Explaining Ethnic Disparities in School Enrollment in Turkey

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Abstract

There exist remarkable differences in educational outcomes across ethnic groups in Turkey. Moreover, almost a quarter of the population of 8- to 15-year-old children belong to ethnic minority groups. Yet, there exists no study that examines the ethnic disparities in educational outcomes in Turkey. This study presents these disparities and uncovers the factors that bring about these disparities using a rich micro-level dataset (Turkish Demographic and Health Survey). In doing so, this paper examines the differences not only in the levels of enrollment but also in the timing of drop-out across ethnic groups. The multivariate analysis accounts for a rich set of regional and socioeconomic factors, which also display striking differences across ethnic groups. The results show that regional and family level characteristics can fully account for the differences in the levels of enrollment across ethnic groups for male children, but not fully for female children. In other words, ethnicity has a direct impact on girls' school enrollment but not on boys'. There exists a gender gap among ethnic Turkish children as well as ethnic Arabic and Kurdish children. However, the gender gap among ethnic Kurdish children is wider than that among ethnic Turkish children.

1 Introduction

Ethnic and racial disparities in economic outcomes among the citizens of the same country are pervasive in many parts of the world. Darity and Nembhard (2000) present evidence for worse economic outcomes for minority groups in various countries across different continents.[1] Education is key to better economic outcomes for an individual as well as a community. The positive impact of education on occupational status and earnings is well-reported (Psacharopoulos, 1985). Moreover, improving the educational status of mothers has other benefits like lower mortality rates and improved health outcomes for their children (Behrman and Deolalikar, 1988)[2]. Therefore, closing the educational gap across ethnic groups would be the key to eliminating the disparities in other socioeconomic outcomes.

I use the 1993 and 1998 waves of the Turkish Demographic and Health Survey (TDHS) to examine whether there, in fact, exists disparities in educational outcomes across ethnic groups in Turkey and, if so, what accounts for them. These ethnic groups include ethnic Kurds, Arabs, and Caucasians along with ethnic Turks. There exist acute disparities in school enrollment rates across ethnic groups in Turkey. Among the 8- to 15-year-olds, ethnic Kurdish and Arabic children are roughly twice more likely to be not enrolled in school. On the other hand, the enrollment rates of ethnic Caucasians are very similar to that of ethnic Turks. Moreover, the levels of non-enrollment are quite high for some ethnic groups. The average of non-enrollment rates in 1993 and 1998 was 28.6 percent for ethnic Kurdish boys and 27.7 percent for ethnic Arabic boys. Non-enrollment rates were even more striking for females: 52.5 percent for ethnic Kurdish girls and 44.9 percent for ethnic Arabic girls were not enrolled in school in this time period. Yet, there also exists remarkable disparities in socioeconomic characteristics across ethnic groups. For instance, while the illiteracy rate – the average for the years 1993 and 1998– was 35.2 percent for ethnic Turkish mothers, it was a

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[1] Smith (1995) reports large racial and ethnic wealth disparities in the U.S, Schafgans (1998) reports ethnic wage differences in Malaysia, Raturi and Swamy (1999) report ethnic disparities in access to credit from the formal sector in Zimbabwe, and Gustafsson and Shi (2003) report ethnic income disparities in rural China. Moreover, many times ethnic disparities persist even after accounting for socioeconomic and demographic differences across ethnic groups as shown by Hannum and Xie (1998) for occupational differences in the Xinjiang Uygur Region of China, by Krivo and Kaufman (2004) for housing equity in the U.S., and by Govindasamy and DaVanzo (1992) for fertility in Malaysia.

[2] P. Schultz (1988) reviews the non-market as well as market production benefits of education. Haveman and Wolfe (1984) characterize the non-market benefits of education and assess the quantitative impact of their imputed values for the U.S.

striking 89.8 percent for ethnic Kurdish mothers and 71.3 percent for ethnic Arabic mothers. Similarly, while 15.7 percent of ethnic Turkish children live in households that are in the lowest income quintile, 39.2 percent of ethnic Kurdish children and 20.3 percent of ethnic Arabic children do so. On the other hand, only 2.8 percent of ethnic Caucasian children's families are in the lowest income quintile. Such disparities in socioeconomic characteristics could in part explain the observed differences in educational outcomes.

The share of ethnic minorities in the population of Turkey makes this topic even more important. Of the children aged 8 to 15 in 1993 and 1998, 20.8 percent are ethnic Kurdish, 2.4 percent are ethnic Arabs, and 0.8 percent are ethnic Caucasians. Moreover, the share of ethnic minorities in the population of Turkey is going to increase in the future due to much higher fertility rates of ethnic minorities. For instance, while 20.8 percent of the children between the ages of 8 and 15 are ethnic Kurds, this percentage drops to 15.6 percent for their mothers. Similarly, while 2.4 percent of the 8- to 15-year-old children are ethnic Arabic, 2 percent of their mothers are.

Despite the wide disparities in educational outcomes across ethnic groups and the significant share of ethnic groups in the population of Turkey, there has yet been no study investigating even the descriptive statistics of these disparities in educational outcomes across ethnic groups, yet alone to analyze what could account for these differences. Therefore, this study is a first attempt to display the relationship between ethnicity and education in Turkey.

Even the numbers of ethnic minorities were not very well known until the first waves of TDHS were made available. Mutlu (1996) estimates the number of ethnic Kurds in Turkey using census data until 1965, which include information on the number of ethnic minorities, along with migration and fertility information after 1965. İçduygu et al. (1999), using the THDS 93, also estimate the number of ethnic minorities in Turkey, and present descriptive statistics on some of the socioeconomic differences across ethnic groups. Gündüz-Hoşgör and Smits (2001) examine the association between nonproficiency in Turkish and a number of socio-economic outcomes for female ethnic minorities.

There has been a richer literature on the determinants of educational outcomes in Turkey.[3] Tunalı (1996), using the 1994 Labor Force Survey, finds that rural residence and parental education in addition to the age and gender of children are key determinants of educational

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[3]Strauss and Thomas (1995) and Haveman and Wolfe (1995) review the determinants of investment in human capital.

outcomes. He also highlights the importance of the trade-off between school and work, especially for children living in agricultural areas. Dayıoğlu (2005) finds that this trade-off between school and work has strengthened over time in Turkey. Tansel (2002), using a different dataset – 1994 Household Income and Expenditure Survey – also finds income, parental education, and rural/urban status as the major factors shaping the schooling of children in Turkey. Finally, using the 1998 TDHS - which I also use along with the 1993 wave – Smits and Gündüz-Hoşgör (2006) find that parental education, number of siblings, household income, occupation of father, and the ability of mother to speak Turkish are the major determinants of school enrollment. My analysis accounts for all of these characteristics that the literature has so far uncovered. Another critical finding of the all four studies mentioned above is the gender gap in enrollment rates. Female children in Turkey are significantly less likely to be enrolled in school. I further extend this question by asking whether there exist disparities in this gender gap across ethnic groups in Turkey.

This paper also introduces some novel features into the estimation of school enrollment. A number of studies on ethnic differences in educational outcomes around the world (e.g. Hannum, 2002, for China; Garcia-Aracil and Winter, 2006, for Ecuador), examine the ethnic disparities in children's school enrollment without allowing for an age-varying impact of ethnicity. Forcing a non-variant impact of ethnicity by age and grade levels could mask important differences at certain age or grade levels, especially when the age bracket taken is fairly wide. Therefore, after examining the differences in the levels of enrollment across ethnic groups using a probit estimation that forces a time-invariant impact of ethnicity, I go on to examine the timing of school drop-out by grade level using discrete-time duration analysis that allows for time-varying ethnic controls. This allows me to see if forcing a time-invariant impact of ethnicity really fails to recognize important ethnic disparities at certain grade levels. In addition, I also incorporate the children who never go to school in the estimation.

Some of the key findings are the following: For male children between the ages of 8 and 15, location of residence and family characteristics excluding mother's proficiency in Turkish can fully account for the differences in the levels of enrollment across ethnic groups but not fully for the differences in the timing of drop-out. Even after controlling for a rich set of regional and family level factors, ethnic Kurdish boys are more likely to drop out before reaching grade five, but less likely to drop out after completing grades six to eight. This highlights the methodological problem in not allowing the impact of ethnicity to vary by age or grade

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intervals, which is a common approach in the literature. However, accounting for mother's ability to speak Turkish in addition to the regional and family level characteristics, ethnic Kurdish boys are no more more likely to drop out before reaching grade five. For female children, ethnic disparities remain both in the level of enrollment and the timing of drop-out even after controlling for regional and family level characteristics as well as mother's ability to speak Turkish. That regional and family level controls can account for the disparities across ethnic groups for boys, but not for girls suggests that there is a taste component in the lower enrollment rates of ethnic Kurdish and Arabic girls. Finally, there exists a gender gap for ethnic Turks as well as ethnic Arabs and Kurds. However, the gender gap for ethnic Kurdish children is wider than that for ethnic Turkish children.

