Does longer compulsory education equalize educational attainment by gender, ethnicity, and socioeconomic background?

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DOES LONGER COMPULSORY EDUCATION EQUALIZE EDUCATIONAL ATTAINMENT BY GENDER, ETHNICITY, AND SOCIOECONOMIC BACKGROUND?*

Preliminary and Incomplete

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Abstract:

This study examines the effects of the extension of compulsory schooling from 5 to 8 years in Turkey—which substantially increased the grade completion rates not only during the new compulsory years but also during the high school years—on the equality of educational outcomes among various subpopulations. While longer compulsory schooling decreases the educational gap for most subgroups—in particular, the gender gap in rural areas, the ethnic gap among men in both urban and rural areas, and the ethnic gap among women in urban areas; at the same time, it increases the gender gap in urban areas as well as the ethnic gap among women in rural areas. For instance, the gap in the 8^{th} grade completion rate between ethnic Turkish and Kurdish women in rural areas increases from 22.5 to 44.6 percentage points for the 1989 birth-cohort. These findings suggest that the differences among subpopulations in the change in schooling costs (both monetary and psychic) during the new compulsory schooling years, in the costs of non-compliance with the policy, in labor force participation, and in the drop-out behavior in earlier grades are the key underlying factors.

Keywords: Compulsory Schooling, Gender, Ethnicity, Parental Schooling, Regression Discontinuity

JEL Codes: I21, I24, I28, J15, J16.

I. INTRODUCTION

Despite the progress made towards equality in schooling, great disparities still exist in many parts of the world by race, ethnicity, gender and place of residence. Women, for instance, continue to lag behind men in many developing countries (Grant and Behrman, 2010; UNESCO, 2006). Rural-urban divide in schooling is also a stylized fact in many parts of the developing world (Orazem and King, 2008). Ethnic and racial differences, on the other hand, are not unique to developing countries but also exist in the developed world.[1]

In Turkey, education gaps exist in many fronts: girls, rural children, and non-ethnic Turks fare worse than boys, urban children and ethnic Turks. Average school enrollment rates in non-compulsory schooling at 61 percent for boys and 56 percent for girls attest to the gender schooling gap (TUIK, 2008). Kırdar (2009) finds that ethnic Kurdish and Arabic children (ages 8-15) are roughly twice more likely not to be enrolled in school. The gap between ethnic Turkish children and non-ethnic Turks are worse for girls, where non-enrollment reaches 52.5 percent for ethnic Kurdish girls and 44.9 percent for ethnic Arabic girls as compared to 28.6 percent for ethnic Kurdish boys and 27.7 percent for ethnic Arabic boys. A large number of studies also point to the negative association between children's schooling, parental education and rural residence in Turkey.[2]

This paper investigates how a recent policy change in compulsory education in Turkey—which made a substantial impact on grade completion rates both during and beyond the extended compulsory schooling years—affected the schooling attainment by gender, ethnicity, and parental schooling and whether this schooling reform narrowed or further exacerbated the

[1] Hall and Patrinos (2005) illustrate the disadvantaged position of the indigenous populations in five Latin American countries, where schooling gaps between non-indigenous and indigenous populations range from 2.3 to 3.7 years to the disadvantaged of the latter. A report prepared for the US Department of Education (Aud et al., 2011), on the other hand, shows that black and Hispanic 16- to 24-year-olds are twice and three times more likely to drop out of high school as do white Americans, respectively.

[2] See, for instance, Tunalı (1996), Tansel (2002); Smits and Gündüz-Hoşgör (2006), Dayıoğlu (2005), Kırdar (2009). Furthermore, Dayıoğlu et al. (2009) find the preference for boys' schooling to be stronger in lower income households in Turkey.

existing differences across these groups. Although the impact of compulsory education laws on educational attainment has been the subject of various studies around the world, that these policy changes may bring about differential impacts by gender, ethnicity, childhood place of residence and parental schooling remains less well studied. Hence, this study contributes to the literature by providing evidence from a developing country on the likely consequences of compulsory schooling laws in expanding the schooling opportunities of individuals of various backgrounds. In addition to evaluating the effect of the policy on the schooling levels that it is intended for, we also investigate spill-over effects on non-compulsory levels. The empirical analysis uses the 2003 and 2008 Demographic and Health Survey data for Turkey.

Numerous studies around the world show that compulsory schooling has high social and private returns: it increases labor force participation and wages (Spohr, 2003), boosts economic growth, improves intergenerational income distribution (Eckstein and Zilcha, 2002), educational outcomes of future generations (Oreopoulos, 2006), and lifetime wealth (Oreopoulos, 2007). It reduces wage inequality (Brunello et al. 2009), crime (Lockner and Moretti, 2004) and unemployment (Oreopoulos, 2007). Furthermore, Oreopolous (2009) argues that longer compulsory schooling especially helps the disadvantaged youth. Indeed, one would expect compulsory schooling to especially raise the educational attainment of the disadvantaged groups by reducing the number of school years that children can choose not to attend school but also by inducing them to act more like groups with traditionally higher schooling attainment. As elaborated below, compulsory schooling laws are, for instance, often accompanied by measures that reduce schooling costs making it cheaper for children of limited means to attend school. Compulsory schooling laws are, therefore, potential interventions that can reduce unequal access to education. Therefore, it is of great interest to establish whether compulsory schooling does indeed lead to more equality in the schooling outcomes of individuals of various backgrounds.

Turkey presents itself as an excellent case study to examine the impact of compulsory education laws on schooling attainment for three main reasons: One, the change in compulsory education that was implemented in 1997 was quite substantial and therefore, it affected a sizeable proportion of the youth; two, prior to the enactment of the law, there was a sizeable enrollment gap between compulsory schooling and non-compulsory levels that immediately followed it; and three, although enrollment in the then compulsory schooling was relatively high, it was by no means universal. We mainly exploit the first two features above and use a regression

discontinuity design to understand whether the change in the compulsory schooling law had differential impacts on the educational attainment of men and women of various backgrounds.

The empirical analysis in this paper shows that the new compulsory schooling policy has a stronger effect on men than women in urban areas for grades 6 through 8 (the new compulsory grades); therefore, the policy did not help narrow down the gender gap in the completion of grades 6 through 8 in urban areas. The policy has in fact widened the gender gap in the transition to high school and the completion of grade 9 in urban areas. In rural areas, we observe more favorable effects for women: the new policy decreases the substantial gender gap in grade completion rates 6 through 8. We attribute the stronger effect of the policy for men in urban areas to their higher likelihood of seeking wage employment.

The new compulsory schooling policy has a stronger effect in high school grade levels on ethnic Kurdish men, compared to ethnic Turkish men, in both urban and rural areas; consequently, the ethnic gap among men narrows not only in new compulsory grade levels but also in high school grade levels. For instance, the ethnic gap in the 11^{th} grade completion rate decreases from 30.2 to 6.5 percentage points for the 1989 birth-cohort of men in urban areas. Similarly, we find that the policy has a stronger effect in high school grade completion rates on ethnic Kurdish women in urban areas, and the ethnic gap diminishes in high school grade levels; however, despite the large ethnic gap, there is no evidence of a closing ethnic gap in grades 6 through 8. Probably, the most interesting finding is that in rural areas, there is actually a weaker effect of the policy on ethnic Kurdish women than on ethnic Turkish women, during the new compulsory schooling years and the ethnic gap widens: the ethnic gap in the 8^{th} grade completion rate increases from 22.5 to 44.6 percentage points for the 1989 birth-cohort of women in rural areas.

Mothers' educational attainment turns out to be an important factor in compliance with the new policy. The policy has a stronger effect on women's completion of extended compulsory schooling years when their mothers have at least compulsory schooling.

