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Effect of Mother's Migration on the Child Education[1]

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Abstract

This study 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. 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, 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.

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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, 2011).

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.

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)[2]. As can be seen from these figures, there are

[2] 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.

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. Valvarde 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.

In Turkey migration became an explanation for the increase in the number of urban residents (Berker, 2011). Studies focused primarily on the determinants of internal migration in Turkey (Filiztekin and Gokhan, 2008) and labour market consequences of internal migration (Berker, 2011). 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. A thorough search of the relevant literature yielded no study that examines the impact of mother's migration on children's educational attainment using data from Turkey.

3. Background Information on Turkey

3.1. 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, 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).

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. Moreover, 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.

3.2. Conflict-Induced Migration

In 1984, the PKK, which is a terrorist 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. During the 1987-2002 time period, provinces which experienced intensive clashes were governed by state emergency law. 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.

4. Data and Methodology

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.

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.

4.2. 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;

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

Where,

i = 1, 2,…, 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 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:

$$\mathrm{EVERMIG}_i = \alpha_0 + \alpha_1 \mathrm{X}_\mathrm{i}^{\mathrm{child}} + \alpha_2 \mathrm{X}_\mathrm{i}^{\mathrm{family}} + \alpha_3 \mathrm{X}_\mathrm{i}^{\mathrm{hh}} + \alpha_4 \mathrm{everlivedhigh} + \sum_{k=2}^{81} \beta_k province_i + \varepsilon_{\mathrm{i}2} \quad \textbf{(2)}$$

$$\mathrm{EVERMIG}_i = \gamma_0 + \gamma_1 \mathrm{X}_\mathrm{i}^{\mathrm{child}} + \gamma_2 \mathrm{X}_\mathrm{i}^{\mathrm{family}} + \gamma_3 \mathrm{X}_\mathrm{i}^{\mathrm{hh}} + \gamma_4 \mathrm{everlivedmig} + \sum_{k=2}^{81} \beta_k province_i + \varepsilon_{\mathrm{i}3} \quad \textbf{(3)}$$

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 $\varepsilon_{\mathrm{i}1}$. 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.

5. Empirical Results

5.1. OLS results

Table 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 1: OLS regressions (Linear probability model) for EVERMIG

	(1)	(2)	(3)
LHS variables	started high school (14-34)	started high school (14-21)	continue to post compulsory educ. (14-34)
Ever migrated mother	.036***	.029**	.030**
Control variables			
Second child	0.009	0.018	0.018
Third child	0.012	.038*	0.02
Fourth child	-.058**	-0.027	-0.038
Fifth child	0.028	.060**	.043*
Age of hh head	.005***	.005***	.005***
Gender of hh head	-0.094	-0.075	-.124*
Gender of child	-.054***	-.048***	-.067***
Age of child	.111***	.239***	.076***
Square of child age	-.003***	-.006***	-.002***
Wealth of hh:poor	-.153***	-.167***	-.143***
Mother's education	.009***	.009***	.009***
Father's education	.018***	.0156***	.017***
Mother's native language:turkish	0.031	0.02	0.027
Mother's native language:other	-0.009	-0.044	0.006
Grandmother's native language:turkish	0.044	0.052	0.051
Grandmother's native language:other	-0.001	-0.004	-0.013
Grandmother's education:low	0.066	0.075	0.097
Grandmother's education:middle	0.081	0.1	0.108
Urban	.094***	.093***	.093***
# of siblings	-.038***	-.042***	-.042***
# of hh members	-.009**	-0.003	-0.006
Had difficulties to afford educ. expenses	.044***	.054***	.050***
No educational expenses	-.184***	-.217***	-.151***
Single mother	0.294	0.338	0.335
Mother is hh head	0.069	0.11	0.073
Mother is hh head and single	-0.112	-0.225	-0.124
Mother's working status: employed	-0.001	0.011	-0.001
Mother's working status: never employed	0.007	0.022	0.014
Constant	-.673***	-1.782***	-.438**
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%.

5.2. IV results

The results of estimating the first stage regressions[3] as in Equation (2) and (3) show that 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 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 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.

[3] The Table which shows these results are not presented in this study.

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.[4]

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. One explanation for this result could be that older children are more likely to experience the effect of conflict-induced migration in person.

Table 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	-.207*	-.232**	-.138*	-.169*	-.170**
Control variables						
Second child	0.013	0.025	0.022	0.012	0.024	0.021
Third child	0.025	.056**	.037*	0.023	.054**	.033*
Fourth child	-.048*	-0.014	-0.025	-.050**	-0.016	-0.028
Fifth child	.055*	.097***	.078**	.051*	.091***	.070**
Age of hh head	.005***	.004***	.005***	.005***	.004***	.005***
Gender of hh head	-0.118	-0.11	-.155**	-0.115	-0.104	-.147**

[4] 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.

Gender of child	-.056***	-.051***	-.071***	-.056***	-.050***	-.070***
Age of child	.104***	.237***	.068***	.105***	.238***	.070***
Square of child age	-.003***	-.006***	-.001***	-.003***	-.006***	-.001***
Wealth of hh:poor	-.164***	-.177***	-.157***	-.162***	-.176***	-.154***
Mother's education	.009***	.010***	.009***	.009***	.010***	.009***
Father's education	.0178***	.015***	.016***	.018***	.015***	.016***
Mother's native language:turkish	0.012	-0.005	0.003	0.015	-0.001	0.009
Mother's native language:other	-0.02	-0.081	-0.008	-0.018	-0.075	-0.005
Grandmother's native language:turkish	0.018	0.022	0.018	0.021	0.027	0.026
Grandmother's native language:other	-0.058	-0.063	-0.086	-0.049	-0.053	-0.069
Grandmother's education:low	0.112	0.15	0.156	0.106	0.138	0.142
Grandmother's education:middle	0.12	0.166	0.158	0.114	0.155	0.146
Urban	.138***	.140***	.150***	.131***	.132***	.137***
# of siblings	-.040***	-.048***	-.047***	-.040***	-.047***	-.046***
# of hh members	-0.006	0.002	-0.002	-0.007	0.001	-0.003
Had difficulties to afford educ. expenses	.054***	.065***	.063***	.052***	.064***	.060***
No educational expenses	-.178***	-.207***	-.144***	-.179***	-.209***	-.146***
Single mother	0.202	0.233	0.217	0.215	0.25	0.245
Mother is hh head	0.108	0.167	0.123	0.102	0.158	0.111
Mother is hh head and single	0.024	-0.078	0.051	0.004	-0.102	0.01
Mother's working status: employed	-0.012	-0.003	-0.014	-0.01	-0.001	-0.011
Mother's working status: never employed	-0.012	-0.005	-0.011	-0.009	-0.001	-0.005
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
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) 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.

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 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.

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 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 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	-0.169	-.207*	-.232**	-.138*	-.169*	-.170**
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*
Constant	-.544***	-1.701***	-0.274	-.564***	-1.714***	-0.313
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

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.

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 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.

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 estimated value in the OLS is positive, bias will be larger than true 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 coefficient in the IV model is an estimate 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. Third explanation for the sign switch could be the violation of monotonicity assumption. Monotonicity assumption is necessary for in order to identify a local average treatment effect. There are four group 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 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 as 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 case there are defiers in the sample, 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 lead to 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 at 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.

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