' dummy is equal to 1 if the woman has never migrated since she was 12, and 0 otherwise. These categorical variables are not used as explanatory variables in every regression. They are used only once to see the effect of migration, which occurred for different reasons.

Ever Migrated: Ever migrated is a dummy variable, which takes the value of one if the woman has migrated at least once since the age of 12.

Urban: Since the household questionnaire enlisted every person currently residing in that house, there are children who are visitors of and do not usually live in that household. If a person is not a usual resident of that household, they are asked for

their residence type. While the usual residents' type of residence is recorded as urban or rural, visitors' type of residence is recorded as province centre, district centre, sub-district/village or abroad in the data set. In order to make them comparable, in our analysis province centre and district centre are coded as urban, sub-district/village is coded as rural and abroad is coded as a missing value. Although TDHS-2008 defined "urban" as settlements with a population of 10,000 and more and "rural" as settlements with a population less than 10,000, district centre, which may have a population less than 10,000, is coded as urban in this study for the visitors[5].

Province: Province is the name of the city where the persons usually lives. Visitors are asked for their province of residence. If they reside abroad, it is coded as missing in this study.

Mother's working status: This categorical variable consists of three different categories: mother is currently working, currently not working and mother has never been employed. These dummy variables are created by using the working history information of women. Women were asked to list their paid or unpaid jobs since they were 12. The employed dummy is equal to 1 if a woman is still working in her last job, and 0 otherwise. The unemployed dummy is equal to 1 if a woman is not currently working at her last job, and 0 otherwise. The 'never employed' dummy is equal to 1 if a woman has never worked, and 0 otherwise.

Father related variables: Children can be matched to their father in the household data set, if their father was enlisted in the household data set. Since there are children who are visitors in that household or it is possible that parents of children do not live together due to death or divorce, the fathers of some children are not in

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[5] When the visitors are excluded from the sample, the results do not change.

the dataset. Besides, even if fathers of children are enlisted, there is limited information on fathers. Therefore, only 'father's education' could be included in the model. There is no variable that gives the father's education directly. First, the identifier number of children's father and personal identifier numbers were matched. If a person was matched with a child's father, than the years of education of that person was coded as the father's education. If the father was not enlisted, education of father is coded as missing.

2.4.2.3. Instruments

Ever lived in a high conflict city (everlivedhigh): In a report prepared by the Turkish Grand National Assembly (TBMM, 1998), the number of villages and hamlets emptied for security reasons is given. Those emptied villages and hamlets belong to three different types of province: provinces[6] which were governed by the state emergency law; provinces[7] which were neighbouring provinces to the first type of provinces; and other provinces[8] which have emptied villages and hamlets. In this study, the first and second types of provinces are defined as high-conflict provinces and the third type of provinces are defined as low-conflict provinces. The instrument is a dummy variable, which takes the value of one if the woman has ever lived in a high-conflict province, and zero otherwise.

Ever lived in a migrant sending city (everlivedmig): According to TMIDPS, there are 14 provinces[9] in which severe displacement of individuals took place. The instrument is a dummy variable, which takes the value of one if the woman has ever lived in one of these provinces, and zero otherwise.

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[6] Diyarbakir, Hakkari, Siirt, Sirnak, Tunceli, Van
[7] Batman, Bingol, Bitlis, Mardin, Mus
[8] Agri, Kars, Erzurum, Erzincan, Sivas, Sanliurfa, Adiyaman, Igdir, Elazig
[9] Adiyaman, Agri, Batman, Bingol, Bitlis, Diyarbakir, Elazig, Hakkari, Mardin, Mus, Siirt, Sirnak, Tunceli and Van.

The difference between the two instruments is that while ever lived in a migrant sending city contains all high-conflict provinces; it also contains three of the low-conflict provinces.

Tables A2.2 and A2.3 present the descriptive statistics for the variables used in this study. While Table A2.2 gives the descriptive statistics for the children between ages 14-21, Table A2.3 gives the descriptive statistics for the children between ages 14-34. These tables indicate that there is no significant difference in the descriptive statistics of variables between the two groups of children.

2.4.3. Methodology

The aim of this study is to explore the effect of having a migrant mother on children's educational attainment. However, studies focused on migrants may suffer from the issues of endogeneity without appropriate controls. Migration decisions are typically taken by individuals to make their lives better off, and these migration decisions are correlated with individuals' observed and unobserved characteristics. For instance, income, age, gender, marital status, education, occupational skills, social capital which is defined as information or direct assistance which is available to potential migrants (Garip, 2008), educational aspirations for children, and risk aversion (Oyelere and Wharton, 2013) are some of the characteristics that may affect the propensity to migrate of a person. That is, the individual decision for migration is not random and certain individuals are more or less likely to migrate based on their unobserved characteristics. As a result, those who self-select themselves into migration could be different from those who stay in terms of their characteristics which may also affect their children's future outcomes. Controlling for those characteristics in the estimation can solve the endogeneity problem of

migration, however, generally due to limited datasets it is not always possible to do so.

One way of dealing with the potential endogeneity is employing instrumental variable (IV) analysis. This study uses the risk of migration as a source of exogenous variation in migration.

In order to account for the potential endogeneity of being a migrant mother, instrumental variables will be employed in this study.

Our empirical model takes the following form;

$$Y_i^{child} = \beta_0 + \beta_1 X_i^{child} + \beta_2 X_i^{family} + \beta_3 X_i^{hh} + \beta_4 EVERMIG_i + \sum_{k=2}^{81} \beta_k province_i + \varepsilon_{i1} \quad (1)$$

Where,

$i = 1, 2, \ldots, n$ denotes the child.

Y_i^{child} = Child's educational attainment

X_i^{child} = Vector describing characteristics of children

X_i^{family} = Vector describing characteristics of family

X_i^{hh} = Vector describing characteristics of household

ε_i = Error term

In equation (1) X_i^{child}, is a vector containing the variables age, gender and birth order. X_i^{family}, is a vector containing the variables mother's education, father's education, mother's native language, maternal grandmother's native language, maternal grandmother's education, number of household members, number of living siblings, mother's working status. X_i^{hh}, is a vector containing the variables urban, age of household head, gender of household head, being single parent and household head, and poorwealth which equals to 1 if a wealth index (poorest, poorer, middle, richer, richest) is poorer or poorest. EVERMIG is a dummy variable, which equals one if the mother has migrated at least once, and zero otherwise.

Three dependent variables are used in this study. The first dependent variable is a dummy variable which takes the value of one if the child, currently aged between 14-34, ever started high school, and zero otherwise. The second dependent variable takes the value of one if the child, currently aged between 14-21, ever started high school, and zero otherwise. The third dependent variable is a dummy variable which takes the value of one if the child, currently aged between 14-34, continued to post-compulsory education, and zero otherwise. In the sample, years of compulsory education is not same for everyone due to the change in the law in 1997. While the years of compulsory schooling is 5 for those who are older than 21 years, it is 8 for those who are 21 or younger. In all three cases the dependent variables are binary variables.

The method of Two Stage Least Square (2SLS) is used to estimate the output equation. It follows two steps (Cerulli, 2012):

1. Running an Ordinary Least Square (OLS) regression of the endogenous variable on the instrument and exogenous variables and getting the predicted values of the endogenous variable.

2. Running a second OLS regression of the dependent variable on the exogenous variables and the predicted values of the endogenous variable.

As discussed by Angrist and Pischke (2009, pp. 142-144), IV probit (or logit) may be applicable since the endogenous variable is binary but it is unnecessary, since producing the first stage residuals that are uncorrelated with fitted values and covariates is guaranteed only by OLS estimation of first stage. They can also be produced by probit if the first stage functional form is truly probit, which is not known. With OLS, there is no need to worry about whether the first stage is really linear, since consistency of second stage estimates does not depend on the correct

specification of the first stage functional form (Kelejian,1971). Angrist and Krueger (2001) states that nonlinear second stage estimates require to be correctly specified; and even if the second stage is truly nonlinear, linear instrumental variables can capture the effect of the interest variable. Therefore, 2SLS is a robust estimation method, easily interpreted and consistent even if the dependent and explanatory variables are nonlinear (Angrist, 2001).

As it was mentioned before, risk of migration is used as a source of exogenous variation in migration. That is risk of migration is used as an instrument. Due to high intensity conflict at certain provinces of Turkey, people living at those provinces either left their residences because of security concerns or have been forced to displace. Eventually, those provinces have become the most migrant giving provinces and therefore living in those provinces influences the risk of migration. With the data we have it is possible to explicitly identify the mothers who have ever lived in a high conflict or migrant giving province. Therefore, risk of migration is measured by by two other variables: everlivedhigh, and everlivedmig, which equal to one if the mother has ever lived in one of the cities classified for each dummy, and zero otherwise.

Equations (2) and (3) shows the first stage regressions for the two different instruments:

$$\text{EVERMIG}_i = \alpha_0 + \alpha_1 X_i^{child} + \alpha_2 X_i^{family} + \alpha_3 X_i^{hh} + \alpha_4 \text{everlivedhigh} + \sum_{k=2}^{81} \beta_k province_i + \varepsilon_{i2} \quad\quad (2)$$

$$\text{EVERMIG}_i = \gamma_0 + \gamma_1 X_i^{child} + \gamma_2 X_i^{family} + \gamma_3 X_i^{hh} + \gamma_4 \text{everlivedmig} + \sum_{k=2}^{81} \beta_k province_i + \varepsilon_{i3} \quad\quad (3)$$

The key challenge in using an IV approach is finding a valid instrument. There are two necessary conditions: the instrument is correlated with the endogenous variable and uncorrelated with the error term in Equation 1. Thus, everlivedhigh and everlivedmig should be correlated with the migrant status of the mother and they

should be uncorrelated with ε_{i1}. If these assumptions fail, this study will have either weak instrument or inconsistent estimation issues respectively. The weak instrument problem arises when the correlation between the endogenous variable and the instrument is nonzero but small. If there is a weak instrument problem, the IV estimator will be biased. In order to test whether we have a weak instrument problem or not, we considered two approaches (Baum et al., 2008): Staiger-Stock's (1997) rule of thumb (if the first stage F-statistics is more than 10, there is not a weak instrument problem) and the Cragg-Donald F-statistic (Cragg-Donald F statistics must exceed the critical values, which were tabulated by Stock and Yogo (2005) for the first-stage F-statistic to test whether instruments are weak). However, while it might be convincing that the instruments are correlated with the endogenous variable, it is not automatically true that the instruments are not correlated with the error term in Equation 1. That is, besides influencing the endogenous variable, an instrument may have additional consequences, which affect the outcome variable. If an instrument does not affect the dependent variable except through the endogenous variable (the instrument is not correlated with the error term in Equation 1), this means that the instrument is a valid exclusion restriction. A valid exclusion restriction is a necessary condition for the validity of an instrument. However a test whether the instrument is a valid exclusion restriction or not cannot be performed in the just identified case, where the number of endogenous variable equals to the number of instruments. The instruments, having a mother who has ever lived in a high conflict city and in a migrant giving city, seem to satisfy exclusion restrictions. I see no reason why having a mother who has ever lived in a high conflict city or in a migrant giving city should have a direct effect on child's educational attainment rather than affecting the mother's probability to migrate.

2.5. EMPIRICAL RESULTS

2.5.1. OLS results

Table 2.1 displays the estimates produced by Ordinary Least Squares (OLS) regressions of Equation (1), which shows the effect of migration on various educational attainment variables estimated by treating EVERMIG as exogenous. These estimates show that having a migrant mother is positively related to children's educational attainment, an effect which is statistically significant. A child who has a migrant mother is 3.6 and 2.9 percentage points more likely to start high school in the unrestricted and restricted sample, respectively than those whose mothers have never migrated and lived in the current province of migrants. Since a dummy for each province in which the children are currently residing is included in the estimation, children of migrant and non-migrant mothers currently living in the same province are being compared. Children with migrant mothers are 3 percentage points more likely to continue to post-compulsory education than children with non-migrant mothers.

These results are expected as migration is considered as an investment decision taken by rational individuals. These results also support that migrants are a selective group and that there are some unobservable characteristics that might account for the better school participation of the children. While being female and living in a poor wealth household decreases the probability of starting high school and continuing to post-compulsory education, living in an urban area and living with a family who had difficulties to afford educational expenses increase the probability of starting high school and continuing to post-compulsory education. It is surprising that living with a family who had difficulties to afford educational expenses increases the probability of starting high school and continuing to post-compulsory education. It is

expected to have a negative sign. One reason for this situation could be that having difficulty to afford in the last 12 months could be a temporary situation for the families. Or it could be that families with more children in school have higher educational expenses and are therefore more likely to have difficulties. In the sample, about 70% of children are coming from families who had difficulties to afford educational expenses. These families include not only poor wealth families but also middle and rich wealth families who may give high value to the education of their children.

Mothers' and fathers' education also have a positive and significant effect. One additional sibling decreases the probability of starting high school by 3.8 and 4.2 percentage points for the unrestricted and restricted samples, respectively. Estimation results show that mothers' native language, grandmothers' native language and mothers' employment status have insignificant effects.

Table A2.4 shows the effect of migration for security reasons on various educational attainment variables by treating it as exogenous. Estimates show that having a mother who migrated for security reasons has a significant and positive effect on children's educational attainment. This effect is bigger than the effect of having a mother who migrated for any other reason. However, it may be that mothers who migrated for security reasons self-selected themselves into migration to secure both their and their children's economic and social-wellbeing. Although the observed characteristics of mothers are controlled, for the unobserved characteristics of mothers still affect their propensity to migrate as well as their children's educational attainments.

Table 2 .1. OLS regressions (Linear probability model) for EVERMIG

LHS variables	(1) started high school (14-34)	(2) started high school (14-21)	(3) continue to post compulsory educ. (14-34)
Ever migrated mother	.036*** (0.013)	.029** (0.014)	.030** (0.013)
Control variables			
Second child	0.009 (0.015)	0.018 (0.016)	0.018 (0.015)
Third child	0.012 (0.019)	.038* (0.021)	0.02 (0.018)
Fourth child	-.058** (0.024)	-0.027 (0.027)	-0.038 (0.024)
Fifth child	0.028 (0.027)	.060** (0.029)	.043* (0.026)
Age of hh head	.005*** (0.001)	.005*** (0.001)	.005*** (0.001)
Gender of hh head	-0.094 (0.072)	-0.075 (0.079)	-.124* (0.072)
Gender of child	-.054*** (0.012)	-.048*** (0.013)	-.067*** (0.012)
Age of child	.111*** (0.015)	.239*** (0.05)	.076*** (0.014)
Square of child age	-.003*** (0.000)	-.006*** (0.001)	-.002*** (0.004)
Wealth of hh:poor	-.153*** (0.017)	-.167*** (0.018)	-.143*** (0.017)
Mother's education	.009*** (0.002)	.009*** (0.003)	.009*** (0.002)
Father's education	.018*** (0.002)	.0156*** (0.002)	.017*** (0.002)
Mother's native language:turkish	0.031 (0.037)	0.02 (0.041)	0.027 (0.037)
Mother's native language:other	-0.009 (0.078)	-0.044 (0.088)	0.006 (0.077)
Grandmother's native language:turkish	0.044 (0.037)	0.052 (0.041)	0.051 (0.037)
Grandmother's native language:other	-0.001 (0.07)	-0.004 (0.081)	-0.013 (0.07)
Grandmother's education:low	0.066 (0.108)	0.075 (0.127)	0.097 (0.107)
Grandmother's education:middle	0.081 (0.109)	0.1 (0.128)	0.108 (0.108)
Urban	.094*** (0.016)	.093*** (0.018)	.093*** (0.016)
# of siblings	-.038*** (0.006)	-.042*** (0.007)	-.042*** (0.006)
# of hh members	-.009** (0.004)	-0.003 (0.005)	-0.006 (0.004)
Had difficulties to afford educ. expenses	.044*** (0.015)	.054*** (0.016)	.050*** (0.015)
No educational expenses	-.184*** (0.023)	-.217*** (0.029)	-.151*** (0.023)
Single mother	0.294 (0.399)	0.338 (0.397)	0.335 (0.395)
Mother is hh head	0.069 (0.097)	0.11 (0.107)	0.073 (0.096)
Mother is hh head and single	-0.112 (0.568)	-0.225 (0.565)	-0.124 (0.562)
Mother's working status: employed	-0.001 (0.017)	0.011 (0.019)	-0.001 (0.017)
Mother's working status: never employed	0.007 (0.015)	0.022 (0.017)	0.014 (0.015)
Constant	-.673***	-1.782***	-.438**
Observations	4824	3902	4824
R-squared	0.33	0.336	0.321

Notes: OLS=Ordinary Least Squares. The table shows the effect of having a migrant mother on the probabilities of their childrens' starting high school and continuing to post compulsory education. Data are from Turkey Demographic and Health Survey-2008. In addition to the regressors listed above, all specifications also include province dummies. Specification (1) and (3) include children older than 13 and younger than 35. Specification (2) includes children aged 14-21. The number of observation is 4824 for the Columns (1) and (3), and it is 3902 for the Column (2). Each coefficient is from an equation estimated using OLS. Standard errors are in parentheses. Single asterisk denotes statistical significance at the at the 90% level of confidence, double 95%, triple 99%.

2.5.2. IV results

Table A2.5 shows the result of estimating the first stage regressions as in Equation (2) and (3). Both instruments (everlivedhigh, everlivedmig) are positively and statistically significantly related to migration. Thus, they satisfy one of the criteria to be used as instruments for this variable. The results indicate that having ever lived in a high conflict city increases the probability of being a migrant by 31 percentage points and having ever lived in a migrant giving city increases the probability of being a migrant by 33 percentage points. As explained in the methodology section, the Staiger-Stock (1997) rule of thumb suggests that first-stage F statistics should be larger than 10 to avoid weak identification by the instrument. F-statistics on the instrument are significant. However, while the F-statistics are larger than 10 for the unrestricted sample, when the restricted sample is used, the F-statistics are somewhat below this threshold; 8.2 and 8.7 respectively. Therefore, we might worry that the coefficients on starting high school in Column (2) and (5) might suffer from weak instruments critique which means the correlation between the instruments and the endogenous variable is weak and instruments cannot identify the equation.

When IV estimation is considered, results change dramatically in terms of the effect of migration. Table 2.2 shows the effect of migration instrumented by conflict on educational attainment of children by treating EVERMIG as endogenous.

The IV estimator gives only the Local average treatment effect (LATE). This is the effect of migration on those whose migrant status is affected by the instruments. Therefore, these results do not represent the mothers who migrated even though they have never lived in the conflict region and who did not migrate even though they have ever lived in the conflict region. The results show that having a mother whose migration is induced by conflict decreases the probability of continuing to post-compulsory education by 23 percentage points if everlivedhigh is used as an

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instrument, and this effect is significantly different from zero at the 5% significance level. Having a mother whose migration is induced by conflict decreases the probability of continuing to post-compulsory education 17 percentage points if everlivedmig is used as an instrument, and this effect is also significantly different from zero at 5% significance level. Having a mother whose migration is induced by conflict decreases the probability of starting high school for the restricted sample by 20.7 and 16.9 percentage points in case everlivedhigh and everlivedmig are respectively used as instruments. These effects are significantly different from zero at 10% significance level.

Finally, if everlivedmig is used as an instrument having a mother whose migration is induced by conflict decreases the probability of starting high school by 13.8 percentage points for the unrestricted sample, this effect is significantly different from zero at 10% significance level. However if everlivedhigh is used as an instrument, the coefficient is insignificant. Therefore, there is no effect of having a conflict induced migrant mother on starting high school for the unrestricted sample.[10]

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[10] Once the empirical analyses were run for boys and girls separately, it is found that there is no significant relationship for girls. For boys, however, having a mother whose migration is induced by conflict decreases the probability of continuing to post-compulsory education by 25 percentage points if everlivedhigh is used as an instrument, and by 26 percentage points if everlivedmig is used as an instrument at 10% and 5% significance levels respectively.

Table 2. 2. IV regressions

	Panel A: Estimation Results					
LHS variables	started high school (14-34)	started high school (14-21)	continue to post compulsory educ	started high school (14-34)	started high school (14-21)	continue to post compulsory educ
Ever migrated mother	-0.169 (.103)	-.207* (.113)	-.232** (.104)	-.138* (.072)	-.169* (.078)	-.170** (.072)
Control variables						
Second child	0.013 (0.103)	0.025 (0.017)	0.022 (0.015)	0.012 (0.015)	0.024 (0.017)	0.021 (0.015)
Third child	0.025 (0.015)	.056** (0.023)	.037* (0.02)	0.023 (0.019)	.054** (0.022)	.033* (0.019)
Fourth child	-.048* (0.02)	-0.014 (0.029)	-0.025 (0.025)	-.050** (0.024)	-0.016 (0.027)	-0.028 (0.024)
Fifth child	.055* (0.025)	.097*** (0.035)	.078** (0.03)	.051* (0.028)	.091*** (0.032)	.070** (0.028)
Age of hh head	.005*** (0.03)	.004*** (0.001)	.005*** (0.001)	.005*** (0.001)	.004*** (0.001)	.005*** (0.001)
Gender of hh head	-0.118 (0.001)	-0.11 (0.082)	-.155** (0.075)	-0.115 (0.073)	-0.104 (0.08)	-.147** (0.072)
Gender of child	-.056*** (0.074)	-.051*** (0.013)	-.071*** (0.012)	-.056*** (0.012)	-.050*** (0.013)	-.070*** (0.012)
Age of child	.104*** (0.012)	.237*** (0.051)	.068*** (0.015)	.105*** (0.015)	.238*** (0.05)	.070*** (0.015)
Square of child age	-.003*** (0.015)	-.006*** (0.001)	-.001*** (.0004)	-.003*** (.0004)	-.006*** (0.001)	-.001*** (.0002)
Wealth of hh:poor	-.164*** (0)	-.177*** (0.019)	-.157*** (0.018)	-.162*** (0.017)	-.176*** (0.019)	-.154*** (0.017)
Mother's education	.009*** (0.018)	.010*** (0.003)	.009*** (0.002)	.009*** (0.002)	.010*** (0.003)	.009*** (0.002)
Father's education	.0178*** (0.002)	.015*** (0.002)	.016*** (0.002)	.018*** (0.002)	.015*** (0.002)	.016*** (0.002)
Mother's native language:turkish	0.012 (0.002)	-0.005 (0.043)	0.003 (0.039)	0.015 (0.038)	-0.001 (0.041)	0.009 (0.038)
Mother's native language:other	-0.02 (0.039)	-0.081 (0.091)	-0.008 (0.079)	-0.018 (0.077)	-0.075 (0.088)	-0.005 (0.077)
Grandmother's native language:turkish	0.018 (0.079)	0.022 (0.044)	0.018 (0.04)	0.021 (0.038)	0.027 (0.042)	0.026 (0.038)
Grandmother's native language:other	-0.058 (0.04)	-0.063 (0.087)	-0.086 (0.077)	-0.049 (0.073)	-0.053 (0.083)	-0.069 (0.073)
Grandmother's education:low	0.112 (0.077)	0.15 (0.135)	0.156 (0.113)	0.106 (0.109)	0.138 (0.129)	0.142 (0.109)
Grandmother's education:middle	0.12 (0.112)	0.166 (0.134)	0.158 (0.113)	0.114 (0.109)	0.155 (0.129)	0.146 (0.109)
Urban	.138*** (0.112)	.140*** (0.029)	.150*** (0.028)	.131*** (0.022)	.132*** (0.023)	.137*** (0.022)
# of siblings	-.040*** (0.028)	-.048*** (0.008)	-.047*** (0.006)	-.040*** (0.006)	-.047*** (0.007)	-.046*** (0.006)
# of hh members	-0.006 (0.006)	0.002 (0.005)	-0.002 (0.005)	-0.007 (0.004)	0.001 (0.005)	-0.003 (0.004)
Had difficulties to afford educ. expenses	.054*** (0.004)	.065*** (0.018)	.063*** (0.016)	.052*** (0.015)	.064*** (0.017)	.060*** (0.015)
No educational expenses	-.178*** (0.016)	-.207*** (0.03)	-.144*** (0.024)	-.179*** (0.023)	-.209*** (0.029)	-.146*** (0.023)
Single mother	0.202 (0.023)	0.233 (0.408)	0.217 (0.41)	0.215 (0.4)	0.25 (0.397)	0.245 (0.397)
Mother is hh head	0.108 (0.408)	0.167 (0.113)	0.123 (0.101)	0.102 (0.098)	0.158 (0.108)	0.111 (0.097)
Mother is hh head and single	0.024 (0.101)	-0.078 (0.581)	0.051 (0.584)	0.004 (0.569)	-0.102 (0.565)	0.01 (0.565)
Mother's working status: employed	-0.012 (0.58)	-0.003 (0.021)	-0.014 (0.018)	-0.01 (0.018)	-0.001 (0.02)	-0.011 (0.017)
Mother's working status: never employed	-0.012 (0.018)	-0.005 (0.022)	-0.011 (0.019)	-0.009 (0.017)	-0.001 (0.019)	-0.005 (0.017)
Instruments	*lived in a high conflict city*	*lived in a high conflict city*	*lived in a high conflict city*	*lived in a migrant giving city*	*lived in a migrant giving city*	*lived in a migrant giving city*
Constant	-.544***	-1.701***	-0.274	-.564***	-1.714***	-0.313
Observations	4824	3902	4824	4824	4824	4824
R-squared	0.293	0.192	0.19	0.199	0.2	0.284
	Panel B: Diagnostic Tests					
F-test of instrument	F(109, 4714) = 10.15	F(109, 3792) = 8.24	F(109, 4714) = 10.15	F(109, 4714) = 10.74	F(109, 3792) = 8.70	F(109, 4714) = 10.74
Underidentification test						
Anderson canon. LM statistic~	0	0	0	0	0	0
Weak identification test						
Cragg-Donald Wald F statistic	75.84>CV	61.75>CV	75.84>CV	129.20>CV	102.83>CV	129.20>CV
Weak-instrument-robust inference						
Anderson-Rubin Wald test(F)~	0.096	0.062	0.021	0.077	0.051	0.028
Anderson-Rubin Wald test(χ^2)~	0.092	0.058	0.02	0.073	0.047	0.026
Stock-Wright LM S statistic~	0.092	0.058	0.02	0.073	0.047	0.026

Notes: IV- Instrumental Variables. In addition to the regressors listed above, all specifications also include province dummies. Specification (1), (3), (4), (6) i include children older than 13 and younger than 35. Specification (2) and (5) include children aged 14-21. The number of observation is 4824 for the former, and it is 3902 for the latter. Each coefficient in Panel A is from an IV estimation using ever lived in a high conflict city or ever lived in a migrant giving city as instruments of being an ever migrated mother. Standard errors are in parentheses. Single asterisk denotes statistical significance at the at the 90% level of confidence, double 95%, triple 99%. Panel B reports the tests for instruments' robustness. The F-tests are the test for the strenght of the instruments. ~ denotes a p-value and CV denotes Stock-Yogo weak ID test critical values.

When the IV and OLS results of control variables are compared, it could be seen that coefficients are quite similar in terms of both significance and magnitude. For example, a one year increase in mothers' and fathers' education increases the probability of starting high school and continuing to post compulsory education in OLS and all specifications of IV. Considering that mothers typically spend more time with their children, it is surprising that fathers' education increases the probabilities more than mothers' education.

In terms of birth order, estimates give mixed results. While there is no significant difference between second and first children, being fifth or younger than fifth child increases the probability of starting high school and continuing to post-compulsory education. This contradicts earlier findings in the education literature, as Dayioglu et.al. (2009) find in their study that there is a negative relationship between educational enrolment and birth order. Thus, the educational enrolment of the first children is higher than the later born children. From my point of view, one explanation for my result could be that older children are more likely to experience the effect of conflict-induced migration in person.

In Column (2) and (5), it is shown that F-statistics of the instruments are 8.24 and 8.70. This means that these instruments are potentially weak, since the rule of thumb is that first stage F-statistics should be above 10. Therefore, a range of test statistics is used to test the weak identification in this study. Table 2.2 summarizes statistical tests for instruments' robustness. The underidentification test (Baum et al., 2008) suggests that the null hypothesis of underidentification can be rejected comfortably, since p-values of Anderson canonical correlations LM statistic are 0.00 for all specifications. This implies that the model is identified, which means that the instrument is correlated with the endogenous regressor. The underidentification test

is an LM test of whether the instrument is correlated with the endogenous regressor. The weak identification test (Baum et al., 2008) suggests that the instruments used in the model are not weak, since the Cragg-Donald Wald F statistics are higher than the Stock-Yogo weak identification test critical values in all specifications. As a result instruments and the endogenous regressor are correlated and this correlation is not weak. Since only one of the instruments is used in each regression, there are no overidentifying restrictions and results for weak-instrument-robust inference tests are not interpreted. The weak-instrument-robust inference tests (Baum et al., 2008) examine the null hypothesis that the coefficients of the endogenous regressors in the structural equation are jointly equal to zero and that the overidentifying restrictions are valid. Accepting the null hypothesis means that the coefficients of the excluded instruments are jointly equal to zero and the instruments are valid. In conditions which researchers have more instrument than the number of endogenous regressors an overidentifying test should be applied in order to check whether orthogonality conditions hold or not. Orthogonality conditions mean that the instruments are independent to each other. Rejection of the hypothesis of the overidentifying test means rejecting orthogonality conditions. When the orthogonality conditions do not hold, it is still necessary to assume that at least one of the instruments is valid (uncorrelated with error term in the structural equation).

In order to check that if this negative effect of maternal migration is not reflecting the children's own migration experiences, the analyses were run for the children who were younger than the age of 6 at mother's last migration or were born after their mothers' last migration. Table 2.3. shows the IV results of the effect of mother's migration. Having a mother whose migration is induced by conflict decreases the probability of continuing to post-compulsory education by 23

percentage points if everlivedhigh is used as an instrument, and by 18 percentage points if everlivedmig is used as an instrument at 5% significance level. Thus, obtained negative effect is not stemming from children's own experience but it is the real effect of mothers' migration.

Table 2. 3 IV Regressions
(children who were younger than the age of 6 at mother's last migration or were born after their mothers' last migration)

	Panel A: Estimation Results					
LHS variables	started high school (14-34)	started high school (14-21)	continue to post compulsory educ	started high school (14-34)	started high school (14-21)	continue to post compulsory educ
Ever migrated mother	-0.186 (.194)	-0.191 (.223)	-.226** (.193)	-.154* (.104)	-.163* (.113)	-.178** (.103)
Control variables						
Instruments	*lived in a high conflict city*	*lived in a high conflict city*	*lived in a high conflict city*	*lived in a migrant giving city*	*lived in a migrant giving city*	*lived in a migrant giving city*
Observations	4049	3342	4049	4049	3342	4049
R-squared	0.287	0.294	0.263	0.299	0.305	0.284
	Panel B: Diagnostic Tests					
F-test of instrument	8.26	6.82	8.26	8.71	7.17	8.71
Underidentification test						
Anderson canon. LM statistic~	0	0	0	0	0	0
Weak identification test						
Cragg-Donald Wald F statistic	58.58>CV	44.77>CV	58.58>CV	99.23>CV	76.12>CV	99.23>CV

Notes: IV- Instrumental Variables. Standard errors are in parentheses. Single asterisk denotes statistical significance at the at the 90% level of confidence, double 95%, triple 99%. In addition to the regressors listed above, all specifications also include province dummies. Specification (1), (3), (4), (6) include children older than 13 and younger than 35. Specification (2) and (5) include children aged 14-21. The number of observation is 4049 for the former, and it is 3342 for the latter. Each coefficient in Panel A is from an IV estimation using ever lived in a high conflict city or ever lived in a migrant giving city as instruments. Panel B reports the tests for instruments' robustness. The F-tests are the test for the strenght of the instruments. ~ denotes a p-value and CV denotes Stock-Yogo weak ID test critical values.

2.6. CONCLUSION

Migration is one of the most studied subjects in the economics literature. The literature presents a particular interest to identify the determinants and immediate effects of migration. However, even though it has not been studied much in the economics literature, in addition to its direct effect on the people who migrate, migration may have intergenerational effects. Therefore, the aim of this study is to contribute to the literature by examining the effect of mother's migration on the educational attainments of children in Turkey. The Turkey Demographic and Health Survey (TDHS) for 2008 is used for the aim of the study.

This study provides evidence that Turkish mothers' internal migration has an effect on their children's educational participation. The results suggest that a mother's migration increases the probability of her children starting high school and continuing to post compulsory education. However, it is also found that there is an important endogeneity problem. The results provide support for the selective nature of migration. In order to identify the exogenous variation in migration, the instrumental variable method is employed. Risk of migration, which is measured by ever living in a high conflict or migrant giving city is used as an instrument. After controlling for the endogeneity of migration, the effect of migration becomes negative. There might be several reasons that lead to this situation. One of them is, as mentioned before, the endogeneity of migration. Because of the endogeneity of migration, OLS estimation gives biased results. In this case, the OLS estimation leads to upward biases. When the bias is larger in absolute value than the true value (given that the estimated value of the OLS coefficient is positive, the bias will be larger than the true value in absolute value), and IV provides a consistent estimate of the true value, it is possible that OLS and IV are of the opposite sign. Another

reason could be that the coefficient in the IV model is an estimate of the local average treatment effect (LATE), which means the estimations include a narrower population than the OLS. In this case, IV presents the results for those whose migrant status is affected by living in a conflict city. The third explanation for the sign switch could be the violation of the monotonicity assumption. The monotonicity assumption is necessary in order to identify a local average treatment effect. There are four groups of people: compliers, always-takers, never-takers and defiers (Angrist and Pischke, 2009). The first group is called compliers who are induced to take the treatment by the instrument. That is they get the treatment when they are assigned to the treatment but not otherwise. Always-takers and never-takers are not influenced by the instrument. While always-takers always take the treatment, never-takers never takes the instrument whatever the instrument is. The last group is called defiers who are doing exactly the opposite of the instrument. Monotonicity implies that the effect of the instrument on the treatment should go in the same direction for all individuals in the sample and therefore there are no defiers. This assumption is crucial for identification because in the case there are defiers in the sample, the treatment effect for those who shift from non-participation to participation when instrument shift from 0 to 1 can be offset by treatment effect of those who shift from participation to non-participation. However, there is a general consensus that monotonicity cannot be testable and its plausibility has to be evaluated in the context. In the context of this study, defiers are the mothers who migrate if they never lived in a high conflict or migrant giving city, but do not migrate if they ever lived in a high conflict or migrant giving city. It is hard to think of examples here but there may be defier mothers which leads to the sign switch of the estimated parameter.

Apparently, each migration type has different effects on the migrant people and their children. People who migrate for economic reasons, for example, go through a preparation process and decide the migration if they think it will be beneficial for them. However, if migrants do not go through such a preparation process before they migrate that may lead to many negative consequences for both them and their children. It is highly possible that migrants migrate to the parts of big cities, which are less urbanized, less industrialized and poorer. Those places limit the access to the key public infrastructure services, the school facilities and the opportunities to find a job. Therefore, one of the negative consequences might be through the access channel. As a suggestion governments could improve the infrastructure services and build enough school buildings in the regions, which migrants migrate to. Another channel might be the information channel. Since migrants left their social networks behind, it is possible that they do not have any friends or relatives to exchange information with at their new place. Therefore, one other suggestion could be that building facilities for migrants to get better information about their rights and the job opportunities.