The study is organized as follows. Section 2 reviews the relevant literature, and Section 3 explains the education system as well as the new compulsory schooling policy in Turkey. Section 4 presents a conceptual framework for the interpretation of our findings. The data and descriptive statistics are explained in Section 5, and Section 6 presents the results. Section 7 concludes.

II. BACKGROUND INFORMATION

II.I Relevant Literature

Numerous studies mostly from developed countries find that the enactment of compulsory schooling or of its extension results in higher schooling attainment (see Angrist and Krueger [1991], Acemoğlu and Angrist [2001], and Lleras-Muney [2002] for the US; Black et al. [2008] for the US and Norway; Oreopoulos [2006] for Britain and Northern Ireland; Chou et al. [2010] for Taiwan; Kemptner et al. [2011] for Germany; Brunello et al. [2009] for a cross-section of 12 European countries). However, these studies do not investigate whether the policy change has a differential impact on schooling attainment by gender, place of residence, ethnicity, or parental schooling.

Notwithstanding this gap in the literature, there are studies that investigate the changes in schooling outcomes by gender and socio-economic background following specific public interventions other than compulsory schooling. Angrist et al. (2002), for instance, examine the impacts of a voucher system in Colombia (the PACES program), where poor urban youth's secondary education in private schools is partially covered by the program. Using a quasi-experiment research design, they find that the voucher status improves schooling outcomes as measured by highest grade completed, grade repetition and test scores but that stronger effects are observed for girls as compared to boys. Skoufias (2001) reports that the Progresa program in Mexico – a conditional cash transfer program targeting children from poor rural households and where girls receive slightly higher benefits than boys– increases the schooling of girls by more than the schooling of boys. While only a small program effect is observed at the primary school level where enrollment is high, at the secondary level the increase in the enrollment for girls surpasses the increase observed for boys. Behrman et al. (2005) also examining the Progresa program find stronger program effects for girls in the first year of secondary school but weaker effects in second and third years. Conditional cash transfer programs in other Latin America countries– in Nicaragua, Ecuador and Brazil – are reported to produce similar effects for boys and girls (Glick, 2008). Glick makes note of the initial gender parity in schooling in these countries. In Bangladesh, the food-for-education program also had a higher effect on the school attainment of girls (Ahmed and del Ninno, 2002) In a policy paper "What works in Girl's Education", Herz and Sperling (2004) provides evidence from a large number of countries that

reducing the cost of schooling – by way of cutting school fees, stipend programs to cover school expenses, building schools close to girls' home - disproportionately improves the schooling of girls.

There is also evidence that program effects vary by place of residence and ethnicity. Duflo (2001), for instance, examines the effect of a major school construction program in Indonesia in the 70s and finds that the program has especially produced favorable effects in sparsely populated regions. She explains this by significant reductions in distance to school due to the program. Glewwe and Kassouf (2012) find that a conditional cash transfer program in Brazil (Bolsa) increases the enrollment rates of black, mulatto, and indigenous children more than that of whites, thereby equalizing the enrollment outcomes by race. Leslie and Drinkwater (1999) examining the economic reasons why ethnic minorities in England tend to remain in school beyond compulsory age conclude that lower current opportunities, as well as higher expected future benefits are instrumental in this decision. Lindley (2009) also finds the likelihood of non-white natives in England to be more over-educated as compared to white natives.

II.II Education System in Turkey and the New Compulsory Schooling Policy

Prior to 1997, the education system in Turkey was built on a 5+3+3 system, which meant five years of compulsory primary, three years non-compulsory lower secondary and three years of upper secondary schooling. In 1997, the government of Turkey increased compulsory education from five to eight years by merging the first two levels under the umbrella of basic education. Children typically start school at age 6 so that the new law required that they remain in school until about age 14. Although compulsory education is free of tuition, it is not free of costs such as transportation, school supplies or school uniforms. Other schooling costs include 'voluntary' donations to the school fund, which can reach sizeable amounts for families of modest backgrounds and are collected in the beginning of the school year during registration. Transportation costs may also become a problem in rural areas where due to sparsely populated villages all schooling levels are not available locally, and children need to travel to the nearest town to attend the appropriate grade. This was especially the case for lower secondary schools that were not part of the compulsory schooling program before 1997. After the extension of compulsory schooling, this level was still unavailable in many small villages but children were encouraged to stay in boarding schools in towns that were free for compulsory school-aged

children and some were bussed to school. Hence, we expect the cost of schooling to be substantially reduced for grades 6 through 8, which have now become part of compulsory schooling.

A year before the extension of compulsory education, there were 6.4 million students enrolled in primary schooling, 2.6 million children in lower secondary and 2.1 million children in upper secondary schooling cycles (TUIK, 2012). In the year that the policy went into effect, the total student population in basic education (primary plus lower secondary) increased only slightly becoming 9.1 million. The increase in that year was not substantial because of the timing of the law: children finishing the 5^{th} grade had already received their primary school diploma before the law went into effect in the summer of 1997, hence many did not chose to continue. However, the following year, in the 1989-1999 school year, the student population in compulsory education increased by more than half a million children. This increase continued on for the next two years so that in the 1999-2000 and 2000-2001 school years the student population in compulsory education reached 10 million and 10.5 million, respectively. Hence, over these three years a 15 percent increase in the student body occurred, which is substantially higher than the 3.3 percent growth that occurred over the 2003/2004-2005/2006 period. In upper secondary (or high school), the student body grew much more slowly becoming 2.3 and 2.4 million in the 1999-2000 and 2000-2001 school year. Nonetheless, it is interesting to note that in a single year going from 1997-1998 to 1998-1999 high school enrollment increased by 7 percent. This is likely to be the result of the forward-looking behavior of parents.

III. CONCEPTUAL FRAMEWORK

Why do compulsory schooling laws affect behavior? This is likely to be a trivial question in countries where these laws are strictly enforced and where the infrastructure is available to track down school-aged children. When enforcement is less than perfect, it is likely that some compulsory school-aged children will not attend school. In this section, we build a simple framework to illustrate how the costs and benefits of acquiring certain educational degrees change as a result of the extension of compulsory schooling in Turkey.

According to the human capital theory, schooling is an investment activity that increases worker productivity (Schultz, 1963; Mincer, 1974; Becker, 1975). The discounted value of future

earnings stemming from higher schooling attainment must exceed the direct and indirect costs of schooling to justify the schooling investment. The signaling hypothesis emphasizes the role of education as a filtering mechanism in environments of imperfect information (Spence, 1973). The information gap between an employer and an employee as to the employee's productivity is resolved by a signal—in terms of educational attainment—that the employee sends. Employers form beliefs about employees' productivity based on this signal, which must be confirmed by the subsequent experience of the employers in equilibrium (Spence). This signaling effect of education on wages, which is distinct from the productivity effects of education, is also called the 'sheepskin' effect. Accordingly, our conceptual framework incorporates both productivity and sheepskin effects of education.

The costs of schooling include not only direct monetary costs like transportation and purchases of school supplies but also indirect costs in the form of the opportunity cost of school time like foregone wages and home production, as well as the psychic costs of sending children to school.[3] We would expect the costs of schooling to be lower during compulsory schooling years because the state ensures the availability and accessibility of schools to all children at compulsory schooling ages.[4] In addition, there are costs associated with not complying with compulsory schooling, which also includes both monetary elements—like the penalties imposed by the state—and psychic elements due to not complying with the legal machinery.

Let us assume for simplicity that students and/or their parents choose between 0, 5, 8, 11, and 13 years of schooling.[5] The last four levels correspond to the required years of schooling—without grade repetition—to earn a primary school, secondary school, high school, and 2-year college degree, respectively, before the implementation of the policy. The net benefits to earning these degrees can be written as follows:

[3] Psychic costs would be especially important in the schooling of girls. For instance, conservative families may not feel comfortable sending their daughters to such school past puberty.