The paper is organized as follows: The next section examines the potential reasons to the observed differences in educational outcomes within a human capital investment model. Section 3 explains the data and presents descriptive statistics. Section 4 discusses the estimation results and section 5 concludes.

2   Conceptual Framework

This section examines the potential factors that could account for the disparities in schooling outcomes across ethnic groups within a well-known educational investment model developed by T.W. Schultz (1961) and Becker (1964). Becker (1964) models the schooling decision as an optimal human capital accumulation path, in which the duration of schooling is the optimal investment period. According to this, it is optimal to continue to invest in schooling as long as the marginal rate of return from investing each additional unit of fund is higher than its marginal cost (the interest rate).[4]

The marginal rate of return to schooling is the difference between the marginal benefit and the marginal production cost of investing in it. Both its marginal benefit and production cost have monetary and psychic elements. Its benefits include the increase in earnings (schooling as an investment good) and the psychic benefits of schooling (schooling as a consumption good). Its costs of production include direct expenses, foregone earnings (opportunity cost of schooling), and psychic costs.

The demand for schooling depends on this marginal rate of return. A number of factors

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[4]Chiswick (1988) uses this framework in his examination of ethnic disparities in the rates of return to schooling in the U.S.

like location of residence, family characteristics, and tastes of the parents as well as the age and gender of the child influence the marginal rate of return of an additional unit of fund spent on schooling and, therefore, the demand for schooling. In the above framework of Becker (1964), I will examine how these factors could affect schooling outcomes in turn, with a particular focus on those that the literature on the determinants of educational outcomes in Turkey has uncovered as the most crucial. The finding of this literature that location of residence and family characteristics are crucial determinants of the schooling outcomes in Turkey and the fact that there exists significant variation in these characteristics across ethnic groups in Turkey suggest that the disparities in educational outcomes across ethnic groups in Turkey could in part be explained by these characteristics.

2.1   Location of Residence

Here, I consider both the region of the country and rural/urban residence. For ethnic Turks, the probability of living in rural areas or in less developed regions of the country is lower compared to all other ethnic groups. In less developed regions of the country and in rural areas, schooling may entail higher production costs due to more limited availability and accessibility of school. For instance, in some rural areas, students are bussed to schools that are at times of significant distance to their village or they may have to walk significant distances which may be a challenging task in winter, especially in the eastern part of the country. Higher schooling costs would imply a lower marginal rate of return and, therefore, a lower demand for schooling.

Even when schools are available in less developed or rural regions, they may be of lower quality both because of the facilities and, more importantly, less motivated teachers as these are less popular places to work for them. This could significantly reduce the productivity of schooling for students in these regions. A lower productivity would mean a lower marginal rate of return and a lower demand for schooling.

Moreover, the opportunity cost of schooling would vary according to location of residence. For instance, in large metropolitan areas, children –especially boys– would have a much better chance of finding market work, which would increase the opportunity cost of schooling for them. Better market work opportunities would imply a lower demand for schooling.

2.2 Family Background

As reported in the review of literature regarding the educational outcomes in Turkey, a number of family characteristics emerge as critical determinants of school enrollment. These are parental education, wealth, occupational status, and sibship size. In these family characteristics, there exist remarkable differences across ethnic groups in Turkey.

More educated parents increase the productivity of schooling for their children. Therefore, since the marginal rate of return of schooling is higher for their children, they demand more schooling for them. Another critical variable is the wealth of families. As explained in Becker (1964), the marginal cost of investing in schooling, the interest rate, is lower for wealthier families as they have access to a cheaper source of credit, which is their own assets. As a result, the equilibrium level of schooling for their children is higher.

Father's employment in agriculture is an important factor because this implies an easily available source of market work, which is working in the family farm. In fact, Tunalı (1996), using the 1994 Labor Force Survey, reports that 33 percent of the 14-year old children living in rural areas work whereas of the same age children living in urban areas only nine percent work. Therefore, the opportunity cost of school enrollment is higher for children whose fathers are employed in agriculture, which implies a lower demand for schooling by their parents.

Finally, number of siblings would be an important factor. The productivity of schooling would be lower for children with large sibship size because they would receive a diminished share of family resources. As a result, we would expect a lower marginal rate of return for these children; hence, a lower demand for schooling.[5] Furthermore, the age composition of this sibship size would matter as well. Siblings under the age of 5 would also mean a higher opportunity cost of schooling as staying home would mean taking care of these children.

2.3 Proficiency in Turkish

For some ethnic minority children, enrolling in school poses a further challenge. They may not be proficient in Turkish when they come to school age. This could seriously hinder their ability to digest the instruction provided at school. This would obviously yield a

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[5]The quantity-quality framework (Becker and Lewis, 1973) yields the same implication as to the impact of sibship size. It claims that as the number of children increases, the price of the quality of children (their schooling) increases; therefore, the demand for quality drops.

lower productivity to schooling and, therefore, decrease their demand for schooling. In fact, Smits and Gündüz-Hoşgör (2006) find that nonproficiency of mothers in Turkish is highly associated with the non-enrollment of their children.

2.4 Age and Gender

Two other crucial determinants of the marginal rate of return to schooling would be the age and gender of the children. Age is a crucial determinant because as children accumulate more schooling, its marginal rate of return diminishes. Moreover, the value of the opportunity cost of schooling increases as children get older because the value of their market as well as home production increases.

The gender of the child would matter due to a number of reasons: First, the returns to schooling in earnings could be different by gender. Second, the opportunity cost of schooling would be different as the value of production in the market as well as home would vary by gender. Finally, parents' psychic costs of their children's schooling could depend on the gender of the child.

Unlike it is for location of residence and family characteristics, we would not expect a notable ethnic variation in the distribution of age and gender variables. However, the impact of age and gender controls could be different across ethnic groups, for instance, due to the variation in the psychic costs of school enrollment by age and gender across ethnic groups. In other words, even though we would not expect different distributions for age and gender variables across ethnic groups, we could expect different parameters for the impact of these variables across ethnic groups.

2.5 Tastes

As explained at the beginning of this section, both the marginal benefit and cost of production of schooling include psychic elements. These psychic benefits/costs may display variation across ethnic groups. Some ethnic groups may have a more negative attitude toward education due to cultural, historical or other factors. Moreover, there may be a gender dimension of this. For instance, schooling may drop the value of females in the marriage market more for some ethnic groups than others. Therefore, parents of certain ethnic groups may have higher psychic costs in sending their daughters to school. Obviously, unlike the previous factors, I can not account for this unobserved factor explicitly in the estimation.

3   Data and Descriptive Statistics

The data used in the study come from the 1993 and 1998 Turkish Demographic and Health Surveys, conducted by the Institute of Population Studies of Hacettepe University in coordination with Macro International. The surveys are nationally representative. The primary purpose of these surveys is to gather information on marriage and fertility behavior as well as the contraceptive use of women and and the health of their children. Therefore, it targets women between the ages of 15 to 49. The survey also includes information on a number of educational measures of the children of these women as well as information on the mother tongue of mothers which I use in defining ethnicity.

I restrict the sample to 8- to 15-year-old children of these women. I drop the children who are younger than 8 because in some parts of the country, especially in rural areas, parents delay the enrollment of their children up to age 8. I also drop the children who are older than 15 because the sample of children above this age may not be representative as many children in this age group leave their parents' household for marriage and work.

Since the children in the sample come from families with mothers between the ages of 15 and 49, the sample misses the 8- to 15-year-old children of women who are older than 50. However, for a 50-year-old woman to have a child in this age group, the earliest age she must have given birth is 35. According to the 1993 TDHS, of all the children born only 6.4 percent belonged to women who were at or above 35. In 1998, this percentage was 7.8 percent.[6] This implies that of all the 15-year-old children, the sample misses 6.4 percent in 1993 and 7.8 percent in 1998. However, we must also realize that for younger children, the percentages that are missing in the sample are lower because, for instance, for 10 year-old children, the sample misses only those whose mothers were more than 40 years old at the time of birth. The percentage of the births that are given by women above 40 was only 1.4 in 1993 and 1.7 in 1998.

The schooling information used in this study includes enrollment status and years of completed schooling. Both pieces of schooling information are used to generate the grade at which children drop out from school. As control variables, I use a rich set of information on location of residence that covers both regional distribution and rural/urban status; on family characteristics that include mother's age and literacy status, father's years of education, number of siblings, number of siblings under age 5, whether father is employed in

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[6]These percentages were calculated using the fertility rates (births per 1,000 women) and the population pyramid of women in Turkey.

agriculture, and wealth; and on Turkish language ability. The survey has information on Turkish proficiency of mothers, which I use as a proxy for the Turkish language ability of their children.