2.7. APPENDIX TO CHAPTER 2
Figure A2. 1. Map of Turkey showing the locations of conflict cities
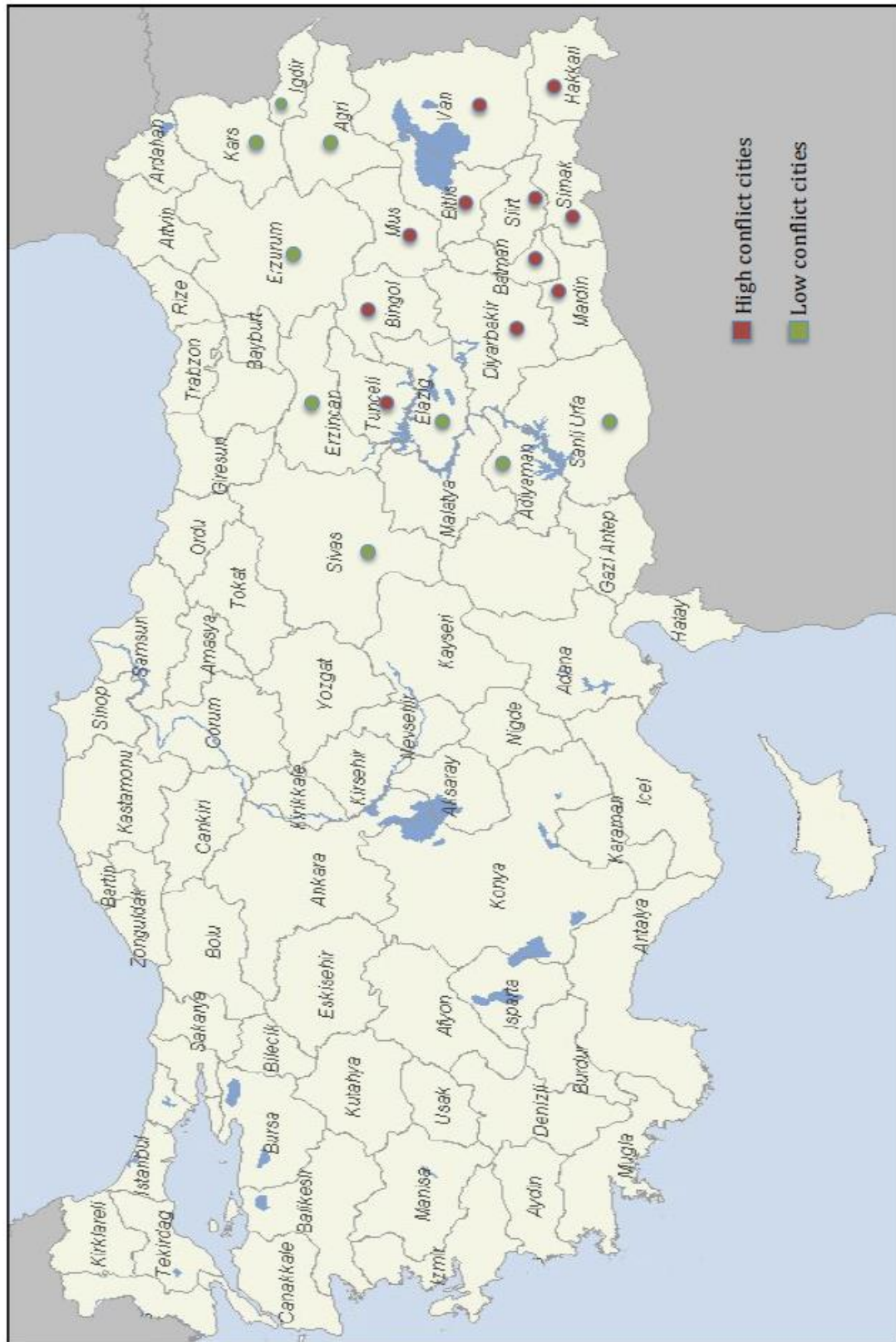
Table A2. 1. Description of Variables

Variable Name	Description
Dependent variables	
started high school (14-34)	=1 if started high school (age>13)
	=0 if otherwise
started high school (14-21)	=1 if started high school (13<age<22)
	=0 if otherwise
continued to post compulsory education	=1 if continued to post-compulsory educ. (age>13)
	=0 if otherwise
Independent variables	
Mother's reason of migration (reference category: never migrated)	
forced migration	=1 if mother migrated for security reasons
	=0 if otherwise
any reason migration	=1 if mother migrated for any other reason
	=0 if otherwise
never migrated	=1 if mother has never migrated
	=0 if otherwise
ever migrated	=1 if mother has migrated at least once
	=0 if otherwise
female	=1 if female
	=0 if male
age	Age of the child
age2	Square of the child age
mother's education	Years of schooling in single years of mother
father's education	Years of schooling in single years of father
family	Number of household members (including visitors)
sibling	Number of living siblings
age of household head	Age of the head of household
gender of household head	Gender of the head of household
urban	=1 if urban residence
	=0 if rural residence
poorwealth	=1 if poorer/poorest
	=0 if middle/richer/richest
province	current province of children
single mother	=1 if mother is widowed/divorced/not living together
	=0 if married
mother is head of the household	=1 if mother is the head of household
	=0 if otherwise
mother is single and head of household	interaction of being the household and single for mother
Birth order (reference category: first child)	
first child	=1 if first child
	=0 if otherwise
second child	=1 if second child
	=0 if otherwise
third child	=1 if third child
	=0 if otherwise
fourth child	=1 if fourth child
	=0 if otherwise

Table A2.1 continued: Description of Variables

fifth child	=1 if fifth child or younger than fifth child
	=0 if otherwise
Mother's native language (reference category: kurdish)	
turkish	=1 if native language of mother is turkish
	=0 if otherwise
kurdish	=1 if native language of mother is kurdish
	=0 if otherwise
other	=1 if native language of mother is arabic or other
	=0 if otherwise
Grandmother's native language (reference category: kurdish)	
turkish	=1 if native language of grandmother is turkish
	=0 if otherwise
kurdish	=1 if native language of grandmother is kurdish
	=0 if otherwise
other	=1 if native language of grandmother is arabic or other
	=0 if otherwise
Grandmother's education (reference category: high education)	
low education	=1 if grandmother's education is no educ./incomplete primary
	=0 if otherwise
middle education	=1 if grandmother's education is primary/secondary complete
	=0 if otherwise
high education	=1 if grandmother's education is high school/graduate education
	=0 if otherwise
Mother's working status(reference category: unemployed)	
employed	=1 if mother is currently working
	=0 if otherwise
unemployed	=1 if mother is not working
	=0 if otherwise
neveremployed	=1 if mother has never worked
	=0 if otherwise
Had difficulties to afford educational expenses (reference category: had no difficulties)	
had difficulties	=1 if family had difficulties to afford educ. expenses in the last 12 months
	=0 if otherwise
had no difficulties	=1 if the family could afford the educ. expenses
	=0 if otherwise
no educational expenses	=1 if family did not have educ. expenses
	=0 if otherwise
Instruments	
ever lived in a high conflict city	=1 if mother have ever lived one of the 11 high conflict cities
	=0 if otherwise
ever lived in a migrant sending city	=1 if mother have ever lived one of the 14 migrant sending cities
	=0 if otherwise

Table A2. 2. Descriptive Statistics (Age 14-34)

Variable Name	Mean	Std. Dev.	Min	Max
	Age Group 14-34			
Dependent variables				
started high school (14-34)	0.648	0.478	0	1
continued to post compulsory education	0.672	0.469	0	1
Independent variables				
Mother's reason of migration (reference category: never migrated)				
forced migration	0.013	0.115	0	1
any reason migration	0.571	0.495	0	1
never migrated	0.415	0.493	0	1
ever migrated	0.587	0.492	0	1
female	0.430	0.495	0	1
age	18.314	3.591	14	34
age2	348.282	143.953	196	1156
mother's education	3.897	3.464	0	19
father's education	6.511	3.616	0	17
family	6.117	2.516	3	35
sibling	4.174	2.181	1	14
age of household head	47.054	7.486	20	95
gender of household head	0.016	0.127	0	1
urban	0.718	0.450	0	1
poorwealth	0.457	0.498	0	1
province	35.849	21.018	1	81
single mother	0.000	0.020	0	1
mother is head of the household	0.009	0.093	0	1
mother is single and head of household	0.000	0.014	0	1
Birth order (reference category: first child)				
first child	36.754	22.005	1	90
second child	0.287	0.452	0	1
third child	0.158	0.365	0	1
fourth child	0.087	0.282	0	1
fifth child	0.104	0.306	0	1
Mother's native language(reference category: kurdish)				
turkish	0.698	0.459	0	1
kurdish	0.267	0.442	0	1
other	0.035	0.184	0	1
Grandmother's native language(reference category: kurdish)				
turkish	0.671	0.470	0	1
kurdish	0.286	0.452	0	1
other	0.043	0.203	0	1
Grandmother's education (reference category: high education)				
low education	0.862	0.345	0	1
middle education	0.135	0.342	0	1
high education	0.003	0.054	0	1
Mother's working status(reference category: unemployed)				
employed	0.301	0.459	0	1
unemployed	0.220	0.414	0	1
neveremployed	0.479	0.500	0	1
Had difficulties to afford educational expenses (reference category: had no difficulties)				
had difficulties	0.665	0.472	0	1
had no difficulties	0.214	0.410	0	1
no educational expenses	0.121	0.326	0	1
Instruments				
ever lived in a high conflict city	0.172	0.377	0	1
ever lived in a migrant sending city	0.252	0.434	0	1
# of Observation	4824			

Table A2. 3. Descriptive Statistics (Age 14-21)

Variable Name	Age Group 14-21			
	Mean	Std. Dev.	Min	Max
Dependent variables				
started high school (14-21)	0.658	0.475	0	1
Independent variables				
Mother's reason of migration (reference category: never migrated)				
forced migration	0.013	0.115	0	1
any reason migration	0.562	0.496	0	1
never migrated	0.424	0.494	0	1
ever migrated	0.578	0.494	0	1
female	0.459	0.498	0	1
age	16.918	2.162	14	21
age2	290.891	74.696	196	441
mother's education	3.941	3.485	0	19
father's education	6.517	3.624	0	17
family	6.121	2.488	3	35
sibling	4.159	2.177	1	14
age of household head	46.178	7.593	20	95
gender of household head	0.016	0.126	0	1
urban	0.714	0.452	0	1
poorwealth	0.473	0.499	0	1
province	35.680	21.159	1	81
single mother	0.001	0.023	0	1
mother is head of the household	0.008	0.092	0	1
mother is single and head of household	0.000	0.016	0	1
Birth order (reference category: first child)				
first child	36.659	22.121	1	90
second child	0.284	0.451	0	1
third child	0.160	0.367	0	1
fourth child	0.088	0.283	0	1
fifth child	0.119	0.324	0	1
Mother's native language(reference category: kurdish)				
turkish	0.689	0.463	0	1
kurdish	0.278	0.448	0	1
other	0.033	0.177	0	1
Grandmother's native language(reference category: kurdish)				
turkish	0.662	0.473	0	1
kurdish	0.299	0.458	0	1
other	0.039	0.194	0	1
Grandmother's education (reference category: high education)				
low education	0.863	0.344	0	1
middle education	0.134	0.341	0	1
high education	0.003	0.051	0	1
Mother's working status(reference category: unemployed)				
employed	0.311	0.463	0	1
unemployed	0.210	0.408	0	1
neveremployed	0.479	0.500	0	1
Had difficulties to afford educational expenses (reference category: had no difficulties)				
had difficulties	0.708	0.455	0	1
had no difficulties	0.216	0.411	0	1
no educational expenses	0.076	0.265	0	1
Instruments				
ever lived in a high conflict city	0.175	0.380	0	1
ever lived in a migrant sending city	0.260	0.439	0	1
# of Observation		3902		

Table A2. 4. OLS regressions (Linear probability model) for forced migration

LHS variables	(1) started high school (14-34)	(2) started high school (14-21)	(3) continue to post compulsory educ. (14-34)
forced migration	.166***	.212***	.157***
any reason migration	.034***	.026*	.0292**
Control variables			
Birth order			
(reference category: first child)			
Second child	0.011	0.02	0.019
Third child	0.015	.043**	0.023
Fourth child	-.057**	-0.026	-0.036
Fifth child	0.028	.062**	.044*
Age of hh head	.005***	.005***	.005***
Gender of hh head	-0.109	-0.1	-.139*
Gender of child	-.055***	-.050***	-.069***
Age of child	.110***	.230***	.075***
Square of child age	-.003***	-.006***	-.002***
Wealth of hh:poor	-.154***	-.168***	-.144***
Mother's education	.008***	.008***	.008***
Father's education	.019***	.016***	.017***
Mother's native language			
(reference category: kurdish)			
Mother's native language:turkish	0.033	0.024	0.03
Mother's native language:other	-0.009	-0.043	0.006
Grandmother's native language			
(reference category: kurdish)			
Grandmother's native language:turkish	0.045	0.053	0.053
Grandmother's native language:other	0	-0.005	-0.013
Grandmother's education			
(reference category: high education)			
Grandmother's education:low	0.066	0.076	0.097
Grandmother's education:middle	0.083	0.102	0.111
Urban	.092***	.089***	.092***
# of siblings	-.038***	-.044***	-.044***
# of hh members	-.009**	-0.002	-0.005
Had difficulties to afford educational expenses			
(reference category: had no difficulties)			
Had difficulties to afford educ. expenses	.045***	.055***	.052***
No educational expenses	-.180***	-.213***	-.147***
Single mother	0.294	0.335	0.336
Mother is hh head	0.06	0.119	0.065
Mother is hh head and single	-0.09	-0.203	-0.102
Mother's working status			
(reference category: unemployed)			
Mother's working status: employed	-0.002	0.01	-0.002
Mother's working status: never employed	0.006	0.022	0.013
Constant	-.658***	-1.694***	-.422**
Observations	4800	3882	4800
R-squared	0.331	0.338	0.322

Table A2. 5. First stage regressions (OLS)

	(1)	(2)	(3)	(4)	(5)	(6)
	Aged 14-34	Aged 14-21	Aged 14-34	Aged 14-34	Aged 14-21	Aged 14-34
LHS variable	ever migrated					
Instruments						
lived in a high conflict city	.309***	.312***	.309***			
lived in a migrant giving city				.329***	.327***	.329***
Control variables						
Second child	0.019	0.03	0.019	0.017	0.029	0.017
Third child	.063***	.075***	.063***	.059***	.071***	.059***
Fourth child	.045*	.056*	.045*	0.041	.054*	0.041
Fifth child	.122***	.147***	.122***	.117***	.141***	.117***
Age of hh head	0	-0.001	0	0	-0.001	0
Gender of hh head	-0.122	-.151*	-0.122	-0.13	-0.149	-0.13
Gender of child	-0.012	-0.007	-0.012	-0.014	-0.011	-0.014
Age of child	-.031*	-0.004	-.031*	-.028*	-0.003	-.028*
Square of child age	.001**	0	.001**	.001**	0	.001**
Wealth of hh:poor	-.050***	-.042**	-.050***	-.050***	-.043**	-.050***
Mother's education	0.002	0.004	0.002	0.002	0.004	0.002
Father's education	-.006**	-.005*	-.006**	-.006***	-.005**	-.006***
Mother's native language:turkish	-0.057	-0.07	-0.057	-0.051	-0.064	-0.051
Mother's native language:other	-0.013	-0.112	-0.013	0	-0.098	0
Grandmother's native language:turkish	-.091**	-.098**	-.091**	-.083**	-.094**	-.083**
Grandmother's native language:other	-.256***	-.238**	-.256***	-.242***	-.228**	-.242***
Grandmother's education:low	.220*	.307**	.220*	.212*	.296**	.212*
Grandmother's education:middle	0.184	.272*	0.184	0.179	.265*	0.179
Urban	.211***	.193***	.211***	.204***	.187***	.204***
# of siblings	-.019***	-.028***	-.019***	-.019***	-.028***	-.019***
# of hh members	.013***	.017***	.013***	.011**	.014***	.011**
Had difficulties to afford educ. expenses	.042**	.041**	.042**	.035**	.033*	.035**
No educational expenses	0.012	0.026	0.012	0.011	0.025	0.011
Single mother	-0.193	-0.454	-0.193	-0.47	-0.459	-0.47
Mother is hh head	0.178	.248**	0.178	.199*	.259**	.199*
Mother is hh head and single	0.696	0.634	0.696	0.798	0.732	0.798
Mother's working status: employed	-.049**	-.059***	-.049**	-.051***	-.062***	-.051***
Mother's working status: never employed	-.100***	-.119***	-.100***	-.097***	-.117***	-.097***
Constant	.551***	0.27	.551***	.527**	0.28	.527**
F-test of instrument	F(109, 4714) = 10.15	F(109, 3792) = 8.24	F(109, 4714) = 10.15	F(109, 4714) = 10.74	F(109, 3792) = 8.70	F(109, 4714) = 10.74
Observations	4824	3902	4824	4824	3902	4824
R-squared	0.19	0.192	0.19	0.199	0.2	0.199

*p<.1; ** p<.05; *** p<.01

CHAPTER 3: THE EFFECT OF INTERMARRIAGE ON CHILDREN'S EDUCATIONAL ATTAINMENT

3.1. INTRODUCTION

In many immigrant-receiving countries including Germany, a primary challenge that both immigrants and natives face is immigrants' integration into the host country. Therefore, the integration of immigrants and particularly the integration of their children is a key challenge for policy makers and is at the forefront of the political debate in many societies. Confiriming its importance, how immigrants fit into their host countries has generated a large literature in the social sciences, including economics.

Marriage is a channel through which cultural specific values and practices are conveyed to the partners and in particular to the children. A high level of intermarriage is a sign of a low level of cultural and social distance between immigrants and natives because it decreases the dissimilarities between them (Gordon, 1964; 2003; Muttarak, 2004). Therefore, intermarriage is considered as a way to examine the immigrants' integration level, both socially and economically, to the host country in the economics and sociology literature.

As the intermarriage rates are increasing in the immigrant-receiving countries, studies that examine the effect of intermarriage on both the immigrants themselves and their children are growing. While most of the studies examine the effect of intermarriage on the labour market outcomes of the immigrants (Kantarevic, 2004; Meng and Gregory, 2005; Gevrek, 2010), only a few studies have specifically investigated the relationship between intermarriage and the educational attainment of the children from those marriages. The children of immigrants spend their lives in the host country as students, labourers, tax payers and so on, and therefore, how they fare in the host country is needed to be taken into account while assessing the long-

run effects of immigration (Furtado, 2009). The long-run effects of immigration probably affect the children of immigrants more than their parents.

For these reasons, it is important to understand in greater depth the relationship between parental marriage type and its effect on children's human development. In this respect, this study aims to investigate one of the main aspects of second-generation immigrants' human development: their educational attainment. In the study, the effect of intermarriage on the educational attainment of children from these marriages is examined using the German Socio-Economic Panel (SOEP). Moreover, it is also investigated whether the effects of an immigrant's marriage to a native differs by gender.

The chapter is organized as follows; Section 2 provides information on the structure of the German education system. Section 3 reviews the literature focusing on intermarriage. Section 4 describes the data and the variables used in the analysis as well as the estimation method employed in the study. Section 5 presents the descriptive statistics and the results. Section 6 discusses the main findings and the limitations of the study.

3.2. EDUCATION SYSTEM IN GERMANY

The education system in the Federal Republic of Germany is under the responsibility of the federal structure of the state. Unless it is mentioned in the Basic Law (Grundgesetz), each of the individual states has the complete power and responsibility to make arrangements (Eurydice, 2009). With the aim to coordinate the educational practices, as well as cultural matters, at the national level, the Standing Conference of the Ministers of Education and Cultural Affairs has been established (Kultusministerkonferenz, 2012). However, there are still slight deviations and the education system in Germany varies from state to state.

The German education system has a highly stratified structure, and after only four years of schooling, children are assigned to one of the three[11] secondary schools. The education system is divided into five stages; pre-school education, primary education, secondary education, tertiary education and continuing education. Figure A3.1 presents the Basic Structure of the Educational System.

3.2.1. Pre-school Education

In Germany, pre-school education is not part of the public education and is not compulsory. Children aged three to six may attend pre-school institutions (Kindergarten). These institutions may be run by public, private, church or non-profit organisations (Education in Germany, 2011). Therefore not all of them are free.

3.2.2. Primary Education

Primary school is compulsory, and it starts when the child is six years old. It takes four[12] years to complete the primary education. At the end of the primary school teachers direct students to one of four different types of secondary school based largely on their grade point average as well as their abilities and interests.

3.2.3. Secondary Education

Considering a child's academic performance, their teacher's recommendation and parent's choice[13], the child will continue his/her education in one of the three types of secondary schools. The three types of schools lead the students to different career possibilities.

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[11] In some regions there are four different secondary school tracks.
[12] It is six years in Berlin and Brandenburg.
[13] Parents can override the teacher's recommendations in some states, but schools are not willing to accept students who have not been recommended. In other states, the recommendations of teachers are obligatory and parents cannot send their children to a track if the children have not received a recommendation.

3.2.3.1. Hauptschule

Hauptschule is a vocational school that takes five years (or six) to complete. It is considered the least prestigious and demanding of the secondary school types. The main aim of this type of school is to prepare the students for a vocational education. It covers the same subjects as the other secondary schools plus some vocational education. Upon completion of the Hauptschule, the student can go into vocational training (part-time or full-time) or enter an apprenticeship in a manual trade or may be able to transfer to the Gymnasium (see below).

3.2.3.2. Realschule

Realschule is the most common secondary school and it takes five years (or six) to complete. Although the structure of the Realschule is similar to Hauptschule, it offers a more comprehensive and challenging curriculum compared to Hauptschule. Graduates of Realschule are more qualified for white-collar professions than the graduates of the Hauptschule. On the other side, although it offers high academic standard, it is more vocationally oriented compared to Gymnasium.

3.2.3.3. Gymnasium

Gymnasium is considered the most prestigious of the three secondary school tracks. It is a secondary school that prepares the student for a university education, and it takes eight years (or nine) to complete. At the end of the Gymnasium, students take the Abitur, which is a series of rigorous exams. The students who graduate from Gymnasium receive the Abitur diploma, which is required to study at a university or equivalent. The Gymnasium curriculum is highly academic with two foreign languages and higher math and science courses.

3.2.3.4. Gesamtschule

Gesamtschule combines the two kinds of secondary school types. Students usually spend six years in this type of school and either obtain a Hauptschule or a Realschule certificate. If they would like to continue to university, they spend three more years in order to get the Gymnasium diploma (Abitur).

After children complete the compulsory education, they continue to the upper secondary education based on their qualifications (Eurydice, 2009). After getting a certificate from Hauptschule and Realschule, children who want to work in vocational jobs can move to vocational schools. Vocational schools combine part-time education and an apprenticeship for two to three years.

3.2.4. Tertiary Education

Tertiary schools include institutions, which enable children to obtain qualifications in order to work in the professional occupations. These establishments are universities, technical universities, teachers colleges, colleges of arts and music, technical institutes, theological seminaries and administrative training institutes. Students who completed upper secondary education and obtained a higher education entrance qualification can continue to these institutions.

3.2.5. Continuing Education

Continuing education includes training and courses given by continuing education centres. These institutions offer general, vocational and academic continuing education. Besides experience, it adds to current knowledge and skills. Within the lifelong learning concept, continuing education is becoming more of an issue and is becoming a field of education.

Figure 3.1 below presents the organisation of the education system in Germany in terms of the education levels and age categories.

Figure 3. 1. Organization of the Education System in German
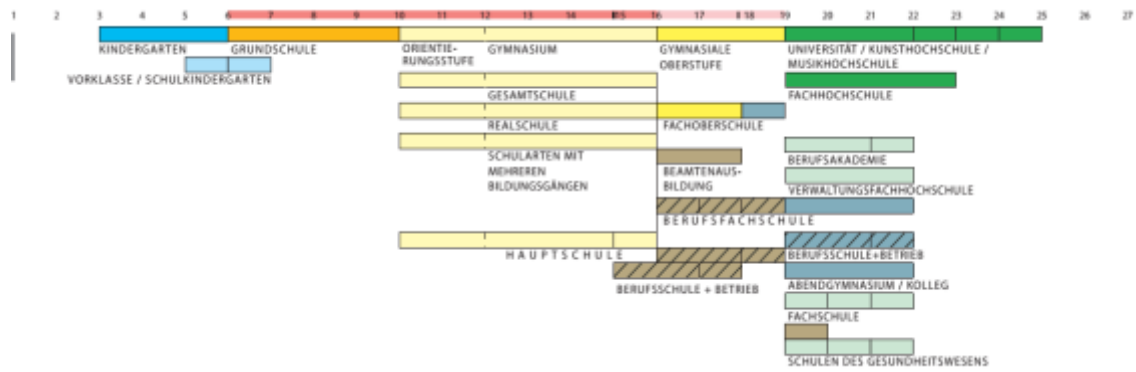
Source: Eurydice, 2009

3.3. LITERATURE REVIEW

3.3.1. Studies on the Interethnic marriage

Studies in the literature on the interethnic marriage can be classified into three categories.

Studies in the *first* category focus on the determinants of interethnic marriage. They investigate why some immigrants are more likely to engage in interethnic marriage than other immigrants. While studies mention similar factors that affect the propensity of interethnic marriage, they may make different classifications. From a sociological perspective, Muttarak (2004) grouped these factors into four categories: economic, demographic, propinquitous, and psychological. However, from an economics perspective, Furtado and Trejo (2012) put these factors into three categories: (1) immigrants' own characteristics that directly affect their preferences of marrying within their ethnicity; (2) immigrants' preference for potential partners to have certain characteristics that are rare or common in their ethnicity; (3) the chance of marrying within their ethnicity.

According to Meng and Gregory (2005), to be eligible to marry interethnically it is essential for an immigrant to be eager to accept a different cultural practices, beliefs, and way of lives within the marriage. This eagerness is expected to have a negative

relationship with strong religious beliefs. Therefore, more religious immigrants are more likely to marry within their own ethnicity.

It is expected that highly educated people, in contrast to religious people, are more permissive to other lifestyles, and therefore schooling makes immigrants more likely to marry someone from outside of their ethnicity. This is defined as the 'cultural adaptability effect' by Furtado and Theodoropoulos (2011). Furtado and Theodoropoulos (2011) also propose two other mechanisms through which education may affect the probability to intermarry: the 'enclave' effect and the 'assortative matching' effect. The enclave effect states that more educated people are more likely to live outside of their ethnic enclaves in order to obtain schooling or get better opportunities in the labour market. Therefore, they are less likely to meet someone from their own ethnic group and therefore they are more likely to intermarry. Finally, the assortative matching effect refers to the theory, suggested by Becker (1973), that people tend to choose their partners from a similar educational level (Kalmijn, 1991).

Linguistic competence in the host country's native language and the length of stay in the host country are also important factors that affect an immigrant's marrying preference. Immigrants who arrived in the host country recently and have limited native language skills are less likely to marry interethnically (Meng and Gregory, 2005; Chiswick and Houseworth, 2011).

Another important factor that affects an immigrant's interethnic marriage probability is the probability of meeting and interacting with someone from the immigrant's own ethnic group (Muttarak, 2004; Furtado and Trejo, 2012; Meng and Gregory, 2005). Independently of the characteristics that affect the preferences for interethnic marriage, the relative size of the ethnic groups in a community and also the

allocation of them across the country also have an effect on the probability to marry someone from the same ethnic group. Ethnic group size and sex ratios are used to predict the chance for an immigrant to interact and marry someone from the same ethnic background. As the group size increases in a community, the probability to marry interethnically decreases. If there is an unbalanced sex ratio in a certain ethnic community- the number of males/females is relatively larger than the number of females/males- it increases the probability of interethnic marriage for the ones whose numbers exceed that of others.

The *second* type of studies examines the importance of interethnic marriage on the human capital levels of the immigrants. Studies in this category are based on two hypotheses suggested by Kantarevic (2004): (1) the productivity hypotheses, and (2) the selection hypothesis. According to the productivity hypotheses, a foreign-born immigrant may benefit from their native partner in a number of ways in the process of human capital accumulation. Native spouses help their immigrant partners to advance quickly in the language; to learn easily the customs, norms and behaviours that are acceptable/nonacceptable to the host country; to provide access to broader social networks and knowledge of the local labour markets (Meng and Gregory, 2005). Therefore, an intermarried immigrant may assimilate faster than an immigrant who is married with another immigrant. In contrast, the selectivity hypothesis states that the effect of intermarriage on the human capital accumulation of immigrants may be biased if the endogeneity of the intermarriage is not taken into account. Intermarried immigrants are an unrepresentative sample of the married immigrant population as they self-select themselves into intermarriage. Therefore, they may differ in various ways from nonintermarried immigrants, which also leads them to have a different human capital level. The findings of Kantarevic (2004) and

Nottmeyer (2010) support the selection hypothesis. In his study, Kantarevic (2004) finds that there is a labour market premium for the intermarried immigrants. However, when he controls for the endogeneity of intermarriage, this intermarriage premium vanishes. This means that the intermarried group is a highly selected group of people among all the immigrant people. On the contrary, Meng and Gregory (2005) and Gevrek (2010) suggest that intermarriage affects the earnings of an immigrant in Australia and Netherlands, respectively, even after taking the endogeneity of the intermarriage into account. Meng and Gregory (2005) also find that even immigrants who marry into another ethnic group do not attain this premium. Moreover, by using U.S. data, Furtado and Theodoropoulos's (2009) find that intermarriage increases the probability of employment by almost 5 percentage points, and once the endogeneity of intermarriage is considered intermarriage more than doubles the likelihood of employment.

The *third* type of studies focuses on the effects of interethnic marriages on the educational levels of the children from those marriages. There are two basic channels through which the type of parents' marriage impacts their children's educational attainments (Furtado, 2009): (1) displaying different parenting styles during child's human capital development, and (2) attachment to ethnic community. Each type of marriage may have positive or negative effects on children's educational outcomes. Having a native parent affects the children's proficiency in the host country's native language, for example, which will affect the educational outcomes of children in a positive way (Bleakley and Chin, 2008). Similarly, having two immigrant parents will increase the probability of the children being bilingual, and there is evidence in the literature that bilingual children show better cognitive and educational achievement than monolingual children (Portes and Hao, 1998).

Having a strong attachment to the ethnic community may also have negative and positive effects. Even though in an ethnic community people tend to share their experiences and knowledge when finding better schools and finding jobs (Furtado, 2009), excluding themselves from social networks composed of natives may result in negative consequences which also affect the children's human capital outcomes (Ramakrishan, 2004).

By using the allocation of Moluccans as a natural experiment, Van Ours and Veenman (2010) studied the effect of interethnic marriage on the educational attainment of children in the Netherlands. In their analysis they applied both an ordered probit model and a probit model. Since the Dutch education system allows students to attain the same schooling level through different tracks of different length, the ordered probit model is used for the children who completed their schooling. For the children who were still at school they applied the probit model. They find no meaningful effect of intermarriage on the educational attainment of children. Once they make a distinction between the types of intermarriage, however, they find a positive effect of Moluccan father-native mother marriage on the education of children, while they find no meaningful effect of Moluccan mother-native father marriage.

Furtado (2009) examined the relationship between marriage of an immigrant to a native and high school dropout rates of children (aged 16-17) from this marriage by using 2000 US Census data. Her results show that while having an immigrant mother and a native father has no significant effect, having an immigrant father and a native mother increases the probability of drop out. Once she controls for the endogeneity of the intermarriage, however, she finds a positive and signifcant effect

of intermarriage on the children's drop out for both types of intermarriage relative to other immigrant children.

Ramakrishan (2004) and Chiswick and DebBurman (2004) also studied the effect of intermarriage on the educational outcomes of children by using data from the Current Population Survey (CPS) from 1991 to 2001 for the first study and from 1995 for the latter. They both applied an Ordinary Least Squares model and the educational characteristics of parents were not controlled for. Ramakrishan (2004) found that having intermarried parents decreases the probability of drop out and increases the years of schooling compared to having two intermarried parents. Similarly, Chiswick and DebBurman (2004) show that having intermarried parents increases the years of education relative to having two immigrant parents. The difference between those studies is the importance of gender. While the first study found that the magnitude of the effect of having an immigrant father-native mother is larger than having an immigrant mother-native father, the latter study finds the opposite.

Finally, Luthra (2010) tested whether having at least one parent who is German affects the educational attainment of children compared to having two immigrant parents by using the German Mikrozensus data from 2005 and 2006. A multinomial logistic regression is used to undertake the analysis, and the socioeconomic characteristics of the parents such as parental educational and occupational attainment, household income, and children in the household are controlled for. In her study she presents evidence of an immigrant advantage by finding that among the children of parents who have similar socio-economic characteristics, children of immigrants have higher educational attainment than the children of natives. Once she controls for the parental characteristics, she finds that many ethnic groups show

higher educational attainment than natives. Therefore she actually concludes that having a German parent has a negative relationship with the children's educational attainment and marrying to a native decreases the effect of immigrant advantage.

3.3.2. Econometric Issues

Estimating the causal impact of intermarriage on the educational attainment of children is not easy since intermarriage may be endogenous for the reasons discussed. Intermarried immigrants might be a selected sub-sample of all married immigrants (Kantarevic, 2004). They may have, for example, unobserved characteristics, such as education or income, that could also affect their children's educational outcome.

In order to control for the endogeneity of intermarriage, studies have adopted an instrumental variables approach. Van Ours and Veenman (2010), for example, using the allocation of Moluccans as a natural experiment, applied an IV model by using three instruments: an indicator for whether or not a municipality had a Moluccan quarter, the size of the municipality, and the percentage of Moluccans within the municipality.

Following Meng and Gregory (2005), some other studies (Furtado, 2009; Gevrek, 2010) used the group size and the sex ratio as instruments for the probability of interethnic marriage. The underlying assumption is that these instruments determine the marriage choice but they are also irrelevant in both the labour and educational outcomes equations.

In the current study, the instrumental variable method could not be applied because of the lack of regional information in the dataset. Instead, it is attempted to control for as many as possible explanatory variables in predicting educational attainment, such as the religion and language of parents in addition to the parental education and

the length of the stay in the host country. These variables are motivated by the existing literature on the determinants of intermarriage. However, in spite of trying to control for a considerable amount of observable characteristics in the analysis there might still be omitted variables, which may lead to a biased coefficient for intermarriage. For example, immigrants who marry other immigrants may value their child's education different to immigrants who marry a native. In such a case the issue of endogeneity bias will arise.

3.4. DATA AND METHODOLOGY

3.4.1. Data

The empirical analysis uses data from the German Socio-Economic Panel (SOEP). The SOEP is a nationally representative longitudinal survey, which started in 1984. This data source includes rich information on the social and economic characteristics of individuals. The SOEP wave from 2013 is used as a cross-sectional data set. The SOEP-2013 was not only the most recent survey available at the time of data application, but also it oversamples immigrants and includes rich information on them. The 2013 survey includes 24,113 individuals whose age is 18 and older, and 14,170 private households.

The SOEP-2013 wave introduced a new sample (IAB-SOEP Migration Sample) to the survey. It is a joint project by the Institute for Employment Research (IAB) and SOEP (Deutsches Institut für Wirtschaftsforschung, 2016). A separate survey, which includes only the households of this new sample, includes some new questions that were not previously considered in the SOEP or other household surveys in Germany, or not in the necessary depth, such as occupational status before migration, German language ability before migration, and labour market integration. Moreover it covers not only direct immigrants, but also second generation

immigrants. The first wave of the IAB-SOEP Migration Sample includes 4,964 individuals and 2,723 private households.

The final data set is prepared by merging several data sets. Parent related variables are obtained in two ways; (1) from the bioparent data set, which asks respondents the information about their parents, such as the country of origin and nationality of father and mother, and (2) if the parents are also a member of the SOEP, by using the father's and mother's identifier numbers respondents are linked to their parents to obtain the information directly from the main data set. By merging different data sets it is also aimed to replace missing values if a similar variable included in the other data sets. Because of merging different data sets, which includes different information, we have a large number of missing values for some variables. In order to deal with these missing values a dummy variable is created which equals to one if missing and zero otherwise; and then a value of zero is given to the missing values.

Since the aim of this study is to examine how the parental marriage type affects the children's education, the data requirements for studying connections between parental information and the educational attainment of individuals are stringent. Therefore, the SOEP-2013 is an appropriate survey for the kind of study as it contains a rich set of relevant variables and enables linking parents with their children.

As previously explained the upper secondary level in Germany includes the age group of children between 15/16 and 18/19. Therefore the sample is restricted to individuals aged 20 to 33 who are supposed to have completed their schooling. The final sample consists of 1,805 male and 2,036 female respondents.

Two main research questions are posed in the chapter: (1) does marrying a native male/female increase the probability of the children of an immigrant female/male

relative to a child with two immigrant parents attending an upper-level secondary school? (2) does marrying an immigrant male/female decrease the probability of the children of a native female/male relative to a child with two native parents attending an upper-level secondary school? This study contributes to the literature by using the SOEP data set, which allows to control a number of important variables that affect the probability of intermarriage such as language ability, religiosity. Moreover to the best of my knowledge, there is no previous study that control for the school related characteristic, which affects both the educational attainment and educational success of children.

3.4.2. Variable Construction and Definition

An overview of the dependent and independent variables is presented in Table A3.1. I will go on to explain them in more detail.

3.4.2.1 Dependent Variable

Education: Measures the educational attainment of the respondents. The variable is ranked from one to six. It takes the value of one if the individual has no school degree or dropped out of school; two if the individual has no school degree yet, which implies being behind schedule given the age group studied; three if the individual has completed secondary school; four if the individual has completed intermediate school; five if the individual has completed technical school; six if the individual has completed upper secondary school. If the variable is coded as 'other degree' in the data set, they are omitted from the sample. Such individuals completed their schooling in another country, and they are not the focus of this study because we are interested in the success of individuals in the host country.

3.4.2.2 Independent Variables

Type of Marriage: In this study, parents' marriage pattern is shown by three categories: mixmarriage, native marriage and immigrant marriage. The 'mixmarriage'' category takes the value one if the children have one immigrant and one native parent. In other words, this variable takes the value one if the children have an immigrant father and a native mother; or if the children have an immigrant mother and a native father. It takes the value of zero otherwise. Following Nottmeyer (2010), nationality is taken into account to determine if father/mother is an immigrant, in cases where there is no information on the country of origin of parents.

Intermarriage (mixmarriage) is defined as the marriage between any immigrant and a native. Immigrant-immigrant marriages, on the other hand, are defined as the marriage between two immigrants, regardless of nationality. The reason for not considering specific ethnic groups is due to sample size considerations.

Table 3.1 presents the marriage types of parents by the gender of their children. Native-native marriages have the highest percentage among the marriage types. The intermarriage rate is lower compared to both native-native and immigrant-immigrant marriages.

Native_mother and Native_father: In order to analyse the effect of intermarriage by gender, these categorical variables are created. Native_mother equals one if the respondent has an immigrant father and a native mother, and takes the value of zero otherwise. Native_father equals one if the respondent has an immigrant mother and a native father, and takes the value of zero otherwise.

Table 3. 1. Marriage Types by the Gender of Children

	Boys	Girls	Total
Native Marriage	1101 (65.5%)	1258 (66.04%)	2359 (65.78%)
Immigrant Marriage	477 (28.38%)	540 (28.35%)	1017 (28.36%)
Mixed Marriage			
Immigrant Father-Native Mother	63 (3.75%)	60 (3.15%)	123 (3.43%)
Immigrant Mother-Native Father	40 (2.38%)	47 (2.47%)	87 (2.43%)
Total	1681 (100%)	1905 (100%)	3586 (100%)

*Numbers in parentheses are percentage values

Male: Represents the gender of the respondent. This variable takes the value of one if the individual is male, and zero if the respondent is female.

Agechild: Measures the age of the person in years. Individuals who are born before 1979 and after 1994 are omitted from the sample. The lower cut-off is set in order to exclude the individuals who are still at schooling age, as we are interested in completed schooling. In order to prevent treating the younger age cohort together with the older age cohort, the higher cut-off is applied because the older age cohort were facing different conditions in terms of their education.

Education of parents: The variables for the education of fathers and mothers are continuous. They measure the parent's education in years, in other words, the number of years of schooling. They take the value of zero if the parents did not attend school. If these variables are missing after merging the different data sets, the procedure to create these variables that are defined in the survey paper (SOEP Group, 2014) is applied to replace those missing values[14]. Table 3.2 presents the

[14] Years of education=years of schooling + years of occupational training. 'Schooling' equals to 7 if no degree; 9 if lower school degree; 10 if intermediary degree, 12 if a professional college; 13 if high school degree; 10 if others. 'Occupational training' equals 1.5 if apprenticeship; 2 if technical schools (incl. health); 1.5 if civil servants apprenticeship; 3 if higher technical college; 5 if university degree.

average years of education of parents. As can be seen from the table, in each case the education of the intermarried immigrant parents is higher than that of the immigrant-immigrant parents. Moreover, the difference is higher for the immigrant mothers. Considering the total sample there is a difference of 1.88 between the average years of education of an immigrant mother who is married to a native and an immigrant mother who married to another immigrant. The difference is 0.63 when we compare the average years of schooling of an immigrant father who is married to a native and an immigrant father who married to another immigrant. Finally, the education of parents who are both native is the highest among the whole sample. The average years of schooling of a native father/mother who is married to a native mother/father is higher than a native father/mother who is married to an immigrant mother/father.

Table 3. 2. Education of Parents by Marriage Type

	Boys		Girls		Total	
	Avg. Yrs. of Educ.		Avg. Yrs. of Educ.		Avg. Yrs. of Educ.	
	Mother	Father	Mother	Father	Mother	Father
Native Marriage	12.25	12.56	12.20	12.43	12.22	12.49
	(.09)	(.10)	(.08)	(.10)	(.06)	(.07)
Immigrant Marriage	9.51	9.94	9.50	9.88	9.50	9.91
	(.14)	(.14)	(.14)	(.14)	(.10)	(.10)
Mixed Marriage						
Immigrant Father-Native Mother	11.15	10.94	11.45	10.11	11.30	10.54
	(.32)	(.58)	(.36)	(.56)	(.24)	(.33)
Immigrant Mother-Native Father	11.83	10.87	11	10.71	11.38	10.78
	(.42)	(.58)	(.42)	(.50)	(.30)	(.38)

*Standard errors are shown in the parentheses

Parents' religion: Father's and mother's religious affiliation has three different categories; religious, nonreligious and religion not stated. If the father/mother belongs to a religious denomination (Catholic, Protestant, Islam, or other religious

communities), they are coded as religious. If they do not belong to any denomination, they are classified in the nonreligious group. The "nonreligious" category is used as the reference category. Table 3.3 and Table 3.4 give the religious status of parents by marriage type. As discussed in the literature review, religious people are not prone to intermarry. While the "religious" category has the higher share for both the intermarried and non-intermarried immigrant fathers, the percentage of the "religious" category for the intermarried immigrant mothers and native non-intermarried mothers is lower than the percentage of the "not stated" for them.