[4] Since the implementation of the policy, students in some remote rural areas are bussed to other villages and others attend boarding schools in nearby towns.

[5] Including even higher levels of schooling does not change the implications of our conceptual framework.

$$
\begin{aligned}
&NB_0(0) = -C_c,\\
&NB_0(5) = f(5) + K_1 - g(5) + 5G,\\
&NB_0(8) = f(8) + K_1 + K_2 - g(8) + 5G,\\
&NB_0(11) = f(11) + K_1 + K_2 + K_3 - g(11) + 5G,\\
&NB_0(13) = f(13) + K_1 + K_2 + K_3 + K_4 - g(13) + 5G,
\end{aligned}
$$

where f(.) stands for the productivity returns to schooling. The marginal sheepskin effect of completing primary school is K_1, secondary school is K_2, high school is K_3, and 2-year college is K_4. The costs of schooling are denoted by the g(.) function, and the costs associated with not complying with the compulsory schooling law are denoted by C_c. That the government ensures the availability of schooling facilities and supplies during the compulsory schooling years brings about a fall in costs of schooling, which is taken to be equal to G per year of compulsory schooling.

After the implementation of the new compulsory schooling policy, the net benefits to 5, 8, 11, and 13 years of schooling are given by

$$
\begin{aligned}
&NB_1(0) = -C_c,\\
&NB_1(5) = f(5) - g(5) + 5G - C_c,\\
&NB_1(8) = f(8) + L_1 - g(8) + 8G,\\
&NB_1(11) = f(11) + L_1 + L_2 - g(11) + 8G,\\
&NB_1(13) = f(13) + L_1 + L_2 + L_3 - g(13) + 8G,
\end{aligned}
$$

where L_1, L_2, L_3 denotes the sheepskin effects for primary education, high school education, and 2-year college, respectively.[6] Moreover, the fall in the costs of schooling as a result of longer compulsory schooling rises from 5G to 8G. Finally, choosing 5 years of schooling now entails an extra cost of not complying with the policy. We assume that the productivity effect of schooling,

[6] We allow the sheepskin effects for primary education, high school, and 2-year college degrees to be different after the policy because the signals that students send change. For instance, while primary education means 8 years of schooling after the policy, it means 5 years of schooling before the policy. In addition, while high school graduates could distinguish themselves from both primary school and secondary school graduates before the policy, they can distinguish themselves only from primary school graduates after the policy.

f(.), does not change with the policy.[7] Accordingly, the changes in the marginal net benefits from increasing educational attainment to higher levels from selected baseline levels can be written as follows:

$$\Delta NB(0 \rightarrow 8) = [\mathrm{NB}_1(8) - \mathrm{NB}_1(0)] - [\mathrm{NB}_0(8) - \mathrm{NB}_0(0)] = \mathrm{L}_1 - \mathrm{K}_1 - \mathrm{K}_2 + 3\mathrm{G}. \quad (1)$$

$$\Delta NB(0 \rightarrow 11) = [\mathrm{NB}_1(11) - \mathrm{NB}_1(0)] - [\mathrm{NB}_0(11) - \mathrm{NB}_0(0)] = \mathrm{L}_1 + \mathrm{L}_2 - \mathrm{K}_1 - \mathrm{K}_2 - \mathrm{K}_3 + 3\mathrm{G}. \quad (2)$$

$$\Delta NB(0 \rightarrow 13) =$$
$$[\mathrm{NB}_1(13) - \mathrm{NB}_1(0)] - [\mathrm{NB}_0(13) - \mathrm{NB}_0(0)] = \mathrm{L}_1 + \mathrm{L}_2 + \mathrm{L}_3 - \mathrm{K}_1 - \mathrm{K}_2 - \mathrm{K}_3 - \mathrm{K}_4 + 3\mathrm{G}. \quad (3)$$

$$\Delta NB(5 \rightarrow 8) = [\mathrm{NB}_1(8) - \mathrm{NB}_1(5)] - [\mathrm{NB}_0(8) - \mathrm{NB}_0(5)] = \mathrm{L}_1 - \mathrm{K}_2 + 3\mathrm{G} + \mathrm{C}_c. \quad (4)$$

$$\mathrm{NB}(5 \rightarrow 11) = [\mathrm{NB}_1(11) - \mathrm{NB}_1(5)] - [\mathrm{NB}_0(11) - \mathrm{NB}_0(5)] = . \mathrm{L}_1 + \mathrm{L}_2 - \mathrm{K}_2 - \mathrm{K}_3 + 3\mathrm{G} + \mathrm{C}_c. \quad (5)$$

$$\mathrm{NB}(5 \rightarrow 13) =$$
$$[\mathrm{NB}_1(13) - \mathrm{NB}_1(5)] - [\mathrm{NB}_0(13) - \mathrm{NB}_0(5)] = . \mathrm{L}_1 + \mathrm{L}_2 + \mathrm{L}_3 - \mathrm{K}_2 - \mathrm{K}_3 - \mathrm{K}_4 + 3\mathrm{G} + \mathrm{C}_c. \quad (6)$$

$$\Delta NB(8 \rightarrow 11) = [\mathrm{NB}_1(11) - \mathrm{NB}_1(8)] - [\mathrm{NB}_0(11) - \mathrm{NB}_0(8)] = \mathrm{L}_2 - \mathrm{K}_3. \quad (7)$$

$$\Delta NB(8 \rightarrow 13) = [\mathrm{NB}_1(13) - \mathrm{NB}_1(8)] - [\mathrm{NB}_0(13) - \mathrm{NB}_0(8)] = \mathrm{L}_2 + \mathrm{L}_3 - \mathrm{K}_3 - \mathrm{K}_4. \quad (8)$$

Equations (1) to (6) illustrate the factors that determine the change in the fraction of students completing the 8th grade, and equations (2), (3), and (5) to (8) the factors that determine the change in the fraction of students completing the 11th grade.[8] Sheepskin effects at all levels of educational attainment—both before and after the policy—all influence both the 8th and the 11th grade completion rates. In other words, for the high school graduation rate, for instance, it is not only the sheepskin effects for high school education, before and after the policy, that determine

[7] In fact, the change in the relative supplies of different levels of schooling could alter the f(.) function. However, since the birth-cohorts who are affected by the policy in our empirical analysis constitute a small fraction of the total labor supply, this effect would be small. We also assume that the policy did not affect the quality of schools. Any change in the quality of schools would bring about changes in labor market productivity, thereby altering the f(.) function. In fact, our analysis of data on student to teacher ratio before and after the policy, using data from the Turkish Ministry of Education, indicates that this ratio remained relatively constant over time.

[8] When $\Delta NB(x \rightarrow y) < 0$, we know for sure that an individual will not change his/her schooling from x to y. When $\Delta NB(x \rightarrow y) > 0$, it is possible that he/she changes the schooling choice from x to y. This happens only if the $\Delta NB(x \rightarrow y)$ is large enough to close the baseline gap between $NB_0(x)$ and $NB_0(y)$.

the change in the completion rate with the policy but also the sheepskin effects for lower as well as higher educational degrees both before and after the policy.

The drop in the costs of school attendance, as well as the rise in the costs of not complying with the compulsory schooling policy, that took place with the extension of compulsory schooling to grades 6 to 8 influence the change in the fraction of students who complete the 11^{th} grade as well as the fraction who complete the 8^{th} grade. The interesting implication of the framework here is that the changes in the cost structure that take place in grades 6 to 8 also influence the high school completion rate. Nonetheless, since many of the students who are induced to complete high school with the policy would be those who would otherwise drop out after obtaining a secondary school degree (8 years) and since the factors that determine this shift—as given in equations (7) and (8)—depend on the sheepskin effects only, we can assert that the change in high school completion would largely be determined by sheepskin effects.