The way ethnicity is defined in this paper is through mothers' mother tongue. According to this, the ethnic groups include Kurds (including Zaza speakers), Arabs, Circassian, Georgian, Laz, and a number of East European groups. I drop the East European groups as they are small in number (less than 0.4 percent) and group Circassian, Georgian, and Laz into one and name this group "Caucasian". Therefore, I have three final ethnic groups: Kurds, Arabs, and Caucasians. The final pooled sample contains 8,804 children of which 6,644 are ethnic Turks, 1,859 are ethnic Kurds, 223 are ethnic Arabs and 78 are ethnic Caucasians.

Household wealth is generated using principal components analysis of a rich set of household assets that include the number of rooms in the house, whether the source of drinking water is piped into residence, whether the house has its own flush toilet, whether the toilet is inside the house as well as the ownership status of the following durable goods: TV, fridge, car, oven, washing machine, dishwasher, vacuum cleaner, video recorder, computer, and radiator.

3.1 Educational Outcomes

3.1.1 Ethnic and Gender Differences in Levels

Table 1 presents enrollment rates by ethnicity and gender. There exist substantial differences in enrollment rates across ethnic groups for both genders. While 85.2 percent of ethnic Turkish boys are enrolled in school, 71.4 percent of ethnic Kurdish boys and 72.3 percent of ethnic Arabic boys are. In other words, compared to ethnic Turkish boys, ethnic Kurdish boys are 93 percent and ethnic Arabic boys are 87 percent more likely to be not enrolled in school. The enrollment rate of ethnic Caucasian boys, however, does not lag behind that of ethnic Turkish boys. In fact, their non-enrollment probability is 21 percent lower. There exist similar disparities for female children across ethnic groups. 75.1 percent of ethnic Turks girls are enrolled in school whereas only 47.5 percent of ethnic Kurdish girls and 55.1 percent of ethnic Arabic girls are. Put differently, non-enrollment probability is 111 percent higher for ethnic Kurdish girls and 80 percent higher for ethnic Arabic girls. As it was for boys, non-enrollment rates of ethnic Caucasian and Turkish girls are closer. Non-enrollment probability for an ethnic Caucasian girl is 29 percent higher than that for an ethnic Turkish

girl. A remarkable gender gap can also be discerned from Table 1 for all ethnic groups in Turkey. Non-enrollment probability for girls is 68 percent higher among ethnic Turks, 84 percent higher among ethnic Kurds, and 62 percent higher among ethnic Arabs.

3.1.2 Ethnic and Gender Differences in Timing

Aggregating across all ages between 8 and 15 (and the corresponding grade levels) could mask more acute differences in the timing of drop-out at various grade levels across ethnic groups. Therefore, next I examine how the timing of drop-out varies across ethnic groups. Table 2 displays the hazard and survival rates by ethnicity and gender. Here, "grade 0" stands for dropping out even before completing first grade. This includes children who never go to school as well as those who drop out during grade 1. Table 2, in fact, uncovers more substantial differences across ethnic groups compared to those that were illustrated in Table 1.

The drop-out rates in grade 0 are much higher for ethnic Kurdish and Arabic children. While 1.1 percent of ethnic Turkish boys drop out in grade 0, 9.7 percent of ethnic Kurdish boys and 7.2 percent of ethnic Arabic boys do so. In other words, the probability of not completing the first year of school is 8.7 times higher for male ethnic Kurds and 6.4 times higher for male ethnic Arabs. For female children, the disparities across ethnic groups in drop-out rates in grade 0 are even wider: 1.4 percent of ethnic Turkish girls do not complete first grade whereas this percentage rises all the way to 25 percent for ethnic Kurdish girls and to 13.7 percent for ethnic Arabic girls. This implies that the drop-out probability in grade 0 is a striking 18.4 times higher for ethnic Kurdish girls and 10 times higher for ethnic Arabic girls.

Ethnic Kurdish and Arabic children have substantially higher drop-out rates after completing grades 1 to 4 as well. The cumulative hazard rate from grade 1 to 4 is 0.7 percent for ethnic Turkish boys whereas it is 5.8 percent for ethnic Kurdish boys and 3.2 percent for ethnic Arabic boys. This means that the odds of dropping out after completing grades 1 to 4 are 8 times higher for ethnic Kurdish boys and 4.4 times higher for ethnic Arabic boys. For girls, the cumulative hazard rate of dropping out from grades 1 to 4 is 1.6 percent for ethnic Turks, 11.3 percent for ethnic Kurds, and 12.3 percent for ethnic Arabs. In other words, the odds of dropping out after completing grades 1 to 4 is 6.9 times higher for ethnic Kurdish girls and 7.5 times higher for ethnic Arabic girls.

The highest drop-out rate is after completing grade 5 for all ethnicities because this is

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the compulsory level of schooling in Turkey for the time period the data cover. 18.7 percent of ethnic Turkish boys, 32.1 percent of ethnic Kurdish boys, 32.4 percent of ethnic Arabic boys, and 23.6 percent of ethnic Caucasian boys drop out after completing the compulsory level of schooling. Even though there still exist significant differences across ethnic groups, the odds ratios are not as high as those in grade 0 and in grades 1 to 4 because the drop-out rate for ethnic Turkish boys is also high at this grade level. The probability of drop-out after completing the compulsory level of schooling is 1.7 times higher for both ethnic Kurdish and Arabic boys. For female children, the drop-out probability after completing grade 5 is 34.5 percent for ethnic Turks, 59.5 percent for ethnic Kurds, 48.2 percent for ethnic Arabs, and 36.5 percent for ethnic Caucasians implying odd ratios of 1.7 for ethnic Kurds, 1.4 for ethnic Arabs, and 1.1 for ethnic Caucasians.

The ethnic gap diminishes even further in grades 6 to 8. This is not a surprise because ethnic minorities in these grades are much more selected compared to ethnic Turks due to their higher drop-out rates in earlier grade levels. While the cumulative hazard rate after completing grades 6 to 8 is 13 percent for ethnic Turkish boys, it is in fact lower for ethnic Kurdish boys at 9.2 percent.[7] For females, the cumulative drop-out rate of ethnic Kurds is still higher at 13.8 percent compared to that of ethnic Turks at 7.9 percent.

There exists a gender gap in the drop-out rates at all grade levels regardless of ethnicity. For ethnic Turkish children, the gender gap is wider in grades 1 to 4 and in grade 5 where the odds ratios are 2.24 and 1.84, respectively. For ethnic Kurdish children, gender gap is the widest in grade 0 where the odds ratio is 2.58. Yet, ethnic Kurdish girls are significantly more likely to drop out in other grade levels as well. The odds ratio is 1.94 after completing grades 1 to 4, 1.85 after grade 5, and 1.5 after completing grades 6 to 8. For ethnic Arabic children, the gender gap is the widest in grades 1 to 4 where the odds ratio is 3.81. Still, the gender gap is significant in other grade levels; the odds ratio is 1.91 in grade 0 and 1.49 in grade 5. Despite these high levels of gender gaps, the level of variation across gender within ethnic groups is not as high as the level of variation across ethnic groups within each gender.

3.2   Regional and Family Characteristics and Language Ability

Table 3 displays descriptive statistics for the variables used in the estimation. There are three sets of control variables: regional controls, family characteristics, and Turkish language ability.

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[7]The sample size for ethnic Arabic children becomes too small at these grade levels.

In the dataset, Turkey is divided into five regions: west, south, north, central, and east. I interact these regional variables with rural location of residence. One immediate observation from the regional distribution is that ethnic Kurds, Arabs and Caucasians are more likely to live in the less developed regions of the country (east, north), which presumably would have inferior educational facilities and harder access to schooling due to availability and distance to school. For instance, 72.7 percent of the ethnic Kurdish children and 34.7 percent of the ethnic Arabic children in the survey live in the eastern part of the country compared to 9.9 percent of the ethnic Turkish children. Of the ethnic Caucasian children, 48.8 percent live in the northern part of the country, of which the majority are in rural areas, compared to 10.8 percent of the ethnic Turkish children. Living in the rural areas of this part of the country would imply harder access to school due to non-concentrated residential structure. Moreover, ethnic Turks are less likely to live in rural areas compared to other ethnic groups. While 38.5 percent of ethnic Turks live in rural areas, 45.2 percent of ethnic Kurds, 40.8 percent of ethnic Arabs, and 53 percent of ethnic Caucasians do so.