Table 3. 3. Religion of Father by Marriage Type

	Religious	Non-Religious	Not Stated	Missing	Total
Native Marriage	873 (37.01%)	455 (19.29%)	787 (33.36%)	244 (10.34%)	2359 (100%)
Immigrant Marriage	357 (35.10%)	82 (8.06%)	99 (9.73%)	479 (47.10%)	1017 (100%)
Mixed Marriage					
Immigrant Father-Native Mother	40 (32.52%)	4 (3.25%)	25 (20.33%)	54 (43.90%)	123 (100%)
Immigrant Mother-Native Father	26 (29.89%)	7 (8.05%)	26 (29.89%)	28 (32.18%)	87 (100%)

*Numbers in parentheses are percentage values

Table 3. 4. Religion of Mother by Marriage Type

	Religious	Non-Religious	Not Stated	Missing	Total
Native Marriage	831 (35.23%)	348 (14.75) %	960 (40.70%)	220 (9.33%)	2359 (100%)
Immigrant Marriage	381 (37.46%)	82 (8.06%)	148 (14.55%)	406 (39.92%)	1017 (100%)
Mixed Marriage					
Immigrant Father-Native Mother	41 (33.33%)	7 (5.69%)	38 (30.89%)	37 (30.08%)	123 (100%)
Immigrant Mother-Native Father	33 (37.93%)	3 (3.45%)	37 (42.53%)	14 (16.09%)	87 (100%)

*Numbers in parentheses are percentage values

Parents' language ability: Parents' language ability in German is measured separately for speaking and writing with three categories; poor, good and native. If the speaking/writing ability of the father/mother is very good or good, it is defined as 'good'; and it is defined as 'poor' if it is fairly good, poor or not able to speak the language at all. If the native language of the father/mother is German, they are coded as 'native'.

Parents' length of stay: This variable is a continuous variable, and it measures the fathers' and mothers' years of stay in the host country. It takes the value of father/mother's age if he/she is not an immigrant.

Parents' region of origin: Parents' country of origin is grouped into four different geographical regions; Europe, Asia, America, and Africa. "Africa" is used as the reference category. The classification of the United Nations (UN)[15] is taken as the reference when assigning countries to geographical regions. Table A3.2 illustrates the regions in which the countries are located. As for the marriage type variable, country of nationality is used when there is no information on the country of origin.

Disadvantages in school: This variable measures if children experienced disadvantages in school due to their country of origin. This variable has four categories: often, seldom, never, and native.

Table A3.3 gives the descriptive statistics for the variables used in this study.

3.4.3. Estimation Methods

In cases where the dependent variable has more than two categories and each category naturally has a rank or meaningful order, the ordered probit model is an appropriate econometric method to use.

The ordered probit model takes the following form:

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[15] http://unstats.un.org/unsd/methods/m49/m49regin.htm

$$y_i^* = x_i'\beta + \varepsilon_i$$

where y_i^* is the latent schooling attainment for the ith individual, x_i is a vector of individual characteristics, and ε is a stochastic error term ($\varepsilon \sim N(0,1)$).

For an m alternative model, y_i is defined as:

$$y_i = j \text{ if } \alpha_{j-1} < y_i^* \leq \alpha_j, \ j = 1,2,\dots\dots,m$$

where the α's denote the threshold values, and for all the probabilities to be non-zero $\alpha_0 < \alpha_1 < \cdots < \alpha_m$, where $\alpha_0 = -\infty$ and $\alpha_m = +\infty$.

The conditional probability of observing the jth category is:

$$\text{Prob}(y_i = j) = \text{Prob}(\alpha_{j-1} < y_i^* \leq \alpha_j)$$

$$= \text{Prob}(\alpha_{j-1} < x_i'\beta + \varepsilon_i \leq \alpha_j)$$

$$= \text{Prob}(\alpha_{j-1} - x_i'\beta < \varepsilon_i \leq \alpha_j - x_i'\beta)$$

$$= F(\alpha_j - x_i'\beta) - F(\alpha_{j-1} - x_i'\beta)$$

It is assumed that the stochastic error term, $\varepsilon,$ has a standard normal distribution. Therefore F is the normal cumulative distribution function (c.d.f.) and the conditional probability of the jth category is:

$$\text{Prob}(y_i = j) = \Phi(\alpha_j - x_i'\beta) - \Phi(\alpha_{j-1} - x_i'\beta)$$

where Φ denotes the standard normal c.d.f. (Greene, 2003; Train, 2003; Cameron and Trivedi, 2009).

In this study, y_i takes the following form:

y_i

$$= \begin{cases} 1 \text{ if the child dropped out from school} \\ 2 \text{ if the child does not have a school degree yet} \\ 3 \text{ if the child has a secondary school degree} \\ 4 \text{ if the child has an intermediate school degree} \\ 5 \text{ if the child has a technical school degree} \\ 6 \text{ if the child has an upper secondary school degree} \end{cases}$$

3.5. RESULTS

3.5.1. Descriptive Analysis

Table 3.5 presents descriptive statistics for the sample used in the analysis. This table provides information on the mean value of the continuous variables and the percentage values of the categorical variables for the different marriage types seperately.

The children of two immigrant parents have the lowest level of education. Although the educational level of children of an immigrant male and a native female is lower than the educational level of of children of an immigrant female and a native male, it is still higher than the children of two immigrant parents. The children of two native parents have the highest level of education.

As discussed in the literature review, there are parental characteristics which may affect both intermarriage rates and schooling levels of their children. Consistent with the literature on assortative matching on education, immigrants that marry other immigrants have fewer years of schooling than those who marry natives. When we consider the marriages of the immigrants, the immigrant females who are married to native males have the highest level of education (11.4). Comparing the education level of the intermarried immigrant males and the intermarried native males, even though there is a very small difference, native males have more years of education than immigrant males. The education levels are 10.7 and 10.8 for the immigrant males and native males, respectively. In contrast to intermarried males, the intermarried immigrant females have slightly longer education than the intermarried native females. Among all parents, the native males who are married to native females (12.3) have the highest years of education.

Table 3. 5. Descriptive Statistics by Marriage Type for the Estimation Sample

Variable	Parents Both Native	Parents Both Immigrant	Immigrant Father	Immigrant Mother
Dependent Variable				
Education	4.753 (.026)	3.964 (.047)	4.319 (.125)	4.593 (.146)
Independent Variables				
Child Characteristics				
Age of child	26.875 (.085)	26.165 (.140)	24.797 (.344)	24.482 (.395)
Square of age	738.272 (4.399)	702.521 (7.399)	628.142 (17.774)	611.840 (20.295)
Male	0.466 (.010)	.469 (.016)	.531 (.047)	.457 (.056)
Missing_disadvantage	0.013 (.002)	0.297 (.015)	0.319 (.044)	0.531 (.056)
Disadvantage_often	0.011 (.002)	0.071 (.008)	0.097 (.028)	0.062 (.027)
Disadvantage_seldom	0.009 (.002)	0.160 (.012)	0.115 (.030)	0.086 (.031)
Disadvantage_never	0.033 (.004)	0.453 (.016)	0.319 (.044)	0.222 (.047)
Disadvantage_native	0.934 (.005)	0.019 (.004)	0.150 (.034)	0.099 (.033)
Father's Characteristics				
Age of father	56.999 (.139)	55.612 (.272)	54.973 (.644)	54.704 (.783)
Education of father	12.578 (.071)	9.915 (.101)	10.673 (.316)	10.790 (.370)
Missing_religion_father	0.096 (.006)	0.457 (.016)	0.407 (.046)	0.321 (.052)
Religious father	0.373 (.010)	0.354 (.016)	0.336 (.045)	0.272 (.050)
Nonreligious father	0.188 (.008)	0.084 (.009)	0.035 (.018)	0.086 (.031)
Not stated rel. father	0.343 (.010)	0.105 (.010)	0.221 (.039)	0.321 (.052)
Missing_stay_father	0.00 (0.00)	0.604 (.016)	0.549 (.047)	0.00 (0.00)
Father's length of stay	56.999 (.139)	9.770 (.462)	16.363 (1.832)	54.704 (.783)
Missing_speaking_father	0.00 (0.00)	0.612 (.016)	0.460 (.047)	0.00 (0.00)
Good speaking father	0.00 (0.00)	0.191 (.013)	0.310 (.044)	0.00 (0.00)
Poor speaking father	0.00 (0.00)	0.141 (.012)	0.071 (.024)	0.00 (0.00)
Native language father	1.00 (0.00)	0.055 (.008)	0.159 (.035)	1.00 (0.00)
Missing_writing_father	0.00 (0.00)	.621 (.016)	.460 (.047)	0.00 (0.00)
Good writing father	0.00 (0.00)	.140 (.011)	.230 (.040)	0.00 (0.00)
Poor writing father	0.00 (0.00)	.192 (.013)	.150 (.034)	0.00 (0.00)
Native language father	1.00 (0.00)	.055 (.008)	.156 (.035)	1.00 (0.00)
Father's region_europe	1.00 (0.00)	.443 (.016)	.504 (.047)	1.00 (0.00)
Father's region_asia	0.00 (0.00)	.519 (.017)	.416 (.047)	0.00 (0.00)
Father's region_america	0.00 (0.00)	.017 (.005)	.062 (.023)	0.00 (0.00)
Father's region_africa	0.00 (0.00)	.021 (.005)	.018 (.013)	0.00 (0.00)

Mother's Characteristics				
Age of mother	54.164 (.122)	52.147 (.240)	51.797 (.616)	50.68 (.734)
Education of mother	12.294 (.060)	9.476 (.105)	11.319 (.257)	11.395 (.314)
Missing_religion_mother	0.091 (.006)	0.403 (.016)	0.283 (.043)	0.161 (.041)
Religious mother	0.352 (.010)	0.394 (.016)	0.354 (.045)	0.370 (.054)
Nonreligious mother	0.141 (.007)	0.083 (.009)	0.044 (.019)	0.037 (.021)
Not stated rel. mother	0.416 (.011)	0.121 (.011)	0.319 (.044)	0.432 (.055)
Missing_stay_mother	0.00 (0.00)	0.531 (.017)	0.00 (0.00)	0.198 (.045)
Mother's length of stay	54.164 (.122)	10.533 (.438)	51.797 (.616)	24.049 (1.749)
Missing_speaking_mother	0.00 (0.00)	0.538 (.016)	0.00 (0.00)	0.173 (.042)
Good speaking mother	0.00 (0.00)	0.213 (.014)	0.00 (0.00)	0.481 (.056)
Poor speaking mother	0.00 (0.00)	0.194 (.013)	0.00 (0.00)	0.161 (.041)
Native language mother	1.00 (0.00)	0.055 (.007)	1.00 (0.00)	0.185 (.043)
Missing_writing_mother	0.00 (0.00)	0.539 (.016)	0.00 (0.00)	0.173 (.042)
Good writing mother	0.00 (0.00)	0.172 (.012)	0.00 (0.00)	0.420 (.055)
Poor writing mother	0.00 (0.00)	0.235 (.014)	0.00 (0.00)	0.222 (.047)
Native language mother	1.00 (0.00)	0.055 (.008)	1.00 (0.00)	0.185 (.043)
Mother's region_europe	1.00 (0.00)	.468 (.017)	1.00 (0.00)	.568 (.055)
Mother's region_asia	0.00 (0.00)	.495 (.017)	0.00 (0.00)	.309 (.052)
Mother's region_america	0.00 (0.00)	.019 (.004)	0.00 (0.00)	.087 (.031)
Mother's region_africa	0.00 (0.00)	.019 (.004)	0.00 (0.00)	.037 (.021)
N	2244	921	113	81

*Standard deviations are shown in the parentheses

Not surprisingly, the immigrant males/females who are married to native females/males have lived in Germany for more years than the immigrant males/females who are married to another immigrant. Finally, although there is no significant difference in terms of the age of immigrants, the immigrants who marry a native are relatively younger than those immigrants who are married to other immigrants. Likewise, native males/females who are married to an immigrant are relatively younger than the native males/females who are married to another native.

As mentioned in the literature review, linguistic ability is another important factor that can affect both parents' marrying preference and children's educational outcomes. Consistent with the literature, the probability of having good speaking and writing abilities in the host country's language is higher for the immigrant parents who are married to a native rather than the immigrant parents who are married to another immigrant. The difference is higher for the intermarried mothers than for non-intermarried mothers. While the proportion of good speaking and writing abilities are 48% and 42% respectively for the intermarried immigrant females, they are 21% and 17% for the nonintermarried immigrant females.

Looking at the region that an immigrant comes from, both males and females who are married to other immigrants generally come from the countries labelled as Asia and Europe. While the percentages of males are 44% and 52% for Europe and Asia respectively; the corresponding percentages for females are 47% and 50%. However, the proportions of fathers and mothers who are married to a native indicate that 50% of intermarried male immigrants and 57% of intermarried female immigrants comes from European countries. For the intermarried parents who come from Asian countries, these percentages are 42% and 31% for males and females respectively.

Table 3.6 presents the schooling levels of children by the marriage type of their parents. As expected, while most of the children of the immigrant-immigrant married parents (29%) continue to lower-level schools which do not allow them to go on to a higher education, most of the children of the native-native married parents (42%) continue to upper-level secondary schools which is a must to go on to the university. Considering intermarried parents, those children who have an immigrant father married to a native complete lower-level schools more often than those

children who have an immigrant mother married to a native. Most of the the children whose parents have the immigrant-immigrant and immigrant father-native mother marriage type continue to the lower secondary schools. The share of children who hold an upper secondary school degree is almost 37% for the ones with an immigrant mother who is married to a native. This is the highest proportion within this group. Looking at this table, it seems that being an intermarried immigrant mother has a more positive effect on the schooling levels of their children than being an intermarried immigrant father.

Table 3. 6. Schooling Levels of Individuals by Marriage Type

	Total						Total
	1	**2**	**3**	**4**	**5**	**6**	**Total**
Native Marriage	27 (1.14%)	38 (1.61%)	356 (15.09%)	732 (31.03%)	206 (8.73%)	**1000** **(42.39%)**	2359 (100%)
Immigrant Marriage	63 (6.19%)	51 (5.01%)	**296** **(29.11%)**	**297** **(29.20%)**	99 (9.73%)	211 (20.75%)	1017 (100%)
Mixed Marriage							
Immigrant Father-Native Mother	3 (2.44%)	3 (2.44%)	29 (23.58%)	**38** **(30.89%)**	17 (13.82%)	33 (26.83%)	123 (100%)
Immigrant Mother-Native Father	1 (1.15%)	5 (5.75%)	14 (16.09%)	22 (25.29%)	13 (14.94%)	**32** **(36.78%)**	87 (100%)

*Numbers in parentheses are percentage values
** (1)-(6) represents the dependent variable which defined as:1=dropout, 2=no degree yet, 3=secondary school degree, 4=intermediate school degree, 5=technical school degree, 6=upper secondary school degree.

3.5.2. Ordered Probit Results

Table 3.7 presents the coefficients of the ordered probit estimations. The parameter estimates of an ordered probit model give information only on the direction of the relationships and the statistical significance levels of the coefficients on the explanatory variables used in the analysis. In order to examine the magnitude of the effects of a change in the explanatory variables on each educational track, the marginal effects should be calculated. Table 3.8 and Table 3.9 presents the marginal effects of the ordered probit model for different models.

The first column of Table 3.7 represents the Model 1 which does not take into account parental characteristics. It shows the effect of having an intermarried parent on the educational level of respondents when controlling for only a baseline set of variables. According to these results, there is a positive and significant relationship between having an intermarried parent and the educational level of their children, relative to having non-intermarried immigrant parents. Contrary to this result, having an intermarried immigrant parent has a negative and significant effect on the education of children compared to having two native parents. Even though it is at a decreasing rate, age is positively associated with the educational level of children, and finally there is a negative relationship between being male and educational attainment.

Starting from the second column of Table 3.7, in addition to the respondent characteristics, different parental characteristics are also gradually added to the analysis. Models (2) and (3) show that adding the educational characteristics of parents to the estimation removes the effect of having an intermarried immigrant parent compared to having two native parents. However, the effect still exists compared to having two immigrant parents. These models also show that education of both fathers and mothers has a positive and significant effect on the education of their children. Father's education seems to be more important than the mother's education, judging by the magnitude of the coefficients. Finally, having religious parents does not have any meaningful effect on the education of children compared to having nonreligious parents. While having a parent whose religious affiliation is not stated has a significant effect on the educational level of the children, it is

Table 3. 7. Effect of Intermarriage on the Educational Attainment; Estimation Results for the Ordered Probit Model

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Nativemarriage	0.23*** (0.08)	0.04 (0.08)	-0.03 (0.08)	-0.11 (0.08)	-0.15 (0.13)
Immigmarriage	-0.39*** (0.08)	-0.17* (0.09)	-0.17* (0.09)	0.02 (0.14)	0.10 (0.15)
Child Characteristics					
Age of child	0.21*** (0.07)	0.19*** (0.07)	0.24*** (0.07)	0.24*** (0.07)	0.26*** (0.07)
Square of age	-0.004*** (0.00)	-0.004*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Male	-0.16*** (0.04)	-0.20*** (0.04)	-0.21*** (0.04)	-0.21*** (0.04)	-0.21*** (0.04)
Father's Characteristics					
Age of father	-	0.06 (0.08)	0.05 (0.05)	0.05 (0.04)	0.04 (0.04)
Age square of father	-	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Education of father	-	0.10*** (0.01)	0.09*** (0.01)	0.09*** (0.01)	0.10*** (0.01)
Missing_religion_father	-	-	-0.1 (0.12)	-0.09 (0.15)	-0.09 (0.15)
Religious father	-	-	0.13 (0.08)	0.12 (0.08)	0.12 (0.08)
Not stated rel. father	-	-	0.40*** (0.09)	0.38*** (0.09)	0.38*** (0.09)
Missing_stay_father	-	-	-	-0.06 (0.24)	-0.03 (0.25)
Father's length of stay	-	-	-	0.00 (0.00)	0.00 (0.00)
Missing_speaking_father	-	-	-	0.07 (0.20)	0.02 (0.20)
Good speaking father	-	-	-	0.12 (0.15)	0.09 (0.15)
Native language father	-	-	-	0.14 (0.19)	0.17 (0.20)
Missing_writing_father	-	-	-	(omitted)	(omitted)
Good writing father	-	-	-	-0.03 (0.15)	-0.01 (0.15)
Native language father	-	-	-	(omitted)	(omitted)
Father's region_europe	-	-	-	-	0.71* (0.43)
Father's region_asia	-	-	-	-	0.70 (0.44)
Father's region_america	-	-	-	-	0.98* (0.53)
Mother's Characteristics					
Age of mother	-	-0.00 (0.05)	0.01 (0.05)	0.01 (0.05)	0.01 (0.05)
Age square of mother	-	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Education of mother	-	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)
Missing_religion_mother	-	-	0.02 (0.13)	0.10 (0.16)	0.11 (0.16)
Religious mother	-	-	0.11 (0.09)	0.1 (0.09)	0.09 (0.09)

Not stated rel. mother	-	-	-0.18* (0.09)	-0.17* (0.10)	-0.18* (0.10)
Missing_stay_mother	-	-	-	0.08 (0.24)	0.07 (0.25)
Mother's length of stay	-	-	-	0.01 (0.01)	0.01 (0.01)
Missing_speaking_mother	-	-	-	1.08 (1.07)	1.25 (1.07)
Good speaking mother	-	-	-	0.24* (0.14)	0.19 (0.14)
Native language mother	-	-	-	-0.03 (0.19)	-0.1 (0.19)
Missing_writing_mother	-	-	-	-1.13 (1.06)	-1.26 (1.06)
Good writing mother	-	-	-	-0.11 (0.13)	-0.08 (0.13)
Native language mother	-	-	-	(omitted)	(omitted)
Mother's region_europe	-	-	-	-	-0.70 (0.43)
Mother's region_asia	-	-	-	-	-0.88** (0.44)
Mother's region_america	-	-	-	-	-0.73 (0.53)
Log-likelihood	-5104.2329	-4423.0804	-4395.8952	-4387.4222	-4376.0682
LR chi2	278.35	900.54	954.91	971.85	982.03
N	3586	3364	3364	3364	3359

[+]*p<.1; ** p<.05; *** p<.01

[++]Standard errors are shown in the parentheses

difficult to make any comments about this variable, as they can be either religious or nonreligious. Finally, when adding the language abilities of parents to the estimation (Model (4)) having a mother whose speaking ability is good rather than poor has a positive effect on the education of their children. However, this effect becomes insignificant when adding regional dummies to the model (Model (5)).

Table 3.8 presents the marginal effects of the ordered probit model for Model (1). The Marginal effects indicate that relative to those children who have intermarried parents if a child has immigrant-immigrant parents, this decreases the probability of holding an upper secondary school degree by 14 percentage points and increases the probability of dropping out by 2 percentage points. However being the child of a native-native parent rather than being a child of intermarried parents increases the

probability of holding an upper secondary school degree by 8 percentage points and decreases the probability of dropping out by 1 percentage points.

Table 3. 8. Effect of Intermarriage on the Educational Attainment; Marginal Effects of the Ordered Probit Model for Model (1)

Variable	Dropout	No Degree Yet	Secondary School Degree	Intermediate School Degree	Technical School Degree	Upper Secondary School Degree
Nativemarriage	-0.01*** (0.005)	-0.01*** (0.004)	-0.05*** (0.16)	-0.02*** (0.006)	0.01*** (0.002)	0.08*** (0.27)
Immigmarriage	0.02*** (0.005)	0.02*** (0.004)	0.08*** (0.16)	0.03*** (0.007)	-0.01*** (0.002)	-0.14*** (0.28)
Child Characteristics						
Age of child	-0.01*** (0.004)	-0.01*** ((0.003)	-0.04*** (0.13)	-0.02*** (0.006)	0.004*** (0.002)	0.07*** (0.24)
Square of age	0.0002*** (0.0001)	0.0002*** (0.0001)	0.0007*** (0.0003)	0.0003*** (0.0001)	-0.00008*** (0.0002)	-0.001*** (0.0004)
Male	0.01*** (0.002)	0.01*** (0.002)	0.03*** (0.007)	0.01*** (0.003)	-0.003*** (0.001)	-0.06*** (0.13)
N	3586					

[+]*p<.1; ** p<.05; *** p<.01
[++]Standard errors are shown in the parentheses

Table 3.9 presents the marginal effects for the second model. Upon adding the parental education and age characteristics, the effect of having two native parents relative to having intermarried parents disappeares. However, even though the magnitude is diminished, the effect of having two immigrant parents compared to having intermarried parents is still significant at the 10% level. Relative to those children who have intermarried parents, If a child has two immigrant parents, this decreases the probability of holding an upper secondary school degree by 5 percentage points and increases the probability of dropping out by 1 percentage point. The results indicate that parental education is associated with the school attainment of their children. However, the marginal effects indicate that it cannot be said that fathers' education is more or less important than the education of mothers.

A one year increase, for example, in the education of both fathers and mothers increases the probability of holding an upper-level secondary school degree by 3 percentage points.

Table 3. 9. Effect of Intermarriage on the Educational Attainment; Marginal Effects of the Ordered Probit Model for Model (2)

Variable	Dropout	No Degree Yet	Secondary School Degree	Intermediate School Degree	Technical School Degree	Upper Secondary School Degree
Nativemarriage	-0.001 (0.004)	-0.001 (0.003)	-0.01 (0.014)	-0.003 (0.007)	0.001 (0.001)	0.01 (0.027)
Immigmarriage	0.01* (0.004)	0.01* (0.004)	0.03* (0.015)	0.01* (0.007)	-0.003* (0.002)	-0.05* (0.028)
Child Characteristics						
Age of child	-0.01*** (0.004)	-0.01*** (0.003)	-0.03*** (0.012)	-0.02*** (0.006)	0.004*** (0.001)	0.06*** (0.023)
Square of age	0.0002*** (0.00007)	0.0002*** (0.00006)	0.001*** (0.0002)	0.0003*** (0.000)	-0.0001*** (0.00003)	-0.001*** (0.0004)
Male	0.01*** (0.002)	0.01*** (0.002)	0.03*** (0.007)	0.02*** (0.003)	-0.004*** (0.001)	-0.06*** (0.012)
Father's Characteristics						
Age of father	-0.002 (0.002)	-0.002 (0.002)	-0.01 (0.007)	-0.005 (0.003)	0.001 (0.001)	0.02 (0.013)
Age square of father	0.00002 (0.00001)	0.00002 (0.00001)	0.0001 (0.0001)	0.00003 (0.00003)	-0.00 (0.00)	-0.0001 (0.0001)
Education of father	-0.005*** (0.001)	-0.004*** (0.004)	-0.02*** (0.001)	-0.01*** (0.001)	0.002*** (0.0002)	0.03*** (0.002)
Mother's Characteristics						
Age of mother	0.0001 (0.002)	0.00004 (0.002)	0.0002 (0.008)	0.0001 (0.004)	-0.00002 (0.001)	-0.0003 (0.016)
Age square of mother	-0.00 (0.00002)	-0.00 (0.00001)	-0.00002 (0.00002)	-0.00 (0.00003)	0.00 (0.00)	0.00003 (0.0001)
Education of mother	-0.004*** (0.001)	-0.003*** (0.004)	-0.01*** (0.001)	-0.01*** (0.001)	0.001*** (0.0002)	0.03*** (0.003)
N	3364					

+*p<.1; ** p<.05; *** p<.01
++Standard errors are shown in the parentheses

Table 3.10 presents the marginal effects for the Model 5. When controlling for all of the parental characteristics and regional variables, the effect of both having two native parents and having two immigrant parents compared to having intermarried parents disappeared.

Table 3. 10. Effect of Intermarriage on the Educational Attainment; Marginal Effects of the Ordered Probit Model for Model (5)

Variable	Dropout	No Degree Yet	Secondary School Degree	Intermediate School Degree	Technical School Degree	Upper Secondary School Degree
Nativemarriage	0.01 (0.01)	0.01 (0.01)	0.03 (0.02)	0.01 (0.01)	-0.003 (.02)	-0.05 (.01)
Immigmarriage	-0.005 (0.01)	-0.004 (0.01)	-0.02 (0.02)	-0.01 (0.01)	0.0002 (0.002)	0.03 (0.05)
Child Characteristics						
Age of child	-0.01*** (0.004)	-0.01*** (0.003)	-0.04*** (0.01)	-0.02*** (0.01)	0.004*** (0.001)	0.08*** (0.02)
Square of age	0.0002*** (0.0001)	0.0002*** (0.0001)	0.001*** (0.0002)	0.0004*** (0.0001)	-0.0001*** (0.00002)	-0.002*** (0.0004)
Male	0.01*** (0.002)	0.01*** (0.002)	0.03*** (0.01)	0.02*** (0.003)	-0.004*** (0.001)	-0.07*** (0.01)
Father's Characteristics						
Age of father	-0.002 (0.02)	-0.002 (0.002)	-0.01 (0.01)	-0.003 (0.003)	0.001 (0.001)	0.01 (0.01)
Age square of father	0.00001 (0.00001)	0.00001 (0.00003)	0.00 (0.0001)	0.00002 (0.00002)	0.00 (0.00)	-0.0001 (0.0001)
Education of father	-0.005*** (0.001)	-0.004*** (0.001)	-0.02*** (0.001)	-0.01*** (0.001)	0.002*** (0.0002)	0.03*** (0.002)
Missing_religion_father	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Religious father	-0.01 (0.004)	0.00 (0.003)	-0.02 (0.01)	-0.01 (0.01)	0.002 (0.001)	0.04 (0.03)
Not stated rel. father	-0.02*** (0.01)	-0.02*** (0.004)	-0.06*** (0.02)	-0.03*** (0.01)	0.01*** (0.01)	0.12*** (0.03)
Missing_stay_father	0.001 (.01)	0.001 (.01)	0.005 (.04)	0.002 (.02)	-0.001(.004)	-0.01 (0.08)
Father's length of stay	-0.0001 (0.0003)	-0.00004 (0.0002)	-0.0001 (0.001)	-0.0001 (0.0003)	0.00002 (0.0001)	0.0003 (0.002)
Missing_speaking_father	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Good speaking father	-0.01 (0.01)	-0.004 (0.01)	-0.02 (0.03)	-0.01 (0.01)	0.002 (0.003)	0.03 (0.05)
Native language father	-0.01 (0.01)	-0.01 (0.008)	-0.03 (0.03)	-0.01 (0.02)	0.003 (0.003)	0.05 (0.06)
Missing_writing_father	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Good writing father	0.0003 (0.07)	0.0003 (0.01)	0.001 (0.02)	0.001 (0.01)	-0.0001 (0.003)	-0.002 (0.05)
Native language father	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Father's region_europe	-0.04 (.02)	-0.03 (.02)	-0.12* (.07)	-0.06* (.03)	0.01 (0.01)	0.22* (.14)
Father's region_asia	-0.03 (.02)	-0.03 (.02)	-0.12 (.07)	-0.05 (0.03)	0.01 (.01)	0.22 (.14)
Father's region_america	-0.05* (.03)	-0.04* (.02)	-0.16* (.09)	-0.08* (.04)	0.02* (.01)	0.31* (.17)
Mother's Characteristics						
Age of mother	-0.001 (0.003)	-0.0004 (0.002)	-0.002 (0.01)	0.00 (0.04)	0.0002 (0.001)	0.004 (0.02)
Age square of mother	0.00 (0.00002)	0.00 (0.00002)	0.00001 (0.0001)	0.00 (0.0003)	0.00 (0.00)	-0.00002 (0.0001)
Education of mother	-0.004*** (0.001)	-0.003*** (0.0004)	-0.01*** (0.01)	-0.01*** (0.001)	0.001*** (0.002)	0.02*** (0.003)
Missing_religion_mother	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Religious mother	-0.004 (0.004)	-0.004 (0.03)	-0.01 (0.01)	-0.01 (0.01)	0.002 (0.001)	0.03 (0.03)
Not stated rel. mother	0.01* (0.005)	0.01* (0.004)	0.03* (0.02)	0.01* (0.01)	-0.003* (0.002)	-0.06* (0.03)
Missing_stay_mother	-0.003(.01)	-0.003(.01)	-0.01 (0.04)	-0.01 (0.02)	0.001 (.004)	0.02 (0.08)
Mother's length of stay	-0.0003 (0.0003)	-0.0003 (0.0002)	-0.001 (0.001)	-0.0001 (0.0004)	0.0001 (0.0001)	0.002 (0.002)
Missing_speaking_mother	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Good speaking mother	-0.01 (.01)	-0.01 (.01)	-0.03 (0.02)	-0.01 (0.01)	0.003 (.002)	0.06 (.04)
Native language mother	0.005 (.01)	0.004 (.01)	0.02 (.03)	0.01 (0.02)	-0.002(.003)	-0.03 (.06)
Missing_writing_mother	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Good writing mother	0.004 (.01)	0.003 (.01)	0.01 (.02)	0.01 (.01)	-0.001(.002)	-0.03 (.04)
Native language mother	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Mother's region_europe	0.03 (0.02)	0.03 (0.02)	0.12 (0.07)	0.05 (0.03)	-0.01 (0.01)	-0.22 (0.14)
Mother's region_asia	0.04* (.02)	0.04* (.02)	0.15** (.07)	0.07** (.03)	-0.02* (.01)	-0.28**(.14)
Mother's region_america	0.04 (0.03)	0.03 (0.02)	0.12 (0.09)	0.06 (0.04)	-0.01 (0.01)	-0.23 (0.17)
N	3359					

+*p<.1; ** p<.05; *** p<.01
++Standard errors are shown in the parentheses

Looking at Table 3.5, which shows the descriptive statistics by marriage type, we can see that the immigrant fathers/mothers who marry another immigrant are different to the immigrant fathers/mothers who marry a native. Moreover, the table also provides evidence that the immigrant fathers who marry a native and the immigrant mothers who marry a native also have different characteristics. Therefore, the analysis is also distinguished between the types of intermarriage. Table 3.11 presents the coefficients of the ordered probit estimation by distinguishing between native mother-immigrant father and native father-immigrant mother marriages.

Table 3. 11. Effect of Types of Intermarriage on the Educational Attainment; Estimation Results of the Ordered Probit Model (Ref. Category: native-native marriage)

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Immigmarriage	-0.62*** (0.04)	-0.20*** (0.05)	-0.14*** (0.05)	0.11 (0.20)	0.23 (0.21)
Native_father	-0.12 (0.12)	0.09 (0.12)	0.14 (0.13)	0.51** (0.23)	0.59** (0.25)
Native_mother	-0.31*** (0.10)	-0.12 (0.10)	-0.06 (0.11)	-0.30 (0.23)	-0.30 (0.25)
Log-likelihood	-5103.3707	-4422.1466	-4395.1144	-4385.2669	-4373.8896
LR chi2	280.08	902.40	956.47	976.16	986.39
N	3586	3364	3364	3364	3359

[+]$p<.1$; [**] $p<.05$; [***] $p<.01$
[++]Standard errors are shown in the parentheses.
[+++]Column (1) is the baseline estimation, and the Columns (2)-(5) are the different specifications of the baseline estimation

As explained before, intermarried immigrant males and intermarried immigrant females have different characteristics. Therefore it is not surprising that they have different effects on child education for all Models. Table 3.11 indicates that if the parental characteristics are not taken into account, having an immigrant mother-native father does not have a significant effect on the education compared to having a native-native married parent. However, having an immigrant father-native mother is associated negatively with the education. On the other hand, when all the parental characteristics are controlled for, the results are changed. Compared to having a

native-native parent, having immigrant mother-native father is associated positively with education while having an immigrant father-native mother does not have any significant relationship with education.

According to Table 3.11, if the parental characteristics are not taken into account, the type of intermarriage does not change the results in terms of the direction of the relationship relative to immigrant-immigrant parents. Compared to immigrant-immigrant married parents having an immigrant-native parent has a positive and significant[16] relationship with education. Upon considering the age and educational characteristics of parent (Model (2)), while having an intermarried immigrant mother is associated positively with education, having an intermarried immigrant father does not have any significant relationship with education. Finally, when all the characteristics of parents are controlled for, only having an intermarried father has a meaningful but negative effect on the education of children compared to having an immigrant-immigrant parent.

Table 3.12 indicates that compared to native-native parents, having an immigrant mother-native father increases the probability of holding an upper-level secondary school degree by 19 percentage points and decreases the probability of dropping out from school by 3 percentage points. However, there is no meaningful difference between having a native-native parent and having an immigrant father-native mother.

According to Table 3.12, compared to immigrant-immigrant parents, having an immigrant father-native mother decreases the probability of holding an upper-level secondary school degree by 17 percentage points and increases the dropping out

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[16] The information on the significance of the difference cannot be drawn from Table 3.11. It is found by looking at the estimation results of the ordered probit model when the immigrant-immigrant parents are the reference category. These results are not reported in the study.

from school by 3 percentage points[17]. However, there is no meaningful difference between having an immigrant-immigrant parent and having an immigrant mother-native father.

Table 3. 12. Effect of Types of Intermarriage on the Educational Attainment; Marginal Effects of the Ordered Probit Model for Model (5) (Ref. Category: native-native marriage)

Variable	Dropout	No Degree Yet	Secondary School Degree	Intermediate School Degree	Technical School Degree	Upper Secondary School Degree
Immigmarriage	-0.01 (0.01)	-0.01 (0.01)	-0.04 (0.04)	-0.02 (0.02)	0.004 (0.004)	0.07 (0.07)
Native_father	-0.03** (0.01)	-0.02** (0.01)	-0.10** (0.04)	-0.05** (0.02)	0.01** (0.004)	0.19** (0.08)
Native_mother	0.01 (0.01)	0.01 (0.01)	0.05 (0.04)	0.02 (0.02)	-0.01 (0.004)	-0.09 (0.08)
N	3359	3359	3359	3359	3359	3359

[+]*p<.1; ** p<.05; *** p<.01
[++]Standard errors are shown in the parentheses.
[+++] All the parental characteristics are controlled for.

3.5.3. Disadvantages in School

As shown in Table 3.6, 42% of respondents with a native-native parents hold an upper level secondary school degree. However, this percentage drops to 21% for the respondents with immigrant-immigrant parents. While the share of upper level degree holders for respondents who have an immigrant father and a native mother is 27%, it is 32% for respondents who have an immigrant mother and a native father. By looking at these raw descriptives statistics, it seems that there is a large disparity in education, and the students who struggle most in school and are least likely to continue to higher education are the children of immigrants.

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[17] These figures are obtained by looking at the coefficients of immigrant-immigrant marriage and immigrant father-native mother marriage on the Table 3.12. However, the information on the significance of the difference cannot be drawn from Table 3.12. It is found by looking at the estimation results of the ordered probit model when the immigrant-immigrant parents are the reference category. These results are not reported in the study.

It is argued in the literature that the reason children of immigrants perform worse in school is the lower socio-economic background of their parents. However, focusing only on children and parental characteristics may neglect what children experienced in the school environment, which is one of the most important factors that affect the students' educational attainment and achievements. Bucerius (2014) states that children from an immigrant background, particularly second-generation immigrants and boys, face serious disadvantages within the German education system, and even if students with an immigrant background have a similar or better academic achievement than their native peers, they are more likely to be recommended for lower level school tracks. As intermarriage decreases cultural and social differences between immigrants and native parents, the children from such marriages will probably take characteristics from both of their parents. Therefore, it is expected that they are going to share more common characteristics with native children than the children of two immigrant parents, and compared to the children of two immigrant parents they are less likely to be exposed to discrimination/disadvantage due to their country of origin, if there is any.

Table A3.4 presents the coefficients of the ordered probit estimations with the models (1)-(5) after additionally controlling also for whether the children experienced any disadvantages in school due to their country of origin, and Table 3.13 and Table 3.14 present the marginal effects. To be specific, Table 3.13 presents the results for the disadvantages-variables-added Model (1) and Table 3.14 presents the results for the disadvantages-variables-added the Model (5). While having a native-native parent was positively associated with holding upper-secondary level degree and negatively associated with dropping out of school, after controlling also for the 'disadvantages' variables, these effects disappear. This implies that having

experienced disadvantage at school is why the children of intermarried parents do worse than native children. Regarding the disadvantages coefficients there does not seem to be much difference across categories of disadvantage in their effect on education. Those children who suffer disadvantages often are 14% less likely to continue to upper secondary school and 2% more likely to dropout.

Table 3. 13. Effect of Intermarriage on the Educational Attainment; Marginal Effects of the Ordered Probit Model for Model (1) with 'disadvantages' variables

Variable	Dropout	No Degree Yet	Secondary School Degree	Intermediate School Degree	Technical School Degree	Upper Secondary School Degree
Nativemarriage	-0.001 (0.01)	-0.001 (0.004)	-0.002 (0.02)	-0.001 (0.01)	0.0003 (0.002)	0.004 (0.04)
Immigmarriage	0.02*** (0.005)	0.01*** (0.004)	0.06*** (0.02)	0.03*** (0.01)	-0.01*** (0.002)	-0.12*** (0.03)
Age of child	-0.01*** (0.004)	-0.01*** (0.003)	-0.04*** (0.01)	-0.02*** (0.01)	0.004*** (0.001)	0.07*** (0.02)
Square of age	.0002*** (0.0001)	.0002*** (0.0001)	0.001*** (0.0002)	0.0003*** (0.0001)	-.0001*** (0.00002)	-0.001*** (0.0004)
Male	0.01*** (0.002)	0.01*** (0.002)	0.03*** (0.01)	0.01*** (0.003)	-0.003*** (0.001)	-0.06*** (0.01)
Missing_disadvantage	0.01* (0.005)	0.01* (0.004)	0.03* (0.02)	0.01* (0.01)	-0.003* (0.002)	-0.06* (0.03)
Disad_often	0.02*** (0.01)	0.02*** (0.01)	0.08*** (0.02)	0.03*** (0.01)	-0.01*** (0.003)	-0.14*** (0.04)
Disad_seldom	0.02** (0.01)	0.01** (0.005)	0.05*** (0.02)	0.02*** (0.01)	-0.01** (0.002)	-0.10*** (0.04)
Disad_never	0.02*** (0.005)	0.02*** (0.004)	0.08*** (0.02)	0.03*** (0.01)	-0.01*** (0.002)	-0.15*** (0.03)
N	3586	3586	3586	3586	3586	3586

⁺*p<.1; ** p<.05; *** p<.01

⁺⁺Standard errors are shown in the parentheses.