We would expect significant heterogeneity across students—by gender, ethnicity, and socioeconomic background—in the sheepskin effects, the costs of school attendance and the costs of not complying with compulsory education. In addition, the above analysis is simplified in the sense that it does not account for selection dynamics in the student pool. Due to differential drop-out rates—which are notable even during compulsory schooling grades for certain groups—sheepskin effects, costs of school attendance and costs of not complying with compulsory education could vary significantly across subpopulations. Next, we investigate these potential differences by gender, rural/urban status, ethnicity, and parental education.

Boys vs. Girls

Due to women's distinctly lower labor market participation rates (25 percent vs. 70 percent in 2008 [TUIK, 2012]) in Turkey, sheepskin effects of education would be expected to be weaker for girls. On the other hand, the fall in the costs of schooling in the completion of grades 6 to 8 is likely to matter more for girls than boys if girls need to be chaperoned to school due to safety concerns or for socio-cultural reasons, or the psychic costs of sending girls to school increase more for girls in grades that are not mandatory. There is no obvious reason to expect the cost of not complying with the policy to differ by gender as this cost mostly depends on the degree of enforcement, which varies by the area of residence.

Hence, whether the impact of the policy will be felt more strongly for boys or girls will depend on whether the gender differences in the sheepskin effects, in favor of a larger increase in boys' school enrollment, or the gender differences in the changes in the cost structure, in favor of a larger increase in girls' school enrollment, dominate. In the case high school completion rates, we could expect stronger effects for boys because, as claimed earlier, sheepskin effects play a relatively more important role in changing the school graduation rate.

Rural vs. Urban Areas

The sheepskin effects would be stronger in urban areas due to much higher rates of wage employment—where sheepskin effects would be more important than in self-employment and agricultural employment (Glewwe, 2002). In addition, we could expect the new compulsory schooling policy to be enforced better in urban areas, where there is a better infrastructure for enforcement. On the other hand, the change in the cost of schooling would be higher in rural areas because the accessibility of school facilities and supplies improve more in the rural areas.

Thus, while the stronger sheepskin effects and higher costs of not complying with compulsory schooling would exert a stronger influence on enrollment in grades 6 to 8 in urban areas, the fall in the costs of schooling would cause a larger increase in enrollment in these grades in rural areas. Hence, whether the policy will be stronger of weaker in urban than rural areas is ambiguous. On the other hand, in high school grade levels, we would expect the policy effect to be stronger in urban areas for sure because of stronger sheepskin effects there.

Ethnicity

Conditional on location of residence, there is no obvious reason for sheepskin effects to differ by ethnicity unless there is discrimination in the labor market based on ethnicity. However, unlike many other contexts of ethnic diversity, it would be hard to distinguish people by their mother tongue in Turkey. Also, conditional on location of residence, we would not expect the change in the costs of schooling in grades 6 to 8 to differ by ethnicity. On the other hand, the costs of not complying with the compulsory schooling policy could differ by ethnicity. This cost is likely to be higher for ethnic Turks, who identify themselves more closely with the legal machinery. Therefore, we would expect the rise in enrollment, especially in grades 6 to 8, to be higher for ethnic Turks.

Nonetheless, as discussed earlier, there is another mechanism which would bring about different policy effects across subpopulations. The selection dynamics in the student pool—through drop-outs before compulsory schooling is completed—could vary across groups. In fact, Kırdar (2009) finds that ethnic Kurds and Arabs are much more likely to drop-out earlier from the schooling system as compared to ethnic Turks. Therefore, those who make it to post-compulsory schooling levels constitute more of a select group, with presumably stronger school attachment as compared to ethnic Turks. We would expect this selection mechanism to work to increase the effect of the policy on 11^{th} grade completion rates for ethnic non-Turks.

Parental schooling

Since lower parental schooling is likely to be associated with lower household income, the reduction in schooling costs is likely to bring about a bigger change for children with less educated parents. On the other hand, the psychic costs of children's enrollment in grades 6 to 8 would be expected to fall more for parents with compulsory schooling because it is likely that these parents will want also their children to receive at least compulsory education. There is also no reason for the sheepskin effects for high school education to differ by parental schooling. Therefore, how the effect of the policy on children's enrollment varies by parental schooling is ambiguous.

IV. DATA

The data for this study come from the 2003 and 2008 rounds of the Demographic and Health Survey (DHS) of Hacettepe University of Turkey. The choice of DHS over other data sources stem from the fact that the former provides information not only on the highest schooling level but the highest grade completed. We rely mainly on the latter information – which is lacking in other data sets – to track the changes occurring in educational attainment in Turkey. Another major advantage of DHS is that it is the only data set in Turkey that provides information on ethnicity, as well as residence at age 12 in the form of region and size of location (large city, small city, village). Parental background variables are often missing in other data sets unless parents happen to live in the household as well. Perhaps one disadvantage of DHS is that due to its focus on reproductive behavior and health of women and children, it does not collect data on men at the same level of detail as it does for women.

The female sample in our analysis is drawn from 2003 and 2008 waves of the Turkish DHS, whereas the male sample is drawn from the 2008 wave only because information on the location of residence at age 12 is not available for men in the 2003 survey. As a result, while the female sample includes 20,799 observations, the male sample includes 11,116 observations. Table 1 provides descriptive statistics for the variables used in the estimation. About a third of the both male and female samples come from the West, which include richer provinces like Istanbul. About a quarter are from the East, which represent the poorest provinces of the country. The South, Center (where the capital Ankara is), and the North each represent 11 to 16 percent of the sample. Over 40 percent of men and women come from villages; and for both men and women, more than 60 percent of the urban population live in large cities. In terms of mother tongue, 16.5 percent of women and 19.1 percent of men declare their mother tongue to be Kurdish. The proportion declaring Arabic as their mother tongue is just above 2 percent for both men and women. Parental education information is available for the female sample only. The fraction of women whose mothers and fathers have less than compulsory education is 56.3 percent and 26.2 percent, respectively.

Figures 1 through 4 present the changes in selected grade completion rates across cohorts by gender, ethnicity and parental schooling for urban and rural areas. A visual analysis of changes in schooling attainment over time given in Figure 1 shows substantial improvements for both men and women. What is particularly important for this study are the jumps in 8^{th} and 11^{th} grade completion rates for cohorts born in mid-80s. These jumps, which look especially sharp for rural women and men, provide the first clues about the impact of compulsory schooling on educational attainment. That the 11^{th} grade completion rates also register visible jumps point to spill-over effects of the new compulsory schooling law.

Figures 2 and 3 show the changes in the schooling attainment of men and women over time by ethnicity. For both ethnic non-Turkish men and women, irrespective of their place of residence, substantial improvements in 8^{th} and 11^{th} grade completion rates are observed for those born after mid-80s. The pictures also show very favorable developments for ethnic Turkish men and women. Hence, from the pictures it is not clear whether the ethnic schooling gap has narrowed. This is one of the questions we investigate shortly.

Finally, Figure 4 shows that the policy change has favorably affected the schooling of another disadvantaged group: women whose parents have less than compulsory education. The 8th grade completion rate for this group improves drastically for those born after the mid-80s.[9] However, Figure 4 also shows smaller spill-over effects for this group of women as compared to women whose parents have at least compulsory schooling. Using a regression discontinuity design – explained below - we investigate the relationships pictured in Figures 1 through 4 in an attempt to quantify both the size of the improvement and the resulting schooling gaps due to the policy by gender, ethnicity and parental education.