The data also reveal striking differences in family characteristics by ethnicity. Ethnic Turks display higher socioeconomic status in almost all dimensions compared to ethnic Kurds and Arabs. The average sibship size of ethnic Turkish children is 3.62 whereas it is remarkably higher at 6.15 for ethnic Kurds, 5.51 for ethnic Arabs, and 4.91 for ethnic Caucasians. Another salient feature of ethnic differences is parents' schooling levels. While 35.2 percent of ethnic Turkish mothers are illiterate, a highly striking 89.8 percent of ethnic Kurdish mothers and 71.3 percent of ethnic Arabic mothers are illiterate. Illiteracy rates of ethnic Caucasian mothers are similar to that of ethnic Turks at 34.2 percent. Similarly, while the average years of schooling of ethnic Turkish fathers is 6.3 years, it is only 3.87 years for ethnic Kurdish fathers and 5.14 years for ethnic Arabic fathers. Another conspicuous difference across ethnic groups is with regard to the distribution of wealth. The incidence of poverty is much higher among ethnic Kurds and Arabs. Among the ethnic Turkish families, 15.7 percent are in the lowest quintile of national distribution whereas 39.2 percent of ethnic Kurdish families and 20.3 percent of ethnic Arabic families are. Similarly while 16.3 percent of the ethnic Turkish families are in the second lowest quintile, 26.3 percent of ethnic Kurdish families and 30.4 percent of ethnic Arabic families are. Only ethnic Caucasian families do not display lower wealth status compared to ethnic Turks. One prominent feature of the wealth distribution of Caucasian families is its relative egalitarianism. Only 2.8 percent of the ethnic Caucasian families are in the lowest quintile and only 15.9 percent are in the

highest quintile.

The final characteristic used in the estimation is language ability for which I use the proficiency status of mothers in Turkish. Whether the mother can speak Turkish would be a good proxy for whether the child can. Obviously, not being able to speak Turkish would be immensely detrimental to the school enrollment probability and the school success of ethnic minorities thereby bringing about higher drop-out rates. I take this feature separately from other family characteristics because lower language ability is an intrinsic part of being an ethnic minority. By definition, ethnic minorities will have lower language ability, but obviously they do not have to have lower wealth or parental schooling levels. In fact, a significant fraction, 38.9 percent of ethnic Kurdish and 34.9 percent of ethnic Arabic mothers are not proficient in Turkish. It is lower for Caucasian mothers at 12.5 percent.

4 Estimation Results: What Accounts for these Ethnic Differences in School Enrollment?

The descriptive statistics in the previous section showed marked differences in enrollment rates and even more substantial differences in the timing of drop-out from school across ethnic groups. Nonetheless, the descriptive statistics also indicated remarkable differences in regional and family characteristics as well as language ability across ethnic groups. The question is, then, do these differences in regional and family characteristics and language ability fully account for the variation in educational outcomes? If not, to what extend do they account for the observed differences? Does ethnicity have a direct impact on educational outcomes?

First, I answer these questions in the context of explaining the differences in the levels of enrollment. However, as it was illustrated in Table 2, the differences in levels could mask wider differences at certain grade levels due to the aggregation of 8- to 15-year-old children. Therefore, I also examine the above questions in the context of the timing of drop-out.

4.1 Levels of Enrollment

Table 4 presents the results of a probit estimation of school enrollment status on the pooled cross-sections.[8] Four different specifications are used. The first one has only ethnicity, gender, and their interaction terms; the second one adds regional controls; the third one family characteristics; and the fourth one language ability, all in a cumulative way. (All specifications also include controls for the age of children and their interactions with the 1998 year dummy.[9]) This nested specification allows me to observe the changes in the magnitude and significance of the ethnicity and gender coefficients once I add a new set of controls and, therefore, identify the ability of various factors in explaining the ethnic and gender disparities. The statistics at the bottom of Table 4 include LR-statistics which I use to test the joint significance of each additional set of control variables in the nested specifications. They also measure the improvement in the model fit and, therefore, the ability of the new set of controls to account for the variation in the education variable.

4.1.1 Male Children

Table 5 presents the ethnicity odds ratios for ethnic Kurds, Arabs, and Caucasians by gender. Ethnicity odds ratios are the ratios of non-enrollment probabilities of these ethnic groups to that of ethnic Turks.[10] In the baseline case (specification 1), ethnic Kurdish boys are 2.53 times more likely to be not enrolled in school compared to ethnic Turkish boys. (Statistical significance is at 1 percent level.) Once the variation in location of residence is controlled for, the odds ratio narrows to 2.09. (Statistical significance is still at 1 percent level.) Controlling, in addition, for family characteristics, the gap completely vanishes. The odds ratio is 1.02 now and statistically insignificant. Therefore, we can assert that almost one third of the difference in the school enrollment rates of ethnic Kurdish and ethnic Turkish boys is explained by regional variation, and that family characteristics along with regional variation fully account for the difference in school enrollment rates between ethnic Kurdish and ethnic Turkish boys between the ages of 8 and 15.

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[8]Standard errors are corrected by clustering on mothers as there are multiple observations per mother in some families.

[9]The reason that age dummies are interacted with the 1998 year dummy is that in 1997 the compulsory level of schooling was extended from 5 to 8 years. However, in 1998 it would make a difference only for those who had just completed 5 years of schooling (those who are 12 years-old).

[10]All control variables for location of residence, family characteristics and language ability are set at their mean values in calculating the predicted probabilities of enrollment.

For ethnic Arabic boys, non-enrollment probability is 2.39 times higher than that for ethnic Turkish boys in the baseline specification. (This is statistically significant at 1 percent level.) This odds ratio falls to 2.11 once I control for regional variation in residence. (Statistical significance is at 5 percent level, now.) When I further add family characteristics, the odds ratio decreases to 1.46 and loses its statistical significance. Like it was for ethnic Kurdish boys, once I control for the variation in location of residence as well as family characteristics, that the enrollment rate of ethnic Arabic boys is lower than that of ethnic Turkish boys loses its statistical significance. However, unlike it was for ethnic Kurdish boys, the magnitude of the gap does not totally vanish. For ethnic Arabic boys, regional variation accounts for around twenty percent of the enrollment rate gap, and regional variation along with family characteristics explain two thirds of the gap. Finally, when I also control for mother's proficiency in Turkish in the last specification, the odds ratio diminishes to 1.15. In other words, regional and family characteristics along with language ability all together explain around 90 percent of the difference between the enrollment rates of ethnic Turkish and Arabic boys, and the remaining gap is statistically insignificant.

As can be seen from the changes in the odds ratios in Table 5, for both ethnic Kurdish and Arabic boys, family characteristics emerge as more important determinants of enrollment rates than location of residence. This can also be seen from the LR statistics reported in Table 4. Adding family characteristics in specification 3 brings about a higher improvement in the model fit compared to adding regional controls in specification 2 despite a lower number of additional covariates.

There is no evidence for a difference between the school enrollment rates of ethnic Caucasian and ethnic Turkish boys even in the baseline model. Moreover, controlling for a richer set of factors does not make much of an impact because there is much less variation between the family characteristics of ethnic Turkish and Caucasian children compared to that between ethnic Turks and ethnic Arabs or Kurds.

4.1.2   Female Children

In the baseline specification, non-enrollment probability for ethnic Kurdish girls is 2.78 times that for ethnic Turkish girls. (Statistical significance is at 1 percent level.[11]) This odds ratio declines to 2.61 once I control for regional variation, and to 1.66 when I also control for family characteristics. (Statistical significance stays at 1 percent level.) Therefore, unlike the case

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[11]This is statistical significance of the summation of "Kurdish" and "Female Kurdish" terms in Table 4.

for boys, the difference between the enrollment rates of ethnic Kurdish and Turkish girls does not vanish after accounting for regional and family characteristics. Even after I also include language ability as a control variable in the final specification, the difference between the enrollment rates of ethnic Turkish and Kurdish girls persists despite the diminished level of odds ratio at 1.38. (Statistical significance is at 1 percent level.)

The non-enrollment probability for ethnic Arabic girls is 2.14 times that for ethnic Turkish girls in the baseline specification. (Statistical significance is at 1 percent level.) This odds ratio does not change much when I control for regional variation (in fact, it slightly rises to 2.17), but drops to 1.69 when I also account for family characteristics in the third specification. (This is statistically significant at 5 percent level.) Like it was for ethnic Kurds, the ethnic gap is more persistent for ethnic Arabs girls than boys. For ethnic Arabic boys, the ethnic gap lost its statistical significance in the third specification whereas the ethnic gap remains statistically significant in the third specification for ethnic Arabic girls. Nevertheless, when I also control for language ability in the final specification, the odds ratio for ethnic Arabic girls loses its statistical significance despite a still notable level of 1.36.