Table 3.14 shows that adding the 'disadvantages' variables to Model (5) changes only the significance of the 'native marriage' coefficient. Before adding the 'disadvantages' variable there was no meaningful difference between having an intermarried parent and a native-native parent (see Table 3.10), according to Table 3.14, compared to having an intermarried parent, having a native-native parent actually decreases the probability of holding an upper-level secondary school degree after controlling for disadvantages.

Table 3. 14. Effect of Intermarriage on the Educational Attainment; Marginal Effects of the Ordered Probit Model for Model (5) with 'disadvantages' variables

Variable	Dropout	No Degree Yet	Secondary School Degree	Intermediate School Degree	Technical School Degree	Upper Secondary School Degree
Nativemarriage	0.01 (0.01)	0.01 (0.01)	0.04 (0.02)	0.02 (0.01)	-0.004 (0.003)	-0.08* (0.05)
Immigmarriage	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.02)	-0.01 (0.01)	0.002 (0.003)	0.04 (0.05)
Age of child	-0.01*** (0.004)	-0.01*** (0.003)	-0.04*** (0.01)	-0.02*** (0.01)	0.004*** (0.001)	0.08*** (0.02)
Square of age	.0002*** (0.0001)	.0002*** (0.0001)	0.001*** (0.0002)	0.0004*** (0.0001)	-.0001*** (0.00002)	-0.002*** (0.0004)
Male	0.01*** (0.002)	0.01*** (0.002)	0.03*** (0.01)	0.02*** (0.003)	-0.004*** (0.001)	-0.07*** (0.01)
Missing_disadvantage	0.01 (0.01)	0.004 (0.004)	0.02 (0.02)	0.01 (0.01)	-0.002 (0.002)	-0.03 (0.03)
Disad_often	-0.002 (0.01)	-0.002 (0.01)	-0.01 (0.02)	-0.003 (0.01)	0.001 (0.002)	0.01 (0.05)
Disad_seldom	-0.01 (0.01)	-0.01 (0.01)	-0.03 (0.02)	-0.02 (0.01)	0.004 (0.002)	0.07 (0.04)
Disad_never	-0.002 (0.01)	-0.002 (0.005)	-0.01 (0.02)	-0.004 (0.01)	0.001 (0.002)	0.01 (0.04)
N	3359	3359	3359	3359	3359	3359

[+]*p<.1; ** p<.05; *** p<.01
[++]Standard errors are shown in the parentheses.

Table 3.15 presents the marginal effects of the 'disadvantages' variables added to Model (5) again but distinguishing between the types of intermarriage. Comparing Table 3.12 and Table 3.15, the significance and the magnitude of the marginal effect for immigrant father-native mother marriage coefficient does not change. At the same time the magnitude of the marginal effect for the immigrant mother-native father has increased. According to Table 3.15, relative to having a native-native parent, having an immigrant mother and native father increases the probability of holding an upper-level secondary school degree by 22 percentage points after controlling for disadvantages.

Table 3. 15. Effect of Types of Intermarriage on the Educational Attainment; Marginal Effects of the Ordered Probit Model for Model (5) (Ref. Category: native-native marriage)

Variable	Dropout	No Degree Yet	Secondary School Degree	Intermediate School Degree	Technical School Degree	Upper Secondary School Degree
Immigmarriage	-0.02 (0.01)	-0.01 (0.01)	-0.06 (0.04)	-0.03 (0.02)	0.01 (0.004)	0.11 (0.07)
Native_father	-0.03*** (0.01)	-0.03*** (0.01)	-0.12*** (0.04)	-0.05*** (0.02)	0.01*** (0.005)	0.22*** (0.08)
Native_mother	0.01 (0.01)	0.01 (0.01)	0.04 (0.04)	0.02 (0.02)	-0.004 (0.004)	-0.07 (0.08)
Age of child	-0.01*** (0.004)	-0.01*** (0.003)	-0.04*** (0.01)	-0.02*** (0.01)	0.004*** (0.001)	0.08*** (0.02)
Square of age	.0002*** (0.0001)	.0002*** (0.0001)	0.001*** (0.0002)	0.0004*** (0.0001)	-.0001*** (0.00002)	-0.002*** (0.0001)
Male	0.01*** (0.02)	0.01*** (0.002)	0.04*** (0.01)	0.02*** (0.003)	-0.004*** (0.001)	-0.07*** (0.01)
Missing_disadvantage	0.01 (0.01)	0.004 (0.004)	0.02 (0.01)	0.01 (0.01)	-0.002 (0.002)	-0.04 (0.03)
Disad_often	-0.002 (0.01)	-0.002 (0.01)	-0.01 (0.02)	-0.003 (0.01)	0.001 (0.002)	0.01 (0.05)
Disad_seldom	-0.01 (0.01)	-0.01 (0.01)	-0.03 (0.02)	-0.02 (0.01)	0.004 (0.002)	0.07 (0.04)
Disad_never	-0.002 (0.01)	-0.002 (0.005)	-0.01 (0.02)	-0.004 (0.01)	0.001 (0.002)	0.01 (0.04)
N	3359	3359	3359	3359	3359	3359

[+]*p<.1; ** p<.05; *** p<.01
[++]Standard errors are shown in the parentheses
[+++]Estimation is controlled for child characteristics, all of the parental characteristics, and 'disadvantages in school' categorical variables

Overall, it is hard to generalize the results and relate them back to the literature both because the findings of the current study are mixed and there is no consensus on the literature relating the effect of intermarriage on the educational attainment of children. While Furtado (2009), for example, finds that having immigrant father-native mother increases the probability of dropping out, Van ours and Veenman (2010) finds that having immigrant father-native mother is positively associated with the educational attainment of children. Moreover, while Furtado (2009) and Van ours Veenman (2010) find no meaningful effect of having immigrant mother-native father, Ramakrishan (2004) and Chiswick and DebBurman (2004) provide evidence of positive effect of having both immigrant father-native mother and immigrant mother-native father. Finally Luthra (2010) finds that marrying to a native decreases

the immigrant advantage effect and as a result children of intermarried parents obtains lower educational attainment.

3.6. CONCLUSION

The question of whether there is an effect of intermarriage on the educaional attainment of children is not easy to answer. Intermarried immigrants may have unobserved characteristics that also effect the educational attinment of their children. In such a situation, unobserved characteristics of the intermarried immigrants may cause an overestimate/underestimate of its true effect. In order to deal with this problem some studies used instruments such as group ratio and sex-ratio. Group ratio mesaures the number of female/male immigrants of a country of origin in a certain age group and living in a certain region divided by the total number of female/male population in the same age group and living in the same region. The second instrument, however, measures the number of female/male immigrants of a country of origin in a certain age group and living in a certain region divided by the number of male/female immigrants of the same country of origin of the same age group and the same region.

However in the current study, given the lack of relevant instruments, IV could not be applied. Instead, the chapter has attempted to include in the analysis as many control variables as possible, exploiting the rich information in the SOEP data. In a further study, the results of this chapter could be tested by using an IV model after acquiring additional data on the regional variables.

In this study, when the background characteristics of parents are not taken into account, having intermarried parents have significant negative and positive effects on the educational attainment of children compared to having native-native and immigrant-immigrant married parents, respectively. When the parental

characteristics are also included in the estimation equation, these significant effects disappear for both native-native and immigrant-immigrant marriages. So this suggests that it is the caharacteristics of individuals in the different marriage types that are driving the differences in children's education outcomes, rather than the type of marriage itself.

When distinguishing between the types of intermarriage, we could not find any significant differences between having an immigrant mother-native father and having two immigrant parents. It is shown, however, that having an immigrant father-native mother has a significant and negative relationship with the education of children compared to having two immigrant parents. Since the findings are not same for each type of intermarriage, it appears that these results are not stemming from the characteristics of intermarriage but the characteristics of the intermarried fathers and intermarried mothers.

After additionally controlling for whether the child had experienced any disadvantages in school due to country of origin, having intermarried parents *increases* the probability of attaining an upper-level secondary school degree compared to having native-native parents. This is an important result which shows that children from intermarried parents are actually doing better in school than their native peers. This result explains that why the children with a migration background are doing worse than the children of two native parents.

In order to develop a strong national education system, disparities in education should be eliminated. Reducing inequalities and offering the children of immigrants equal opportunities in the education system should be a priortiy for governments to integrate them into society, since the participation and attainments in the education system are key components for their integration into society and therefore for the

future of country. As a suggestion, providing better information to the students both with and without an immigrant background, as well as teachers and instutions, observing and reducing discrimination may help to attain equal opportunities in education. It is also important to inform parents and students better about the German education system, which has different school types for the different educational paths. It is possible that immigrant parents may be aspiring to send their children to university but at the same time they might not know that the Gymnasium is the main route to university education.

To the best of my knowledge, this is the first study in this field using a variable related to school environment to explain the educational outcomes of second generation immigrants versus natives. This is an important contribution, as the school environment and obstacles faced in the school will almost certainly have an effect on the students' success in both education and the life after education, so any study which does not control for school related variables may suffer from omitted variable bias.

3.7. APPENDIX TO CHAPTER 3

Figure A3. 1. Basic Structure of the Educational System in the Federal Republic of Germany
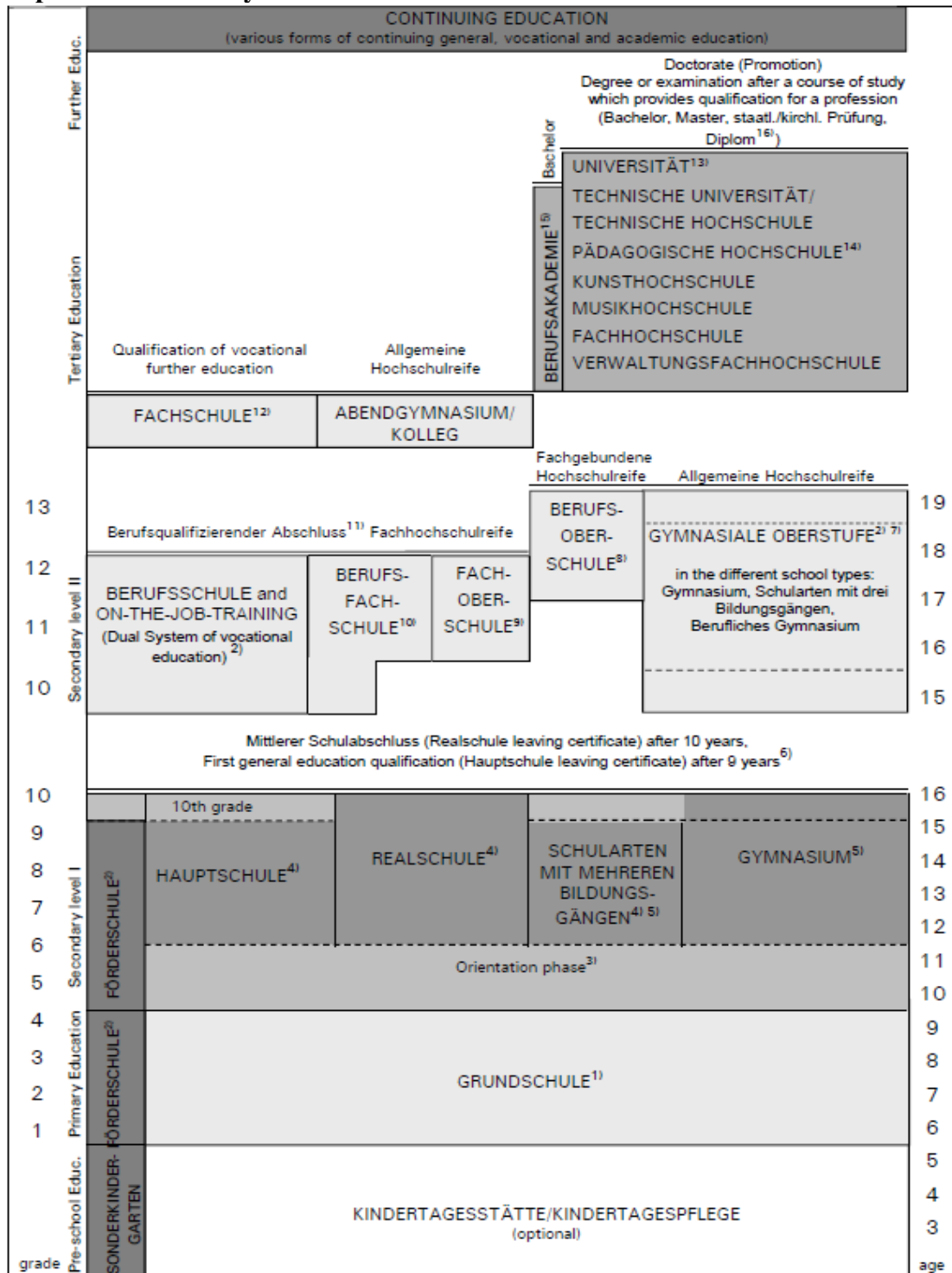
Table A3. 1. Definition of Variables

education	=1 if dropout =2 if no degree yet =3 if secondary school degree =4 if intermediate school degree =5 if technical school degree =6 if upper secondary
Marriage Type of Parents	
mixedmarriage (*ref. cat.*)	=1 if father/mother is native and mother/father is immigrant =0 if otherwise
nativemarriage	=1 if both father and mother is native =0 if otherwise
immigmarriage	=1 if both father and mother is immigrant =0 if otherwise
native_father	=1 if father is native and mother is immigrant =0 if otherwise
native_mother	=1 if mother is native and father is immigrant =0 if otherwise
Child Characteristics	
agechild	Age of the child in years
age2	Square of the child age
male	Binary variable, =1 if the child is male =0 if the child is female
disadvantage_often	=1 if children often experienced disadvantages in school =0 otherwise
disadvantage_seldom	=1 if children seldom experienced disadvantages in school =0 otherwise
disadvantage_never	=1 if children never experienced disadvantages in school =0 otherwise
disadvantage_native (*ref. cat.*)	=1 if the children is native =0 otherwise
missing_disadvantage	=1 if the information on disadvantages in school is missing =0 otherwise
Father's Characteristics	
agefather	Age of the father in years
age2father	Square of the father's age
edufather	Education of father in years
relfather	=1 if father belongs to a denomination =0 if otherwise
notrelfather (*ref. cat.*)	=1 if father does not belong to a denomination =0 if otherwise
narelfather	=1 if no answer for father's denomination =0 if otherwise
missingreligion_father	=1 if the information on the father's religion is missing =0 if otherwise
good_oral_ability_father	=1 if father's speaking ability in German is very good or good =0 if otherwise
poor_oral_ability_father (*ref. cat.*)	=1 if father's speaking ability in German is fairly, poorly or not at all =0 if otherwise
native_oral_father	=1 if the father's native language is German =0 if otherwise
missingoral_father	=1 if the information on the father's speaking ability is missing =0 if otherwise
good_writing_ability_father	=1 if father's writing ability in German is very good or good =0 if otherwise
poor_writing_ability_father (*ref. cat.*)	=1 if father's writing ability in German is fairly, poorly or not at all =0 if otherwise
native_writing_father	=1 if the father's native language is German =0 if otherwise
missingwriting_father	=1 if the information on the father's writing ability is missing

	=0 if otherwise
stayfather	Length of stay of the immigrant father in years
father_region_europe	=1 if immigrant father comes from European countries =0 if otherwise
father_region_asia	=1 if immigrant father comes from Asian countries =0 if otherwise
father_region_america	=1 if immigrant father comes from American countries =0 if otherwise
father_region_africa (*ref. cat.*)	=1 if immigrant father comes from African countries =0 if otherwise
Mother's Characteristics	
agemother	Age of the mother in years
age2mother	Square of the mother's age
edumother	Education of mother in years
relmother	=1 if mother belongs to a denomination =0 if otherwise
notrelmother (*ref. cat.*)	=1 if mother does not belong to a denomination =0 if otherwise
narelmother	=1 if no answer for mother's denomination =0 if otherwise
missingreligion_mother	=1 if the information on the mother's religion is missing =0 otherwise
good_oral_ability_mother	=1 if mother's speaking ability in German is very good or good =0 if otherwise
poor_oral_ability_mother (*ref. cat.*)	=1 if mother's speaking ability in German is fairly, poorly or not at all =0 if otherwise
native_oral_mother	=1 if mother's native language is German =0 if otherwise
missingoral_mother	=1 if the information on the mother's speaking ability is missing =0 if otherwise
good_writing_ability_mother	=1 if mother's writing ability in German is very good or good =0 if otherwise
poor_writing_ability_mother (*ref. cat.*)	=1 if mother's writing ability in German is fairly, poorly or not at all =0 if otherwise
native_writing_mother	=1 if mother's native language is German =0 if otherwise
missingwriting_mother	=1 if the information on the mother's writing ability is missing =0 if otherwise
staymother	Length of stay of the immigrant mother in years
mother_region_europe	=1 if immigrant mother comes from European countries =0 if otherwise
mother_region_asia	=1 if immigrant mother comes from Asian countries =0 if otherwise
mother_region_america	=1 if immigrant mother comes from American countries =0 if otherwise
mother_region_africa (*ref. cat.*)	=1 if immigrant mother comes from African countries =0 if otherwise

Table A3. 2. Region Classification of the Countries

Regions	Countries
Europe	Germany, Ex-Yugoslavia, Greece, Italy, Spain, Ex-GDR, Austria, France, Benelux, Denmark, Great Britain, Sweden, Finland, Switzerland, Romania, Poland, Hungary, Portugal, Bulgaria, Czech Republic, Russia, Australia, Ireland, Albania, Ukraine, Estonia, Latvia, Luxemburg, Belgium, Holland, Croatia, Bosnia-Herzegovina, Macedonia, Slovenia, Slovakia, Belarus, Kosovo-Albania, Lithuania, Serbia, Montenegro, Eastern-Europe
Asia	Turkey, Korea, Iran, Indonesia, Syria, Philippines, India, Afghanistan, Bangladesh, Cyprus, Iraq, Sri Lanka, China, Kazakhstan, Lebanon, Kyrgyzstan, Vietnam, Pakistan, Jordan, Uzbekistan, Malaysia, Azerbaijan, Georgia, Armenia, Palestine, Taiwan, Cambodia
America	USA, Chile, Bolivia, Columbia, Venezuela, Canada, Cuba, Brazil, Peru, Costa Rica, Ecuador, Puerto Rico, Nicaragua, Guyana
Africa	Cap Verde Isl., Ghana, Tunisia, Nigeria, Tanzania, Morocco, Algeria, Mozambique, South Africa, Kenya, Cameroon, Egypt, Togo, Senegal, Gambia

Table A3. 3. Descriptive Statistics of Variables for the Estimation Sample

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Education	3359	4.518	1.344	1	6
Independent Variables					
Mixedmarriage	3359	0.058	0.233	0	1
Nativemarriage	3359	0.668	0.471	0	1
Immigmarriage	3359	0.274	0.446	0	1
Native_father	3359	0.024	0.153	0	1
Native_mother	3359	0.034	0.180	0	1
Respondent's Characteristics					
Age of child	3359	26.553	4.085	20	33
Square of age	3359	721.716	217.554	400	1089
Male	3359	0.466	0.499	0	1
Missing_disadvantage	3359	0.114	0.318	0	1
Disadvantage_often	3359	0.031	0.174	0	1
Disadvantage_seldom	3359	0.056	0.230	0	1
Disadvantage_never	3359	0.162	0.368	0	1
Disadvantage_native	3359	0.637	0.481	0	1
Father's Characteristics					
Age of father	3359	56.495	7.144	35	93
Education of father	3359	11.740	3.492	0	18
Missing_religion_father	3359	0.211	0.408	0	1
Religious father	3359	0.364	0.481	0	1
Nonreligious father	3359	0.152	0.359	0	1
Not stated rel. father	3359	0.273	0.446	0	1
Missing_stay_father	3359	0.184	0.388	0	1
Father's length of stay	3359	42.627	23.613	0	93
Missing_speaking_father	3359	0.183	0.387	0	1
Good speaking father	3359	0.063	0.243	0	1
Poor speaking father	3359	0.041	0.199	0	1
Native language father	3359	0.713	0.453	0	1
Missing_writing_father	3359	0.183	0.387	0	1
Good writing father	3359	0.046	0.210	0	1
Poor writing father	3359	0.058	0.233	0	1
Native language father	3359	0.713	0.453	0	1
Father's region_europe	3359	0.831	0.375	0	1
Father's region_asia	3359	0.156	0.363	0	1
Father's region_america	3359	0.007	0.082	0	1
Father's region_africa	3359	0.006	0.079	0	1
Mother's Characteristics					
Age of mother	3359	53.444	6.352	34	76
Education of mother	3359	11.467	3.176	0	18
Missing_religion_mother	3359	0.185	0.388	0	1
Religious mother	3359	0.364	0.481	0	1
Nonreligious mother	3359	0.119	0.324	0	1
Not stated rel. mother	3359	0.332	0.471	0	1
Missing_stay_mother	3359	0.150	0.357	0	1
Mother's length of stay	3359	41.395	21.425	0	76
Missing_speaking_mother	3359	0.152	0.359	0	1
Good speaking mother	3359	0.070	0.255	0	1
Poor speaking mother	3359	0.057	0.232	0	1
Native language mother	3359	0.721	0.448	0	1
Missing_writing_mother	3359	0.152	0.359	0	1
Good writing mother	3359	0.057	0.232	0	1
Poor writing mother	3359	0.070	0.255	0	1
Native language mother	3359	0.721	0.448	0	1
Mother's region_europe	3359	0.844	0.363	0	1
Mother's region_asia	3359	0.143	0.350	0	1
Mother's region_america	3359	0.007	0.084	0	1
Mother's region_africa	3359	0.006	0.077	0	1

Table A3. 4. Effect of Intermarriage on the Educational Attainment; Estimation Results for the Ordered Probit Model with 'disadvantages' variables

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Nativemarriage	0.01 (0.10)	-0.02 (0.11)	0.01 (0.11)	-0.16 (0.14)	-0.24* (0.15)
Immigmarriage	-0.33*** (0.08)	-0.16* (0.09)	-0.19** (0.09)	0.04 (0.14)	0.13 (0.15)
Child Characteristics					
Age of child	0.21*** (0.07)	0.20*** (0.07)	0.25*** (0.07)	0.25*** (0.07)	0.26*** (0.07)
Square of age	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Male	-0.16*** (0.04)	-0.20*** (0.04)	-0.21*** (0.04)	-0.21*** (0.04)	-0.21*** (0.04)
Missing_disadvantage	-0.16* (0.09)	-0.04 (0.10)	-0.01 (0.10)	-0.05 (0.10)	-0.11 (0.10)
Disad_often	-0.39*** (0.12)	-0.17 (0.12)	0.10 (0.14)	0.05 (0.14)	0.04 (0.15)
Disad_seldom	-0.27*** (0.10)	0.02 (0.11)	0.28** (0.12)	0.23* (0.13)	0.21 (0.13)
Disad_never	-0.42*** (0.08)	-0.13 (0.09)	0.13 (0.10)	0.08 (0.11)	0.04 (0.12)
Father's Characteristics					
Age of father	-	0.06 (0.04)	0.05 (0.04)	0.05 (0.04)	0.04 (0.04)
Age square of father	-	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Education of father	-	0.10*** (0.01)	0.10*** (0.01)	0.09*** (0.01)	0.10*** (0.01)
Missing_religion_father	-	-	-0.17 (0.12)	-0.17 (0.16)	-0.18 (0.16)
Religious father	-	-	0.12 (0.08)	0.12 (0.08)	0.12 (0.08)
Not stated rel. father	-	-	0.40*** (0.09)	0.39*** (0.09)	0.39*** (0.09)
Missing_stay_father	-	-	-	-0.06 (0.24)	-0.01 (0.25)
Father's length of stay	-	-	-	0.00 (0.00)	0.00 (0.00)
Missing_speaking_father	-	-	-	0.12 (0.20)	0.09 (0.20)
Good speaking father	-	-	-	0.12 (0.15)	0.07 (0.16)
Native language father	-	-	-	0.21 (0.20)	0.24 (0.21)
Missing_writing_father	-	-	-	(omitted)	(omitted)
Good writing father	-	-	-	-0.01 (0.15)	0.02 (0.15)
Native language father	-	-	-	(omitted)	(omitted)
Father's region_europe	-	-	-	-	0.72* (0.43)
Father's region_asia	-	-	-	-	0.67 (0.44)
Father's region_america	-	-	-	-	1.00* (0.54)
Mother's Characteristics					
Age of mother	-	-0.00	0.01	0.01	0.01

		(0.05)	(0.05)	(0.05)	(0.05)
Age square of mother	-	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Education of mother	-	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)
Missing_religion_mother	-	-	0.01 (0.13)	0.09 (0.16)	0.11 (0.16)
Religious mother	-	-	0.11 (0.09)	0.10 (0.09)	0.08 (0.09)
Not stated rel. mother	-	-	-0.15 (0.10)	-0.16* (0.10)	-0.17* (0.10)
Missing_stay_mother	-	-	-	0.05 (0.24)	0.01 (0.25)
Mother's length of stay	-	-	-	0.01 (0.01)	0.01 (0.01)
Missing_speaking_mother	-	-	-	1.02 (1.07)	1.19 (1.07)
Good speaking mother	-	-	-	0.26* (0.14)	0.21 (0.14)
Native language mother	-	-	-	0.01 (0.19)	-0.05 (0.20)
Missing_writing_mother	-	-	-	-1.02 (1.06)	-1.15 (1.06)
Good writing mother	-	-	-	-0.13 (0.13)	-0.10 (0.14)
Native language mother	-	-	-	(omitted)	(omitted)
Mother's region_europe	-	-	-	-	-0.67 (0.43)
Mother's region_asia	-	-	-	-	-0.83* (0.44)
Mother's region_america	-	-	-	-	-0.69 (0.53)
Log-likelihood	-5087.2372	-4420.4101	-4392.0656	-4384.1865	-4372.1419
LR chi2	312.34	905.88	962.57	978.32	989.88
N	3586	3364	3364	3364	3359

[+]*p<.1; ** p<.05; *** p<.01

[++]Standard errors are shown in the parentheses

CHAPTER 4: DETERMINANTS OF HOUSEWORK OF CHILDREN, AND PARTICIPATION IN CHILD ACTIVITIES IN TURKEY

4.1. INTRODUCTION

In reducing the poverty in a country, human capital improvements play an important role. Education is one of the most important elements for human capital improvements since it increases the human capital, which has a positive relationship with economic development and growth (Barro, 2001). Regarding the effect of education on economic development and growth, studies point out that the effect of different levels of education differs for developing and developed countries. For example, Petrakis and Stamatakis (2002) found that while higher education is essential for developed countries, primary and secondary education is more important for developing countries. For this reason, it is crucial that children participate in primary and secondary schools in developing countries such as Turkey.

Any activities that prevent children from attending school or prevent them sparing more time for school-related activities are obstacles that need to be overcome. Child labour (both market and non-market) is one of these activities. As in many developing countries, child labour is a widespread problem also in Turkey. Comparison of the results of the Working Child Survey-2006 and the Working Child Survey-2012 show that there has not been much improvement in child labour from 2006 to 2012. While the employment rate for boys aged 6-17 increased from 7.7% to 7.9%, it decreased from 4.0% to 3.7% for girls aged 6-17. In 2012, 364,000 (41%) of the children, who are engaged in economic activities and aged 6-17, were working more than 45 hours as either a regular/casual employee, self-employed or unpaid family worker. A high majority of those children (307,000 children out of 364,000) are working in a paid job. Considering that an employee cannot work by

law more than 45 hours in a week, labour market conditions are very demanding for child labourers.

Some early studies from Turkey (Dayioglu and Assad, 2003; Kiral and Tiras, 2013) only considered working in the labour market as child labour. In this study, a distinction between market and non-market work is made. This will be a more appropriate approach in the context of Turkey because excluding non-market work from the analysis will underestimate the extent of girls' working in particular. From this point of view, this chapter aims to get a better understanding of the child labour phenomena in Turkey.

The empirical methodology used in this chapter is discussed in Section 3.4.3 below. A multinomial logit model is used and it is extended to allow for a random household specific component in the error term. Siblings coming from the same household within the sample might share the same unobserved family characteristics, which cause the error terms to be correlated for these individuals. The reason for allowing a random household specific component in the error term is to prevent this problem that may arise (King and Lillard, 1983). To the best of my knowledge, this is the first study, to use the random effects multinomial logit model to examine the determinants of children's participation in different activities.

Bearing in mind the importance of investing in education, an understanding of the factors underlying household decisions regarding the children's participation in different activities other than attending school may be useful for policy makers in implementing true strategies to increase the education levels of society by reducing the burden of children. From this point of view, the aim of this chapter is to identify the relevant determinants of the participation in different child's activities of girls and boys in Turkey using the 2012 Household Labour Force Survey and the 2012

Working Child Survey. To the best of my knowledge, this study is the first attempt to use the 2012 Working Child Survey in the determinants of the child's participation in different activities.

The rest of the chapter is structured as follows; Section 2 provides information on the structure of the education system and the child labour in Turkey. Section 3 reviews the background literature focusing on the econometric methodologies of the studies and discusses the contributions of the current study. Section 4 describes the data, explains the variables used in the analysis and the estimation methods employed in this study. Section 5 discusses the results, and Section 6 discusses the main findings.

4.2. THE EDUCATION SYSTEM AND CHILD LABOUR IN TURKEY

4.2.1. Structure of the Education System

The Basic Law of National Education, which was issued in 1973, determines the general framework of the Turkish National Education System. The Turkish national education system consists of two main parts: formal education and informal education. Formal education can be defined as the regular education, which is being given in schools to individuals of a given age. Formal education includes pre-primary, primary, secondary and higher education institutions. Informal education covers all activities and organisations intended to satisfy the educational needs of every individual at any age level and educational background. Informal education activities are offered out-of-school. The aim of informal education is to improve individuals' standard of living by teaching them how to read and write and developing their current skills.

Between 1997 and 2012, the formal educational system consisted of pre-school, primary, secondary and higher education institutions. Primary education, which

takes eight years to complete, is compulsory for everybody and it is free of charge in public schools. With the extension of compulsory schooling, the terms "primary school" (5 years) and "middle school" (3 years) were removed and the term "primary education" (8 years) was introduced.

In 2012, the act 6287 named as *amendment in primary school and public education law* was introduced. The law introduced strict changes to the structure and curriculum of the Turkish education system. By this law, the uninterrupted 8-year compulsory school structure was changed with the establishment of a 12-year compulsory fragmented system which makes it possible to orient children toward a religious vocational middle school in the second 4-year-period and an Anatolian high school, a high school of science, a fine arts high school or a vocational and technical high school in the third 4-year-period. The starting school age was also reduced by the law. Before this law, children who were 72 months of age by the 31st of December of that year could enrol in school. This rule has been changed by enabling children, who are 66 months of age by the 30th of September, to enrol in school.

Figure 4.1 below presents the organisation of the education system in terms of the education levels and age categories.

Figure 4. 1. Organization of the Education System in Turkey, 2014/2015
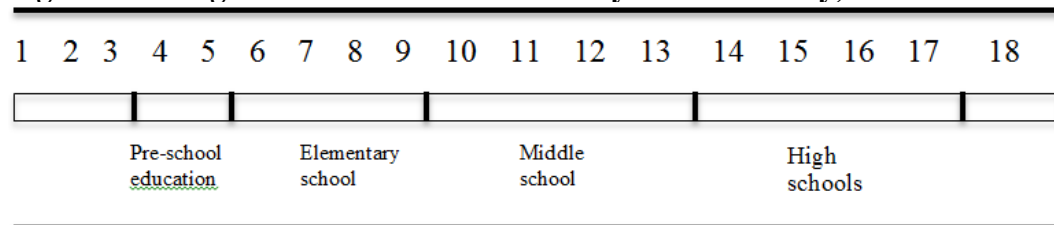
Source: Eurydice, 2014

4.2.2. Review of Child Labour in Turkey

Child labour is a serious problem in Turkey like other developing countries. Although discussions on child labour arise from time to time, generally necessary attention is not paid to it. For example, while outcomes of household labour surveys are announced monthly, the results do not contain child labour surveys. However Turkey has to take necessary precautions against child labour within the framework of agreements which are contracted by the International Labour Organization (ILO). Since 1992, Turkey is a part of the "International Programme for the Elimination of the Child Labour" (IPEC), which was launched by the ILO. By participating in this programme, Turkey aims to eliminate child labour in the long term; and to protect working children and improve their working conditions in the short and medium terms (TURKSTAT and ILO, 2013). Under this project the first child labour survey was conducted in 1994 and later child surveys of Turkey were conducted in 1999, 2006 and 2012. Comparison of results of the last two child surveys (Table 4.1) indicates that there has not been much improvement in child labour. While the employment rate for boys increased from 7.7% to 7.9%, the employment rate for girls decreased from 4.0% to 3.7% from 2006 to 2012.

Table 4. 1. Employment rate of children by gender and age groups

	Boys						Girls					
	6-14		15-17		6-17		6-14		15-17		6-17	
	2006	2012	2006	2012	2006	2012	2006	2012	2006	2012	2006	2012
Employed Population	207	185	425	430	632	614	113	108	213	171	326	279
Child Population	6286	5794	1906	1981	8192	7775	6192	5592	1880	1880	8072	7472
Employment Rate(%)	3.3	3.2	22.3	21.7	7.7	7.9	1.8	1.9	11.3	9.1	4.0	3.7

* TURKSTAT and ILO, 2007; and TURKSTAT and ILO, 2013
**Numbers are in thousand
***Figures in table may not add up to totals due to rounding

Figure 4.2 and Figure 4.3 show that most of the children engaged in economic activities are working in the agriculture sector. This situation is prevalent especially for the 6-14 age group boys and for girls in both the 6-14 and 15-17 age groups. Since agriculture is one of the most dangerous sectors for children (ILO, n.d.a) it is worrying that the highest increase in the share of agriculture happened in the 6-14 age group categories.

Figure 4. 2. Branches of economic activities for boys by age groups
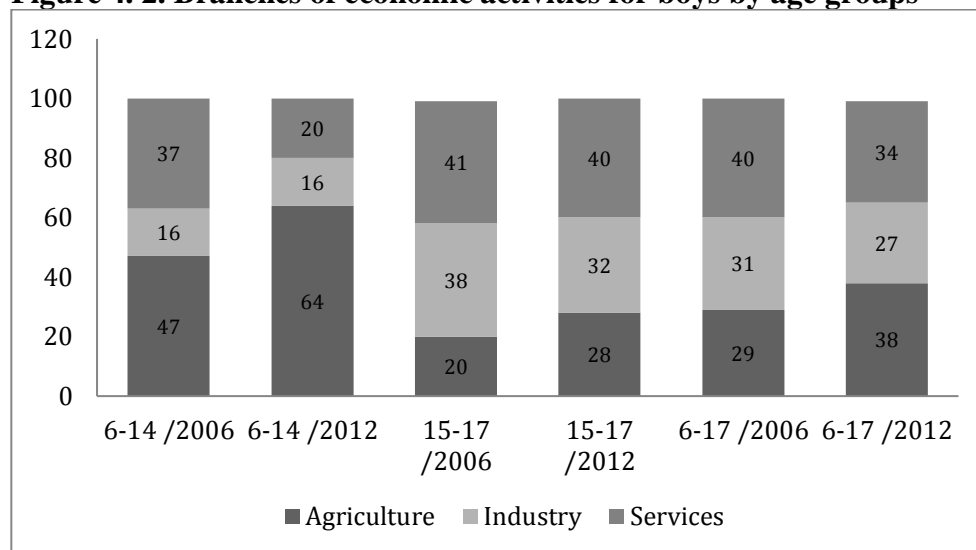
*Numbers are in percentages
**Based on author's calculations using figures from TURKSTAT and ILO, 2007; and TURKSTAT and ILO, 2013

Figure 4. 3. Branches of economic activities for girls by age groups
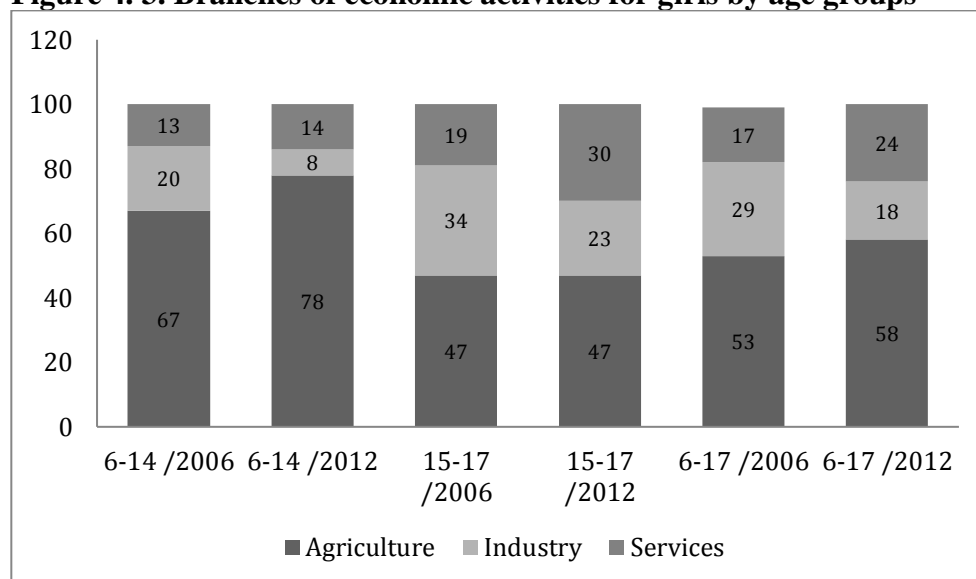
*Numbers are in percentages
**Based on author's calculations using figures from TURKSTAT and ILO, 2007; and TURKSTAT and ILO, 2013

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Table 4. 2. The actual hours of work of children engaged in economic activities (ages 6-17)

	Regular or casual employee		Self-employed		Unpaid family worker		Total	
	2006	2012	2006	2012	2006	2012	2006	2012
1-7 hours	2 (0%)	5 (1%)	2 (8%)	0 (0%)	69 (16%)	133 (32%)	72 (8%)	138 (15%)
8-15 hours	17 (3%)	18 (4%)	3 (12%)	na	86 (20%)	96 (23%)	106 (11%)	114 (13%)
16-30 hours	63 (12%)	87 (19%)	5 (19%)	3 (30%)	100 (24%)	78 (19%)	168 (18%)	169 (19%)
31-39 hours	15 (3%)	14 (3%)	4 (15%)	1 (10%)	31 (7%)	37 (9%)	51 (5%)	51 (6%)
40-45 hours	34 (7%)	35 (7%)	2 (8%)	2 (20%)	30 (7%)	16 (4%)	66 (7%)	53 (6%)
46-54 hours	116 (23%)	108 (23%)	3 (12%)	1 (10%)	11 (3%)	16 (4%)	130 (14%)	125 (14%)
55+ hours	258 (50%)	199 (%42)	6 (23%)	4 (40%)	82 (20%)	36 (9%)	345 (36%)	239 (27%)
Not at work	9 (2%)	3 (1%)	0 (0%)	na	11 (3%)	1 (0%)	20 (2%)	4 (0%)
Total	513 (100%)	470 (100%)	26 (100%)	10 (100%)	420 (100%)	413 (100%)	958 (100%)	893 (100%)

*Numbers are in thousand
** Total numbers may not be correct due to rounding of the numbers.
***Based on author's calculations using figures from TURKSTAT and ILO 2007; and TURKSTAT and ILO, 2013

Table 4.2 shows the actual hours worked in a week. According to this table, 32 percent of the children who are working as an unpaid family worker work less than 7 hours in a week; and 70 percent of them work 30 hours in a week at most. Despite that, 475,000 (50%) of the working children and 364,000 (41%) of the working children were working more than 45 hours in 2006 and 2012 respectively as either regular/casual employee, self-employed or unpaid family worker. A high majority of those children (307,000 children out of 364,000) are working in a paid job. Considering that in Turkey, an employee's total working hours cannot exceed 45 hours in a week, children in the labour market work under very demanding conditions.