V. IDENTIFICATION METHOD AND ESTIMATION

In order to identify the effect of the new education policy, we exploit the variation in the exposure to the policy across birth-cohorts. The policy was first implemented in the 1997-98-school-year, and students who completed grade 4 or a lower grade in the 1996-97-school-year were covered by the policy (i.e. students who did not have a primary school diploma by the beginning of the 1997-98-school-year). In other words, the new compulsory education law affected children who started school in or after the 1993-94-school-year. Since we do not have information on the exact school start age for individuals, we assume that children start school at age 6—which is the case for most children—and, therefore, take 1987 and later birth-cohorts as those affected by the policy, and 1986 and earlier cohorts as those not affected by the policy.

Figure 1 shows that in addition to the policy effect, there is a time trend in grade completion rates. The critical feature of our identification analysis will be to disentangle the effect of the education policy from these secular time changes in educational outcomes. We use a regression-discontinuity design to accomplish this.

[9] In Figure 4 we also see a slight dip in 5-year completion rates for women born around mid-80s with parents who have less than compulsory education. We suspect that the temporary decline in 5-year completion rates is to do with the initial closure of some village schools that served to only a small number of 6 to 10-year-olds. Following the enactment of the 8-year compulsory schooling, children in sparsely located villages were encouraged to attend 8-year basic education schools that were made available in large villages and towns. The village schools were later re-opened.

We run a logistic regression for each grade level separately, where the dependent variable—grade completion status—takes the value of 1 if the individual completed that grade level, and 0 otherwise. The key variable of interest, the new education policy, is controlled by a dummy variable—called "policy"—which takes the value of 1 for cohorts born in or after 1987, and 0 otherwise. The time trend in grade completion rates is accounted for using a linear time trend. As can be seen in Figure 1, as well as in the other figures (presented earlier) for various subpopulations, the time trend for grades 6 through 11 is indeed very close to being linear. In grades 1 through 5, the trends within the time frame of our study, 1963 to 1998 birth cohorts, are sometimes not well approximated by a linear trend; in those cases, we restrict the time frame of the study so that the time trend is closer to being linear.

In order to estimate any differential effect of the policy across various subpopulations, we include interactions of the policy dummy variable with the dummies for various subgroups. Moreover, the effect of the linear time trend is also allowed to vary across subgroups. For instance, in the examination of the effect of the new policy on ethnic gaps, the regressions include interactions of the policy dummy variable as well as the time trend variable with both the ethnic Kurd dummy as well as the ethnic Arab dummy.

In addition to the time trend, the other control variables include gender, mother tongue (Turkish, Kurdish, and Arabic), location of residence at age 12 in the form of the size of the location (large city, small city, village) and the region of the location (West, Central, South, North, and East).[10]

The discontinuity in our analysis, which takes place between the 1986 and 1987 birth-cohorts, is fuzzy due to two reasons: first, since not all children start school at age 6, some children in the 1986 birth-cohort—in particular, those who started school late—would be affected by the new policy; similarly, among the 1987 birth-cohort, those children who started school early would not be affected by the policy. Second, the implementation of the policy was not immediate in some areas. This fact is actually visible in our figures depicting the fraction of children completing various grades over time: the slope of the graph is higher for birth-years immediately following 1986. Therefore, in all of our regressions, we omit two birth-cohorts immediately before and two

[10] Parental schooling variables are not used because they are not available for men in the sample. In the regressions for females only, the results are not sensitive to the inclusion of parental schooling controls.

birth-cohorts immediately after the discontinuity: 1985 to 1988 birth-cohorts. Our analysis includes all other birth cohorts from 1964 to 1998.

According to our conceptual framework, the benefits as well as the monetary and psychic costs of schooling would vary by rural vs. urban status. An advantage of our data set is that we know whether the individual resided in an urban or a rural area at age 12, when it matters for the schooling outcome. Using this variable, we carry out our analyses separately for urban and rural areas.

VI. RESULTS

The empirical results regarding the effects of the policy on schooling outcomes are presented separately by gender, ethnicity, and parental schooling. In each part, we first illustrate the estimated parameters for the effect of the policy on different subgroups at each grade level; then, based on these estimates, we illustrate how the predicted gaps across subgroups change as a result of the new policy for the 1989 birth-cohort.

VII.I Analysis by Gender

The regression discontinuity analysis whose results are given in Table 2 confirms the visual observations made earlier that the extension of compulsory schooling has indeed led to higher completion rates in grades it intended to affect (grades 6 through 8). The coefficient estimates presented in the first columns of Panel A and B in Table 2 show highly signifincant coefficient estimates for both men and women irrespecive of their childhood place of residence. Despite these general improvements, we find stronger policy effects for urban men: column 3 of Table 2 shows that for women whose childhood place of residence was an urban area, the improvement in completion rates in grades 6 through 8 is smaller as compared to their male counterparts. For those who grew up in rural areas, there is no evidence that the policy exerted a differential impact on completion rates though. Interestingly, however, we find a negative policy effect on rural women's completion rates in earlier grades: in grades 1, 4 and 5 the completion rates are lower after the policy. The extension of compulsory schooling and therefore, the need to invest in schooling three more years before a diploma is earned has probably discouraged some parents from investing in their girl child's education.

Although the policy did not intent to affect grades 9 though 11, the results in Table 2 show highly significant and positive policy effects for these grade levels as well. Hence, it seems that the effect of the compulsory schooling policy has spilled over to higher grades for both men and women. Although the spill-over effects are smaller than the policy effects observed for grades 6 though 8 and decline at higher grade levels, they remain highly significant through the last year of high school (grade 11). The coefficient estimates on the interaction term between the policy and the gender dummy show stronger effects for urban men in grade 9 or the first year of high school. This finding indicates stronger policy impacts in men's transition from basic education to high school. In grades 10 and 11, and in rural areas there is no evidence of stronger spill-over effects for men.

Using the coefficients in Table 2, we compute baseline probabilities and compare them to grade completion probabilities that come about due to the policy. We also show the effect of the policy on the resulting gender schooling gap as measured by differences in grade completion rates. A comparison of predicted grade completion rates before and after the policy shows substantial improvements. For instance, urban men's 6^{th} grade completion rate increases from 81.2 percent to 97.6 percent – a 16.4 percentage point improvement -. The improvements in non-mandated levels are quite impressive as well. The completion rate in grade 11 for urban men increases from 62.2 percent to 73.3 percent – a 11.1 percentage point improvement -. Even larger improvements are observed for women: the 6^{th} grade completion rate is predicted to increase from 71.1 percent to 92.4 percent – a 21.3 percentage point improvement – due to the policy. Likewise, the 11^{th} grade completion rate improves for women from 60.7 percent to 67.4 percent. Hence, despite the less favorable policy effect for urban women, we find that the change in the probability of completing grades 6 though 8 – the mandated levels - is higher among women as compared to men, which comes about due to women's substantially lower baseline probabilities. The observed improvements in the gender gap at these levels, however, are not statistically significant at conventional levels. In contrast, the differential effect of the policy in grade 9 works to increase the gender gap, which grows from 2.7 percentage points to 9.2 percentage points. In grades 1 through 3, we observe improvements in the urban gender schooling gap but these are relatively small effects.

The effect of the policy on the probability of completing grades 6 through 8 is quite substantial for men and women who grew up in rural areas as well. While the predicted probability of

completing any one of these three grades increases by over 30 percentage points for rural men, the corresponding improvement among rural women is even more substantial at around 40 percentage points. As a result, the gender gap in the newly mandated schooling levels decreases by 20 percentage points in grade 6 (statistical significance is at 1 percent) and by 9 percentage points in grades 7 and 8 (statistical significance is at 5 percent). The spill-over effects of the policy for both men and women are impressive as well; grade completion rates increase by more than 10 percentage points for both groups. The gender gap beyond the 8th grade slightly increases but these changes are not statistically significant.