For ethnic Caucasian girls, like it was for ethnic Caucasian boys, there is no evidence for a difference in the enrollment probabilities in the baseline model. Neither does controlling for a richer set of factors make a difference.

Comparing the ability of the three set of controls to account for the ethnic differences by gender, I find that they do a better job in capturing the ethnic gaps for males. While only regional controls and family characteristics can fully account for the ethnic gap for ethnic Kurdish males, all three set of control groups can account for less than 80 percent of the ethnic gap for ethnic Kurdish girls. Similarly, while the three set of controls explain 90 percent of the ethnic gap for Arabic boys, the same set of controls can explain only two thirds of the ethnic gap for ethnic Arabic girls.

4.1.3 Gender Gap

Table 6 presents the gender gap in enrollment rates by ethnicity. For all ethnic groups, there is a substantial gender gap. This gender gap is statistically significant for all groups but ethnic Caucasians as there are fewer observations of this group.

For ethnic Turks, non-enrollment is almost twice more likely among female children in the final specification. (Statistical significance is at 1 percent level.) The gender odds ratio for ethnic Turkish children is quite insensitive to the specification used. However, for ethnic

Kurdish and Arabic children, the gender gap widens as I increase the set of control variables. The gender gap is more pronounced among ethnic Kurdish and Arabic children compared to ethnic Turkish children. In the final specification, non-enrollment of girls is 3.48 times more likely for ethnic Kurdish children, and 2.32 times more likely for ethnic Arabic children. (The statistical significance is at 1 percent level for ethnic Kurds and at 5 percent level for ethnic Arabs.)

An interesting fact about the gender gap is that there is evidence, at one percent level statistical significance, that the difference between the enrollment rates of male and female children is higher for ethnic Kurds than ethnic Turks. (This fact and its statistical significance at 1 percent level are maintained in all specifications as can be seen from the interaction of female and Kurdish dummies in Table 4.) In the final specification with all control variables, while the gender odds ratio is 1.96 for ethnic Turkish children, it is 3.48 for ethnic Kurdish children.

4.2   Timing of School Drop-Out

In this section, I examine the differences in the timing of school drop-out across ethnic groups using duration analysis. I use a discrete time complementary log-log estimation with a flexible baseline hazard function where the duration time concept is grade level.[12] The baseline hazard function is piece-wise constant. This type of modeling allows me to vary the impact of ethnicity and gender variables by the grade level of children. I group the grade levels into four: Grade 0, Grades 1-4, Grade 5, Grades 6-8. Grade 0 covers those who did not complete a single year of schooling. This would include those who never go to school as well as those who drop out before completing first grade. Grades 1-4 include those who drop out after completing grades 1 to 4. Grade 5 is not grouped with any other grade level because this is the compulsory schooling level (for the time period the data cover) and, therefore, many children drop out after this grade. Grades 6 to 8 are secondary school grade levels. In the estimation, I let the impact of not only the ethnicity and gender variables but also all three set of control variables to vary by the four grade level groups. Estimation results are given in Table 7 for four different specifications. The baseline specification only adds a calendar year dummy to the control variables of major interest. The second specification adds regional controls, the third one family characteristics, and the last one mothers' proficiency in Turkish, all in a cumulative way. Table 8 presents the ethnicity odds ratios in the timing

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[12]A logit regression produced very similar results.

of drop-out by gender. Next, I go over these results by gender and then talk about the gender gap.

4.2.1 Male Children

Ethnic Kurdish boys are strikingly more likely to drop out in earlier grades. In the baseline specification, ethnic Kurdish boys are 7.61 times more likely to drop out at grade 0 and 7.75 times more likely to drop out in grades 1 to 4. Despite a lower odds ratio at 1.69, ethnic Kurdish boys are still more likely to drop out after grade 5 in the baseline specification. (All are statistically significant at 1 percent level.) After completing grades 6 to 8, ethnic Kurdish boys are in fact 30 percent less likely to drop out; however, this is statistically insignificant. After controlling for regional variation across ethnic groups in the second specification, the odds ratios decline to 4 in grade 0 and to 4.69 in grades 1 to 4. This means that regional variation alone accounts for 55 percent of the ethnic gap for ethnic Kurdish boys in grade 0 and 45 percent of it in grades 1 to 4. These percentages are much higher than those that indicated the explanatory power of regional variation in enrollment rates in the previous section. However, controlling for regional variation brings about a slight rise in the odds ratio at grade 5 from 1.69 to 1.71. Therefore, regional variation matters especially in earlier grades.

When I further control for family characteristics in the third specification, despite diminished odds ratios, there is still evidence for an ethnic gap at both grade 0 and grades 1 to 4. Ethnic Kurdish boys are 1.83 times more likely to drop out in grade 0 and twice more likely to drop out after completing grades 1 to 4. One interesting change that takes place when family characteristics are also controlled for is that that ethnic Kurdish boys are less likely to drop out after completing grades 6 to 8 becomes statistically significant at 1 percent level. They are 68 percent less likely to drop out at these grade levels. The analysis of enrollment rates in the previous section revealed that the ethnic gap between ethnic Turkish and ethnic Kurdish boys vanished once the variation in family characteristics as well as location of residence was accounted for. However, here, there exists a statistically significant difference in the timing of drop-out between ethnic Kurdish and Turkish boys even after both family and regional characteristics are accounted for. Ethnic Kurdish boys are more likely to drop out of school before grade 5, but less likely to drop out after completing grade 6. This implies that the out-selection of ethnic Kurdish boys takes place at earlier grade levels. Since ethnic Kurdish boys are a more selected bunch at later grades due to higher drop-out rates in earlier

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grades, they are less likely to drop out.

Adding proficiency in Turkish in the final specification further decreases the odds ratios for ethnic Kurdish boys in grade 0 and in grades 1 to 4 and yields them statistically insignificant. That ethnic Kurdish boys are less likely to drop out after completing grades 6 to 8 remains statistically significant, though, at 5 percent level. At these grade levels, ethnic Kurdish boys are 61 percent less likely to drop out.

Ethnic Arabic boys are also remarkably more likely to drop out in earlier grades compared to ethnic Turkish boys in the baseline specification. The odds ratios are 5.42 at grade 0 level, 3.58 at grades 1 to 4, and 1.69 after completing compulsory schooling. (The statistical significances are at one percent, ten percent, and five percent levels, respectively.) As it was for ethnic Kurdish boys, regional variation accounts for a sizeable portion of the ethnic gap in earlier grade levels. Once I control for it in the second specification, there takes place a 37 percent drop in the odds ratio in grade 0 to 3.80 and a 58 percent drop in the odds ratio in grades 1 to 4 to 2.08. When I also control for family characteristics in specification three, odd ratios further diminish. Family characteristics along with regional variation account for 78 percent of the variation in the odds ratio in grade 0 and all of it in grades 1 to 4. Moreover, for all grade levels, the ethnic gap for Arabic boys becomes statistically insignificant. Therefore, regional and family characteristics account for the disparity between ethnic Arabic and ethnic Turkish boys not only in the levels of enrollment – as shown in the previous section – but also in the timing of the drop-out.

4.2.2 Female Children

For ethnic Kurdish girls, as it was for boys, there is evidence in the baseline model that they are more likely to drop out until completing the compulsory level of schooling compared to ethnic Turkish girls. Moreover, the magnitudes of the odds ratios are remarkable. Ethnic Kurdish girls are 15.95 times more likely to drop out at grade 0, 7.84 times more likely to drop out at grades 1 to 4, and 1.57 times more likely to drop out right after completing compulsory school. Once I control for location of residence, there is a notable fall in the drop-out rates both at grade 0 and at grades 1 to 4, but not at grade 5. Despite the fall, the odds ratios until the end of grade 5 remain statistically significant at 1 percent level.

When I account for family characteristics as well as location of residence in the third specification, odds ratios further diminish; however, their magnitudes remain impressive. Ethnic Kurdish girls are still 4.58 times more likely to drop out at grade 0 level and 2.14

times more likely to drop out at grades 1 to 4. (Both are statistically significant at 1 percent level.) Unlike ethnic Kurdish boys, ethnic Kurdish girls remain more likely to drop out at grade 5 level even after family characteristics as well as location of residence are accounted for. Finally, when I add language ability to the set of control variables, that ethnic Kurdish girls are more likely to drop out at grade 0 and grades 1 to 4 levels persist. (Statistical significances are at 1 percent and 5 percent levels, respectively.) This is unlike the finding for ethnic Kurdish boys. Moreover, the magnitudes of the ethnic gaps even after accounting for all three set of control variables remain remarkable. Ethnic Kurdish girls are still 3.62 times more likely to drop out at grade 0 and 1.82 times more likely to drop out at grades 1 to 4.