Table 4. 3. Weekly working hours of children who engage in housework by gender (ages 6-17)

	Boys	Girls	Total
1-7 hours	2959	3053	6012
8-15 hours	196	738	934
16-30 hours	84	388	472
31-39 hours	1	35	37
40+ hours	3	45	49

*Numbers are in thousand
** Based on author's calculations using figures from TURKSTAT and ILO, 2013

Table 4.3 shows the number of working hours in household chores in 2012. Most of the children spend at most 7 hours per week doing housework. According to this table the number of hours of housework done by girls is much higher than boys. 45,000 (1.1%) girl children are engaging in housework for more than 40 hours per week. It may be possible to attend school with long hours of work, but both due to fatigue and attentiveness in school, and spending less time on homework at home will likely affect the learning of children (Assaad et. al., 2010).

Because enrolment decision is a one-time event and occurs only at the beginning of the school year, it is also possible that even though children are enrolled in school, they may not actually be attending school (Burkee and Beegle, 2004). In their study, Rivera-Batiz and Durmaz (2014) found that one of the reasons for the decreased success of Turkish students in The Programme for International Student Assessment (PISA) is increasing student absenteeism. Therefore child labour must be a priority for policy makers.

4.3. LITERATURE REVIEW

4.3.1. Child Labour

Child labour is difficult to define since it is a complex phenomenon and there is no universally accepted definition of it. The purpose of this section is to review how child labour is defined in related studies.

According to the ILO not all types of work have negative effects on children. Therefore the ILO makes a distinction between work to be eliminated and beneficial

work. Child labour is defined as work that worsens children's physical, mental, moral or social development. If work does not interfere with a child's schooling nor affects a child's personal development and health, it is considered as positive. This is a narrow definition of child labour since it includes only market work and housework is not included in this definition. Housework is considered as a type of work that enhances the children's and their families' welfare (ILO, n.d.b).

On the other hand, The United Nations Children's Fund (UNICEF) makes a more broad definition of child labour. Work is defined as child labour if it exceeds; 1 hour of economic work or 28 hours of household work per week for children aged between 5 and 11 years, 14 hours of economic work or 28 hours of household work per week for children aged between 12 and 14 years, and 43 hours of economic or household work per week for children aged between 15 and 17 years (Fassa et. al., 2010).

Most of the child labour and schooling literature has focused on the traditional definition of child labour and thus only focused on labour force participation (Lodhi et al., 2011; Dayioglu and Assaad, 2003; Gunnarsson et al., 2006). They assume that the lost value of a child's labour is the opportunity cost of attending school by treating schooling as the only alternative to work in the labour market (Burke and Beegle, 2004; Emerson and Souza, 2008).

However it is important to note that child labour can cover activities other than paid jobs. Household chores, for example, are a part of children's life in many parts of the world. It is likely to be the most prevalent kind of child labour. Therefore, it is also possible to define child labour as including time spent on household activities, which are not directly related to income earning activities. From one point of view, children may benefit from working at home as they will gain attitudes and personal

qualities such as responsibility and dependability, which are likely to affect their future achievements. Moreover they will learn how to use their time wisely. From another point of view, doing housework may also require them to give up other productive activities such as gaining an education, doing homework, studying or working in the labour market (Wikle, 2014).

Zapata et al., (2011); Edmonds (2008); Levision, Moe and Knaul (2001); Kurosaki et al. (2006); Assaad et al., (2001); Moyi (2011) included housework in their analysis. Based on the definition of work a significant gender bias may occur. In order to avoid this bias happening, Assaad et al., (2001), for example, make different work definitions to be used in the analyses of girls and boys; inclusive work (includes housework, agriculture and animal husbandry, and market work), exclusive work (includes agriculture and animal husbandry, and market work) and market work (includes only market work). While they use the inclusive work definition for girls, they used the market work definition for boys. Similarly, Kruger, et al. (2010) defined three activities; attending school, working, and a combination of school and work. They run separate analyses for their two different work definitions; including only market activities, and including both market and housework activities.

In the current study a broader definition of child labour is adopted. One reason for this is to become able to include a large number of children who engage in household chores. Excluding housework from the definition of child labour would underestimate the burden on the children. This is especially the case for girls, since worldwide housework is mostly carried out by girls (Biggeri et al., 2003; Cigno and Rosati, 2002). The other reason for including housework in the child labour definition is that the determinants of children's participation in market work and

family or housework may differ from each other (Webbink et al., 2010) and therefore it is important to examine the factors that affect children's participation choices in different child labour types.

4.3.2. Theoretical Discussion

Two approaches are used in the literature to study the joint allocation of time within the family: the household production model, and the collective model. The most common model used in analysing the participation decision to the multiple activities of children is the standard household production model which is introduced by Becker (1965). The standard household model (which is also called the 'unitary' model) assumes that a household acts as a single decision-making unit. That is, either family members have the same preferences and agree completely regarding the choices or there is a dictator within the family who takes all the decisions.

Contrary to the unitary model of household decision-making, the collective model rejects the common utility function and allow for differences in individual preferences by assuming that a household consists of several individuals with different utility functions. The collective model can be separated into two broad categories (Bourguignon and Chiappori, 1994): cooperative setting and non-cooperative setting. The non-cooperative setting (bargaining approach) assumes that the decision of the allocation of household resources is the consequence of a bargaining process which depends on the bargaining strength of individual household members who aim to allocate the resources to the goods they individually prefer. In the bargaining model family members do not cooperate and act like there is a game between them. On the other hand, a cooperative setting does not make any assumption relating to the decision process, and only assumes that the outcomes of the household decisions are Pareto efficient.

The decision to alocate the children to the multiple activities will differ depending on whether households behave as in the unitary model or the collective model. A household consisting of several individuals with different preferences does not always behave as a single rational decision maker. Because the utilities of different household members differ, they have different preferences over different choices and therefore they may have different impacts. In order to analyze the factors affecting the decision-making process, it is necessary to depart from the unitary household model.

In the current study, it is assumed that a household is described as a group of individuals (instead of a single decision maker/household head), each of whom is characterized by particular preferences, and among whom a collective decision process takes place. That is, a household structure consisting of a mother, a father and n children who can be sons or daughters is considered. Additionally, it is assumed that all the relevant decisions are made by parents. The decision of the parents regarding child activities is influenced by any child, individual, household and community characteristic.

4.3.3. Estimation Issues

Most research undertakes separate analyses for the estimations of schooling and work by estimating a linear probability, logit or probit models. For example, Dayioglu and Assaad (2003) applied a probit model in order to examine the determinants of child labour in urban Turkey; and Kabubo-Mariara and Mwabu (2007) also applied a probit model to examine the determinants of school enrollment in Kenya. However, a child who attends school might also engage in market work or non-market work or even might combine them. Therefore, as it is argued in Patrinos and Psacharopoulos (1997), schooling and child labour decisions are naturally not

mutually exclusive. As a result, researchers have started to include the work decision in order to analyze schooling and child labour jointly; and have applied empirical methods in order to analyze the correlations between schooling and other alternatives to schooling.

The bivariate probit model is one method that can be applied to consider both only schooling and only working. Kamga (2011) estimates a bivariate probit model to examine the relationship between child work hours and school performance. Canagarajah and Coulombe (1997) also use a bivariate probit model to analyze the determinants of child labour in conjunction with schooling for Ghana by treating schooling and working as two interdependent activities. Zapata et al. (2011) is another example of a study using the bivariate probit model. They used data from Bolivia to examine the work and schooling decisions of children.

When the dependent variable takes the form of several unordered activities, other approaches that can be applied are the multinomial logit (MNL) model and the multinomial probit (MNP) model. MNL is simpler but imposes the independence of irrelevant alternatives (IIA) assumption, which will be defined later in the methodology section (Greene, 2003). MNP is more flexible since it does not make the assumption of IIA. Lodhi et al. (2011) analyzed the determinants of children's participation in different activities in Pakistan by using the MNP model. In addition to attending secular school, they defined four other categories; religious education, child labour, attending secular school and child labour, and inactivity. Moyi (2011); Levision, Moe and Knaul (2001); Levision and Moe (1998) used MNL in their analysis to explore the determinants of children's participation in school and/or market/non-market work.

There are also other studies using alternative estimation methods such as the generalized ordered logit model. The ordered logit model depends on an ordering of activities. Thus, it assumes that parents order their preferences on child activities from worst to best. Kruger et al. (2010) apply a generalized ordered logit model in order to analyse the relationship between all possible time allocation patterns of children. In this study, parents prefer the 'schooling only' option to 'working and schooling'; and 'working with schooling' is preferred to the 'working only' option. Therefore schooling only, working with schooling, and working only are defined as best, intermediate and worst outcome respectively. In order to order these activities, two principles are considered; the welfare of the child and the child's contribution to household income.

All the models above assume that the choice between alternatives is made simultaneously. However, there are also studies which assume that households consider a sequential decision-making process. Grootaert and Patrinos (1999), for example, used a sequential probit model to examine the determinants of child labour in four countries - Côte Ivoire, Colombia, Bolivia and Philippines. With sequential decision making, a choice is made between sending children to school (preferred option) and all other options. If the household does not choose the preferred option, then the next step will be to make a decision between the second best and the remaining options. This process continues until no alternative remains.

In the current study, it is assumed that time allocation decisions are simultaneous and they are unordered. The MNL model is a good starting point for this kind of study. Therefore the MNL model is applied, and in order to relax the IIA assumption and compare the results with the multinomial logit model a random effect multinomial logit model is also applied.

This study contributes to the literature in two ways. First, in terms of the methodology used to analyze the determinants of child participation in different activities, this study uses a random effect multinomial logit model in addition to the standard multinomial logit model to relax the IIA assumption. To the best of my knowledge this is the first study that uses this methodology in this literature. Second, most of the studies consider only schooling and working in the labour market. In this study housework is also considered as one of the alternatives to schooling. We investigate different thresholds of housework intensity for the 6-14 age group and whether decisions vary according to the family's characteristics. To the best of my knowledge this is the first study that includes housework in child time allocation decisions using data from Turkey.

4.4. DATA AND METHODOLOGY

4.4.1. Data

The 2012 Household Labour Force Survey (HLFS-2012) for Turkey and the 2012 Working Child Survey (WCS-2012) for Turkey are used in this study. The WCS was administered to 27,118 children whose age is between 6 and 17, in 15,538 households. The surveyed households were located in 26 sub-regions (NUTS2) of Turkey. The survey is nationally representative with 3,931 households from rural and 11,607 households from urban areas.

The questions of the WCS are grouped into three categories. The first category contains questions related to labour force status (i.e. whether the child is working, status in employment, hours of working, monthly earnings, and reason for working). The second group of questions is related to the education of the child such as whether they are attending school, reasons for non-attendance, last school and class attended. Having measures of educational outcomes such as grades received and test

scores would be useful, however this information is not available in the dataset. Finally, the third category contains questions related to housework. The housework section includes the question of whether children helped doing household chores such as shopping, cooking, house cleaning, laundry, childcare and collecting water, as well as the total amount of time spent on all housework activities.

Since the WCS was conducted with the same households who were selected for the HLFS, it is possible to match the two data sets by using the household number, which is unique for each household. The WCS contains information on children's characteristics but not information on their parents such as parents' education and income which is in the HLFS. The unique data set, which is created by merging the two data sets, is suited to the analysis because it contains detailed information on both parents and their children, which constitutes a crucial part in examining the participation decisions of children in different activities.

In this study, the dataset is split into two age groups (6-14 and 15-17 age groups) and analyzed separately. For the 6-14 age group, those children who work in the labour market, doing only housework and participating in none of the activities are dropped from the analysis. The reason for dropping the children who work in the labour market is because there are too few children. Only 2.4% of (475 children out of 19,815 children) children in the data engage in labour market. And the reason for dropping the children who do 'only housework' is to investigate how the intensity of housework is affected by the children's and family's characteristics. The comparison was only possible when the amount of housework of the school-attending children was taken into consideration. There are 191 children in this category. The number of children who participate in none of the activities is 250. As a result, the final sample

includes 9,306 girls and 9,593 boys for the 6-14 age group; and 3,382 girls and 3,577 boys for the 15-17 age group.

The age restrictions related to the unit of analysis are determined according to the aims of the study and the structure of the education system in Turkey. We restrict the sample to ages 6-14 and 15-17 to adhere to the ILO definition of a child labourer. According to the ILO the minimum age for working should not be below the age for finishing compulsory schooling. Another reason is that these two age groups differ from each other in terms of work done. Therefore it was crucial to define separate activities for each age group.

The objective of this study is to explore the socioeconomic factors that affect demand for school attainment versus alternative activities by considering housework as a possible child activity.

4.4.2. Variable Construction and Definition

Table A4.1 gives an overview of the dependent and independent variables used in this study. However it is needed to explain some of them in more detail.

4.4.2.1. Dependent Variables

As stated in the data section, the data set is split into two groups by age and different choice variables defined for each age group.

Activity6_14: In order to construct this variable, those children who are working and those who are neither attending school nor work nor doing housework are dropped from the sample. The choice variable takes the value of one if the child attends only school and does no housework. It takes the value of two, three and four respectively if the child attends school and also does 1-2, 3-7 and 8 or more hours housework per week.

Activity15_17: Child labour is separated into two categories as market and non-market child labour. Therefore, 6 activities are considered in this category. The choice variable takes the value of one if the child attends only school. It takes the value of two and three, respectively if the child only works in the labour market and only does housework. It takes the value of four if the child both attends school and works. It takes the value of five if the child both attends school and does housework. Finally it takes the value of six if the child neither attends school nor works nor does housework. The last category is defined as *inactivity*. Although parents do not actually choose 'inactivity', it may be a defacto choice so that parents are forced to embrace it due to economic or other constraints (Lodhi et al., 2011).

4.4.2.2. Independent Variables

male: Represents the gender of the child. This variable takes the value of one if the child is male, and zero if the child is female. It is emphasized in the literature that while boys are more likely to engage in the labour market, girls are more likely to engage in housework (Patrinos and Psacharopoulos, 1995; Psacharopoulos and Arriagada,1989). Also, boys are more likely to go to school than girls (Nielsen, 1998; Tansel, 2002).

agechild: measures the age of the child in years. The empirical studies reviewed in the literature review show consistent results with each other and the results are as expected in terms of child's age. It is found that as children get older, it is less likely that they only attend school without working - both market work and housework - (Kruger et al., 2010)

extended, adult, sibling: Responsibilities of children are affected by the presence of others in the household who can do labour force work, housework and childcare. For example, having an infant at home reduces the child's availability for school and

other activities, as infants require a constant attention of older children or adults (Assaad et al., 2001). Kruger et al. (2010) found that while the presence of siblings aged 0-5 decreases the probability of a child to only attend school, the presence of an elderly family member aged 60 or over increases the probability of a child to only attend school.

In the current study, the 'extended' variable takes the value of one if at least three generations are living together in the household, and zero otherwise. The 'adult' variable represents the number of family members aged 15 or over. Finally, the 'sibling' variable represents the number of family members aged 5 or younger.

education of parents: In this study father's and mother's education have five different categories; have no qualifications, five years primary school, eight years primary school, secondary school, and university degree. The 'have no qualifications' category is used as the reference category.

In the empirical literature, there is ample evidence that the education of parents affects their decision to send their children to school or the labour market. It is assumed that having more educated parents increases the probability of being sent to school while it decreases the probability of being sent to work. However mothers' and fathers' education may have different effects on boys' and girls' time allocation decisions. Using data from rural India, Kurosaki et al. (2006), for example, found that while fathers' education has a negative effect on boys' labour force participation and a positive effect on boys' school enrollment, it has the opposite effects for girls' labour force participation and school enrollment. However mothers' education has similar positive effects on boys' and girls' participation choices.

parents' employment: In this study father's and mother's employment status have three different categories; employed, unemployed and not in labour force. The 'unemployed' category is used as the omitted category.

weekly working hours of father and mother: This variable represents the usual weekly working hours in the parents' main job if they are employed. This variable takes the value of zero if the father/mother is unemployed or not in the labour force. Mothers' labour and children's labour are substitutes, especially within the household. Thus an increase in the working hours of mothers is likely to lead to an increase in domestic chores done by children (Ray, 1999; Self, 2011).

ever worked in agriculture: This variable takes the value of 1 if the father/mother is currently working in agriculture, or the last job was an agricultural job, or the main job in the last year was an agricultural job. It takes the value of zero otherwise. It is common in Turkey to get help from children for the household duties and children coming from farming families are expected to work in agricultural production (Rankin and Aytac, 2006). Therefore it is expected that having families working in the agriculture sector may interfere with schooling and increase the probability to work both in the household and in the field as an unpaid family worker.

urban/rural: Represents the place of residence. In the survey, "urban" is defined as settlements with a population of 20,001 and more; and "rural" is defined as settlements with a population of 20,000 and less.

total employment rate and weekly working hours: These variables represent the total employment rate and average number of usual weekly hours of work in the main job by 26 sub-regions (NUTS2 regions) in 2012. Related data is extracted from the EUROSTAT website.

regions: There are 12 level 1 statistical regions (NUTS1 regions); Istanbul, Western Marmara, Aegean, Eastern Marmara, Western Anatolia, Mediterranean, Middle Anatolia, Western Black Sea, Eastern Black Sea, Westeastern Anatolia, Southeastern Anatolia and Middleeastern Anatolia. A dummy variable is included for each region except Middleeastern Anatolia, the least developed region, which is used as the reference category.

Tables A4.2 and A4.3 present the descriptive statistics for the variables used in this study. While Table A4.2 gives the descriptive statistics for the 6-14 age group, Table A4.3 gives the descriptive statistics for the 15-17 age group.

4.4.3. Estimation Methods

To analyze the factors affecting the children's participation decisions in different activities, a multinomial logit model (MNL) will be applied. The MNL applies to a context where an agent chooses from an unordered set of options. Unordered choice models can be motivated by a random utility model.

If a group of decision makers *i=1, 2, …….., n* are faced with *j=1, 2, ……, J* choices, then the utility obtained by decision maker *i* from choosing option *j*, can be given as (Greene,2003):

$$U_{ij} = z_i'\beta_j + \varepsilon_{ij} \qquad\qquad (1)$$

Here the choices have no natural order and the exogenous variables z_i describe only the individual and are identical across alternatives. If the decision maker chooses *j* then we assume that U_{ij} is the maximum among the *J* utilities. It can be shown as:

$$U_{ij} > U_{ik} \qquad \forall\, k \neq j \qquad\qquad (2)$$

A statistical model which is driven by the probability that choice *j* is made, can be derived as:

$$P_{ij} = \Pr\left(U_{ij} > U_{ik}\right) \qquad\qquad \forall\, k \neq j \qquad (3)$$

$$= \Pr(z_i'\beta_j + \varepsilon_{ij} > z_i'\beta_k + \varepsilon_{ik}) \qquad \forall \; k \neq j$$

$$= \Pr(\varepsilon_{ik} - \varepsilon_{ij} < z_i'\beta_j - z_i'\beta_k) \qquad \forall \; k \neq j$$

In order to estimate such a model, it is needed to make a choice about the distribution of the disturbance term ε. If we assume that the disturbance terms are independently and identically extreme value distributed, the probability that decision maker i chooses alternative j is given by:

$$Prob(y_i = j) = \frac{e^{\beta_j z_i}}{\sum_{k=0}^{J} e^{\beta_k z_i}} \; , \qquad \text{j=1, 2, ..., J} \qquad (4)$$

which is the multinomial logit model.

The interpretation of the coefficients is not straightforward and the marginal effects need to be calculated for interpretation. Marginal effects are the derivatives of the probabilities $[Prob(y_i = j) = \frac{e^{\beta_j z_i}}{\sum_{k=0}^{J} e^{\beta_k z_i}}]$ with respect to explanatory variables and can be formulated as follows:

$$\frac{\partial P_j}{\partial z_i} = P_j \left[\beta_j - \sum_{k=0}^{J} P_k \beta_k \right] = P_j [\beta_j - \bar{\beta}]$$

For identification purposes, the coefficient vector of one category is normalized by setting it to zero. It is not important which β_k is normalized to zero. It only changes the interpretation of the coefficients: if β_j is set to zero then other coefficients are interpreted relative to it.

The MNL model can be estimated by using maximum likelihood methods. The log likelihood can be derived by defining d_{ij}=1 if alternative j is chosen by individual i, and 0 if not, for the J possible outcomes. Hence for each individual only one of the d_{ij}'s is 1. The log likelihood function is given by:

$$\ln L = \sum_{i=1}^{n} \sum_{j=0}^{J} d_{ij} \times \ln[\text{prob}(y_i = j)] \qquad (5)$$

The dependent variable y_i is defined as follows:

For the 6-14 age group,

$$y_i = \begin{cases} 1 \text{ if the child is attending school only} \\ 2 \text{ if the child is attending school and doing } 1-2 \text{ hours housework per week} \\ 3 \text{ if the child is attending school and doing } 3-7 \text{ hours housework per week} \\ 4 \text{ if the child is attending school and doing 8 and more hours housework per week} \end{cases}$$

And for the 15-17 age group,

$$y_i = \begin{cases} 1 \text{ if the child is attending school} \\ 2 \text{ if the child is working} \\ 3 \text{ if the child is doing housework} \\ 4 \text{ if the child is both attending school and working} \\ 5 \text{ if the child is both attending school and doing housework} \\ 6 \text{ if the child is inactive (neither goes school nor works nor does housework)} \end{cases}$$

z_i contains the variables such as the education of mother and father, employment status of father and mother, whether parent working in agriculture, gender and age of the child, number of adults, number of siblings (aged 0-5), living in an urban area and a dummy for the each of 12 sub-regions.

The MNL requires the independence of irrelevant alternatives (IIA) assumption (Greene, 2003). The IIA property imposes that the relative odds of choosing between any two activities is independent of the remaining probabilities. In other words adding/deleting any other alternative does not change the odds of the remaining alternatives. However, based on their unobserved characteristics certain households, who prefer their children to engage in only school rather than doing housework, are also likely to have unobserved preferences for working. Therefore, this assumption is questionable.

If the IIA assumption is violated, the model estimation results may be biased (Long and Freese, 2006). Therefore where there is concern about the possible violation of IIA, a choice model that allows this assumption to be relaxed should be used. In this study, in order to control for unobserved household heterogeneity a random effects

multinomial logit model is also applied by using the 'mixlogit' command in STATA (Hole, 2007). In this case, the model will be:

$$U_{hij} = z_{hi}\beta_j + a_{hj} + \varepsilon_{hij} \tag{7}$$

where a_{hj} denotes unobserved family characteristics and ε_{hij} are i.i.d error terms.

The model then takes the form:

$$Prob(y_i = j) = \frac{e^{\beta_j z_{hi} + a_{hj}}}{\sum_{k=0}^{J} e^{\beta_k z_i + a_{hj}}}, \qquad j=0, 1, 2, \ldots, J \tag{8}$$

where h is a subscript for the households.

To identify the model, one of the β_k's and a_{hk}'s are set to zero.

In the simple multinomial logit model the correlation between each alternatives are assumed to be zero, which implies that IIA holds. Random effects multinomial logit model relaxes the IIA assumption (Glick and Sahn, 2005) since corr(a_{hj}, a_{hk}) can be nonzero.

4.5. RESULTS

4.5.1. Descriptive Analysis for the 6-14 Age Group

Table 4.4 shows the child activities by gender and demography. According to this table most of the children living in rural areas (61%) are attending only school without doing any housework. This percentage decreases to 48% when children living in urban areas are considered. Urban and rural children have the same percentages in terms of attending school and doing three or more hours of housework. When boys and girls are compared, it can be seen that percentages of attending only school are higher for boys than girls in both urban and rural areas. Thus girls are doing more housework than boys.

Table 4.5 shows the child activities by the age of children. As the age increases the percentages of children who are only attending school are decreasing; and the

percentages of children who are attending school and doing eight or more hours of

housework is increasing.

Table 4. 4. Summary of child activities by gender and demography

	Urban			Rural		
	Boy	Girl	Total	Boy	Girl	Total
School	3954 (51.79)	3029 (44.47)	6623 (48.17)	1784 (67.22)	1347 (53.99)	3131 (60.81)
School & 1-2 hours hw	2239 (32.27)	1788 (26.25)	4027 (29.29)	499 (18.80)	413 (16.55)	912 (17.71)
School & 3-7 hours hw	861 (12.41)	1319 (19.37)	2180 (15.85)	301 (11.34)	484 (19.40)	785 (15.25)
School & 8+ hours hw	245 (3.53)	675 (9.91)	920 (6.69)	70 (2.64)	251 (10.06)	321 (6.23)
Total	6939 (100)	6811 (100)	13750 (100)	2654 (100)	2495 (100)	5149 (100)

*Numbers in parentheses are percentage values

Table 4. 5. Summary of child activities by age

	School	1-2 hours hw	3-7 hours hw	8 and more hours hw	Total
Age 6	1441 (72.56)	389 (19.59)	115 (5.79)	41 (2.06)	1986 (100)
Age 7	1351 (66.42)	468 (23.01)	153 (7.52)	62 (3.05)	2034 (100)
Age 8	1283 (61.12)	530 (25.25)	222 (10.58)	64 (3.05)	2099 (100)
Age 9	1116 (54.84)	579 (28.45)	261 (12.83)	79 (3.88)	2035 (100)
Age 10	1016 (50.22)	603 (29.81)	299 (14.78)	105 (5.19)	2023 (100)
Age 11	942 (44.39)	619 (29.17)	413 (19.46)	148 (6.97)	2122 (100)
Age 12	1034 (43.63)	617 (26.03)	485 (20.46)	234 (9.87)	2370 (100)
Age 13	818 (38.10)	604 (28.13)	517 (24.08)	208 (9.69)	2147 (100)
Age 14	753 (36.15)	530 (25.44)	500 (24.00)	300 (14.40)	2083 (100)

*Numbers in parentheses are percentage values

Table 4.6 and Table 4.7 present the child activities by education of household head for girls and boys, respectively. As the education of the household head increases, a substantial decrease in the percentages of girls doing eight or more hours of housework can be seen. As the household head becomes more educated, the percentage of children who attend school and do 1-2 hours of housework is increasing for both girls and boys. It can also be seen from Table A4.4 that as the household head gets more educated, the percentages of children who only attend school are decreasing and the percentages of children who attend school and do 1-2 hours of housework are increasing.

Table 4. 6. Child activities by education of household head for girls

Girls	Illiterate	Literate but no qualification	Primary school (5 years)	Primary school (8 years + middle school)	High school (regular + vocational)	University (+ master/ doctorate)
School	356 (57.33)	232 (55.37)	2050 (46.08)	477 (43.56)	703 (44.55)	558 (48.78)
School & 1-2 hours hw	80 (12.88)	68 (16.23)	1000 (22.48)	283 (25.84)	447 (28.33)	323 (28.23)
School & 3-7 hours hw	101 (16.26)	69 (16.47)	888 (19.96)	227 (20.73)	319 (20.22)	199 (17.40)
School & 8+ hours hw	84 (13.53)	50 (11.93)	511 (11.49)	108 (9.86)	109 (6.91)	64 (5.59)
Total	621 (100)	419 (100)	4449 (100)	1095 (100)	1578 (100)	1144 (100)

*Numbers in parentheses are percentage values

Table A4.5 presents the child activities by the geographical regions. The two least developed regions (Souhtheastern Anatolia and Middleeastern Anatolia) have the highest percentages in terms of children who are attending school and doing eight or more hours of housework. The percentages of children who are only attending school are higher in rural areas than urban areas for all regions except Western Marmara region.

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Table 4. 7. Child activities by education of household head for boys

Boys	illiterate	literate but no qualification	primary school (5 years)	primary school (8 years + middle school)	high school (regular + vocational)	university (+ master/ doctorate)
School	511 (73.31)	314 (64.88)	2575 (56.03)	552 (50.97)	834 (51.23)	592 (53.57)
School & 1-2 hours hw	107 (15.35)	92 (19.01)	1261 (27.44)	353 (32.59)	550 (33.78)	375 (33.94)
School & 3-7 hours hw	59 (8.46)	57 (11.78)	620 (13.49)	145 (13.39)	173 (10.63)	108 (9.77)
School & 8+ hours hw	20 (2.87)	21 (4.34)	140 (3.05)	33 (3.05)	71 (4.36)	30 (2.71)
Total	697 (100)	484 (100)	4596 (100)	1083 (100)	1628 (100)	1105 (100)

*Numbers in parentheses are percentage values

4.5.2. The Results of the Multinomial Logit Analysis

4.5.2.1. Results for the 6-14 Age Group

Table A4.6 presents the coefficients, and Table 4.8 presents marginal effects for the multinomial logit model for the 6-14 age group. In terms of gender and age of the child, the coefficients have the expected signs. While being male has a negative relationship with the probability of doing more housework, there is a positive relationship between the age of the child and the probability of doing more housework. Confirming our results, by using data from Brazil, Krueger et al. (2010) also find that girls are less likely to work in the market work and more likely to work in household chores. Our result suggests that being male increases the probability to attend only school. This result is also confirmed by Tansel (2002) who uses data from Turkey to study the determinants of educational attainment, and Nielsen (1998) who uses data from Zambia to study the joint allocation of child labor and school attendance.

Regarding the household composition, the results are consistent with the literature. While a one unit increase in the number of family members aged 15 or over

decreases the probability of doing eight or more hours of housework by 1 percentage point, an increase in the number of siblings aged 5 or younger increases the probability of doing eight or more hours of housework by 1 percentage point. Krueger et al. (2010) find that the time that children's allocate to domestic works shifts toward school as the number of pre-school aged children decreases and the number of adults increases. Similarly, Dayioglu et al. (2009), by using data from Turkey, found that the size of sibling is negatively associated with the school enrollment.

Considering the education of fathers and mothers, a rise in either will decrease the probability of only attending school and increase the probability of doing some amount of housework in addition to schooling. This may be a consequence of the idea that giving some responsibilities to children, which do not hinder their schooling, can help the children to develop healthy habits and enhance their social skills (Call, Mortimer and Shanahan, 1995). An increase in father's education also decreases the probability of doing 8 or more hours of housework.

In terms of parental employment, no meaningful effect of mother's employment status is found. However an increase in the father's weekly working hours increases the probability of doing 8 or more hours of housework. Moreover, relative to children who have an unemployed father, children with a father who is not in the labour force have a higher probability to only attend school and a lower probability to do 1-2 hours of housework in addition to attending school. These results can be explained by the substitution of the father's labour and child labour. In the sample, the most prevalent type of housework is shopping. Therefore if the father is not in the labour force, he can do this kind of housework and this will reduce the burden on

the children. If the father is unemployed, he will go out to search for a job and this will lead to the children doing more housework.

Regarding the household income, children who live in a household with an income higher than 5,000 TRY have higher probability to only attend school and lower probability of doing both 1-2 and 3-7 hours of housework in addition to schooling. Moreover, relative to children who live in a household with an income lower than 1,000 TRY, children who live in a household with an income higher than 10,000 TRY also have lower probability of doing 8 or more hours of housework.

It is found that relative to children who are living in rural areas, children who live in urban areas have a higher probability of doing 1-2 hours of housework in addition to schooling. Also, total employment rates and weekly working hours in the region have a positive relationship with doing housework in addition to schooling. As the total employment rates and weekly working hours increase, the probability of

Table 4. 8. Marginal Effects for the Multinomial Logit Model (6-14 age group)

	School	1-2 hours housework	3-7 hours housework	8 and more hours housework
Male	0.07*** (0.007)	0.06*** (0.007)	-0.07*** (0.006)	-0.06*** (0.004)
Agechild	-0.05*** (0.001)	0.01*** (0.001)	0.03*** (0.001)	0.02*** (0.001)
Agemother	0.001 (0.001)	-0.001 (0.001)	0.0003 (0.001)	-0.001** (.0004)
Agefather	-0.0004 (0.001)	0.001 (0.001)	-0.001* (0.001)	0.001 (.0004)
Extended	-0.01 (0.013)	-0.001 (0.013)	-0.01 (0.01)	0.01* (0.008)
Adult	0.03*** (0.004)	-0.02*** (0.004)	-0.01*** (0.003)	-0.01*** (0.002)
Sibling	-0.01 (0.006)	-0.02** (0.006)	0.01*** (0.005)	0.01*** (0.003)
Father 5 years school graduate	-0.03 (0.018)	0.03* (0.017)	0.01 (0.013)	-0.01 (0.009)
Father 8 years school graduate	-0.05*** (0.02)	0.06*** (0.019)	0.02 (0.015)	-0.02* (0.01)
Father secondary school graduate	-0.05** (0.02)	0.06*** (0.019)	0.01 (0.015)	-0.02* (0.01)
Father university graduate	-0.03 (0.023)	0.05** (0.022)	0.01 (0.017)	-0.04*** (0.011)
Mother 5 years school graduate	-0.03*** (0.012)	0.03** (0.011)	0.01* (0.008)	-0.01 (0.006)
Mother 8 years school graduate	-0.06*** (0.018)	0.03* (0.016)	0.03* (0.014)	0.002 (0.01)
Mother secondary school graduate	-0.03** (0.016)	0.02* (0.015)	0.02 (0.012)	-0.01 (0.008)
Mother university graduate	0,01 (0.024)	0.03 (0.021)	-0.03** (0.016)	-0,00 (0.013)
Father weekly working hours	-0.0001 (.0003)	-0.0001 (.0003)	-0.0001 (0.0002)	0.0003** (.0002)
Mother weekly working hours	0.002*** (0.001)	-0.002*** (.0005)	-0.0002 (0.0004)	0.0001 (.0003)
Father employed	-0.01 (0.024)	-0.03 (0.023)	0.05*** (0.015)	-0.01 (0.014)
Father not in labor force	0.06** (0.024)	-0.06** (0.023)	0.01 (0.016)	-0.01 (0.012)
Mother employed	-0.03 (0.035)	0.03 (0.031)	-0.01 (0.025)	0.003 (0.017)
Mother not in labor force	0.01 (0.025)	-0.02 (0.021)	-0.01 (0.018)	0.01 (0.013)
Father employed last year	-0.003 (0.014)	0.02 (0.013)	0.01 (0.011)	-0.02*** (0.008)
Father not in labor force last year	-0.02 (0.025)	0.01 (0.024)	0.01 (0.02)	-0.003 (0.014)
Mother employed last year	0.09** (0.034)	-0.07** (0.033)	-0.01 (0.028)	-0.001 (0.021)
Mother not in labor force last year	0.10*** (0.034)	-0.08** (0.032)	-0.01 (0.027)	-0.01 (0.021)
Father ever worked in agriculture	0.01 (0.015)	0.002 (0.014)	-0.004 (0.011)	-0.01 (0.007)
Mother ever worked in agriculture	-0.005 (0.014)	-0.01 (0.013)	0.01 (0.01)	0.001 (0.007)
Urban	-0.08*** (0.01)	0.08*** (0.009)	-0.001 (0.008)	0.01* (0.005)
Total employment rate	-0.02*** (0.001)	0.01*** (0.001)	0.01*** (0.001)	0.001* (0.001)
Weekly working hours	-0.02*** (0.004)	0.01** (0.004)	0.002 (0.003)	0.004** (0.002)
HH income (1000-2499)	-0.02 (0.009)	0.01 (0.009)	-0.002 (0.007)	0.01 (0.005)
HH income (2500-4999)	-0.0002 (0.018)	0.01 (0.016)	-0.02 (0.013)	0.01 (0.01)
HH income (5000-9999)	0.11*** (0.036)	-0.07** (0.029)	-0.04* (0.027)	0.01 (0.023)
HH income (>9999)	0.20*** (0.075)	-0.11** (0.057)	-0.03 (0.066)	-0.06*** (0.003)
Istanbul	0.03 (0.033)	-0.08** (0.034)	0.11*** (0.025)	-0.06** (0.025)
Westernmarmara	0.09*** (0.027)	0.02 (0.03)	0.01 (0.02)	-0.12*** (0.022)
Aegean	0.10*** (0.032)	0.01 (0.035)	-0.01 (0.022)	-0.10*** (0.023)
Easternmarmara	0.11*** (0.027)	0.03 (0.03)	-0.03 (0.019)	-0.11*** (0.022)
Westernanatoliaa	-0.09*** (0.023)	0.06** (0.025)	0.09*** (0.018)	-0.06*** (0.02)
Mediterranean	0.03 (0.025)	0.06** (0.027)	0.02 (0.019)	-0.11*** (0.021)
Middleanatolia	0.19*** (0.025)	-0.08*** (0.026)	-0.003 (0.018)	-0.11*** (0.021)
Westernblacksea	0.40*** (0.031)	-0.21*** (0.032)	-0.07*** (0.021)	-0.12*** (0.023)
Easternblacksea	0.15*** (0.025)	-0.13*** (0.026)	0.05*** (0.019)	-0.07*** (0.02)
Westeasternanatolia	0.12*** (0.033)	-0.04 (0.035)	0.02 (0.023)	-0.09*** (0.024)
Southeasternanatolia	0.07 (0.05)	-0.12*** (0.048)	0.08* (0.041)	-0.03 (0.041)
N	15467			
LL	-16054.658			

~*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

parents working and not being in the household for a long time increase. This situation may lead children to take responsibilities in terms of housework. As expected, living in the least developed region increases the probability of doing eight and more hours of housework and decreases the probability of only attending school.

As is shown in Table 4.8, the age of the father and the age of the mother have no significant effect on the chosen activity for children. On the other hand, living in an extended family increases the probability of doing 8 or more hours of housework.

Considering that household characteristics may exert differing effects on the participation decisions of girls and boys, analyses are disaggregated by gender. While Table 4.9 presents the marginal effects for the multinomial logit model for boys, Table 4.10 presents the results for girls. The coefficients of the multinomial logit models for boys and girls are presented in the appendix.

An increase in age has the same effect for boys and girls in terms of the sign. However, the effect is higher for girls. For example, while a one-year increase in the age decreases the probability of only attending school by 4 percentage points for boys, it decreases the probability of only attending school by 6 percentage points for girls.

Living in an extended family increases the probability of doing 1-2 hours of housework for boys and the probability of doing eight or more hours of housework for girls. In extended families, the grandparents live within the household, and because grandparents may need extra or special care, it increases the burden on the children. An increase in the number of siblings aged 5 or younger increases the probability of doing more housework for girls but has no effect on boys. Likewise an increase in the number of family members who are aged 15 or older has the same

effect on both girls and boys. It increases the probability of only attending school by decreasing the burden on the children.