VII.II Analysis by Ethnicity and Gender

Table 4 shows significant policy effects for all men irrespective of their ethnic backgrounds. In grades 6 through 8, the effect of the policy is similar for ethnic Turks and Kurds irrespective of their place of residence, and ethnic Arabs in rural areas. (We do not have enough observations for ethnic Arabs in urban areas to say anything about the effect of the policy.) In grades 9 through 11, stronger policy effects are observed for ethnic Kurds in urban and rural areas as compared to ethnic Turks. For these schooling levels, we observe similar policy effects for ethnic Arabs as for ethnic Turks.

To illustrate the rather impressive changes in the levels of completed schooling, we turn to Table 5 where grade completion probabilities with policy are compared to baseline probabilities. Among Turkish men who grew up in urban areas the 82.7 percent completion rate in grade 6 increases to 97.2 percent with the policy. The corresponding increase among Kurdish men is even more substantial; it increases from 56.1 percent to 95.1 percent. As a result of the more favorable changes occurring for Kurdish men (due to their lower baseline probabilities), the ethnic schooling gap in grade 6 reduces sharply from 26.6 percentage points to 2.2 percentage points. The improvements in Kurdish men's school completion rates after the policy and the drop in the ethnic gender gap are equally substantial in grades 7 and 8 as those demonstrated for grade 6. Indeed, by the end of the 8th grade, the schooling gap between the two ethnic groups is reduced from 28.4 percentage points to 6.2 percentage points. The improvements in grades 7 and 8 indicate that the majority of Kurds who start the 6th grade do continue and finish the 8th grade.

When we turn to grades 9 through 11, we observe that the positive effects of the policy are not limited to grades 6 through 8 but extend to non-mandated levels of schooling for urban ethnic

Turks and Kurds. In fact, the spill-over effects are stronger for the latter: while a statistically significant policy effect is only observed for the 9th and 10th grades for ethnic Turkish men (Table 5, first column), the effect of the policy is felt very strongly for ethnic Kurdish men for all grades 9 through 11. To give an example, while the 9th grade completion rate increases from 68.3 percent to 81.3 percent for ethnic Turkish men, the corresponding increase for ethnic Kurds is from 40.5 percent to 72.6 percent. As a result, the ethnic schooling gap in the 9th grade reduces from 27.9 percentage points to 8.7 percentage points. By the end of the 11th grade, the schooling gap between ethnic Turkish and Kurdish men is reduced further to 6.5 percentage points. For ethnic Arabic men, there is no evidence for a smaller schooling gap.

Among men raised in rural areas, rather impressive changes are observed in grade completion rates 6 through 8 due to the policy change (see Panel B of Table 5). For instance, the 6th grade completion rate increases from 69.3 percent to 96.4 percent for ethnic Turkish men and from 40.1 percent to 83.2 percent for ethnic Kurdish men. As a result, the schooling gap between ethnic Turkish and Kurdish men narrows from 29.2 percentage points to 13.2 percentage points. Improvements of similar magnitudes are observed in grades 7 and 8 as well. In the case of rural ethnic Arabic men, sizeable improvements in grade completion rates are also observed. However, the drop in the schooling gap between ethnic Turkish and Arabic men is not as substantial as pointed out above for ethnic Turks and Kurds. Due to this and the fact that our estimates are less precise due to smaller sample sizes for ethic Arabs, the improvement in the ethnic schooling gap between Turkish and Arabic in grades 6 through 8 is not found to be statistically significant.

The spill-over effects of policy are higher among rural ethnic Kurdish men. While the effect of the policy is significant only for grade 9 among ethnic Turkish men (for whom the increase in the predicted completion rate is from 54.6 percent to 63.6 percent), for ethnic Kurdish men, the improvement in grade completion rates in grades 9 through 11 exceed 25 percentage points. Hence, the schooling gap in grade 11 between rural ethnic Turkish and Kurdish men is reduced substantially from 38 percentage points to 19 percentage points. In the case of ethnic Arabic men, there is no evidence for spill-over effects.

In terms of schooling, ethnic Kurdish and Arabic women constitute the most disadvantaged groups. Even in grade 5, a 15.2 and 9.0 percentage point schooling gap is observed between

urban ethnic Turkish and Kurdish and ethnic Turkish and Arabic women, respectively (Table 7). These differences are 14.6 and 18.4 percentage points in rural areas. The policy change has favorably affected all groups of women as evidenced by positive and significant coefficient estimates in both urban and rural areas for grades 6 through 8 (Table 6). The estimated coefficients on the interaction terms between ethnicity and policy, on the other hand, show similar policy effects for all ethnic groups raised in urban areas, but weaker effects for ethic Kurdish and Arabic women who grew up in rural areas. The spill-over effects, on the other hand, are felt more strongly for non-ethnic Turks in urban areas. The is no evidence for a stronger policy effect for either of the three ethnic groups in rural areas.

The predicted grade completion probabilities at baseline and after policy - given in Table 7 - illustrate more clearly the substantial improvements occurring in women's schooling. Urban ethnic Turkish women's grade completion rates in grades 6 through 8 improve by about 15 percentage points and their completion probabilities exceed 90 percent after the policy. The improvements for urban ethnic Kurdish and Arabic women are even more substantial ranging around 21-25 percentage points for the former and 29-38 percentage points for the latter. As a result, the schooling gap between ethnic Turkish and Kurdish women and between ethnic Turkish and Arabic women narrows but none of these improvements are statistically significant.

Among rural women, the ethnic schooling gap in grades 6 through 8 is predicted to actually increase (Panel B of Table 7). This is mainly to do with the relatively more favorable improvements in the schooling among ethnic Turks as compared to ethnic Kurds and Arabs. For instance, while the improvement in the 6^{th} grade completion rate due to the policy exceeds 50 percentage points for ethnic Turks, the corresponding change among ethnic Kurds and Arabs is about 30 and 20 percentage points, respectively. These differences as well as the relatively similar baseline probabilities – as compared urban areas - have resulted in larger ethnic schooling gaps. The gap between ethnic Turks and Kurds in grades 6 through 8 increases from levels that are around 21-23 percentage points to 42-45 percentage points (statistical significance is at 1 percent). Similarly, the gap between ethnic Turks and Arabs that is on the order of 16-22 percentage points increases to 47-53 percentage points (statistical significance is at 5 percent).

In grades 9 through 11, the rather strong spill-over effects observed for urban ethnic Kurdish and Arabic women reduce the ethnic schooling gap. (For Turks, the spill-over effect is only

significant in grade 9 at 10 percent level of significance.) In the case of ethnic Turks and Kurds, the gap reduces from 46-50 percentage points to 31-36 percentage points (significant at 10 percent or better). The drop is even more dramatic between ethnic Turks and Arabs; the gap drops to 5 percentage points in grade 9 but completely disappears in grades 10 and 11 from levels as high as 47 percentage points. (All changes are significant at 5 percent.) Among women raised in rural areas, the spill-over effects cause the predicted grade completion rates to improve by about the same amount for ethnic Turks and Kurds so that the ethnic schooling gap increases but only slightly, though the change is not statistically significant. For Arabic women raised in rural areas, there is no evidence for a spill-over effect and as a result in grade 10, the schooling gap between ethnic Turks and Arabs almost doubles from 14.2 percentage points to 28.5 percentage points (significant at 10 percent; Table 7, Panel B). The gap also grows for grade 9 and 11 but these changes are not statistically significant.