As it is for ethnic Kurdish girls, the odds ratios are quite large for ethnic Arabic girls in grade 0 and grades 1 to 4 in the baseline specification. (Both are statistically significant at 1 percent level.) However, unlike it is for ethnic Kurdish girls, there is no evidence that they are more likely to drop out at grade 5 level. After accounting for both location of residence and family characteristics, ethnic Arabic girls are still more likely to drop out at grade 0 and grades 1 to 4: The odds ratio is 3.8 at grade 0 level and 2.38 at grades 1 to 4. (Statistical significance is at 1 percent and 5 percent level, respectively.) When I further control for the Turkish language proficiency of mothers, that ethnic Arabic girls are more likely to drop out at grade 0 remains statistically significant at 1 percent level, and the odds ratio is still remarkable at 3. However, there is no more evidence that they are more likely to drop out at grades 1 to 4.

4.2.3 Gender Gap

Table 9 presents the gender gap in drop-out rates by grade level and ethnicity. There exists a gender gap regardless of ethnicity, as there was for enrollment rates; however, there are differences in the timing of it by grade level across ethnic groups. For ethnic Turks, the gender gap is limited to grades 1 to 4 and to grade 5. In the final specification, ethnic Turkish girls are 2.44 times more likely to drop out at grades 1 to 4 and 2.11 times more likely to drop at grade 5. (Statistical significance is at 1 percent level in both cases.) On the other hand, for ethnic Kurdish children, the gender gap exists at grade 0 as well as at grades 1 to 4 and at grade 5. For ethnic Kurdish children, in the final specification, the gender odds ratio is 2.94 at grade 0, 2.86 at grades 1 to 4, and 2.61 at grade 5 level. (Statistical significance is at 1 percent level for all.) For ethnic Arabic children, like it was for ethnic

Turks, there is evidence for a gender gap only at grades 1 to 4 and grade 5. In the final specification, ethnic Arabic girls are 6.14 times more likely to drop out than ethnic Arabic boys in grades 1 to 4 and 1.84 times more likely to drop out right after completing the compulsory level of schooling.

4.3 Impact of Regional Controls, Family Characteristics, and Proficiency in Turkish

In this subsection, I examine the impact of control variables other than ethnicity and gender on the enrollment rates and the timing of drop-out according to the final specifications. In the northern, central, and southern regions of Turkey, there is evidence for the fact that living in rural areas decreases enrollment probability. On the other hand, no such evidence exists in the western (the most developed) and the eastern (the least developed) regions of the country. Across the rural regions, only living in the central rural region is associated with a lower enrollment rate than living in the western rural region.[13] On the other hand, across the urban regions, there is evidence for the fact that living in all other urban regions is associated with a higher enrollment rate than living in the western urban region. This is probably a result of the existence of major metropolitan areas in the western part of the country where there are better work opportunities that become an alternative to school.

Family characteristics are strongly associated with school enrollment status. The estimation results in Table 4 indicate, as expected, a strong negative association of enrollment status with sibship size and with the number of siblings under age 5. As can be seen from Table 10, sibship size matters at all grade levels but at grade 0. Moreover, as the grade level of a child rises, his/her sibship size becomes more important in staying on school. On the contrary, the number of siblings under age 5 matters more in earlier grade levels. Its impact is insignificant after completing grade 5 level.

Literacy of mothers and years of schooling of fathers, which increase the productivity of schooling for children, increase school enrollment probability as can be seen from the estimation results in Table 4. In terms of the timing of drop-out, mother's literacy status is statistically significant at grades 1 to 4 and grade 5 whereas father's years of schooling is statistically significant at all grade levels.

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[13]This is based on the point estimates and standard errors for the linear combinations west_rural - x_rural, where x stands for the other four regions.

Table 4 indicates that father's employment in agriculture decreases enrollment probability. For these children, market work is more readily available as they can always work on their father's farm. As can be seen from Table 10, when I examine its impact by grade level, I find that father's employment in agriculture matters only right after completing grade 5 – the compulsory level schooling –. Therefore, the negative impact of residence in agricultural areas could also arise from the unavailability of secondary schools in addition to the easy availability of farm work.

Finally, as expected, family wealth is positively and nonproficiency of mothers in Turkish is negatively associated with enrollment probability. Both family wealth and nonproficiency of mothers in Turkish are statistically significant at all grade levels but grades 6 to 8. Moreover, mother's proficiency in Turkish especially matters in earlier grades. Predicted probabilities indicate that nonproficiency of mothers in Turkish increases drop-out rates by a factor of 2 at grade 0 level.

5 Summary and Conclusions

This paper presents the ethnic disparities in school enrollment in Turkey and examines the potential reasons that account for these disparities. The disparities that are scrutinized are not only at the level of enrollment but also at the timing of drop-out. The paper also has a gender dimension that examines the gender gap in these enrollment outcomes and how the gender gap varies across ethnic groups. The key findings can be summarized as follows:

For male children, the gaps between the enrollment rates of ethnic Turks and those of both ethnic Kurds and Arabs vanish once location of residence and family characteristics are accounted for. Location of residence explains one third of the gap, and family characteristics along with location of residence can fully account for it for ethnic Kurdish boys. However, even though the gap in the levels of enrollment of children aged 8 to 15 vanishes, the differences in the timing of drop-out persists for ethnic Kurdish boys even after accounting for location of residence and family characteristics. Ethnic Kurdish boys are still more likely to drop out until completing grade 4, but less likely to drop out after completing grade 6. This implies that ethnic Kurdish boys with a low propensity to enroll in school are selected out earlier compared to ethnic Turkish boys. Since ethnic Kurdish boys are a more selected bunch once they reach grade 6 level, they are less likely to drop out. When I also account for the ability of mothers to speak Turkish, there is no more evidence for the fact that ethnic

Kurdish boys are more likely to drop out in earlier grade levels. Therefore, we can assert that location of residence, family characteristics, and proficiency in Turkish can account for the ethnic disparities in levels of enrollment as well as the timing of drop-out for male children between the ages of 8 and 15.

However, the picture is completely different for female children. Even after controlling for location of residence, family characteristics, and proficiency in Turkish, the gap between the enrollment rate of ethnic Turkish girls and those of ethnic Kurdish and Arabic girls remains. For instance, non-enrollment of ethnic Kurdish girls is still 38 percent more likely. When I examine the drop-out rates by grade level, striking disparities persist despite accounting for regional and family characteristics as well as language proficiency. Ethnic Kurdish girls are still more likely to drop out until completing grade 4. Moreover, the levels of disparities are remarkable. Even after accounting for all the control variables, ethnic Kurdish girls are 3.6 times more likely to drop out before completing the first grade compared to ethnic Turkish girls, and 1.8 times more likely to drop out at grades 1 to 4. Similarly, ethnic Arabic female children are 3 times more likely drop out before completing the first grade even after accounting for the differences in socioeconomic and regional characteristics.

There exists a gender gap among ethnic Turkish children as well as ethnic Kurdish and Arabic children even after controlling for location of residence, family characteristics, and language ability. For children aged 8 to 15, non-enrollment of girls is roughly twice more likely for ethnic Turks, three and a half times more likely for ethnic Kurds, and 2.3 times more likely for ethnic Arabs. In terms of the gender gap in the timing of drop-out, there is evidence for a gender gap after completing grades 1 to 5 for ethnic Turkish and Arabic children. For ethnic Kurdish children, in addition to the gender gap in grades 1 to 5, there is also evidence for a gender gap in the drop-out rate before completing the first grade.

Furthermore, there is evidence for the fact that the gender gap for ethnic Kurdish children is wider than that for ethnic Turkish children. When I examine the timing of this gender gap "premium" for ethnic Kurds, I find that the gender gap in the drop-out even before completing the first grade is much wider for ethnic Kurds.

Location of residence and family characteristics emerge as significant contributors to the disparities in educational outcomes across ethnic groups in Turkey. That the disparities in school enrollment across ethnic groups vanish for boys but not for girls after accounting for a number of factors suggests that tastes play a significant role in the disparities across ethnic groups for female children. In other words, ethnicity has a direct impact on girls'

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educational outcomes and equalizing opportunities through regional and socioeconomic distribution would not completely solve the lagged-behind status of ethnic Kurdish and Arabic girls compared to ethnic Turkish girls. If this gap was brought about by different rates of return to schooling or different opportunity cost of schooling across ethnic groups, we would expect a similar difference for ethnic boys as well. (There is no reason to expect different rates of return to schooling across ethnic groups for girls but not boys or, for that matter, in the value of home and market production.) Therefore, this is likely to arise due to the variation in the psychic costs of girls' school attendance across ethnic groups. There may be cultural and historical reasons that bring about the unfavorable attitude of ethnic Kurdish and Arabic parents' toward their daughter's education, which could not be altered through economic policies.