Fathers' and mothers' educations have different effects on girls and boys. Fathers' education has no effect on girls' participation decisions. However, as the fathers become more educated, this increases the probability of doing 1-2 hours of housework for boys. On the other side, as the mothers become more educated, this increases the probability of doing more housework and decreases the probability of only attending school for boys. However as the mothers become more educated, this decreases the probability of doing more housework for girls. Thus mothers' education appears to be more important than the fathers' education in shielding girls from domestic work.

An increase in fathers' and mothers' weekly working hours has no effect on girls. However an increase in mothers' weekly working hours increases the probability of only attending school by 0.03 percentage points for boys. No effect of fathers' and mothers' employment status on girls' and boys' participation choices is found.

Regarding the household income, living in a household with an income between 5000 and 10000 increases the probability of only attending school for both boys and girls. No meaningful effect of other income categories is found.

Living in an urban area and an increase in the total employment rate in the region have the same effects in terms of sign and similar effects in terms of magnitude for both girls and boys. While living in an urban area decreases the probability of only attending school by 0.10 percentage points, it increases the probability of doing 1-2 hours of housework by 0.09 percentage points for boys. Living in an urban area also has no significant effect on the probability of doing eight or more hours of housework for boys.

Living in the more developed regions decreases the probability of doing eight or more hours of housework for girls and boys. This is true especially for girls because the magnitude and significance of the relevant coefficients are higher for girls.

Table 4. 9. Marginal Effects for the Multinomial Logit Model for boys (6-14 age group)

	School	1-2 hours housework	3-7 hours housework	8 and more hours housework
Agechild	-0.04*** (0.002)	0.01*** (0.002)	0.02*** (0.002)	0.005*** (0.001)
Agemother	0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Agefather	0.001 (0.001)	0.0001 (0.001)	-0.001 (0.001)	0.0004 (0.0005)
Extended	-0.04** (0.019)	0.04** (0.019)	0.01 (0.013)	-0.004 (0.008)
Adult	0.04*** (0.006)	-0.03*** (0.006)	-0.01 (0.004)	-0.002 (0.002)
Sibling	0.002 (0.009)	-0.01 (0.009)	0.004 (0.006)	0.01* (0.003)
Father 5 years school graduate	-0.05* (0.026)	0.06** (0.027)	0.002 (0.017)	-0.01 (0.009)
Father 8 years school graduate	-0.08*** (0.029)	0.08*** (0.029)	0.001 (0.02)	-0.01 (0.01)
Father secondary school graduate	-0.08*** (0.029)	0.09*** (0.029)	-0.02 (0.02)	0.01 (0.01)
Father university graduate	-0.06* (0.033)	0.09*** (0.033)	-0.02 (0.023)	-0.01 (0.012)
Mother 5 years school graduate	-0.04*** (0.016)	0,01 (0.016)	0.02** (0.011)	0,005 (0.006)
Mother 8 years school graduate	-0.08*** (0.024)	0.03 (0.023)	0.03** (0.016)	0.02*** (0.008)
Mother secondary school graduate	-0.07*** (0.023)	0.02 (0.021)	0.03** (0.016)	0.02** (0.009)
Mother university graduate	-0.003 (0.033)	-0,004 (0.031)	0.005 (0.025)	0.002 (0.014)
Father weekly working hours	-0.0001 (.0004)	0.0002 (0.0004)	-0,0003 (0.0003)	0.0002 .(0002)
Mother weekly working hours	0.003*** (0.001)	-0.003*** (0.001)	-0,0005 (0.001)	-0,0001 (.0003)
Father employed	-0.01 (0.034)	-0.03 (0.032)	0.05* (0.024)	-0.003 (0.013)
Father not in labor force	0.03 (0.035)	-0,05 (0.034)	0.02 (0.025)	-0,005 (0.012)
Mother employed	-0.11** (0.049)	0.07* (0.043)	0.03 (0.033)	0.01 (0.021)
Mother not in labor force	-0.01 (0.035)	-0.02 (0.031)	0.02 (0.024)	0.02 (0.016)
Father employed last year	-0.004 (0.021)	0.03 (0.02)	-0.0001 (0.014)	-0.02*** (0.006)
Father not in labor force last year	-0,03 (0.035)	0.02 (0.035)	0.01 (0.024)	-0.001 (0.012)
Mother employed last year	0.07 (0.049)	-0.09** (0.043)	-0,01 (0.035)	0.03 (0.025)
Mother not in labor force last year	0.08 (0.048)	-0.09** (0.041)	0.01 (0.034)	0.01 (0.024)
Father ever worked in agriculture	0.03 (0.021)	-0.02 (0.021)	-0,01 (0.014)	0.002 (0.008)
Mother ever worked in agriculture	-0,02 (0.019)	-0.01 (0.019)	0.02 (0.013)	0.003 (0.007)
Urban	-0.10*** (0.015)	0.09*** (0.015)	0.0001 (0.01)	0,01* (0.006)
Total employment rate	-0.02*** (0.002)	0.01*** (0.002)	0.01*** (0.001)	0.00** (0.001)
Weekly working hours	-0.02*** (0.005)	0.01** (0.006)	0.01* (0.003)	0.00*** (0.002)
HH income (1000-2499)	-0.01 (0.013)	0.01 (0.012)	-0.001 (0.009)	0.001 (0.005)
HH income (2500-4999)	0.01 (0.026)	0.002 (0.024)	-0.02 (0.019)	0.003 (0.01)
HH income (5000-9999)	0.13** (0.055)	-0.09* (0.052)	-0.06 (0.048)	0.01 (0.022)
HH income (>9999)	0.34 (8.42)	0.02 (5.161)	0.00 (2.771)	-0.36 (16.347)
Istanbul	0.03 (0.048)	-0.09* (0.048)	0.09*** (0.03)	-0.03* (0.016)
Westernmarmara	0.08** (0.04)	0.03 (0.039)	-0.03 (0.029)	-0.08*** (0.017)
Aegean	0.10** (0.046)	-0.03 (0.046)	-0.04 (0.032)	-0.04** (0.015)
Easternmarmara	0.11*** (0.04)	0.01 (0.04)	-0.07** (0.029)	-0.05*** (0.015)
Westernanatoliaa	-0.12*** (0.034)	0.05 (0.034)	0.08** (0.024)	-0.01 (0.011)
Mediterranean	0.04 (0.036)	0.03 (0.035)	-0.02 (0.028)	-0.05*** (0.016)
Middleanatolia	0.19*** (0.037)	-0.10*** (0.036)	-0.04 (0.028)	-0.05*** (0.016)
Westernblacksea	0.44*** (0.053)	-0.32*** (0.056)	-0.05 (0.036)	-0.07*** (0.019)
Easternblacksea	0.15*** (0.037)	-0.20*** (0.038)	0.07*** (0.025)	-0.02 (0.013)
Westeasternanatolia	0.12*** (0.047)	-0.08* (0.048)	0.02 (0.032)	-0.06*** (0.017)
Southeasternanatolia	0.13* (0.074)	-0.15** (0.076)	0.03 (0.046)	-0.01 (0.025)
N	7856			
LL	-7556.2447			

*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

Table 4. 10. Marginal Effects for the Multinomial Logit Model for girls (6-14 age group)

	School	1-2 hours housework	3-7 hours housework	8 and more hours housework
Agechild	-0.06*** (0.002)	-0.0001 (0.002)	0.03*** (0.002)	0.03*** (0.002)
Agemother	0.002* (0.001)	-0.003** (0.001)	0.002* (0.001)	-0.001 (0.001)
Agefather	0.002 (0.001)	0.002* (0.001)	0.001 (0.001)	0.001 (0.001)
Extended	0.02 (0.019)	-0.04** (0.019)	-0.01 (0.016)	0.03*** (0.011)
Adult	0.03*** (0.006)	0.002 (0.006)	-0.01** (0.005)	-0.02*** (0.004)
Sibling	-0.01 (0.008)	-0.02** (0.008)	0.02*** (0.007)	0.01** (0.005)
Father 5 years school graduate	-0.01 (0.025)	0.002 (0.026)	0.02 (0.022)	-0.02 (0.012)
Father 8 years school graduate	-0.02 (0.029)	0.02 (0.028)	0.03 (0.024)	-0.03* (0.015)
Father secondary school graduate	-0.01 (0.028)	0.03 (0.028)	0.03 (0.024)	-0.05*** (0.015)
Father university graduate	0.02 (0.033)	0.01 (0.031)	0.04 (0.028)	-0.06*** (0.019)
Mother 5 years school graduate	-0.03* (0.016)	0.04*** (0.016)	0.4 (0.013)	-0.02** (0.009)
Mother 8 years school graduate	-0.02 (0.026)	0.04 (0.023)	0.01 (0.021)	-0.03* (0.016)
Mother secondary school graduate	0.01 (0.023)	0.03 (0.021)	0.01 (0.019)	-0.05*** (0.015)
Mother university graduate	0.02 (0.033)	0.07** (0.029)	-0.08*** (0.03)	-0.01 (0.022)
Father weekly working hours	0.0001 (0.0004)	0.0004 (0.0004)	-0.0003 (.0003)	0.0003 (0.0003)
Mother weekly working hours	0.0004 (0.001)	0.001 (0.001)	0.0001 (0.001)	0.0002 (0.0005)
Father employed	-0.01 (0.034)	-0.03 (0.031)	0.06** (0.029)	-0.02 (0.02)
Father not in labor force	0.08** (0.034)	-0.07** (0.033)	0.02 (0.03)	-0.02 (0.019)
Mother employed	0.05 (0.05)	-0.01 (0.041)	-0.04 (0.038)	0.003 (0.032)
Mother not in labor force	0.04 (0.037)	-0.01 (0.029)	-0.03 (0.027)	0.003 (0.024)
Father employed last year	-0.01 (0.02)	0.01 (0.019)	0.01 (0.017)	-0.02 (0.011)
Father not in labor force last year	0.004 (0.035)	-0.01 (0.034)	0.02 (0.03)	-0.04 (0.019)
Mother employed last year	0.09* (0.052)	-0.05 (0.041)	-0.03 (0.039)	-0.02 (0.031)
Mother not in labor force last year	0.12** (0.051)	-0.06 (0.04)	-0.04 (0.038)	-0.02 (0.031)
Father ever worked in agriculture	-0.01 (0.02)	0.02 (0.019)	0.004 (0.016)	-0.01 (0.012)
Mother ever worked in agriculture	0.002 (0.019)	-0.01 (0.018)	0.005 (0.015)	-0.001 (0.011)
Urban	-0.07*** (0.015)	0.07*** (0.015)	-0.01 (0.012)	0.01 (0.009)
Total employment rate	-0.02*** (0.002)	0.01*** (0.002)	0.01*** (0.001)	0.0002 (0.001)
Weekly working hours	-0.01 (0.005)	0.01 (0.006)	-0.004 (0.004)	0.003 (0.003)
HH income (1000-2499)	-0.02 (0.013)	0.01 (0.012)	-0.003 (0.011)	0.01* (0.008)
HH income (2500-4999)	-0.01 (0.026)	0.02 (0.022)	-0.02 (0.021)	0.01 (0.017)
HH income (5000-9999)	0.10* (0.052)	-0.06 (0.047)	-0.04 (0.05)	0.003 (0.037)
HH income (>9999)	0.67 (26.978)	0.07 (15.186)	0.3 (18.079)	-1.04 (60.242)
Istanbul	0.04 (0.047)	-0.09* (0.047)	0.08** (0.037)	-0.04* (0.023)
Westernmarmara	0.11*** (0.038)	-0.003 (0.038)	0.04 (0.032)	-0.15*** (0.022)
Aegean	0.10** (0.045)	0.01 (0.045)	-0.003 (0.038)	-0.11*** (0.023)
Easternmarmara	0.11*** (0.039)	0.02 (0.039)	-0.01 (0.033)	-0.11*** (0.02)
Westernanatoliaa	-0.09*** (0.034)	0.05 (0.033)	0.10*** (0.028)	-0.06*** (0.017)
Mediterranean	0.02 (0.035)	0.05 (0.033)	0.06* (0.03)	-0.13*** (0.022)
Middleanatolia	0.18*** (0.036)	-0.07** (0.035)	0.02 (0.03)	-0.13*** (0.023)
Westernblacksea	0.43*** (0.051)	-0.22*** (0.055)	-0.09** (0.045)	-0.13*** (0.029)
Easternblacksea	0.17*** (0.035)	-0.13*** (0.036)	0.03 (0.029)	-0.06*** (0.018)
Westeasternanatolia	0.09** (0.046)	-0.03 (0.048)	0.02 (0.039)	-0.08*** (0.023)
Southeasternanatolia	0.04 (0.072)	-0.16** (0.076)	0.14** (0.058)	-0.02 (0.037)
N	7611			
LL	-8332.8094			

*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

4.5.2.2. Results for the 15-17 Age Group

Table 4.11 shows the marginal effects of the multinomial logit model for the 15-17 age group.

As expected, being male increases the probability of only attending school, working in the labour market and the combination of school and labour force participation; and it decreases the probability of doing housework and the combination of doing housework and schooling. An increase in the age of the child decreases the probability of only attending school; and it increases the probability of working in the labour market and doing housework.

In terms of parental education, fathers' and mothers' education have the same effect on children's participation choices. Having more educated mothers and fathers increases the probability of only attending school and the combination of attending school and doing housework. However it decreases the probability of working in the labour market and doing only housework. Relative to children whose fathers have no qualification, children whose fathers have a university degree have 16 percentage points less probability to work in the labour market.

It is found that fathers' and mothers' employment statuses do not have any significant effect on the participation decisions. However, having a father who ever worked in the agriculture sector increases the probability of doing housework.

Regarding the household income, living in a household with an income higher than 5,000 TRY decreases the probability of working in the labor market, doing housework and combining both schooling and labour market work. This result is confirmed by both Dayioglu (2006) and Kiral and Tiras (2013). They both uses data from Turkey and claims that poverty is one of the main determinants of child labor in Turkey along with the parent education as it is presented in the current study.

Living in an urban area increases the probability to combine both schooling and labour market work, and schooling and housework.

Table 4. 11. Marginal Effects for the Multinomial Logit Model (15-17 age group)

	School	Labor	Houesework	School+ labor	School+ housework	Inactivity
Male	0.13*** (0.011)	0.09*** (0.007)	-0.11*** (0.008)	0.03*** (0.006)	-0.18*** (0.013)	0.03*** (0.005)
Agechild	-0.02*** (0.007)	0.03*** (0.004)	0.02*** (0.004)	0.04*** (0.004)	-0.07*** (0.008)	0.01*** (0.003)
Agemother	0.0004 (0.001)	0.0005 (0.001)	-0.0002 (0.001)	0.001 (0.001)	-0.002 (0.002)	0.001 (0.001)
Agefather	0.003*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.0004 (0.001)	0.002 (0.002)	-0.001* (0.001)
Extended	0.03 (0.02)	-0.01 (0.011)	-0.01 (0.011)	-0.01 (0.009)	0.02 (0.023)	-0.02*** (0.006)
Adult	0.01* (0.006)	0.003 (0.003)	0.01*** (0.003)	-0.002 (0.003)	-0.03*** (0.007)	0.01*** (0.002)
Sibling	0.002 (0.012)	0.01 (0.006)	0.02*** (0.006)	0.01* (0.006)	-0.05*** (0.014)	0.003 (0.004)
Father 5 years school graduate	0.03 (0.022)	-0.08*** (0.019)	-0.03** (0.015)	-0.003 (0.015)	0.11*** (0.026)	-0.02* (0.011)
Father 8 years school graduate	0.04 (0.027)	-0.12*** (0.02)	-0.06*** (0.018)	-0.002 (0.017)	0.18*** (0.032)	-0.03** (0.013)
Father secondary school graduate	0.07*** (0.027)	-0.13*** (0.02)	-0.09*** (0.017)	-0.01 (0.017)	0.18*** (0.032)	-0.03** (0.013)
Father university graduate	0.12*** (0.033)	-0.16*** (0.019)	-0.08*** (0.022)	-0.03* (0.017)	0.19*** (0.038)	-0.04** (0.016)
Mother 5 years school graduate	0.04** (0.016)	-0.04*** (0.011)	-0.06*** (0.011)	0.01 (0.009)	0.08*** (0.019)	-0.03*** (0.009)
Mother 8 years school graduate	-0.01 (0.028)	-0.08*** (0.016)	-0.07*** (0.021)	0.03 (0.018)	0.17*** (0.034)	-0.04** (0.015)
Mother secondary school graduate	0.11*** (0.028)	-0.09*** (0.015)	-0.11*** (0.015)	-0.01 (0.012)	0.15*** (0.031)	-0.05*** (0.012)
Mother university graduate	0.15*** (0.046)	-0.11*** (0.009)	-0.12*** (0.022)	-0.03** (0.014)	0.12** (0.048)	-0.01 (0.035)
Father weekly working hours	-0.0001 (0.0005)	-0.0001 (0.0003)	0.0003 (0.0003)	0.001*** (0.002)	-0.001 (0.001)	-0.0001 (0.0002)
Mother weekly working hours	-0.001 (0.001)	-0.0002 (0.0004)	-0.0003 (0.001)	0.0001 (0.0003)	0.001 (0.001)	0.0004 (0.0004)
Father employed	0.01 (0.036)	0.01 (0.02)	-0.02 (0.023)	-0.02 (0.023)	0.01 (0.041)	0.01 (0.013)
Father not in labor force	-0.02 (0.032)	-0.005 (0.018)	0.03 (0.023)	0.03 (0.028)	-0.06 (0.039)	0.03* (0.014)
Mother employed	0.07 (0.051)	-0.01 (0.046)	0.05* (0.027)	-0.002 (0.02)	-0.12** (0.059)	0.01 (0.022)
Mother not in labor force	0.05 (0.036)	-0.06* (0.035)	0.07*** (0.019)	0.01 (0.016)	-0.09** (0.043)	0.02 (0.018)
Father employed last year	0.00005 (0.022)	0.004 (0.012)	-0.01 (0.013)	0.01 (0.011)	0.00 (0.025)	-0.01 (0.01)
Father not in labor force last year	0.01 (0.033)	0.01 (0.02)	-0.02 (0.017)	-0.02 (0.012)	0.03 (0.037)	-0.02 (0.01)
Mother employed last year	0.04 (0.046)	0.04* (0.021)	-0.07 (0.057)	0.03 (0.024)	0.03 (0.056)	-0.07 (0.045)
Mother not in labor force last year	0.03 (0.045)	0.06*** (0.02)	-0.07 (0.057)	-0.003 (0.023)	0.07 (0.056)	-0.07 (0.047)
Father ever worked in agriculture	0.02 (0.021)	0.02 (0.012)	0.03** (0.013)	0.01 (0.011)	-0.07*** (0.024)	-0.01 (0.008)
Mother ever worked in agriculture	-0.02 (0.019)	0.002 (0.011)	0.01 (0.012)	0.04*** (0.013)	-0.02 (0.022)	-0.01 (0.008)
Urban	-0.02 (0.016)	-0.02 (0.01)	-0.03*** (0.01)	0.03*** (0.006)	0.06*** (0.018)	-0.03*** (0.009)
Total employment rate	-0.01*** (0.002)	0.002* (0.001)	0.002 (0.001)	-0.0003 (0.001)	0.01*** (0.002)	-0.002 (0.001)
Weekly working hours	-0.01 (0.005)	0.005 (0.003)	0.01* (0.003)	-0.002 (0.003)	0.004 (0.006)	-0.005** (0.002)
HH income (1000-2499)	0.01 (0.015)	-0.01 (0.009)	0.001 (0.01)	-0.004 (0.007)	0.01 (0.016)	-0.004 (0.008)
HH income (2500-4999)	0.001 (0.028)	-0.04 (0.028)	-0.001 (0.031)	-0.002 (0.017)	0.06 (0.037)	-0.02 (0.016)
HH income (5000-9999)	0.09 (0.071)	-0.09*** (0.006)	-0.09*** (0.004)	-0.05*** (0.004)	0.19*** (0.071)	-0.04*** (0.003)
HH income (>9999)	0.19 (0.188)	-0.09 (0.224)	-0.09*** (0.004)	-0.05*** (0.004)	0.08 (18.137)	-0.04*** (0.003)
Istanbul	-0.02 (0.043)	-0.002 (0.026)	-0.06* (0.036)	0.05** (0.022)	0.02 (0.054)	0.01 (0.017)
Westernmarmara	0.11*** (0.037)	0.02 (0.022)	-0.09*** (0.03)	0.04*** (0.016)	-0.11** (0.045)	0.03** (0.015)
Aegean	0.01 (0.041)	0.01 (0.025)	-0.08** (0.033)	0.05** (0.021)	-0.04 (0.051)	0.05*** (0.019)
Easternmarmara	0.04 (0.036)	0.03 (0.023)	-0.04 (0.031)	0.02 (0.015)	-0.08* (0.046)	0.02* (0.012)
Westernanatoliaa	-0.01 (0.031)	0.03* (0.019)	-0.06** (0.027)	0.02 (0.013)	0.02 (0.039)	0.00004 (0.008)
Mediterranean	-0.005 (0.032)	0.05** (0.022)	-0.03 (0.028)	0.02 (0.014)	-0.05 (0.042)	0.02 (0.011)
Middleanatolia	0.22*** (0.038)	-0.001 (0.022)	-0.06** (0.029)	0.02 (0.015)	-0.21*** (0.042)	0.03* (0.017)
Westernblacksea	0.37*** (0.056)	-0.03 (0.024)	-0.11*** (0.033)	-0.01 (0.015)	-0.30*** (0.055)	0.09** (0.033)
Easternblacksea	0.07** (0.034)	0.02 (0.021)	-0.01 (0.027)	-0.02 (0.013)	-0.06 (0.041)	0.001 (0.009)
Westeasternanatolia	0.04 (0.043)	0.01 (0.026)	-0.06 (0.035)	0.01 (0.019)	-0.04 (0.054)	0.03* (0.017)
Southeasternanatolia	-0.03 (0.059)	-0.003 (0.038)	-0.08* (0.045)	0.01 (0.029)	0.06 (0.079)	0.03 (0.031)
N	5303					
LL	-6161.3116					

*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

For the same reason as above, analyses for the 15-17 age group are also disaggregated by gender. Table 4.12 and Table 4.13 show the marginal effects of the MNL for boys and for girls, respectively.

An increase in the age of the child increases the probability of working in the labour market for both boys and girls, but the effect on boys is much bigger than that for girls. Moreover, while there is no significant effect of age on housework for boys, it increases the probability of doing housework by 3 percentage points for girls.

An increase in the number of siblings aged 5 or younger has different effects for boys and girls. It increases the probability of working in the labour market for boys and it increases the probability of doing housework for girls.

Fathers' education has the same effect for boys and girls in terms of working in the labour market. However the magnitude of the effect for boys is much higher than for girls. Moreover, while fathers' education has no effect on boys' housework participation, as the fathers become more educated girls have a lower probability to do housework. Mothers' education also has a negative effect on boys' labour force participation. As mothers become more educated, the boys' probability of working in the labour market falls. Contrary to the finding in the younger age group, for the 15-17 age group it seems that mothers' education is less important than the fathers' education in shielding girls from domestic work.

It is found that both fathers' and mothers' employment status have no significant effect on children's participation decisions. Also their weekly working hours have no meaningful effect.

Boys who live in urban areas are 7 percentage points more likely to combine school and labour force participation relative to boys who live in rural areas. The reason for

this could be that it is easier to find a part-time job in urban areas. Those girls who live in urban areas are 9 percentage points more likely to combine school and household chores relative to those who live in rural areas. Finally, while there is no prominent difference among boys who live in different regions, living in the least developed region increases the probability of doing only housework for girls.

Table 4. 12. Marginal Effects for the Multinomial Logit Model for boys (15-17 age group)

	School	Labor	Houesework	School+ labor	School+ housework	Inactivity
Agechild	-0.04*** (0.01)	0.05*** (0.007)	0.01 (omitted)	0.04*** (0.006)	-0.08*** (0.01)	0.01*** (0.005)
Agemother	0.001 (0.002)	0.0001 (0.001)	0.0001 (omitted)	0.001 (0.001)	-0.003 (0.002)	0.001 (0.001)
Agefather	0.00** (0.002)	-0.001 (0.001)	-0.003 (omitted)	-0.0003 (0.001)	0.001 (0.002)	-0.001 (0.001)
Extended	0.04 (0.029)	0.01 (0.019)	-0.02 (omitted)	-0.01 (0.017)	0.01 (0.032)	-0.03* (0.014)
Adult	0.01 (0.009)	-0.001 (0.005)	0.01 (omitted)	-0.003 (0.005)	-0.03*** (0.01)	0.01** (0.003)
Sibling	0.01 (0.018)	0.03** (0.011)	-0.003 (omitted)	0.01 (0.01)	-0.05** (0.02)	0.01 (0.007)
Father 5 years school graduate	0.002 (0.037)	-0.07*** (0.018)	-0.02 (omitted)	0.01 (0.022)	0.10** (0.043)	-0.02* (0.012)
Father 8 years school graduate	0.02 (0.043)	-0.14*** (0.028)	-0.01 (omitted)	0.01 (0.024)	0.16*** (0.048)	-0.04* (0.018)
Father secondary school graduate	0.05 (0.043)	-0.13*** (0.029)	-0.05 (omitted)	0.01 (0.025)	0.20*** (0.048)	-0.07*** (0.024)
Father university graduate	0.16*** (0.058)	-0.34*** (0.103)	-0.02 (omitted)	-0.02 (0.036)	0.28*** (0.066)	-0.06 (0.037)
Mother 5 years school graduate	0.06** (0.025)	-0.06*** (0.015)	-0.03 (omitted)	0.01 (0.013)	0.06** (0.026)	-0.03*** (0.011)
Mother 8 years school graduate	-0.03 (0.051)	-0.14*** (0.049)	-0.02 (omitted)	0.02 (0.023)	0.20*** (0.047)	-0.03 (0.032)
Mother secondary school graduate	0.13*** (0.042)	-0.22*** (0.061)	-0.02 (omitted)	-0.02 (0.026)	0.16*** (0.045)	-0.03 (0.03)
Mother university graduate	0.72 (37.056)	-1.37 (101.354)	-0.48 (omitted)	0.10 (11.063)	0.84 (45.899)	0.18 (12.939)
Father weekly working hours	-0.00005 (0.001)	-0.0001 (.0005)	-0.0001 (omitted)	0.001*** (.0004)	-0.001 (0.001)	-0.00003 (.0004)
Mother weekly working hours	-0.002* (0.001)	0.0004 (0.001)	-0.0002 (omitted)	-0.0002 (0.001)	0.002 (0.001)	0.0003 (0.001)
Father employed	0.04 (0.055)	0.005 (0.036)	-0.02 (omitted)	-0.04 (0.03)	0.02 (0.057)	-0.004 (0.026)
Father not in labor force	-0.03 (0.052)	0.01 (0.032)	-0.001 (omitted)	0.02 (0.028)	-0.01 (0.053)	0.02 (0.021)
Mother employed	-0.05 (19.904)	-0.19 (14.884)	0.59 (omitted)	-0.02 (5.17)	-0.32 (25.755)	-0.01 (7.421)
Mother not in labor force	-0.11 (19.904)	-0.24 (14.884)	0.59 (omitted)	-0.03 (5.17)	-0.23 (25.755)	0.02 (7.421)
Father employed last year	-0.02 (0.032)	0.01 (0.021)	0.003 (omitted)	0.02 (0.019)	-0.01 (0.034)	-0.004 (0.014)
Father not in labor force last year	0.01 (0.049)	0.01 (0.032)	0.001 (omitted)	-0.01 (0.029)	0.03 (0.052)	-0.03 (0.019)
Mother employed last year	0.05 (0.08)	0.10 (0.079)	-0.05 (omitted)	-0.004 (0.034)	-0.02 (0.076)	-0.07* (0.038)
Mother not in labor force last year	0.03 (0.079)	0.16** (0.078)	-0.07 (omitted)	-0.03 (0.035)	-0.02 (0.075)	-0.07* (0.038)
Father ever worked in agriculture	0.03 (0.031)	0.02 (0.019)	0.001 (omitted)	0.003 (0.016)	-0.05 (0.033)	-0.01 (0.014)
Mother ever worked in agriculture	-0.02 (0.03)	-0.01 (0.019)	-0.01 (omitted)	0.05*** (0.013)	-0.01 (0.031)	-0.02 (0.015)
Urban	-0.02 (0.024)	-0.01 (0.016)	-0.02 (omitted)	0.07*** (0.016)	0.02 (0.026)	-0.03*** (0.011)
Total employment rate	-0.02*** (0.003)	0.002 (0.002)	0.001 (omitted)	0.001 (0.002)	0.02*** (0.003)	-0.002 (0.002)
Weekly working hours	-0.01 (0.008)	0.004 (0.006)	-0.0003 (omitted)	-0.002 (0.005)	0.01 (0.009)	-0.01* (0.004)
HH income (1000-2499)	0.01 (0.022)	-0.02 (0.016)	0.01 (omitted)	-0.02* (0.011)	0.03 (0.022)	-0.005 (0.012)
HH income (2500-4999)	-0.02 (0.048)	-0.05 (0.063)	0.02 (omitted)	-0.01 (0.03)	0.07 (0.048)	-0.01 (0.041)
HH income (5000-9999)	0.93 (101.062)	-0.54 (177.055)	-0.30 (omitted)	-0.63 (185.48)	42979 (123.775)	-0.55 (174.02)
HH income (>9999)	0.59 (224.978)	0.28 (457.276)	0.11 (omitted)	-0.78 (345.293)	0.49 (272.538)	-0.69 (359.316)
Istanbul	-0.05 (0.076)	-0.001 (0.052)	-0.001 (omitted)	0.05 (0.04)	-0.04 (0.078)	0.04 (0.034)
Westernmarmara	0.08 (0.058)	0.04 (0.04)	-0.02 (omitted)	0.03 (0.035)	-0.17*** (0.064)	0.04 (0.027)
Aegean	-0.01 (0.068)	0.01 (0.047)	-0.01 (omitted)	0.05 (0.04)	-0.08 (0.074)	0.05 (0.031)
Easternmarmara	0.003 (0.059)	0.06 (0.041)	-0.003 (omitted)	0.04 (0.037)	-0.12* (0.066)	0.02 (0.029)
Westernanatoliaa	-0.07 (0.052)	0.04 (0.036)	-0.03 (omitted)	0.03 (0.032)	0.03 (0.057)	0.002 (0.024)
Mediterranean	-0.05 (0.055)	0.05 (0.038)	0.02 (omitted)	0.03 (0.033)	-0.08 (0.059)	0.03 (0.025)
Middleanatolia	0.19*** (0.053)	-0.04 (0.048)	-0.02 (omitted)	0.03 (0.032)	-0.20*** (0.06)	0.04 (0.028)
Westernblacksea	0.32*** (0.075)	-0.01 (0.057)	-0.03 (omitted)	-0.06 (0.057)	-0.34*** (0.087)	0.12*** (0.034)
Easternblacksea	0.08 (0.054)	0.05 (0.038)	-0.01 (omitted)	-0.10 (0.062)	-0.03 (0.062)	0.01 (0.025)
Westeasternanatolia	0.01 (0.07)	0.02 (0.049)	0.003 (omitted)	0.02 (0.043)	-0.09 (0.077)	0.03 (0.033)
Southeasternanatolia	-0.08 (0.109)	0.02 (0.077)	-0.02 (omitted)	0.05 (0.065)	-0.03 (0.12)	0.06 (0.049)
N	2760					
LL	-3475.6603					

*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

Table 4. 13. Marginal Effects for the Multinomial Logit Model for girls (15-17 age group)

	School	Labor	Houeswork	School+ labor	School+ housework	Inactivity
Agechild	-0.01 (0.009)	0.01** (0.004)	0.03*** (0.008)	0.03 (omitted)	-0.06*** (0.011)	0.004 (0.004)
Agemother	-0.0003 (0.002)	0.001 (0.001)	-0.001 (0.001)	-0.0002 (omitted)	-0.001 (0.002)	0.001* (0.001)
Agefather	0.003* (0.002)	-0.004*** (0.001)	-0.002 (0.001)	-0.001 (omitted)	0.004* (0.002)	-0.001 (0.001)
Extended	0.02 (0.026)	-0.03* (0.014)	-0.01 (0.021)	-0.01 (omitted)	0.03 (0.034)	-0.01 (0.01)
Adult	0.005 (0.008)	0.01** (0.004)	0.01* (0.006)	-0.0001 (omitted)	-0.03*** (0.01)	0.01*** (0.002)
Sibling	-0.01 (0.016)	-0.01 (0.008)	0.05*** (0.01)	0.01 (omitted)	-0.04** (0.02)	0.001 (0.005)
Father 5 years school graduate	0.02 (0.034)	-0.05*** (0.011)	-0.04** (0.019)	-0.02 (omitted)	0.09** (0.039)	-0.01 (0.009)
Father 8 years school graduate	0.03 (0.039)	-0.08*** (0.019)	-0.09*** (0.028)	-0.01 (omitted)	0.17*** (0.046)	-0.02 (0.015)
Father secondary school graduate	0.08** (0.037)	-0.10*** (0.026)	-0.13*** (0.031)	-0.02 (omitted)	0.16*** (0.047)	0.01 (0.011)
Father university graduate	0.14 (3.388)	-0.48 (27.955)	-0.03 (6.967)	-0.01 (omitted)	0.37 (14.94)	0.02 (1.224)
Mother 5 years school graduate	0.01 (0.022)	-0.002 (0.009)	-0.07*** (0.016)	0.01 (omitted)	0.08*** (0.027)	-0.02** (0.008)
Mother 8 years school graduate	0.07 (5.319)	-0.47 (43.888)	0.01 (10.937)	0.05 (omitted)	0.36 (23.456)	-0.02 (1.922)
Mother secondary school graduate	0.15 (5.164)	0.03 (1.849)	-0.23 (8.684)	0.01 (omitted)	0.42 (15.941)	-0.38 (32.636)
Mother university graduate	0.13 (4.726)	-0.38 (38.991)	-0.09 (9.717)	-0.003 (omitted)	0.34 (20.839)	0.01 (1.707)
Father weekly working hours	-0.001 (0.001)	-0.0001 (0.0003)	0.001 (0.0005)	-0.00 (omitted)	0.0002 (0.001)	-0.0003 (0.0003)
Mother weekly working hours	0.0004 (0.001)	-0.0005 (0.0004)	-0.0005 (0.001)	0.0002 (omitted)	-0.0003 (0.001)	0.001 (0.0004)
Father employed	0.001 (0.047)	0.01 (0.02)	-0.02 (0.039)	0.02 (omitted)	-0.04 (0.059)	0.04 (0.024)
Father not in labor force	0.01 (0.043)	-0.02 (0.023)	0.04 (0.035)	0.04 (omitted)	-0.11* (0.056)	0.03* (0.02)
Mother employed	0.04 (0.073)	0.06 (0.038)	0.07 (0.088)	-0.02 (omitted)	-0.13 (0.097)	-0.02 (0.034)
Mother not in labor force	0.06 (0.056)	0.02 (0.033)	0.11 (0.076)	0.002 (omitted)	-0.19** (0.076)	-0.005 (0.027)
Father employed last year	0.02 (0.031)	-0.01 (0.012)	-0.03 (0.022)	-0.003 (omitted)	0.03 (0.037)	-0.01 (0.011)
Father not in labor force last year	0.02 (0.042)	0.01 (0.021)	-0.02 (0.031)	-0.07 (omitted)	0.07 (0.056)	-0.01 (0.012)
Mother employed last year	-0.04 (12.643)	-0.05 (4.599)	-0.06 (10.261)	0.45 (omitted)	-0.26 (49.007)	-0.04 (2.121)
Mother not in labor force last year	-0.05 (12.643)	-0.05 (4.599)	-0.07 (10.261)	0.42 (omitted)	-0.21 (49.007)	-0.05 (2.121)
Father ever worked in agriculture	0.01 (0.028)	0.01 (0.01)	0.05*** (0.019)	0.02 (omitted)	-0.08** (0.034)	-0.01 (0.011)
Mother ever worked in agriculture	-0.01 (0.026)	0.01 (0.01)	0.01 (0.02)	0.01 (omitted)	-0.01 (0.032)	-0.01 (0.011)
Urban	-0.01 (0.021)	-0.01 (0.009)	-0.05*** (0.016)	0.003 (omitted)	0.09*** (0.026)	-0.02*** (0.008)
Total employment rate	-0.003 (0.003)	0.002* (0.001)	-0.002 (0.002)	-0.002 (omitted)	0.004 (0.003)	-0.0001 (0.001)
Weekly working hours	-0.01 (0.008)	0.01* (0.004)	0.01** (0.005)	-0.004 (omitted)	-0.002 (0.009)	-0.01 (0.003)
HH income (1000-2499)	0.002 (0.018)	-0.01 (0.009)	-0.01 (0.018)	0.01 (omitted)	-0.0001 (0.024)	-0.002 (0.009)
HH income (2500-4999)	0.07 (4.066)	-0.43 (33.547)	0.07 (8.36)	0.03 (omitted)	0.26 (17.929)	-0.01 (1.469)
HH income (5000-9999)	0.38 (41.69)	-0.21 (73.112)	-1.17 (210.058)	-0.32 (omitted)	1.59 (162.416)	-0.27 (108.125)
HH income (>9999)	0.40 (125.894)	0.22 (261.852)	-1.29 (675.236)	-0.34 (omitted)	1.31 (499.73)	-0.30 (252.624)
Istanbul	0.08 (5.922)	-0.003 (2.12)	-0.01 (9.959)	0.07 (omitted)	0.19 (18.282)	-0.33 (37.428)
Westernmarmara	0.16*** (0.061)	-0.02 (0.03)	-0.14*** (0.044)	0.06 (omitted)	-0.10 (0.072)	0.04* (0.023)
Aegean	0.09 (0.071)	-0.01 (0.033)	-0.14*** (0.048)	0.06 (omitted)	-0.07 (0.083)	0.07** (0.026)
Easternmarmara	0.13** (0.062)	-0.02 (0.03)	-0.05 (0.039)	0.03 (omitted)	-0.13* (0.073)	0.05** (0.024)
Westernanatoliaa	0.08 (0.056)	0.01 (0.025)	-0.07** (0.035)	0.02 (omitted)	-0.04 (0.064)	0.002 (0.023)
Mediterranean	0.08 (0.058)	0.02 (0.024)	-0.09** (0.039)	0.02 (omitted)	-0.06 (0.067)	0.03 (0.021)
Middleanatolia	0.22*** (0.054)	0.02 (0.025)	-0.05 (0.041)	0.03 (omitted)	-0.27*** (0.067)	0.05** (0.02)
Westernblacksea	0.33*** (0.074)	-0.08* (0.047)	-0.12** (0.059)	0.04 (omitted)	-0.21** (0.095)	0.04 (0.031)
Easternblacksea	0.13** (0.056)	-0.01 (0.026)	0.01 (0.034)	-0.01 (omitted)	-0.11* (0.067)	-0.004 (0.023)
Westeasternanatolia	0.11 (0.072)	-0.02 (0.035)	-0.10** (0.047)	0.04 (omitted)	-0.08 (0.085)	0.06** (0.028)
Southeasternanatolia	0.07 (0.105)	-0.06 (0.055)	-0.14* (0.074)	-0.03 (omitted)	0.09 (0.128)	0.06 (0.045)
N	2543					
LL	-2515.5714					

*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

4.5.3. The Results of the Random Effects Multinomial Logit Analysis

As stated in the methodology section in order to control for the unobserved household heterogeneity, a random effects multinomial logit model is applied by extending the MNL model with a random term. Table 4.14 and Table 4.15 present the marginal effects of the random effects MNL for the 6-14 and 15-17 age groups respectively. The coefficients of the random effect MNL for both groups are presented in the appendix.