VII.III Analysis by Parental Education

The regression discontinuity results given in Table 8 by parental schooling indicate strong policy effects in grades 6 through 8 but particularly for women whose mothers have at least compulsory schooling. In fact, compliance with the new policy is almost perfect for this group of women; the 8^{th} grade completion rate, for instance, increases from 67.7 to 96.1 percent (Table 9). The policy impacts on women's school completion rates positively beyond the mandated levels as well; indeed, there is evidence at least at the 10 percent level that women's 9^{th} and 10^{th} grade completion rates increase with the policy. However, we do not find evidence for stronger spill-over effects for women with more educated parents. Interestingly, the policy also improves 1^{st}, 2^{nd} and 3^{rd} grade completion rates for women whose mothers have compulsory schooling or more. No such effect is observed for women whose fathers have at least compulsory education.

Despite stronger policy effects for women with more educated mothers, the schooling gap by mother's educational attainment narrows in grades 6 through 8 due to the substantially lower baseline probabilities for women whose mothers have less than compulsory schooling. The 27.1 percentage point gap in 6^{th} grade completion rates between women with more and less educated mothers reduces to 11.7 percentage points with the policy. Similar improvements but at slightly smaller magnitudes are observed in grades 7 and 8 as well. (All changes are significant at 5 percent or better.) In non-mandated schooling levels, women's grade completion probabilities

increase substantially in grades 9 and 10 for women whose mothers have less than compulsory school education, and in grades 9 through 11 for women whose mothers have at least compulsory education. The 11th grade completion among women whose mothers have compulsory education or more increases from 57.6 to 71.8 percent. Although the schooling gap between women with more and less educated mothers slightly increases at these levels, these changes are not found to be statistically significant at conventional levels.

When we come to father's education, despite similar policy effects, due to the lower baseline probabilities of women with less educated fathers, the education gap between women with more and less educated fathers decreases. The 30.5 percentage point difference in completion rates among 6 graders in favor of women whose fathers have more than compulsory education reduces to 9.3 percentage points after the policy (statistical significance is at the 1 percent level). Improvements of roughly similar magnitudes are observed in grades 7 and 8 as well. Hence, it seems that the policy has not only succeeded in pushing more women with less advantageous backgrounds to the next grade but managed to keep them in the schooling system all the way through the 8th grade that marks the end of compulsory schooling under the new law. A comparison of predicted grade completion rates before and after the policy clearly shows the importance of parental education in achieving near universal compulsory schooling levels. Women whose mothers (fathers) have compulsory education or more are predicted to have 6th grade completion rates that reach 97.0 (93.4) percent.

The spill-over effects of the policy are observed in grades 9 and 10 for women with less educated fathers but in grades 9 through 11 for women with more educated fathers. For instance, the 11th grade completion rate of women whose fathers have at least compulsory education increases from 49.8 percent to 59.4 percent as a result of the policy. Due to the lower baseline probabilities for women with less educated fathers, the schooling gap between the two groups of women narrows in grades 9 and 10, but these changes are not statistically significant.

VII. CONCLUSION

In this paper, we examine the effects of the education policy implemented in 1997 in Turkey –

which increased the compulsory schooling duration from 5 to 8 years – on the educational attainment of subpopulations by gender, ethnicity, and parental schooling. Since there were substantial differences in the educational attainment of these subpopulations before the implementation of the new policy, we focus on how the effects of the policy vary across subpopulations and how the education gaps by gender, ethnicity, and parental schooling change.

The policy resulted in a substantial increase in school completion rates in grades 6 through 8 – the levels that became compulsory with the new policy – for both men and women regardless of urban and rural status. Since compliance with compulsory schooling policies are far from perfect in Turkey, this increase is important. For instance, the completion of the 8^{th} grade in rural areas increased from 58.2 to 90.1 percent for men and from 28.3 to 69.1 percent for women of the 1989 birth-cohort. What is perhaps more interesting is the remarkable increase in the completion of high school grades as a result of the policy, and this is true for both men and women irrespective of their place of childhood residence. There is roughly a 10 percentage-points increase in the completion of 11^{th} grade regardless of gender and rural vs. urban status.

Another important finding is the differential impact of the education policy on certain subpopulations. Stronger policy effects in grades 6 through 9 are observed for urban men, which we explain by their higher participation in wage work as compared to women. Stronger policy effects are also observed for ethnic Kurdish men as compared to ethnic Turkish men both in urban and rural areas in grades 9 through 11. Similar findings are noted for ethnic Kurdish and Arabic women in urban areas. These are not surprising results given that ethnic non- Turks who continue beyond compulsory schooling are a more select group—due to their higher drop-out rates at earlier grades—who stand to gain more from additional schooling. However, weaker policy effects emerge for ethnic non-Turkish women as compared to ethnic Turkish women in rural areas in grades 6 through 8, which we explain by the lower costs of not complying with the compulsory schooling policy for the former group. Finally, the effect of the policy in improving women's grade completion rates during the extended compulsory schooling years, grades 6 through 8, is much stronger for women whose mothers themselves have at least compulsory schooling, which is likely to result from the higher psychic costs of a daughter's not completing compulsory schooling for a mother with compulsory schooling.

The changes in schooling gaps, which are in part determined by the initial grade completion rates of various subpopulations, paint a brighter picture than the policy impacts. In the 12 sub-populations examined, schooling gaps either narrow or remain unchanged in all but three. The exceptions are urban women, who experience higher gender gaps in grade 9 (from 2.7 to 9.2 percentage points), and rural ethnic Kurdish and Arabic women, who continue to lag behind rural ethnic Turkish women in grades 6 through 8 (and 10 in the case of Arabic women) but by even a larger margin after the policy. In the completion of the 8^{th} grade, for instance, the ethnic gap rises from 22.5 to 44.6 percentage points for ethnic Kurdish women and from 18.4 to 53.3 percentage points for ethnic Arabic women. Notwithstanding the growing gap, substantial improvements are observed in educational outcomes of both groups of women after the policy.

The improvements in educational outcomes for most subpopulations, but particularly for those who traditionally lag behind, have important implications for individual as well as social welfare. Higher schooling improves labor earnings and household income, and therefore, help mitigate income shocks (Card, 1999). Higher schooling is likely to improve health outcomes, reduce crime and have favorable intergenerational effects (King and Hill, 1993; Haveman and Wolfe, 1984, 1995; Lam and Duryea, 1999). We have already shown that mother's schooling attainment is an important factor that influences the effectiveness of the new compulsory schooling policy on women. In this regard, the continued educational gaps means continued inferior outcomes for certain subpopulations. A mix of a carrot and a stick approach may help in bringing about equality in educational outcomes. Better enforcement will surely help; however, this could be accompanied by interventions that make schooling more attractive. Since ethnic non-Turkish women in rural areas – the disadvantaged group in all three dimensions – constitute the main subpopulation who benefit the least from compulsory schooling, specific policies geared towards this group would help.

An important result that emerges with respect to the gender gap in the educational attainment is that longer compulsory schooling does not eliminate it – even though it improves girls' schooling during the compulsory schooling years substantially – because the gender gap in post-compulsory schooling persists. The effect of a compulsory schooling policy on post-compulsory schooling levels is largely determined by the sheepskin effects of schooling in the labor market. Due to the low female labor force participation rate in Turkey, sheepskin effects matter much less for women; therefore, the effect of the compulsory schooling policy on post-compulsory

attainment is weaker for them. Hence, policies that aim to increase the labor force participation of women would much improve their post-compulsory schooling attainment as well.