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Table 1: Enrollment Rates by Ethnicity and Gender

	Male		Female	
	# Observations	Enrollment Rate	# Observations	Enrollment Rate
Turkish	3,392	85.2%	3,252	75.1%
Kurdish	970	71.4%	889	47.5%
Arabic	114	72.3%	109	55.1%
Caucasian	34	88.3%	44	67.9%
Total	*4,510*	*82.0%*	*4,294*	*69.0%*

The above numbers are for children between the ages of 8 and 15.

Table 2: Timing of Drop-Out by Ethnicity and Gender

Hazard Rates (%)

Grade	Male				Female			
	Turkish	Kurdish	Arabic	Caucasian	Turkish	Kurdish	Arabic	Caucasian
0	1.1	9.7	7.2	0.0	1.4	25.0	13.7	6.5
1	0.1	0.9	0.0	0.0	0.1	2.5	1.3	0.0
2	0.1	1.2	2.3	0.0	0.4	2.7	3.7	0.0
3	0.2	1.7	1.0	0.0	0.4	3.9	4.6	0.0
4	0.3	2.2	0.0	0.0	0.7	2.7	3.3	0.0
5	18.7	32.1	32.4	23.6	34.5	59.5	48.2	36.5
6	2.5	1.2	0.0	0.0	2.4	5.5	3.9	0.0
7	2.4	3.3	0.0	0.0	0.9	4.0	0.0	0.0
8	8.6	5.0	31.7	0.0	4.7	5.0	0.0	22.5

Survival Rates (%)

Grade	Male				Female			
	Turkish	Kurdish	Arabic	Caucasian	Turkish	Kurdish	Arabic	Caucasian
0	98.9	90.3	92.9	100.0	98.6	75.0	86.4	93.5
1	98.8	89.4	92.9	100.0	98.5	73.1	85.3	93.5
2	98.7	88.4	90.8	100.0	98.2	71.1	82.1	93.5
3	98.4	86.9	89.9	100.0	97.7	68.3	78.3	93.5
4	98.2	85.0	89.9	100.0	97.0	66.5	75.7	93.5
5	79.8	57.7	60.7	76.4	63.5	26.9	39.3	59.4
6	77.8	57.0	60.7	76.4	62.0	25.5	37.7	59.4
7	75.9	55.1	60.7	76.4	61.4	24.4	37.7	59.4
8	69.4	52.4	41.5	76.4	58.5	23.2	37.7	46.1

Table 3: Descriptive Statistics by Ethnicity

	Turkish	Kurdish	Arabic	Caucasian
Regional Controls				
West Urban	26.0%	6.9%	16.3%	24.1%
West Rural	8.6%	0.9%	0.0%	16.5%
South Urban	10.8%	7.5%	29.0%	0.0%
South Rural	6.4%	4.1%	18.6%	0.0%
North Urban	4.1%	0.1%	0.4%	13.8%
North Rural	6.7%	0.1%	0.0%	35.0%
Central Urban	15.7%	2.6%	1.1%	8.9%
Central Rural	11.8%	5.1%	0.0%	1.5%
East Urban	4.9%	37.7%	12.5%	0.0%
East Rural	5.0%	35.0%	22.2%	0.0%
Family Characteristics				
Sibship Size	3.62	6.15	5.51	4.91
Number of Siblings Under Age 5	0.43	1.14	1.02	0.33
Mother's Age	36.24	36.26	36.13	38.37
Mother Illiterate	35.2%	89.8%	71.3%	34.2%
Father's Years of Schooling	6.30	3.87	5.14	5.60
Father Employed in Agriculture	17.7%	22.0%	17.7%	6.1%
Wealth				
Lowest Quantile	15.7%	39.2%	20.3%	2.8%
Second Quantile	16.3%	26.3%	30.4%	17.6%
Third Quantile	19.3%	17.8%	24.7%	29.2%
Fourth Quantile	22.7%	10.5%	11.4%	34.5%
Top Quantile	25.9%	6.2%	13.2%	15.9%
Language Ability				
Mother Not Proficient in Turkish	0.0%	38.9%	34.9%	12.5%

In the estimation, a wealth index rather than dummies for wealth quantiles are used.

Table 4: Probit Estimation of School Enrollment Status

	Specification 1		Specification 2		Specification 3		Specification 4	
Kurdish	-0.636	[-9.01]***	-0.474	[-5.86]***	-0.013	[-0.15]	0.139	[1.57]
Arabic	-0.587	[-2.99]***	-0.483	[-2.03]**	-0.224	[-0.99]	-0.082	[-0.34]
Caucasian	0.172	[0.39]	0.222	[0.49]	-0.014	[-0.03]	0.084	[0.18]
Female	-0.391	[-9.30]***	-0.394	[-9.04]***	-0.428	[-9.25]***	-0.429	[-9.30]***
Female Kurdish	-0.344	[-3.73]***	-0.396	[-4.23]***	-0.386	[-4.00]***	-0.390	[-4.05]***
Female Arabic	-0.068	[-0.27]	-0.175	[-0.59]	-0.190	[-0.67]	-0.157	[-0.53]
Female Caucasian	-0.282	[-0.55]	-0.326	[-0.62]	-0.026	[-0.05]	-0.058	[-0.11]
Regional Controls								
West Rural			-0.390	[-4.40]***	0.136	[1.43]	0.128	[1.34]
South Urban			0.001	[0.01]	0.247	[2.91]***	0.226	[2.68]***
South Rural			-0.569	[-6.75]***	0.167	[1.77]*	0.156	[1.64]
North Urban			0.293	[2.46]**	0.419	[3.62]***	0.424	[3.68]***
North Rural			-0.523	[-6.57]***	0.115	[1.29]	0.099	[1.11]
Central Urban			0.052	[0.65]	0.150	[1.83]*	0.150	[1.84]*
Central Rural			-0.667	[-8.58]***	-0.013	[-0.15]	-0.044	[-0.51]
East Urban			-0.091	[-1.09]	0.253	[2.82]***	0.298	[3.24]***
East Rural			-0.814	[-9.06]***	0.057	[0.55]	0.137	[1.30]
Family Characteristics								
Sibship Size					-0.071	[-4.84]***	-0.066	[-4.49]***
Number of Siblings Under Age 5					-0.058	[-2.13]**	-0.052	[-1.98]**
Mother's Age					0.011	[2.27]**	0.011	[2.40]**
Mother Illiterate					-0.162	[-3.23]***	-0.160	[-3.15]***
Fathers's Years of Schooling					0.062	[7.58]***	0.062	[7.71]***
Father Employed in Agriculture					-0.119	[-2.08]**	-0.104	[-1.83]*
Wealth Index					0.185	[12.01]***	0.178	[11.57]***
Language Ability								
Mother Not Proficient in Turkish							-0.530	[-6.06]***
Number of Observations	8707		8707		8707		8707	
Log Likelihood								
w/ constant, age and year dummies	-4,225.5							
w/ all covariates in this specification	-3877.9		-3681.0		-3292.5		-3263.8	
LR Statistic	695.2		393.8		777.0		57.4	
Number of Additional Covariates	7		9		7		1	
Significance	0.0000		0.0000		0.0000		0.0000	

Robust z statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

All specifications include dummies for age of children and their interaction with 1998 year dummy.

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Table 5: Ethnicity Odds Ratios (Probability of Not Enrollment of Ethnic Minorities / Probability of Not Enrollment of Ethnic Turks) by Gender

	Baseline	Baseline + Regional Controls	Baseline + Regional Controls + Family Charac.	Baseline + Regional Controls + Family Charac. + Language Ability
Male Kurdish	2.53 ***	2.09 ***	1.02	0.78
Male Arabic	2.39 ***	2.11 **	1.46	1.15
Male Caucasian	0.74	0.67	1.03	0.86
Female Kurdish	2.78 ***	2.61 ***	1.66 ***	1.38 ***
Female Arabic	2.14 ***	2.17 ***	1.69 **	1.36
Female Caucasian	1.16	1.16	1.06	0.96

For females, significance is for the summation of ethnicity and the interaction of ethnicity with female.

Table 6: Gender Odds Ratios (Probability of Not Enrollment of Girls / Probability of Not Enrollment of Boys) by Ethnicity

	Baseline	Baseline + Regional Controls	Baseline + Regional Controls + Family Charac.	Baseline + Regional Controls + Family Charac. + Language Ability
Turkish	1.84 ***	1.87 ***	1.98 ***	1.96 ***
Kurdish	2.02 ***	2.33 ***	3.21 ***	3.48 ***
Arabic	1.65 *	1.92 *	2.29 **	2.32 **
Caucasian	2.90	3.24	2.04	2.19

Significance is for the summation of female dummy with the interaction of ethnicity dummy with female dummy.