Random effects MNL model is estimated using the 'mixlogit' command in STATA. Standard errors for the marginal effects are obtained by using the bootstrap method. Compared to the results of the MNL, the signs are the same in the random effects MNL. The marginal effects are generally the same with ±0.01 difference. In order to compare both models a likelihood-ratio test can be performed. Test statistic is given by the following formula:

LR test statistic= -2 [log likelihood (model1) – log likelihood (model2)]

For the 6-14 age group;

LR test statistic= -2 [(-15353.37) – (-15134.798)] = 437.144

This statistic is distributed chi-squared with degrees of freedom equal to the difference in the number of degrees of freedom between the two models. In this case degree of freedom is equal to 6-3=3 and associated p-value is very low (less than 0.00001).

For the 15-17 age group;

LR test statistic= -2 [(-6109.3942) – (-6092.8965)] = 32.9954

In this case degrees of freedom is equal to 15-5=10 and associated p-value is 0.000273. These test results imply that by using random effects model results in a statistically significant improvement in model fit.

Table 4. 14. Marginal effects of the random effects multinomial logit model (6-14 age group)

	School	1-2 hours housework	3-7 hours housework	8 and more hours housework
Male	0.08 (0.03)	0.06 (0.04)	-0.07 (0.03)	-0.07 (0.04)
Agechild	-0.05 (0.01)	0.01 (0.01)	0.03 (0.01)	0.02 (0.01)
Agemother	0.001 (0.0003)	-0.001 (0.0003)	0.001 (0.001)	-0.001 (0.001)
Agefather	0.0005 (0.0002)	0.001 (0.0004)	-0.002 (0.001)	0.001 (0.001)
Extended	-0.01 (0.004)	-0.01 (0.003)	0.002 (0.003)	0.01 (0.01)
Adult	0.03 (0.01)	-0.02 (0.01)	-0.01 (0.004)	-0.01 (0.01)
Sibling	-0.01 (0.01)	-0.02 (0.01)	0.02 (0.01)	0.01 (0.01)
Father 5 years school graduate	-0.02 (0.01)	0.03 (0.01)	0.01 (0.01)	-0.01 (0.01)
Father 8 years school graduate	-0.04 (0.01)	0.05 (0.01)	0.02 (0.01)	-0.02 (0.02)
Father secondary school graduate	-0.04 (0.02)	0.06 (0.02)	0.003 (0.01)	-0.02 (0.02)
Father university graduate	-0.02 (0.02)	0.04 (0.01)	0.01 (0.01)	-0.03 (0.03)
Mother 5 years school graduate	-0.03 (0.01)	0.03 (0.01)	0.01 (0.01)	-0.01 (0.01)
Mother 8 years school graduate	-0.06 (0.01)	0.03 (0.01)	0.03 (0.01)	0.001 (0.004)
Mother secondary school graduate	-0.03 (0.01)	0.03 (0.01)	0.02 (0.01)	-0.01 (0.01)
Mother university graduate	-0.003 (0.01)	0.03 (0.01)	-0.03 (0.01)	-0.001 (0.002)
Father weekly working hours	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	0.0003 (0.0003)
Mother weekly working hours	0.002 (0.0005)	-0.002 (0.001)	-0.0002 (0.0002)	0.0001 (0.0001)
Father employed	0.002 (0.01)	-0.03 (0.01)	0.04 (0.02)	-0.01 (0.01)
Father not in labor force	0.07 (0.01)	-0.07 (0.02)	0.01 (0.01)	-0.01 (0.01)
Mother employed	-0.03 (0.01)	0.03 (0.01)	-0.01 (0.01)	0.01 (0.01)
Mother not in labor force	0.03 (0.01)	-0.03 (0.01)	-0.01 (0.01)	0.02 (0.01)
Father employed last year	-0.01 (0.01)	0.01 (0.004)	0.01 (0.01)	-0.02 (0.02)
Father not in labor force last year	-0.03 (0.01)	0.01 (0.01)	0.02 (0.01)	0.002 (0.003)
Mother employed last year	0.07 (0.02)	-0.07 (0.02)	-0.01 (0.01)	0.01 (0.01)
Mother not in labor force last year	0.08 (0.02)	-0.08 (0.02)	-0.004 (0.01)	0.001 (0.004)
Father ever worked in agriculture	0.01 (0.003)	0.002 (0.003)	-0.01 (0.002)	-0.01 (0.005)
Mother ever worked in agriculture	-0.005 (0.004)	-0.01 (0.01)	0.02 (0.01)	0.002 (0.002)
Urban	-0.07 (0.02)	0.07 (0.02)	-0.002 (0.01)	0.004 (0.004)
Total employment rate	-0.01 (0.003)	0.01 (0.003)	0.01 (0.002)	0.001 (0.001)
Weekly working hours	-0.02 (0.003)	0.01 (0.004)	-0.001 (0.003)	0.01 (0.004)
HH income (1000-2499)	-0.01 (0.002)	0.01 (0.002)	-0.004 (0.004)	0.01 (0.007)
HH income (2500-4999)	0.01 (0.004)	0.01 (0.007)	-0.02 (0.01)	0.002 (0.003)
HH income (5000-9999)	0.12 (0.02)	-0.06 (0.03)	-0.05 (0.02)	-0.01 (0.01)
HH income (>9999)	0.23 (0.05)	-0.12 (0.05)	-0.05 (0.03)	-0.07 (0.07)
Istanbul	0.13 (0.02)	-0.05 (0.02)	0.03 (0.04)	-0.1 (0.06)
Westernmarmara	0.04 (0.01)	-0.09 (0.02)	0.13 (0.07)	-0.07 (0.04)
Aegean	0.10 (0.03)	0.02 (0.03)	0.01 (0.04)	-0.13 (0.08)
Easternmarmara	0.11 (0.03)	0.002 (0.03)	-0.01 (0.02)	-0.11 (0.06)
Westernanatoliaa	0.12 (0.03)	0.02 (0.04)	-0.03 (0.02)	-0.12 (0.07)
Mediterranean	-0.07 (0.02)	0.05 (0.02)	0.09 (0.04)	-0.07 (0.04)
Middleanatolia	0.04 (0.03)	0.06 (0.03)	0.02 (0.04)	-0.12 (0.07)
Westernblacksea	0.21 (0.03)	-0.08 (0.04)	-0.01 (0.03)	-0.12 (0.07)
Easternblacksea	0.41 (0.08)	-0.22 (0.07)	-0.06 (0.03)	-0.13 (0.08)
Westeasternanatolia	0.15 (0.03)	-0.14 (0.03)	0.06 (0.04)	-0.07 (0.04)
Southeasternanatolia	0.09 (0.02)	-0.14 (0.04)	0.11 (0.05)	-0.06 (0.03)
N	15467			
LL	-15134.798			

*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

Table 4. 15. Marginal effects of the random effects multinomial logit model (15-17 age group)

	School	Labor	Houesework	School+ labor	School+ housework	Inactivity
Male	0.14 (0.05)	0.09 (0.07)	-0.11 (0.10)	0.03 (0.03)	-0.18 (0.05)	0.03 (0.03)
Agechild	-0.03 (0.02)	0.03 (0.03)	0.02 (0.02)	0.04 (0.04)	-0.08 (0.03)	0.01 (0.01)
Agemother	0.0005 (0.001)	0.0002 (0.0002)	-0.0002 (0.0004)	0.001 (0.001)	-0.002 (0.001)	0.001 (0.001)
Agefather	0.003 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.0005 (0.001)	0.002 (0.002)	-0.001 (0.001)
Extended	0.03 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.08)	0.02 (0.01)	-0.02 (0.02)
Adult	0.01 (0.01)	0.003 (0.004)	0.01 (0.01)	-0.003 (0.003)	-0.03 (0.01)	0.01 (0.01)
Sibling	0.003 (0.01)	0.01 (0.01)	0.03 (0.02)	0.01 (0.01)	-0.05 (0.01)	0.003 (0.003)
Father 5 years school graduate	0.03 (0.03)	-0.07 (0.05)	-0.03 (0.03)	-0.004 (0.01)	0.10 (0.03)	-0.02 (0.02)
Father 8 years school graduate	0.03 (0.05)	-0.12 (0.08)	-0.05 (0.05)	-0.003 (0.01)	0.18 (0.04)	-0.03 (0.02)
Father secondary school graduate	0.07 (0.06)	-0.12 (0.06)	-0.09 (0.07)	-0.01 (0.01)	0.18 (0.06)	-0.03 (0.03)
Father university graduate	0.12 (0.08)	-0.16 (0.12)	-0.08 (0.07)	-0.03 (0.03)	0.18 (0.07)	-0.04 (0.03)
Mother 5 years school graduate	0.04 (0.03)	-0.04 (0.03)	-0.07 (0.05)	0.01 (0.01)	0.09 (0.03)	-0.03 (0.02)
Mother 8 years school graduate	-0.002 (0.04)	-0.08 (0.07)	-0.07 (0.06)	0.03 (0.03)	0.17 (0.04)	-0.04 (0.03)
Mother secondary school graduate	0.11 (0.07)	-0.09 (0.07)	-0.11 (0.09)	-0.01 (0.01)	0.15 (0.07)	-0.05 (0.04)
Mother university graduate	0.14 (0.06)	-0.11 (0.11)	-0.12 (0.10)	-0.03 (0.03)	0.12 (0.08)	-0.005 (0.03)
Father weekly working hours	-0.0001 (0.0001)	-0.00003 (0.0001)	0.0003 (0.0003)	0.0005 (0.001)	-0.001 (0.0003)	-0.0001 (0.0001)
Mother weekly working hours	-0.001 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	0.0002 (0.0002)	0.001 (0.0002)	0.0004 (0.0005)
Father employed	0.004 (0.005)	0.003 (0.004)	-0.02 (0.02)	-0.02 (0.02)	0.02 (0.01)	0.01 (0.01)
Father not in labor force	-0.02 (0.02)	-0.01 (0.01)	0.03 (0.03)	0.03 (0.02)	-0.06 (0.02)	0.03 (0.02)
Mother employed	0.04 (0.03)	0.08 (0.05)	0.004 (0.01)	-0.01 (0.01)	-0.12 (0.03)	0.002 (0.01)
Mother not in labor force	0.05 (0.03)	-0.06 (0.05)	0.07 (0.07)	0.01 (0.01)	-0.09 (0.03)	0.02 (0.02)
Father employed last year	0.001 (0.01)	0.001 (0.004)	-0.01 (0.01)	0.01 (0.01)	0.005 (0.01)	-0.008 (0.01)
Father not in labor force last year	0.01 (0.01)	0.01 (0.01)	-0.02 (0.02)	-0.02 (0.02)	0.04 (0.02)	-0.02 (0.02)
Mother employed last year	0.04 (0.03)	0.04 (0.04)	-0.05 (0.04)	0.03 (0.03)	0.01 (0.03)	-0.07 (0.06)
Mother not in labor force last year	0.03 (0.03)	0.06 (0.06)	-0.06 (0.05)	-0.006 (0.01)	0.05 (0.03)	-0.07 (0.06)
Father ever worked in agriculture	0.02 (0.01)	0.02 (0.01)	0.03 (0.02)	0.01 (0.01)	-0.06 (0.01)	-0.01 (0.01)
Mother ever worked in agriculture	-0.02 (0.01)	0.01 (0.01)	0.004 (0.01)	0.04 (0.04)	-0.02 (0.02)	-0.01 (0.01)
Urban	-0.02 (0.02)	-0.01 (0.02)	-0.03 (0.03)	0.03 (0.03)	0.07 (0.02)	-0.03 (0.02)
Total employment rate	-0.01 (0.003)	0.002 (0.002)	0.0001 (0.001)	-0.0002 (0.001)	0.01 (0.003)	-0.002 (0.002)
Weekly working hours	-0.01 (0.0003)	0.01 (0.001)	0.005 (0.004)	-0.001 (0.001)	0.01 (0.004)	-0.005 (0.01)
HH income (1000-2499)	0.01 (0.01)	-0.02 (0.01)	0.004 (0.01)	-0.003 (0.003)	0.01 (0.01)	-0.01 (0.005)
HH income (2500-4999)	0.01 (0.02)	-0.04 (0.03)	0.008 (0.01)	-0.002 (0.01)	0.04 (0.01)	-0.02 (0.02)
HH income (5000-9999)	0.12 (0.12)	-0.10 (0.11)	-0.10 (0.12)	-0.05 (0.06)	0.17 (0.11)	-0.04 (0.05)
HH income (>9999)	0.18 (0.11)	-0.10 (0.11)	-0.10 (0.12)	-0.05 (0.06)	0.11 (0.11)	-0.04 (0.05)
Istanbul	0.05 (0.02)	0.02 (0.02)	-0.05 (0.05)	0.01 (0.01)	-0.06 (0.03)	0.03 (0.03)
Westernmarmara	-0.02 (0.02)	0.002 (0.01)	-0.06 (0.05)	0.05 (0.04)	0.01 (0.04)	0.02 (0.02)
Aegean	0.11 (0.03)	0.02 (0.02)	-0.08 (0.07)	0.03 (0.03)	-0.12 (0.06)	0.03 (0.03)
Easternmarmara	0.02 (0.03)	0.01 (0.02)	-0.08 (0.07)	0.04 (0.04)	-0.05 (0.05)	0.05 (0.06)
Westernanatoliaa	0.05 (0.03)	0.03 (0.03)	-0.03 (0.03)	0.02 (0.02)	-0.10 (0.03)	0.02 (0.03)
Mediterranean	-0.01 (0.01)	0.04 (0.03)	-0.06 (0.05)	0.02 (0.02)	0.02 (0.03)	0.002 (0.004)
Middleanatolia	0.0001 (0.02)	0.05 (0.04)	-0.03 (0.03)	0.02 (0.02)	-0.05 (0.03)	0.02 (0.02)
Westernblacksea	0.22 (0.05)	0.01 (0.01)	-0.06 (0.05)	0.02 (0.02)	-0.22 (0.07)	0.03 (0.03)
Easternblacksea	0.36 (0.07)	-0.03 (0.04)	-0.10 (0.10)	-0.02 (0.02)	-0.31 (0.10)	0.09 (0.09)
Westeasternanatolia	0.07 (0.02)	0.02 (0.02)	-0.01 (0.01)	-0.02 (0.02)	-0.06 (0.02)	0.002 (0.002)
Southeasternanatolia	-0.01 (0.02)	-0.003 (0.01)	-0.07 (0.06)	0.008 (0.01)	0.04 (0.03)	0.04 (0.05)
N	5303					
LL	-6092.8965					

*p<.1; ** p<.05; *** p<.01

~Standart errors are in the parentheses

4.6. CONCLUSION

The main objective of this chapter is to identify and describe the determinants of participation in children's activities by defining different child activities for the 6-14 and 15-17 age groups. The impacts of child and household characteristics on a selection of children's activities such as;

- attending only school, doing 1-2 hours of housework per week in addition to schooling, doing 3-7 hours of housework per week in addition to schooling, doing 8 and more hours of housework in addition to schooling were analyzed for the 6-14 age group children

- attending only school, only working in the labour market, only doing household work, a combination of school and working in the labour market, a combination of school and doing housework, and inactivity were analyzed for the 15-17 age group children.

First of all the results show that a child who is older and female is less likely to attend school for the both age groups. Based on the results, while being female increases the probability of only doing housework, being male increases the probability of working in the labour market. As expected the work dynamics of girls and boys are different. Therefore it should be taken into account in designing child labour eradication and school promoting policies. For example, any policy that aims to improve children's market work will not pay sufficient attention to girls' working conditions since they mostly do housework.

Parental education is found to be a primary determinant of child activities. For the 6-14 age group, as fathers and mothers become more educated, the probability of doing a higher number of hours of housework decreases. Especially for girls, the mother's education is more important than the father's education. For the 15-17 age group, the father's education is important both for boys and girls, but especially for boys, in order to prevent children from working in the labour market. Contrary to the finding in the younger age group, for the 15-17 age group it seems that mothers' education is less important than the fathers' education in shielding girls from

domestic work. Therefore in general it seems that targeting the education of fathers is more important.

An increase in the number of siblings aged 5 or younger, increases the burden of both girls and boys. While it increases the probability of working in the labour market for boys in the 15-17 age group, it increases the probability of only doing housework for girls in the same age. It also increases the probability of doing more hours of housework for girls in the 6-14 age group. The schooling of both boys and girls is hindered by the presence of very young children. Therefore an improvement in the childcare subsidy policies may promote the educational attainment of both boys and girls.

Father's and mother's employment status, and the weekly working hours of fathers and mothers do not seem to play a role in determining boys' and girls' participation in different activities for both age groups. On the other hand, mother's employment status might have a lagged effect on the 6-14 age group children's school attainment. The total employment rate and weekly working hours in a region increases doing more housework for both boys and girls in the 6-14 age group. The total employment rate and living in an urban area also increase the probability of working in the labour market for boys in the 15-17 age group. As the opportunity to find a job increases, the probability to work in the labour market increases for boys.

Regarding the regions, both boys and girls who live in the least developed region (The Middleeastern Anatolia) have a higher probability to do more hours of housework compared to the children who live in a more developed region in the 6-14 age group.

Another finding of this study relates to the econometric methodology. Since the results of the MNL model and the random effects MNL model are similar, we can

conclude that the MNL model is sufficient to examine the determinants of participation in children's activities in this application.

4.7. APPENDIX TO CHAPTER 4

Table A4. 1. Description of Variables

Variable Name	Description
Activity6_14 (for 6-14 age group)	=1 if the child attending school only (base category) =2 if the child doing 1-2 hours housework per week =3 if the child doing 3-7 hours housework per week =4 if the child doing 8+
Activity15_17 (for 15-17 age group)	=1 if the child attending school (base category) =2 working =3 doing housework =4 both school and work =5 both school and housework =6 inactivity (neither goes school nor works nor does housework)
Male	=1 if child is male =0 if female
Agechild	Age of child
Agemother	Age of mother
Agefather	Age of father
Extended	=1 if at least three generations live together =0 if otherwise
Adult	# of adults, aged 15 or over
Sibling	# of younger siblings, aged 0-5
Noqualf (ref. cat.)	=1 if father has no educational qualification =0 otherwise
Prifivef	=1 if father has primary school (5 years) degree =0 otherwise
Prieightf	=1 if father has primary school (8 years) degree =0 otherwise
Secondaryf	=1 if father has secondary school degree =0 otherwise
Univf	=1 if father has university degree =0 otherwise
Noqualm (ref. cat.)	=1 if mother has no educational qualification =0 otherwise
Prifivem	=1 if mother has primary school (5 years) degree =0 otherwise
Prieightm	=1 if mother has primary school (8 years) degree =0 otherwise
Secondarym	=1 if mother has secondary school degree =0 otherwise
Univm	=1 if mother has university degree =0 otherwise
Father weekly working hours	# of weekly working hours of father
Mother weekly hours	# of weekly working hours of mother
Employedf	=1 if father is employed =0 otherwise
Unemployed (ref. cat.)	=1 if father is unemployed =0
Notinlff	=1 if father is not in labour forced =0 otherwise
Employedm	=1 if mother is employed =0 otherwise
Unemployed (ref. cat.)	=1 if mother is unemployed =0
Notinlfm	=1 if mother is not in labour forced =0 otherwise
Lyemployedf	=1 if father was employed last year

	=0 otherwise
Lyunemployedf (ref. cat.)	=1 if father was unemployed last year
	=0
Lynotinlff	=1 if father was not in labour forced last year
	=0 otherwise
Lyemployedm	=1 if mother was employed last year
	=0 otherwise
Lyunemployedm (ref. cat.)	=1 if mother was unemployed last year
	=0
Lynotinlfm	=1 if mother was not in labour forced last year
	=0 otherwise
Agrf	=1 if father has ever engaged in agriculture
	=0 if otherwise
Agrm	=1 if mother has ever engaged in agriculture
	=0 if otherwise
Urban	=1 if household reside in urban area
	=0 if household reside in rural area
Total employment rate	Total employment rate by NUTS2 regions in 2012
Weekly working hours	Average number of usual weekly hours of work in main job by NUTS 2 regions in 2012
HH income (<1000)	=1 if HH income is lower than 1000 TRY
	=0 otherwise
HH income (1000-2499)	=1 if HH income is between 1000 and 2499 TRY
	=0 otherwise
HH income (2500-4999)	=1 if HH income is between 2500 and 4999 TRY
	=0 otherwise
HH income (5000-9999)	=1 if HH income is between 5000 and 9999 TRY
	=0 otherwise
HH income (>9999)	=1 if HH income is higher than 9999 TRY
	=0 otherwise
Georegion	NUTS1 (there are 12 level 1 statistical regions)
Istanbul	=1 if georegion==1
	=0 if otherwise
Westernmarmara	=1 if georegion==2
	=0 if otherwise
Aegean	=1 if georegion==3
	=0 if otherwise
Easternmarmara	=1 if georegion==4
	=0 if otherwise
Westernanatolia	=1 if georegion==5
	=0 if otherwise
Mediterranean	=1 if georegion==6
	=0 if otherwise
Middleanatolia	=1 if georegion==7
	=0 if otherwise
Westernblacksea	=1 if georegion==8
	=0 if otherwise
Easternblacksea	=1 if georegion==9
	=0 if otherwise
Westeasternanatolia	=1 if georegion==10
	=0 if otherwise
Middleeasternanatolia (ref. cat.)	=1 if georegion==11
	=0 if otherwise
Southeasternanatolia	=1 if georegion==12
	=0 if otherwise

Table A4. 2. Descriptive Statistics of the 6-14 Age Group

Variable	Mean	Std. Dev.	Min	Max
Activity6_14	1.778	0.94	1	4
Male	0.508	0.50	0	1
Agechild	10.023	2.57	6	14
Agemother	36.807	6.57	16	89
Agefather	40.813	6.72	16	85
Extended	0.132	0.34	0	1
Adult	2.862	1.26	2	16
Sibling	0.487	0.71	0	5
Father no educational qualification	0.065	0.25	0	1
Father 5 years school graduate	0.473	0.50	0	1
Father 8 years school graduate	0.127	0.33	0	1
Father secondary school graduate	0.196	0.40	0	1
Father university graduate	0.139	0.35	0	1
Mother no educational qualification	0.226	0.42	0	1
Mother 5 years school graduate	0.511	0.50	0	1
Mother 8 years school graduate	0.074	0.26	0	1
Mother secondary school graduate	0.123	0.33	0	1
Mother university graduate	0.067	0.25	0	1
Father weekly working hours	45.502	22.75	0	97
Mother weekly working hours	7.715	17.21	0	97
Father employed	0.858	0.35	0	1
Father unemployed	0.058	0.23	0	1
Father not in labour force	0.085	0.28	0	1
Mother employed	0.197	0.40	0	1
Mother unemployed	0.027	0.16	0	1
Mother not in labour force	0.776	0.42	0	1
Father employed last year	0.836	0.37	0	1
Father unemployed last year	0.107	0.31	0	1
Father not in labour force last year	0.057	0.23	0	1
Mother employed last year	0.187	0.39	0	1
Mother unemployed last year	0.014	0.12	0	1
Mother not in labour force last year	0.798	0.40	0	1
Father ever worked in agriculture	0.105	0.31	0	1
Mother ever worked in agriculture	0.125	0.33	0	1
Urban	0.784	0.41	0	1
Total employment rate	44.398	6.39	26.9	53.9
Weekly working hours	48.635	3.08	41.9	56.4
HH income (<1000)	0.606	0.49	0	1
HH income (1000-2499)	0.295	0.46	0	1
HH income (2500-4999)	0.082	0.27	0	1
HH income (5000-9999)	0.014	0.12	0	1
HH income (>9999)	0.002	0.05	0	1
Istanbul	0.108	0.31	0	1
Westernmarmara	0.045	0.21	0	1
Aegean	0.095	0.29	0	1
Easternmarmara	0.080	0.27	0	1
Westernanatolia	0.146	0.35	0	1
Mediterranean	0.124	0.33	0	1
Middleanatolia	0.063	0.24	0	1
Westernblacksea	0.052	0.22	0	1
Easternblacksea	0.042	0.20	0	1
Westeasternanatolia	0.060	0.24	0	1
Middleeasternanatolia	0.049	0.22	0	1
Southeasternanatolia	0.138	0.34	0	1
# of Observations	15467			

Table A4. 3. Descriptive Statistics of the 15-17 Age Group

Variable	Mean	Std. Dev.	Min	Max
Activity15_17	3.638	1.75	1	6
Male	0.520	0.50	0	1
Agechild	15.980	0.82	15	17
Agemother	42.101	6.26	21	89
Agefather	46.056	6.41	30	85
Extended	0.118	0.32	0	1
Adult	4.020	1.25	3	16
Sibling	0.244	0.55	0	5
Father no educational qualification	0.088	0.28	0	1
Father 5 years school graduate	0.515	0.50	0	1
Father 8 years school graduate	0.126	0.33	0	1
Father secondary school graduate	0.155	0.36	0	1
Father university graduate	0.115	0.32	0	1
Mother no educational qualification	0.271	0.44	0	1
Mother 5 years school graduate	0.539	0.50	0	1
Mother 8 years school graduate	0.054	0.23	0	1
Mother secondary school graduate	0.093	0.29	0	1
Mother university graduate	0.043	0.20	0	1
Father weekly working hours	40.664	25.03	0	97
Mother weekly working hours	8.644	18.66	0	97
Father employed	0.783	0.41	0	1
Father unemployed	0.064	0.24	0	1
Father not in labour force	0.154	0.36	0	1
Mother employed	0.205	0.40	0	1
Mother unemployed	0.025	0.15	0	1
Mother not in labour force	0.771	0.42	0	1
Father employed last year	0.779	0.41	0	1
Father unemployed last year	0.105	0.31	0	1
Father not in labour force last year	0.116	0.32	0	1
Mother employed last year	0.199	0.40	0	1
Mother unemployed last year	0.199	0.40	0	1
Mother not in labour force last year	0.785	0.41	0	1
Father ever worked in agriculture	0.128	0.33	0	1
Mother ever worked in agriculture	0.147	0.35	0	1
Urban	0.788	0.41	0	1
Total employment rate	44.485	6.28	26.9	53.9
Weekly working hours	48.623	3.09	41.9	56.4
HH income (<1000)	0.637	0.48	0	1
HH income (1000-2499)	0.286	0.45	0	1
HH income (2500-4999)	0.066	0.25	0	1
HH income (5000-9999)	0.009	0.09	0	1
HH income (>9999)	0.002	0.04	0	1
Istanbul	0.104	0.31	0	1
Westernmarmara	0.049	0.22	0	1
Aegean	0.101	0.30	0	1
Easternmarmara	0.085	0.28	0	1
Westernanatolia	0.137	0.34	0	1
Mediterranean	0.117	0.32	0	1
Middleanatolia	0.065	0.25	0	1
Westernblacksea	0.055	0.23	0	1
Easternblacksea	0.043	0.20	0	1
Westeasternanatolia	0.060	0.24	0	1
Middleeasternanatolia	0.050	0.22	0	1
Southeasternanatolia	0.136	0.34	0	1
# of Observations	5303			

Table A4. 4. Child activities by education of household head

Total	illiterate	literate but no qualification	primary school (5 years)	primary school (8 years + middle school)	high school (regular + vocational)	university (+ master/ doctorate)
School	867 (65.78)	546 (60.47)	4625 (51013)	1029 (47.25)	1537 (47.94)	1150 (51.13)
School & 1-2 hours hw	187 (14.19)	160 (17.72)	2261 (25.00)	636 (29.20)	997 (31.10)	698 (31.04)
School & 3-7 hours hw	160 (12.14)	126 (13.95)	1508 (16.67)	372 (17.08)	492 (15.35)	307 (13.65)
School & 8+ hours hw	104 (7.89)	71 (7.86)	651 (7.20)	141 (6.47)	180 (5.61)	94 (4.18)
Total	697 (100)	903 (100)	9045 (100)	2178 (100)	3206 (100)	2249 (100)

*Numbers in parentheses are percentage values

Table A4. 5. Child activities by region and demography

		School	1-2 hours housework	3-7 hours housework	8 and more hours housework
Istanbul	Urban	853 (48.30)	518 (29.33)	288 (16.31)	107 (6.06)
	Rural	56 (70)	12 (15)	9 (11.25)	3 (3.75)
	Total	909 (49.24)	530 (28.71)	297 (16.09)	110 (5.96)
Western Marmara	Urban	234 (40.28)	136 (23.41)	164 (28.23)	47 (8.09)
	Rural	105 (34.09)	74 (24.03)	90 (29.22)	39 (12.66)
	Total	339 (38.13)	210 (23.62)	254 (28.57)	86 (9.67)
Aegean	Urban	591 (41.94)	537 (38.11)	241 (17.10)	40 (2.84)
	Rural	197 (45.39)	139 (32.03)	81 (18.66)	17 (3.92)
	Total	788 (42.76)	676 (36.68)	322 (17.47)	57 (3.09)
Eastern Marmara	Urban	543 (44.25)	459 (37.41)	158 (12.88)	67 (5.46)
	Rural	105 (50.97)	554 (26.21)	31 (15.05)	16 (7.77)
	Total	648 (45.22)	513 (35.80)	189 (13.19)	83 (5.79)
Western Anatolia	Urban	1068 (50.12)	755 (35.43)	222 (10.42)	86 (4.04)
	Rural	344 (64.78)	107 (20.15)	57 (10.73)	23 (4.33)
	Total	1412 (53.04)	862 (32.38)	279 (10.48)	109 (4.09)
Mediterranean	Urban	578 (31.46)	653 (35.55)	443 (24.12)	163 (8.87)
	Rural	214 (38.56)	182 (32.79)	129 (23.24)	30 (5.41)
	Total	792 (33.11)	835 (34.91)	572 (23.91)	193 (8.07)
Middle Anatolia	Urban	372 (47.63)	258 (33.03)	124 (15.88)	27 (3.46)
	Rural	249 (52.53)	135 (28.48)	72 (15.19)	18 (3.80)
	Total	621 (49.48)	393 (31.31)	196 (15.62)	45 (3.59)
Western Blacksea	Urban	417 (58.98)	171 (24.19)	94 (13.30)	25 (3.54)
	Rural	196 (59.39)	50 (15.15)	71 (21.52)	13 (3.94)
	Total	613 (59.11)	221 (21.31)	165 (15.91)	38 (3.66)
Eastern Blacksea	Urban	362 (70.84)	77 (15.07)	55 (10.76)	17 (3.33)
	Rural	255 (75.89)	28 (8.33)	37 (11.01)	16 (4.76)
	Total	617 (72.85)	105 (12.40)	92 (10.86)	33 (3.90)
Westeastern Anatolia	Urban	375 (58.78)	119 (18.65)	111 (17.40)	33 (5.17)
	Rural	470 (71.10)	28 (4.24)	115 (17.40)	48 (7.26)
	Total	845 (65.05)	147 (11.32)	226 (17.40)	81 (6.24)
Southeastern Anatolia	Urban	977 (59.14)	209 (12.65)	218 (13.20)	248 (15.01)
	Rural	567 (78.97)	41 (5.71)	55 (7.66)	55 (5.66)
	Total	1544 (65.15)	250 (10.55)	273 (11.52)	303 (12.78)
Middleeastern Anatolia	Urban	253 (49.61)	135 (26.47)	62 (12.16)	60 (11.76)
	Rural	373 (72.29)	62 (12.02)	38 (7.36)	43 (8.33)
	Total	626 (61.01)	197 (19.20)	100 (9.75)	103 (10.04)

*Numbers in parentheses are percentage values

Table A4. 6. Multinomial Logit Coefficients (6-14 age group)

	1-2 hours housework	3-7 hours housework	8 and more hours housework
male	0.05	-0.68***	-1.35***
agechild	0.14***	0.331***	0.41***
agemother	-0.01	-0.00	-0.02**
agefather	0.00	-0.01	0.01
extended	0.03	0.03	0.25**
adult	-0.14***	-0.15***	-0.25***
sibling	-0.05**	0.11***	0.15***
father 5 years school graduate	0.19*	0.16	-0.13
father 8 years school graduate	0.35***	0.24*	-0.15
father secondary school graduate	0.36***	0.15	-0.20
father university graduate	0.28**	0.11	-0.55***
mother 5 years school graduate	0.19***	0.18**	-0.04
mother 8 years school graduate	0.26***	0.32***	0.19
mother secondary school graduate	0.18**	0.21**	-0.12
mother university graduate	0.10	-0.29*	-0.11
father weekly working hours	-0.00	-0.00	0.01*
mother weekly working hours	-0.01***	-0.01*	-0.00
father employed	-0.08	0.39**	-0.14
father not in labour force	-0.37***	-0.03	-0.33
mother employed	0.19	0.03	0.12
mother not in labour force	-0.10	-0.07	0.14
father employed last year	0.08	0.04	-0.33***
father not in labour force last year	0.07	0.14	0.01
mother employed last year	-0.48***	-0.34	-0.25
mother not in labour force last year	-0.54***	-0.39*	-0.45
father ever worked in agriculture	-0.01	-0.05	-0.13
mother ever worked in agriculture	-0.02	0.09	0.03
urban	0.51***	0.20***	0.35***
total employment rate	0.07***	0.08***	0.06***
weekly working hours	0.07***	0.05**	0.10***
HH income (1000-2499)	0.07	0.03	0.16*
HH income (2500-4999)	0.05	-0.13	0.08
HH income (5000-9999)	-0.57***	-0.60**	-0.17
HH income (>9999)	-0.99**	-0.68	-14.52
istanbul	-0.40**	0.55***	-0.59**
westernmarmara	-0.15	-0.24	-2.13***
aegean	-0.23	-0.45**	-1.44***
easternmarmara	-0.18	-0.62***	-1.72***
westernanatoliaa	0.49***	0.82***	-0.28
mediterranean	0.12	0.02	-1.60***
middleanatolia	-0.77***	-0.55***	-1.95***
westernblacksea	-2.07***	-1.66***	-2.81***
easternblacksea	-0.99***	-0.08	-1.01***
westeasternanatolia	-0.46**	-0.21	-1.42***
southeasternanatolia	-0.75**	0.28**	-0.41
_cons	-8.22***	-9.60***	-11.12***
Log likelihood		--16054.658	
N		15467	

*p<.1; ** p<.05; *** p<.01

Table A4. 7. Multinomial Logit Coefficients (15-17 age group)

	labour	housework	school+ labour	school+ housework	inactivity
male	0.70***	-2.02***	0.21	-1.01***	0.19
agechild	0.59***	0.42***	0.95***	-0.06	0.44***
agemother	0.01	0.00	0.01	-0.01	0.02
agefather	-0.05***	-0.05***	-0.03	-0.01	-0.05***
extended	-0.27	-0.31	-0.42	-0.06	-0.66**
adult	0.02	0.08	-0.09	-0.12***	0.17***
sibling	0.16	0.32***	0.24	-0.12	0.12
father 5 years school graduate	-0.88***	-0.51***	-0.25	0.15	-0.61**
father 8 years school graduate	-1.70***	-0.85***	-0.30	0.28	-1.02***
father secondary school graduate	-1.94***	-1.57***	-0.61	0.13	-1.18***
father university graduate	-4.22***	-1.66***	-1.42***	-0/02	-1.67***
mother 5 years school graduate	-0.68***	-0.88***	-0.06	0.02	-0.91***
mother 8 years school graduate	-1.42***	-0.86**	0.48	0.44**	-1.02*
mother secondary school graduate	-2.10***	-2.29***	-0.92**	-0.11	-1.94***
mother university graduate	-15.49	-2.72***	-1.76**	-0.30	-0.82
father weekly working hours	0.00	0.00	0.01**	-0.00	-0.00
mother weekly working hours	0.00	-0.00	0.01	0.01	0.01
father employed	0.03	-0.27	-0.43	-0.04	0.19
father not in labour force	0.10	0.40	0.57	-0.06	0.79**
mother employed	-0.35	0.81	-0.40	-0.61*	-0.00
mother not in labour force	-0.91**	1.20	-0.08	-0.46*	0.51
father employed last year	0.05	-0.17	0.30	0.00	-0.14
father not in labour force last year	0.02	-0.29	-0.67	0.01	-0.52
mother employed last year	0.53	-0.91	0.42	-0.10	-1.33**
mother not in labour force last year	0.85	-0.95	-0.19	0.02	-1.29**
father ever worked in agriculture	0.16	0.26	0.13	-0.23*	-0.21
mother ever worked in agriculture	0.14	0.15	0.84***	0.05	-0.23
urban	-0.14	-0.30*	0.93***	0.25**	-0.59***
total employment rate	0.08***	0.05***	0.05***	0.08***	0.01
weekly working hours	0.10*	0.10**	-0.00	0.04	-0.08
HH income (1000-2499)	-0.26*	-0.03	-0.14	-0.01	-0.17
HH income (2500-4999)	-0.64	-0.04	-0.08	0.14	-0.63
HH income (5000-9999)	-11.42	-14.13	-15.43	0.07	-15.87
HH income (>9999)	-8.24	-14.10	-15.83	-0.47	-16.64
istanbul	0.14	-0.54	1.31*	0.19	0.67
westernmarmara	-0.20	-1.61***	0.55	-0.79***	0.43
aegean	0.11	-1.06***	1.02	-0.20	1.21**
easternmarmara	0.28	-0.58	0.51	-0.44	0.59
westernanatoliaa	0.51	-0.56*	0.65	0.12	0.07
mediterranean	0.67*	-0.26	0.65	-0.10	0.68
middleanatolia	-0.78***	-1.48***	-0.18	-1.42***	0.20
westernblacksea	-1.79***	-2.68***	-1.95***	-2.10***	0.60
easternblacksea	-0.12	-0.43	-1.69**	-0.51**	-0.27
westeasternanatolia	0.02	-0.81*	0.27	-0.33	0.72
southeasternanatolia	0.09	-0.78	0.52	0.26	1.10
_cons	-15.38***	-9.92***	-19.20***	-1.41	-2.84
Log Likelihood			-6161.3116		
N			5303		

*p<.1; ** p<.05; *** p<.01

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Table A4. 8. Multinomial Logit Coefficients for boys (6-14 age group)

	1-2 hours housework	3-7 hours housework	8 and more hours housework
agechild	0.13***	0.24***	0.24***
agemother	0.002	-0.01	-0.02
agefather	-0.002	-0.01	0.01
extended	0.23**	0.15	-0.04
adult	-0.18***	-0.14***	-0.13**
sibling	-0.05	0.03	0.15
father 5 years school graduate	0.31**	0.13	-0.10
father 8 years school graduate	0.48***	0.19	0.01
father secondary school graduate	0.50***	0.03	0.34
father university graduate	0.47***	-0.01	-0.14
mother 5 years school graduate	0.15*	0.29**	0.25
mother 8 years school graduate	0.29***	0.49***	0.90***
mother secondary school graduate	0.25**	0.45***	0.72***
mother university graduate	-0.01	0.05	0.08
father weekly working hours	0.00	-0.00	0.01
mother weekly working hours	-0.02***	-0.01**	-0.01
father employed	-0.09	0.42*	-0.06
father not in labour force	-0.24	0.06	-0.21
mother employed	0.51**	0.56	0.44
mother not in labour force	-0.06	0.19	0.57
father employed last year	0.10	0.00	-0.67***
father not in labour force last year	0.13	0.13	0.04
mother employed last year	-0.49**	-0.20	0.62
mother not in labour force last year	-0.49**	-0.13	0.02
father ever worked in agriculture	-0.15	-0.18	-0.02
mother ever worked in agriculture	0.02	0.20	0.14
urban	0.55***	0.24**	0.53***
total employment rate	0.07***	0.08***	0.09***
weekly working hours	0.11***	0.11***	0.20***
HH income (1000-2499)	0.07	0.02	0.07
HH income (2500-4999)	-0.02	-0.16	0.05
HH income (5000-9999)	-0.60**	-0.77	0.07
HH income (>9999)	-0.69	-0.89	-11.82
istanbul	-0.38	0.74**	-0.91*
westernmarmara	-0.08	-0.46	-2.48***
aegean	0.31	-0.56*	-1.32***
easternmarmara	-0.23	-0.88***	-1.96***
westernanatoliaa	0.46**	-0.92***	-0.05
mediterranean	0.01	-0.30	-1.59***
middleanatolia	-0.81***	-0.83***	-1.87***
westernblacksea	-2.12***	-1.48***	-3.03***
easternblacksea	-1.03***	0.21	-0.83***
westeasternanatolia	-0.57**	-0.15	-2.04**
southeasternanatolia	-0.83**	-0.04	-0.73
_cons	-9.80***	-12.23***	-18.12***
Log likelihood		-7556.2447	
N		7856	

*p<.1; ** p<.05; *** p<.01

Table A4. 9. Multinomial Logit Coefficients for girls (6-14 age group)

	1-2 hours housework	3-7 hours housework	8 and more hours housework
agechild	0.16***	0.36***	0.50***
agemother	-0.02**	0.005	-0.02**
agefather	0.01	-0.002	0.02*
extended	-0.22*	-0.07	0.31**
adult	-0.10***	-0.18***	-0.31***
sibling	-0.05	0.17***	0.16**
father 5 years school graduate	0.03	0.13	-0.20
father 8 years school graduate	0.17	0.22	-0.27
father secondary school graduate	0.17	0.17	-0.50**
father university graduate	0.02	0.13	-0.78***
mother 5 years school graduate	0.25**	0.09	-0.15
mother 8 years school graduate	0.23	0.13	-0.27
mother secondary school graduate	0.10	-0.01	-0.60***
mother university graduate	0.21	-0.54**	-0.18
father weekly working hours	-0.002	-0.0003	0.004
mother weekly working hours	-0.004	-0.001	0.002
father employed	-0.07	0.36	-0.16
father not in labour force	-0.51**	-0.13	-0.41
mother employed	-0.18	-0.38	-0.12
mother not in labour force	-0.15	-0.27	-0.08
father employed last year	0.07	0.09	-0.17
father not in labour force last year	-0.04	0.13	-0.02
mother employed last year	-0.47*	-0.41	-0.49
mother not in labour force last year	-0.58**	-0.56*	-0.53
father ever worked in agriculture	0.12	0.05	-0.13
mother ever worked in agriculture	-0.03	0.02	-0.01
urban	0.47***	0.16*	0.26**
total employment rate	0.07***	0.08***	0.05***
weekly working hours	0.04	-0.01	0.04
HH income (1000-2499)	0.07	0.04	0.21*
HH income (2500-4999)	0.12	-0.10	0.12
HH income (5000-9999)	-0.52*	-0.49	-0.25
HH income (>9999)	-1.34*	-0.64	-13.77
istanbul	-0.48	0.34	-0.53*
westernmarmara	-0.30	-0.15	-2.05***
aegean	-0.22	-0.34	-1.51***
easternmarmara	-0.19	-0.43*	-1.61***
westernanatoliaa	0.48**	0.77***	-0.38
mediterranean	0.19	0.21	-1.54***
middleanatolia	-0.78***	-0.42*	-1.94***
westernblacksea	-2.07***	-1.76***	-2.68***
easternblacksea	-1.02***	-0.34	-1.15***
westeasternanatolia	-0.39	-0.19	-1.14***
southeasternanatolia	-0.76	0.68	-0.23
_cons	-6.47***	-7.49***	-8.25***
Log likelihood	-8332.8094		
N	7611		

*p<.1; ** p<.05; *** p<.01

Table A4. 10. Multinomial Logit Coefficients for boys (15-17 age group)

	labour	housework	school+ labour	school+ housework	inactivity
agechild	0.63***	0.59***	0.87***	-0.10	0.49***
agemother	-0.002	0.0001	0.02	-0.01	0.01
agefather	-0.03**	-0.09***	-0.02	-0.01	-0.04*
extended	-0.08	-0.72**	-0.35	-0.08	-0.63**
adult	-0.04	0.22**	-0.09	-0.12**	0.11
sibling	0.21	-0.09	0.17	-0.19**	0.11
father 5 years school graduate	-0.66***	-0.76**	0.09	0.28	-0.53**
father 8 years school graduate	-1.39***	-0.59	0.01	0.42	-0.91***
father secondary school graduate	-1.49***	-1.73***	-0.22	0.40	-1.67***
father university graduate	-3.80***	-1.64**	-1.19*	0.23	-2.12***
mother 5 years school graduate	-0.79***	-1.22***	-0.16	-0.01	-0.94***
mother 8 years school graduate	-1.17**	-0.68	0.42	0.69***	-0.60
mother secondary school graduate	-2.56***	-1.29**	-1.02**	-0.01	-1.30**
mother university graduate	-15.49	-16.83	-1.86*	-0.16	-1.08
father weekly working hours	0.0004	-0.001	0.02***	-0.002	0.0001
mother weekly working hours	0.01	0.004	0.005	0.01*	0.01
father employed	-0.13	-0.65	-0.85	-0.06	-0.22
father not in labour force	0.24	0.12	0.42	0.08	0.55
mother employed	-0.95	16.07	-0.17	-0.72	0.50
mother not in labour force	-1.17**	16.49	-0.06	-0.23	1.16
father employed last year	0.21	0.19	0.45	0.04	0.03
father not in labour force last year	-0.06	-0.02	-0.23	0.07	-0.57
mother employed last year	0.66	-1.60**	-0.20	-0.21	-1.42*
mother not in labour force last year	1.19	-1.87**	-0.58	-0.16	-1.41*
father ever worked in agriculture	0.08	-0.05	-0.06	-0.23	-0.24
mother ever worked in agriculture	-0.003	-0.09	0.96***	0.05	-0.24
urban	-0.04	-0.43	1.26***	0.15	-0.51**
total employment rate	0.08***	0.09**	0.08**	0.11***	0.02
weekly working hours	0.06	0.02	0.001	0.07	-0.10
HH income (1000-2499)	-0.29	0.21	-0.43*	0.02	-0.16
HH income (2500-4999)	-0.34	0.70	-0.11	0.27	-0.18
HH income (5000-9999)	-9.55	-12.84	-14.74	-0.09	-14.85
HH income (>9999)	-0.60	0.19	-15.50	-0.63	-14.96
istanbul	0.26	0.23	1.09	0.07	1.02
westernmarmara	0.13	-0.71	0.28	-0.75**	0.52
aegean	0.19	-0.28	0.94	-0.19	0.92
easternmarmara	0.59	-0.002	0.68	-0.33	0.39
westernanatoliaa	0.60	-0.42	0.84	0.32	0.28
mediterranean	0.74*	-0.95*	0.79	-0.05	0.80
middleanatolia	-1.00*	-1.30*	-0.16	-1.24***	0.03
westernblacksea	-1.16*	-1.89*	-2.30**	-2.11***	1.21*
easternblacksea	0.11	-0.66	-1.96*	-0.39	-0.07
westeasternanatolia	0.22	0.10	0.24	-0.31	0.57
southeasternanatolia	0.57	-0.11	1.15	0.17	1.33
_cons	-14.65***	-25.34	-19.62***	-4.21*	-3.11
Log Likelihood			-3475.6603		
N			2760		

*p<.1; ** p<.05; *** p<.01

Table A4. 11. Multinomial Logit Coefficients for girls (15-17 age group)

	labour	housework	school+ labour	school+ housework	inactivity
agechild	0.51***	0.38***	1.24***	-0.02	0.33*
agemother	0.04	0.001	-0.01	-0.001	0.06*
agefather	-0.14***	-0.05***	-0.05	-0.01	-0.07**
extended	-1.10**	-0.27	-0.58	-0.10	-0.75*
adult	0.24*	0.08	-0.02	-0.08	0.34***
sibling	-0.28	0.49***	0.29	-0.03	0.14
father 5 years school graduate	-1.75***	-0.59**	-0.91	-0.01	-0.70
father 8 years school graduate	-2.92***	-1.18***	-0.79	0.07	-1.12*
father secondary school graduate	-3.91***	-1.80***	-1.35**	-0.26	-0.44
father university graduate	-16.62	-1.90***	-1.84**	-0.33	-0.83
mother 5 years school graduate	-0.24	-0.75***	0.28	0.09	-1.05***
mother 8 years school graduate	-15.73	-1.18**	0.71	0.08	-1.85*
mother secondary school graduate	-0.76	-3.57***	-0.74	-0.21	-17.22
mother university graduate	-13.34	-2.25**	-1.41	-0.31	-1.16
father weekly working hours	0.002	0.01	0.004	0.004	-0.01
mother weekly working hours	-0.02**	-0.01	0.004	-0.003	0.02
father employed	0.20	-0.14	0.62	-0.08	1.48
father not in labour force	-0.57	0.35	1.36	-0.25	1.45*
mother employed	1.60	0.40	-0.96	-0.49	-0.97
mother not in labour force	0.26	0.61	-0.32	-0.75*	-0.40
father employed last year	-0.63	-0.47	-0.27	-0.10	-0.50
father not in labour force last year	-0.02	-0.28	-2.63**	-0.001	-0.38
mother employed last year	-0.88	-0.34	16.67	-0.17	-1.59
mother not in labour force last year	-0.84	-0.36	15.61	-0.01	-1.62
father ever worked in agriculture	0.44	0.41	0.58	-0.20	-0.30
mother ever worked in agriculture	0.58	0.24	0.45	0.08	-0.20
urban	-0.41	-0.38*	0.18	0.25	-0.93**
total employment rate	0.09**	0.01	-0.05	0.03	0.02
weekly working hours	0.29**	0.15**	-0.10	0.05	-0.14
HH income (1000-2499)	-0.20	-0.09	0.48	-0.01	-0.12
HH income (2500-4999)	-14.07	-0.41	0.26	-0.04	-1.15
HH income (5000-9999)	-11.61	-13.88	-14.89	0.17	-15.95
HH income (>9999)	1.78	-14.57	-15.19	-0.42	-16.93
istanbul	-1.01	-1.16	2.06	-0.16	-14.53
westernmarmara	-1.97*	-2.35***	1.14	-1.28**	0.55
aegean	-0.89	-1.75**	1.44	-0.76	1.97*
easternmarmara	-1.52	-1.29***	0.22	-1.08**	1.08
westernanatoliaa	-0.34	-1.15**	0.23	-0.60	-0.55
mediterranean	0.11	-1.26**	0.16	-0.65	0.60
middleanatolia	-0.96	-1.85***	-0.21	-1.97***	0.50
westernblacksea	-4.98***	-3.37***	-1.01	-2.59***	-0.67
easternblacksea	-1.19	-0.84	-1.26	-1.07**	-1.03
westeasternanatolia	-1.30	-1.55**	0.69	-0.87	1.50
southeasternanatolia	-2.53	-1.75*	-1.71	-0.37	1.76
_cons	-19.60***	-9.33**	-28.84	0.69	1.13
Log Likelihood			-2515.5714		
N			2543		

*p<.1; ** p<.05; *** p<.01

Table A4. 12. Marginal Effects for the Multinomial Logit Model for urban (6-14 age group)

	School	1-2 hours hw	3-7 hours hw	8 and more hours hw
male	0.06***	0.07***	-0.07***	-0.06***
agechild	-0.05***	0.01***	0.02***	0.02***
agemother	0.002*	-0.001	0.001	-0.001**
agefather	-0.001	0.002	-0.001	0.0005
extended	0.005	0.01	-0.02*	0.01
adult	0.03***	-0.02***	-0.004	-0.01***
sibling	-0.01	-0.02***	0.02***	0.01***
father 5 years school graduate	-0.01	0.02	0.00005	-0.01
father 8 years school graduate	-0.03	0.04*	-0.001	-0.01
father secondary school graduate	-0.03	0.06**	-0.01	-0.02*
father university graduate	-0.004	0.05*	-0.01	-0.04***
mother 5 years school graduate	-0.04***	0.03**	0.01	-0.01
mother 8 years school graduate	-0.05**	0.03	0.02	0.002
mother secondary school graduate	-0.04**	0.03*	0.02	-0.01
mother university graduate	0.002	0.04	-0.05***	0.01
father weekly working hours	-0.00003	0.00005	-0.0001	0.0001
mother weekly working hours	0.002***	-0.001***	-0.0004	0.0002
father employed	-0.01	-0.04	0.04**	-0.002
father not in labour force	0.08***	-0.07**	0.01	-0.02
mother employed	-0.04	0.04	-0.01	-0.001
mother not in labour force	0.02	-0.01	-0.01	0.01
father employed last year	-0.001	0.02	0.001	-0.02***
father not in labour force last year	-0.02	0.01	0.02	0.0002
mother employed last year	0.11***	-0.08**	-0.04	-0.0001
mother not in labour force last year	0.14***	-0.09***	-0.05	-0.01
father ever worked in agriculture	0.02	-0.02	-0.01	0.0001
mother ever worked in agriculture	0.02	-0.02	0.01	-0.01
total employment rate	-0.02***	0.01***	0.01***	0.001
weekly working hours	-0.01***	0.01*	0.003	0.003*
HH income (1000-2499)	-0.005	0.01	-0.01	0.005
HH income (2500-4999)	0.01	0.01	-0.03*	0.01
HH income (5000-9999)	0.13***	-0.08**	-0.05	-0.004
HH income (>9999)	0.55	0.07	0.18	-0.80
istanbul	0.11***	-0.14***	0.07***	-0.05***
westernmarmara	0.14***	-0.01	-0.01	-0.12***
aegean	0.13***	-0.01	-0.04	-0.07***
easternmarmara	0.13***	0.01	-0.06**	-0.08***
westernanatoliaa	-0.7**	0.03	0.07***	-0.03***
mediterranean	0.09***	0.005	0.01	-0.10**
middleanatolia	0.25***	-0.12***	-0.04	-0.09***
westernblacksea	0.49***	-0.30***	-0.08**	-0.11***
easternblacksea	0.17***	-0.14***	0.03	-0.05***
westeasternanatolia	0.14***	-0.07	-0.004	-0.07***
southeasternanatolia	0.10	-0.13**	0.04	-0.01
N		12132		

*p<.1; ** p<.05; *** p<.01

Table A4. 13. Marginal Effects for the Multinomial Logit Model for rural (6-14 age group)

	School	1-2 hours housework	3-7 hours housework	8 and more hours housework
male	0.12***	0.03**	-0.07***	-0.08***
agechild	-0.05***	0.03	0.03***	0.02***
agemother	0.0001	0.001	-0.001	-0.00003
agefather	0.001	-0.003	-0.001	0.001
extended	-0.05**	-0.03	0.06***	0.03**
adult	0.04***	-0.005	-0.02***	-0.01***
sibling	-0.01	0.01	-0.0001	0.003
father 5 years school graduate	-0.07**	0.04	0.05*	-0.02*
father 8 years school graduate	-0.11***	0.07**	0.07*	-0.03*
father secondary school graduate	-0.10***	0.06*	0.06*	-0.02
father university graduate	-0.08*	0.03	0.07	-0.02
mother 5 years school graduate	-0.02	0.01	0.01	-0.01
mother 8 years school graduate	-0.11***	0.05	0.06**	0.01
mother secondary school graduate	-0.02	-0.005	0.03	-0.002
mother university graduate	0.03	0.01	0.05	-0.09
father weekly working hours	-0.0001	-0.001*	-0.0001	0.001***
mother weekly working hours	0.001	-0.001	0.0002	-0.0001
father employed	-0.02	-0.01	0.07*	-0.04*
father not in labour force	0.02	-0.05	0.03	0.003
mother employed	-0.04	-0.02	0.01	0.04
mother not in labour force	-0.05	-0.03	0.02	0.06
father employed last year	-0.02	0.002	0.03	-0.01
father not in labour force last year	-0.02	0.01	0.01	0.003
mother employed last year	-0.02	-0.05	0.09	-0.02
mother not in labour force last year	-0.05	-0.04	0.13*	-0.04
father ever worked in agriculture	-0.02	0.01	0.01	-0.01
mother ever worked in agriculture	-0.04*	0.01	0.02	0.01
total employment rate	-0.01***	0.003	0.01***	0.001
weekly working hours	-0.01*	0.01	-0.003	0.01*
HH income (1000-2499)	-0.06***	0.02	0.03*	0.02*
HH income (2500-4999)	-0.09*	0.03	0.04	0.01
HH income (5000-9999)	-0.01	-0.13	0.001	0.14**
HH income (>9999)	2.24	-1.16	-0.87	-0.21
istanbul	-0.17***	0.05	0.13***	-0.01
westernmarmara	-0.05	0.09**	0.03	-0.08***
aegean	0.02	0.02	0.02	-0.05*
easternmarmara	0.06	0.04	-0.01	-0.08***
westernanatoliaa	-0.15***	0.13***	0.10***	-0.07***
mediterranean	-0.09**	0.13***	0.04	-0.08***
middleanatolia	-0.02	0.02	0.07**	-0.07***
westernblacksea	0.28***	-0.12**	-0.06	-0.09***
easternblacksea	0.12***	-0.17***	0.08**	-0.03
westeasternanatolia	0.1	-0.02	0.01	-0.09**
southeasternanatolia	0.09	-0.14*	0.1	-0.05
N		3335		

*p<.1; ** p<.05; *** p<.01

Table A4. 14. Marginal Effects for the Multinomial Logit Model for urban (15-17 age group)

	school	labour	houesework	school+ labour	school+ housework	inactivity
male	0.11***	0.09***	-0.08***	0.04***	-0.18***	0.02***
agechild	-0.02***	0.03***	0.02***	0.04***	-0.08***	0.01**
agemother	0.0002	0.0003	0.001	0.001	-0.003	0.001
agefather	0.004***	-0.002**	-0.003***	-0.001	0.003*	-0.001*
extended	0.03	0.002	-0.01	-0.002	0.003	-0.02**
adult	0.01**	-0.001	0.01***	-0.005	-0.03***	0.01***
sibling	-0.01	0.01	0.03***	0.01*	-0.05***	0.01*
father 5 years school graduate	0.01	-0.05***	-0.02**	-0.01	0.08**	-0.01
father 8 years school graduate	0.02	-0.10***	-0.03**	-0.01	0.14***	-0.02
father secondary school graduate	0.05	-0.11***	-0.07***	-0.01	0.15***	-0.02
father university graduate	0.13***	-0.22***	-0.06**	-0.03	0.20***	-0.01
mother 5 years school graduate	0.02	-0.03***	-0.05***	0.001	0.07***	-0.02***
mother 8 years school graduate	-0.02	-0.08***	-0.06***	0.02	0.16***	-0.02
mother secondary school graduate	0.09***	-0.10***	-0.10***	-0.03	0.17***	-0.03*
mother university graduate	0.30	-0.82	-0.07	0.03	0.50	0.05
father weekly working hours	0.0002	-0.0005	0.0003	0.001***	-0.001	-0.0001
mother weekly working hours	-0.0003	-0.0003	-0.001	-0.001	0.001	0.0002
father employed	-0.03	0.03	0.0003	-0.03	0.01	0.02
father not in labour force	-0.02	-0.01	0.03	0.02	-0.05	0.03*
mother employed	0.06	0.004	0.08	0.01	-0.17**	0.01
mother not in labour force	0.07	-0.05**	0.08*	0.002	-0.12**	0.02
father employed last year	0.02	-0.00004	-0.02**	0.01	-0.004	-0.002
father not in labour force last year	0.02	0.003	-0.03	-0.03	0.04	-0.01
mother employed last year	0.02	0.03	-0.05	0.02	0.005	-0.03
mother not in labour force last year	0.02	0.06	-0.07**	-0.01	0.03	-0.03
father ever worked in agriculture	0.01	0.002	0.01	0.01	-0.03	-0.01
mother ever worked in agriculture	-0.01	0.002	-0.005	0.03***	-0.02	0.004
total employment rate	-0.01***	0.003**	0.001	-0.002	0.01***	-0.001
weekly working hours	-0.01	0.01	0.001	0.003	0.007	-0.01**
HH income (1000-2499)	0.02	-0.01	-0.0003	-0.01	0.01	-0.01
HH income (2500-4999)	0.004	-0.05	0.01	-0.004	0.05	-0.02
HH income (5000-9999)	0.59	-0.39	-0.61	-0.51	1.28	-0.36
HH income (>9999)	0.65	-0.19	-0.60	-0.55	1.08	-0.39
istanbul	-0.02	0.01	-0.01	0.02	-0.03	0.02
westernmarmara	0.13***	-0.01	-0.04	0.03	-0.15***	0.04**
aegean	0.03	-0.02	-0.03	0.03	-0.07	0.05**
easternmarmara	0.05	0.02	0.001	0.02	-0.11**	0.03
westernanatoliaa	-0.03	0.03	-0.02	0.02	-0.01	0.01
mediterranean	0.02	0.03	-0.03	0.03	-0.06	0.02
middleanatolia	0.23***	0.01	-0.04	0.02	-0.25***	0.02
westernblacksea	0.32***	-0.02	-0.02	-0.03	-0.32***	0.07***
easternblacksea	0.09*	0.03	0.03	-0.04	-0.12**	0.02
westeasternanatolia	0.05	-0.0004	-0.01	-0.01	-0.08	0.04*
southeasternanatolia	-0.03	-0.01	-0.001	-0.05	0.04	0.05
N				4181		

*p<.1; ** p<.05; *** p<.01

Table A4. 15. Marginal Effects for the Multinomial Logit Model for rural (15-17 age group)

	school	labour	houesework	school+ labour	school+ housework	inactivity
male	0.16***	0.10***	-0.20	0.01	-0.10***	0.04
agechild	-0.04***	0.04***	0.02	0.01	-0.05***	0.02
agemother	0.0001	0.001	-0.002	0.001	-0.001	0.002
agefather	0.003	-0.003	-0.001	0.0002	0.001	-0.001
extended	0.03	-0.03	-0.01	-0.04	0.08*	-0.02
adult	-0.005	0.01*	0.01	0.01	-0.04***	0.01
sibling	0.02	0.002	0.02	-0.0002	-0.02	-0.01
father 5 years school graduate	0.03	-0.06**	-0.04	0.02	0.09	-0.04
father 8 years school graduate	0.06	-0.15***	-0.11	0.04	0.21***	-0.06
father secondary school graduate	0.09	-0.16***	-0.13	0.04	0.19***	-0.04
father university graduate	1.02	-1.97	0.63	0.10	1.35	-1.14
mother 5 years school graduate	0.07**	-0.06***	-0.04	0.02	0.06*	-0.05
mother 8 years school graduate	0.99	-1.98	0.69	0.17	1.30	-1.17
mother secondary school graduate	1.05	0.68	-2.30	0.14	1.55	-1.13
mother university graduate	1.85	-1.28	-1.68	-0.40	2.32	-0.81
father weekly working hours	-0.001	0.001	0.0003	-0.0002	-0.00004	-0.0001
mother weekly working hours	-0.002	-0.0002	0.0003	0.001	-0.0002	0.001
father employed	0.08	-0.10	-0.14	0.36	-0.17	-0.03
father not in labour force	-0.05	-0.04	-0.08	0.36	-0.19	0.001
mother employed	-1.13	0.93	1.02	0.20	-1.43	0.40
mother not in labour force	-1.18	0.89	1.09	0.24	-1.49	0.45
father employed last year	-0.05	-0.01	0.04	0.004	0.03	-0.01
father not in labour force last year	0.002	0.01	0.07	-0.02	-0.001	-0.06
mother employed last year	-0.40	1.41	-0.37	0.34	-0.65	-0.33
mother not in labour force last year	-0.46	1.40	-0.32	0.32	-0.60	-0.34
father ever worked in agriculture	0.01	0.03	0.04	0.01	-0.07***	-0.02
mother ever worked in agriculture	-0.04	0.01	0.04	0.04	-0.02	-0.03
total employment rate	-0.01	-0.001	-0.002	0.001	0.01**	-0.002
weekly working hours	-0.01	0.01	0.02	-0.01	0.003	-0.01
HH income (1000-2499)	-0.02	-0.04	0.02	0.01	0.02	0.01
HH income (2500-4999)	0.95	0.69	-2.18	0.11	1.49	-1.07
HH income (5000-9999)	-4.06	1.43	-0.78	-0.10	2.52	0.99
HH income (>9999)	-4.61	1.20	-1.18	0.38	2.08	2.12
istanbul	-0.04	-0.11	-0.15	0.09	0.15	0.05
westernmarmara	0.01	0.14**	-0.23	0.07	0.02	-0.02
aegean	-0.04	0.12*	-0.21	0.07	0.06	0.001
easternmarmara	0.05	0.05	-0.10	0.05	-0.09	0.04
westernanatoliaa	0.04	0.01	-0.13	0.02	0.08	-0.01
mediterranean	-0.11	0.08*	-0.04	0.03	-0.001	0.02
middleanatolia	0.04	-0.01	-0.07	0.05	-0.09	0.07
westernblacksea	0.41	0.001	-0.20	-0.56	0.21	0.14
easternblacksea	0.19	0.12	0.01	-0.60	0.33	-0.04
westeasternanatolia	0.68	0.40	0.21	-0.51	0.60	-1.38
southeasternanatolia	0.16	0.02	-0.18	-0.47	0.36	0.11
N				1122		

*p<.1; ** p<.05; *** p<.01

Table A4. 16. Coefficients of the random effects multinomial logit model (6-14 age group)

	1-2 hours housework	3-7 hours housework	8 and more hours housework
male	-0.17***	-1.09***	-2.64***
agechild	0.23**	0.52***	0.74***
agemother	-0.01	-0.001	-0.05**
agefather	0.004	-0.02**	0.03
extended	-0.02	0.05	0.30
adult	-0.23***	-0.24***	-0.41***
sibling	-0.09	0.22***	0.43***
father 5 years school graduate	0.24	0.24	-0.30
father 8 years school graduate	0.49**	0.34	-0.44
father secondary school graduate	0.56**	0.16	-0.48
father university graduate	0.38	0.20	-1.03**
mother 5 years school graduate	0.35***	0.24*	-0.20
mother 8 years school graduate	0.45***	0.46**	0.24
mother secondary school graduate	0.32*	0.26	-0.41
mother university graduate	0.22	-0.47	-0.21
father weekly working hours	-0.0005	-0.001	0.01**
mother weekly working hours	-0.02***	-0.01	-0.005
father employed	-0.27	0.64**	-0.31
father not in labour force	-0.78***	0.07	-0.60
mother employed	0.34	-0.02	0.48
mother not in labour force	-0.29	-0.23	0.57
father employed last year	0.14	0.17	-0.74***
father not in labour force last year	0.17	0.32	0.12
mother employed last year	-0.84**	-0.31	0.12
mother not in labour force last year	-0.89**	-0.32	-0.25
father ever worked in agriculture	-0.004	-0.06	-0.28
mother ever worked in agriculture	-0.10	0.22	0.12
urban	0.84***	0.21*	0.50**
total employment rate	0.11***	0.13***	0.09***
weekly working hours	0.13***	0.05	0.23***
HH income (1000-2499)	0.09	0.03	0.26
HH income (2500-4999)	0.6	-0.30	0.14
HH income (5000-9999)	-0.89**	-1.10**	-0.39
HH income (>9999)	-1.86**	-1.35	-20.55
istanbul	-0.83**	-0.19	-3.14***
westernmarmara	-0.92**	1.11***	-2.65***
aegean	-0.22	-0.36	-4.41***
easternmarmara	-0.39	-0.72*	-3.08***
westernanatoliaa	-0.30	-0.10***	-3.56***
mediterranean	0.63**	1.28***	-1.15**
middleanatolia	0.25	0.02	-3.48***
westernblacksea	-1.32***	0.90***	-3.92***
easternblacksea	-3.52***	-2.45***	-5.38***
westeasternanatolia	-1.68***	-0.02	-1.89***
southeasternanatolia	-1.52**	0.69	-1.23
Log likelihood		-15353.37	
N		15467	

*p<.1; ** p<.05; *** p<.01

Table A4. 17. Coefficients of the random effects multinomial logit model (15-17 age group)

	labour	houesework	school+ labour	school+ housework	inactivity
male	1.14***	-2.47***	0.31	-1.43***	0.15
agechild	0.78***	0.54***	1.12***	-0.19***	0.47***
agemother	0.004	-0.02	0.02	-0.1	0.02
agefather	-0.06***	-0.06***	-0.03	-0.01	-0.05***
extended	-0.32	-0.36	-0.47	-0.03	-0.68***
adult	0.03	0.12*	-0.11	-0.19***	0.17***
sibling	0.20	0.35***	0.25	-0.26**	0.12
father 5 years school graduate	-1.14***	-0.62**	-0.31	0.37	-0.63***
father 8 years school graduate	-2.26***	-0.96***	-0.34***	0.69	-1.02**
father secondary school graduate	-2.53***	-1.86***	-0.70	0.50*	-1.19***
father university graduate	-5.03***	-1.90***	-1.65***	0.30	-1.68***
mother 5 years school graduate	-0.91***	-1.10***	-0.01	0.24	-0.91***
mother 8 years school graduate	-1.95***	-1.06**	0.58	0.79***	-1.05*
mother secondary school graduate	-2.65***	-2.64***	-1.03**	0.17	-2.00***
mother university graduate	-20.54	-3.14***	-1.95**	-0.14	-0.86
father weekly working hours	0.001	0.01	0.02**	-0.02	-0.001
mother weekly working hours	-0.002	-0.002	0.1	0.1	0.1
father employed	-0.03	-0.40	-0.48	0.05	0.15
father not in labour force	0.03	0.50	0.66	-0.14	0.78*
mother employed	-0.19	1.13	-0.50	-0.78	0.05
mother not in labour force	-1.16**	1.53*	-0.10	-0.66*	0.49
father employed last year	0.03	-0.21	0.31	0.01	-0.17
father not in labour force last year	0.10	-0.38	-0.75	0.10	-0.51
mother employed last year	0.72	-1.12	0.47	-0.13	-1.39**
mother not in labour force last year	1.13	-1.18	-0.26	0.07	-1.30**
father ever worked in agriculture	0.22	0.29	0.16	-0.39**	-0.22
mother ever worked in agriculture	0.23	0.20	0.98***	0.02	-0.20
urban	-0.13	-0.37*	1.13***	0.43***	-0.58***
total employment rate	0.09***	0.06**	0.05	0.10***	0.01
weekly working hours	0.14*	0.13**	-0.004	0.07	-0.08
HH income (1000-2499)	-0.34	-0.03	-0.17	0.02	-0.18
HH income (2500-4999)	-0.84	-0.10	-0.11	0.18	-0.66
HH income (5000-9999)	-16.15	-19.54	-20.01	0.13	-20.12
HH income (>9999)	-10.70	-18.79	-20.08	-0.44	-20.39
istanbul	0.11	-1.11*	0.36	-0.62	0.74
westernmarmara	0.19	-0.78	1.54*	0.13	0.68
aegean	-0.11	-1.97***	0.69	-1.19***	0.48
easternmarmara	0.19	-1.39**	1.21	-0.41	1.31**
westernanatoliaa	0.43	-0.81*	0.61	-0.80**	0.63
mediterranean	0.76	-0.81*	0.78	0.13	0.11
middleanatolia	0.94*	-0.44	0.73	-0.29	0.72
westernblacksea	-0.72	-1.76***	-0.13	-2.05***	0.24
easternblacksea	-2.05***	-3.23***	-2.39**	-2.96***	0.66
westeasternanatolia	-0.01	-0.54	-1.80*	-0.70**	-0.25
southeasternanatolia	0.01	-1.15	0.64	0.18	1.17
Log Likelihood			-6109.3942		
N			5303		

*p<.1; ** p<.05; *** p<.01

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CHAPTER 5: CONCLUSION

Turkey is a country that displays the main characteristics of developing countries. While Turkey has made a good progress in increasing the number of children enrolled in schools, like in other developing countries there are still many children who are not enrolled and who do not complete compulsory schooling. There are many reasons for that. As improving education is necessary for developing countries' long-run economic growth, it is important to identify these reasons and make policy suggestions where needed. The overall aim of this thesis is to examine and analyse three separate studies that try to shed light on different issues related to child education.

The first empirical study presented in Chapter 2 examined the effects of having a mother with migration history on children's education in Turkey. The Turkey Demographic and Health Survey (TDHS) for the year 2008 was used in the analysis. In order to explore the relationship between mother's migration background and the education of her children, a standard OLS equation is estimated as a first step. In addition, an instrumental variables model is estimated to account for the potential endogeneity problem, which may arise from the fact that unobserved characteristics of mothers may affect their propensity to migrate as well as their children's educational attainment.

The main finding of this chapter is that Turkish mothers' internal migration has an effect on their children's educational attainment. Having a migrant mother increases the probability of starting high school and to continue to post compulsory education. Another main finding relates to the econometric methodologies employed in this chapter since the results of the main interest variables are different between the specifications, which highlights the importance of accounting for the selective

nature of the migration. Once the risk of migration is used as an instrument for the propensity to migrate, a negative effect of mothers' migration is found. It is an important result for policy makers. According to official estimations, the number of Turkish individuals who migrated for security reasons is around 1 million during the 1986-2005 time period. Considering the intergenerational effects of migration, education of both the migrants themselves and their children is important if a country wants to build a strong and economically sustainable economy. Building facilities that provide information to the migrants and more schools to the areas, in which the migrants live intensely, should be the priorities for policy makers. This would help to accelerate the integration of the migrants to the new place and change their aspirations in a positive way.

The second empirical study presented in Chapter 3 investigated the effect of intermarriage on the educational attainment of children from those marriages in Germany. For the purpose of this study, the German Socio-Economic Panel (SOEP) was used. The SOEP is a nationally representative longitudinal survey, which started in 1984, and in this chapter the 2013 wave was used as a cross sectional data set. The most important reason for using the 2013 wave is that it introduced a new sample (IAB-SOEP Migration Sample) to the survey which oversamples immigrants and includes rich information on both first and second generation immigrants. As the dependent variable has more than two categories and each category naturally has a meaningful order, an ordered probit model is estimated.

It is founded that having intermarried parents does not have a significant effect on the educational attainment of children compared to having native-native and immigrant-immigrant married parents relatively. However, while there are no significant differences between having an immigrant mother-native father and

having two immigrant parents; having an immigrant father-native mother has a significant and negative relationship with the education of children compared to having two immigrant parents. These findings indicate that it is hard to generalize the effect of intermarriages on the educational attainment of children since the results are mixed. Moreover since the results are different for each type of intermarriage, this indicates that the results are not stemming from the characteristics of intermarriage but the characteristics of the intermarried fathers and mothers.

Another important finding is that the school environment is a vital factor that affects children's educational attainment. After additionally controlling for whether the child had experienced any disadvantages in school due to country of origin, having intermarried parents increases the probability of attaining an upper-level secondary school degree compared to having native-native parents. This proves the importance of offering equal opportunities to the children of immigrants. In order not to cause any unrest in the society due to immigrants, participation and attainments of them in the education system is a must for their integration. Therefore, governments should provide better information to students both with and without immigrant background, as well as teachers and institutions. Moreover informing parents and students better about the education system of the host country such as different educational paths, different school types, required exams and so on should also be encouraged.

Overall, the findings imply that countries, including Turkey, should focus on the policies, which aim to improve the community and school environments of immigrants and their children rather than policies, which aims to integrate them into native society through intermarriage even though the second type of policies may

lead to more and rapid integration of immigrants such as language acquisition and a social network composed of natives.

Finally, the third empirical study presented in Chapter 4 examined the relevant determinants of children's participation in different activities in Turkey. The 2012 Household Labour Force Survey (HLFS-2012) and the 2012 Working Child Survey (WCS-2012) were used to estimate a multinomial logit and a random effects multinomial logit models. The random effects multinomial logit model is used to relax the independence of irrelevant alternatives assumption that the multinomial logit model imposes. In this chapter the dataset is split into two age groupss, 6-14 and 15-17, and analyzed separately. The reason for doing this is that these two age groups differ from each other in terms of work done. While the first age group generally work at home, working in the labour market is prevalent in the latter age group.

One of the main finding of this chapter is that being older and female are associated with a lower probability to attend school for both age groups; and the work dynamics of girls and boys are different. While being female increases the probability of only doing housework, being male increases the probability of working in the labour market. This implies that policies geared toward an increase in school participation and completion of the schooling, and to improve the child labour conditions, should consider household chores as a component of child labour. Any policy which does not take into account housework as child labour will underestimate the time devoted to household chores instead of studying. As a result, increased schooling of the children will not translate into an increase in the quality of education, especially for girls.

The findings from Chapter 4 indicate that father's and mother's education is a primary determinant of a child's participation in different activities. For the 6-14 age group, as fathers and mothers become more educated, the probability of their children doing higher number of hours of housework decreases. Especially for girls in this age group, the mother's education is more important than the father's education. This result suggests that policies that aim to improve the education of girls will contribute toward closing the gender gap in the future. For the 15-17 age group, father's education seems to be more important than the mother's education for both boys and girls, but especially for boys. As a result, intergenerational transmission of parental education is confirmed by the findings and these findings call policy makers' attention to the importance of increasing the educational level of the current generation once again.

The findings from Chapter 4 further indicate that the number of siblings aged 5 and younger creates a burden on girls and boys. The presence of very young children prevents both girls and boys from schooling by increasing the probabilities of working in the labour market for boys and of doing only housework for girls in the 15-17 age group. It also increases the probability of doing more hours of housework for girls in the 6-14 age group. Therefore, policies devoted to improve childcare subsidies may help to prevent children from working in the labour market and doing household chores, and to promote educational attainment.

Findings related to the community characteristics are also important determinants of the child participation decisions. Living in an urban area decreases the probability of only attending school and increases the probability of doing 1-2 hours of housework for the 6-14 age group. The reason for this could be the perception of parents towards child participation in the household works. Parents living in urban areas

may think that doing a small amount of housework does not interfere with the child's schooling but it may promote it. Moreover, living in an urban area increases the probability of working in the labour market for boys in the 15-17 age group. This finding implies that opportunities to find a job increases the probability to work in the labour market for boys. Similarly, for both boys and girls in the 6-14 age group, living in the least developed region increases the probability to do more hours of housework compared to children who live in a more developed region. Therefore, in order to get the desirable results, policies that encourage children's participation in schooling should be designed depending on the location of the target groups since it is likely to depend on the location of the programs.

In conclusion, the empirical studies presented in this thesis have provided a number of interesting insights into three specific issues related to child education. Since Turkey is a developing country, which tries to maintain a sustainable development, the government should aim to improve the human capital of the country. While doing this, each child, and particular the ones with backgrounds, should be taken into account. Therefore, the empirical findings presented in this thesis may be beneficial for policy makers.

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