Table 7: Duration Analysis of Timing of Drop-Out (Complementary Log-Log Model)

	Baseline		Baseline + Regional Controls		Baseline + Regional Controls + Family Charac.		Baseline + Regional Controls + Family Charac. + Language Ability	
Grades 1-4	-2.361	[-7.09]***	-1.896	[-3.80]***	-2.675	[-2.91]***	-2.912	[-3.16]***
Grade 5	3.197	[15.70]***	3.324	[9.87]***	2.715	[4.09]***	2.487	[3.75]***
Grades 6-8	1.119	[4.44]***	1.675	[4.18]***	1.582	[1.58]	1.273	[1.28]
Kurdish * Grade 0	2.074	[9.39]***	1.395	[5.80]***	0.612	[2.48]**	0.414	[1.57]
Kurdish * Grades 1-4	2.026	[6.42]***	1.564	[4.77]***	0.615	[1.72]*	0.489	[1.35]
Kurdish * Grade 5	0.667	[5.88]***	0.640	[4.86]***	-0.016	[-0.11]	-0.093	[-0.64]
Kurdish * Grades 6-8	-0.365	[-1.05]	-0.545	[-1.36]	-1.149	[-2.66]***	-0.957	[-2.33]**
Arabic * Grade 0	1.719	[4.23]***	1.342	[3.09]***	0.693	[1.53]	0.520	[1.14]
Arabic * Grades 1-4	1.249	[1.71]*	0.750	[0.99]	-0.083	[-0.11]	-0.202	[-0.26]
Arabic * Grade 5	0.666	[2.37]**	0.519	[1.68]*	0.360	[1.35]	0.260	[0.97]
Arabic * Grades 6-8	0.447	[0.67]	0.228	[0.30]	-0.241	[-0.29]	-0.083	[-0.10]
Female * Grade 0	0.234	[1.02]	0.200	[0.88]	0.199	[0.87]	0.205	[0.89]
Female * Grades 1-4	0.950	[3.43]***	0.965	[3.46]***	0.936	[3.34]***	0.944	[3.37]***
Female * Grade 5	0.735	[10.71]***	0.801	[11.51]***	0.873	[11.87]***	0.873	[11.90]***
Female * Grades 6-8	-0.294	[-1.60]	-0.238	[-1.27]	-0.179	[-0.94]	-0.178	[-0.94]
Female * Kurdish * Grade 0	0.834	[3.09]***	0.921	[3.42]***	0.936	[3.47]***	0.897	[3.34]***
Female * Kurdish * Grades 1-4	0.048	[0.14]	0.050	[0.14]	0.131	[0.37]	0.117	[0.33]
Female * Kurdish * Grade 5	0.106	[0.75]	0.158	[1.05]	0.238	[1.53]	0.259	[1.64]
Female * Kurdish * Grades 6-8	0.739	[1.33]	0.732	[1.29]	0.874	[1.54]	0.752	[1.34]
Female * Arabic * Grade 0	0.376	[0.70]	0.521	[0.94]	0.663	[1.16]	0.597	[1.05]
Female * Arabic * Grades 1-4	0.705	[0.85]	0.767	[0.90]	0.933	[1.08]	0.875	[1.02]
Female * Arabic * Grade 5	-0.395	[-1.10]	-0.214	[-0.55]	-0.142	[-0.38]	-0.139	[-0.37]
Female * Arabic * Grades 6-8	-0.541	[-0.67]	-0.375	[-0.46]	-0.210	[-0.24]	0.056	[0.06]
Number of Subjects	8624		8624		8624		8624	
Number of Failures	2036		2036		2036		2036	
Time at Risk	46775		46775		46775		46775	
Log Likelihood								
w/ constant and year dummy	-7,466.8							
w/ all covariates in this model	-5,485.9		-5,198.3		-4,638.7		-4,616.8	
LR Statistic	3,961.8		575.2		1,119.2		43.6	
Number of Additional Covariates	23		36		28		4	
Significance	0.0000		0.0000		0.0000		0.0000	

Robust z statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Regional controls include 5 region variables interacted with rural/urban dummy (9 controls); family characteristics include mother's age and literacy status, father's years of schooling, whether father is employed in agriculture, family wealth, number of children, and number of children under the age of 5; language ability is whether mother can speak Turkish. All specifications also include a dummy for year 1998. All control variables are interacted with the four duration (grade level) dummies.

Table 8: Ethnicity Odds Ratios (Probability of Drop-Out of Ethnic Minorities / Probability of Drop-Out of Ethnic Turks) by Gender and Grade Level

		Baseline	Baseline + Regional Controls	Baseline + Regional Controls + Family Charac.	Baseline + Regional Controls + Family Charac. + Language Ability
Male Kurdish	Grade 0	7.61 ***	4.00 ***	1.83 **	1.51
	Grades 1-4	7.75 ***	4.69 ***	2.00 *	1.56
	Grade 5	1.69 ***	1.71 ***	0.99	0.92
	Grades 6-8	0.70	0.58	0.32 ***	0.39 **
Male Arabic	Grade 0	5.42 ***	3.80 ***	1.98	1.67
	Grades 1-4	3.58 *	2.08	1.00	0.78
	Grade 5	1.69 **	1.56 *	1.38	1.26
	Grades 6-8	1.55	1.25	0.79	0.92
Female Kurdish	Grade 0	15.95 ***	9.69 ***	4.58 ***	3.62 ***
	Grades 1-4	7.84 ***	4.94 ***	2.14 ***	1.82 **
	Grade 5	1.57 ***	1.68 ***	1.19 *	1.14
	Grades 6-8	1.45	1.20	0.76	0.82
Female Arabic	Grade 0	7.66 ***	6.28 ***	3.80 ***	3.00 ***
	Grades 1-4	6.97 ***	4.50 ***	2.38 **	1.95
	Grade 5	1.20	1.25	1.18	1.10
	Grades 6-8	0.91	0.86	0.64	0.97

For females, significance is for the summation of ethnicity dummy and the interaction of ethnicity dummy with female dummy.

Table 9: Gender Odds Ratios (Probability of Drop-Out of Girls / Probability of Drop-Out of Boys) by Ethnicity and Grade Level

		Baseline	Baseline + Regional Controls	Baseline + Regional Controls + Family Charac.	Baseline + Regional Controls + Family Charac. + Language Ability
Turkish	Grade 0	1.26	1.22	1.21	1.22
	Grades 1-4	2.67 ***	2.62 ***	2.63 ***	2.44 ***
	Grade 5	1.78 ***	1.94 ***	2.12 ***	2.11 ***
	Grades 6-8	0.75	0.79	0.84	0.84
Kurdish	Grade 0	2.64 ***	2.96 ***	3.04 ***	2.94 ***
	Grades 1-4	2.70 ***	2.75 ***	2.81 ***	2.86 ***
	Grade 5	1.65 ***	1.91 ***	2.55 ***	2.61 ***
	Grades 6-8	1.55	1.63	1.98	1.76
Arabic	Grade 0	1.79	2.02	2.33 *	2.20
	Grades 1-4	5.19 **	5.67 **	6.25 **	6.14 **
	Grade 5	1.26	1.56	1.82 **	1.84 **
	Grades 6-8	0.44	0.55	0.68	0.89

Significance is for the summation of female dummy with the interaction of ethnicity dummy with female dummy.

Table 10: Impact of Family Characteristics by Grade Level

	Grade 0		Grades 1-4		Grade 5		Grades 6-8	
Sibship Size	0.024	[0.58]	0.097	[1.77]*	0.099	[4.32]***	0.186	[2.86]***
Number of Siblings Under Age 5	0.190	[3.01]***	0.173	[2.17]**	0.007	[0.15]	-0.079	[-0.49]
Mother's Age	-0.018	[-1.10]	-0.017	[-0.91]	-0.007	[-0.90]	-0.033	[-1.53]
Mother Illiterate	0.038	[0.19]	0.939	[3.24]***	0.289	[3.55]***	0.296	[1.32]
Fathers's Years of Schooling	-0.108	[-4.74]***	-0.080	[-2.71]***	-0.116	[-9.59]***	-0.086	[-2.51]**
Father Employed in Agriculture	-0.206	[-1.26]	0.102	[0.48]	0.228	[2.81]***	-0.009	[-0.04]
Wealth Index	-0.434	[-7.95]***	-0.190	[-2.90]***	-0.283	[-11.96]***	-0.078	[-1.30]
Mother Not Proficient in Turkish	0.723	[4.11]***	0.486	[2.11]**	0.299	[2.02]**	-1.120	[-1.42]

Robust z statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%