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Figure 1: Fraction Completing Selected Grades by Gender in Urban and Rural Areas

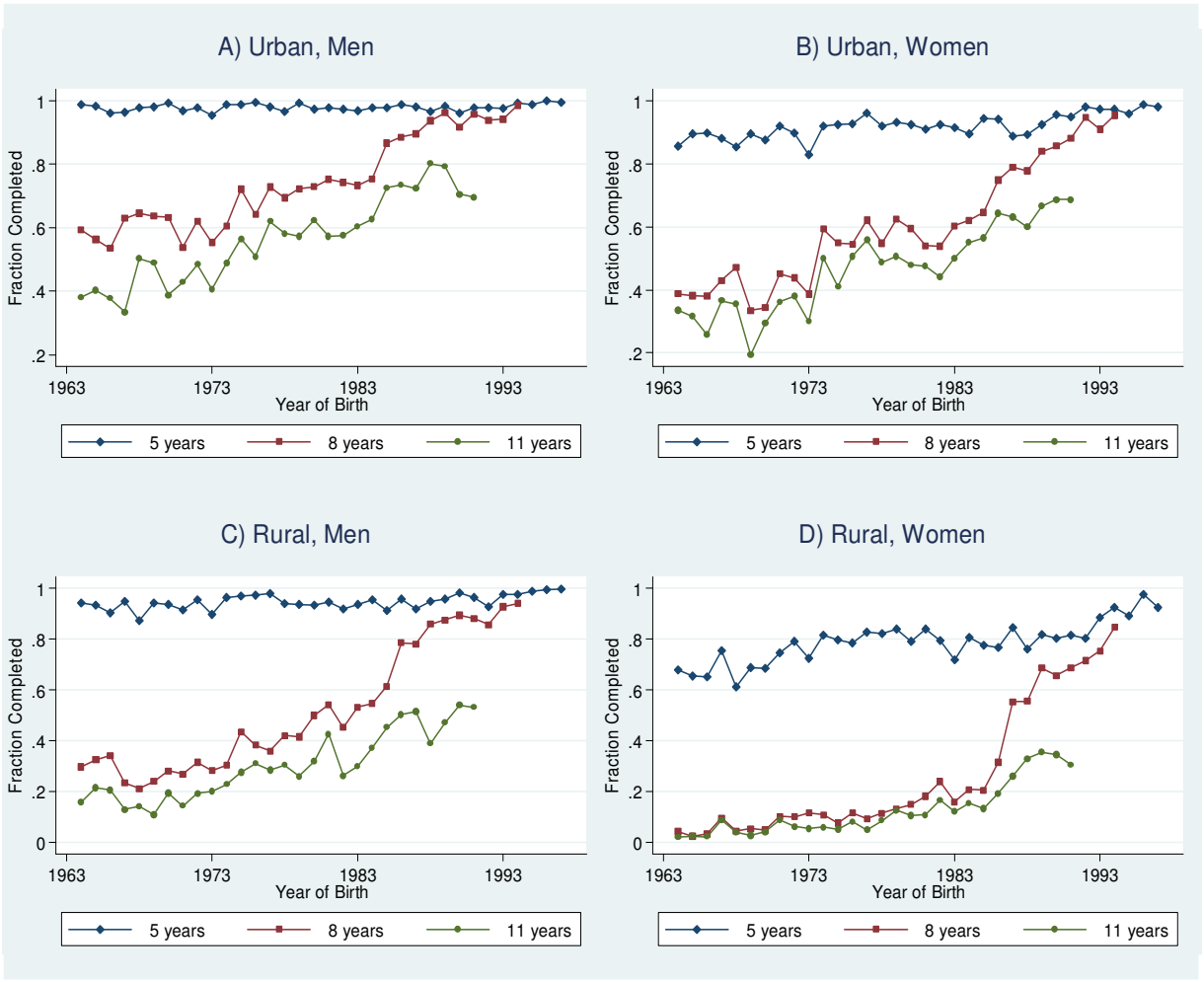

Figure 2: Fraction Completing Seleted Grades by Ethnicity for Urban and Rural Men

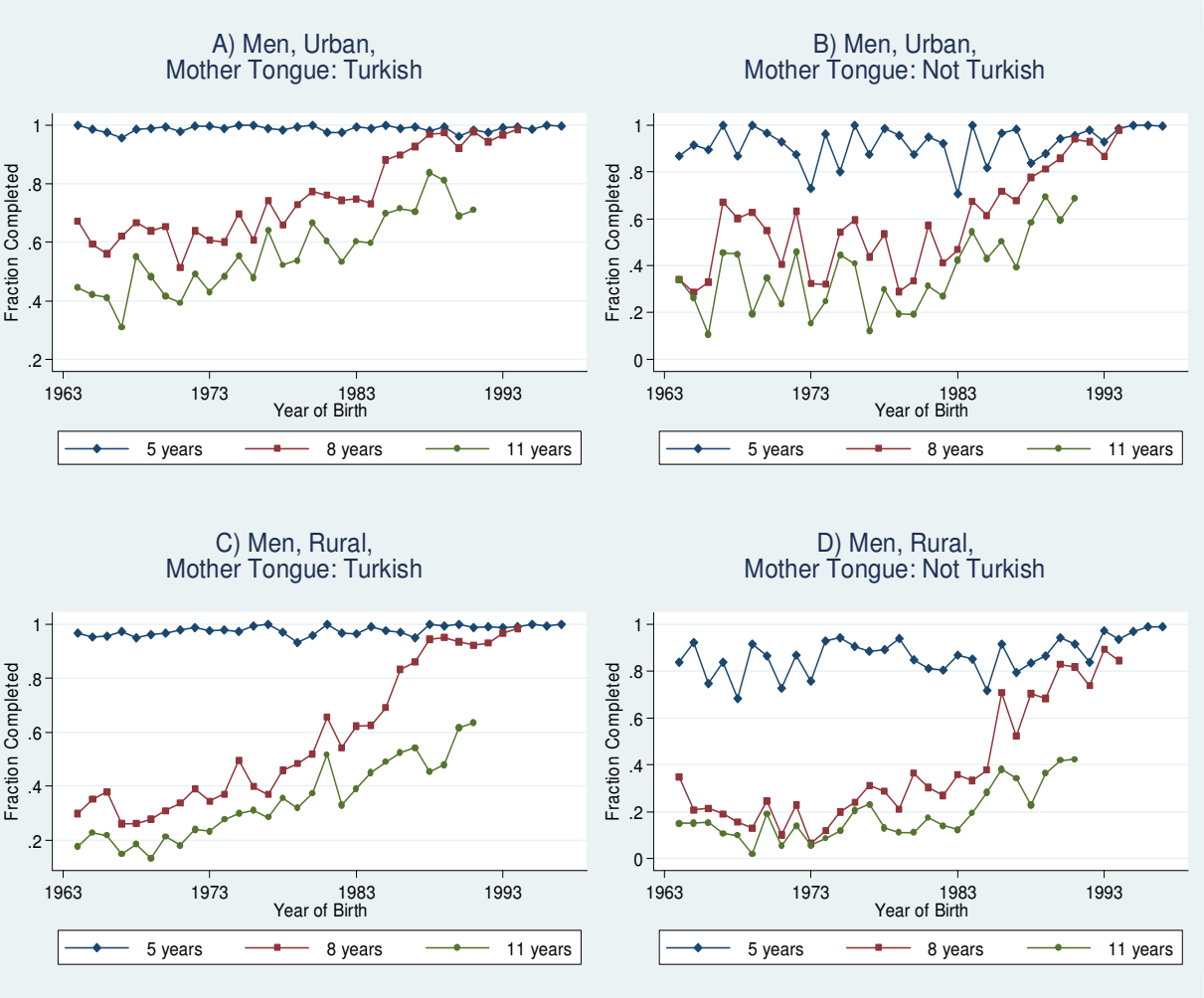

Figure 3: Fraction Completing Selected Grades by Ethnicity for Urban and Rural Women

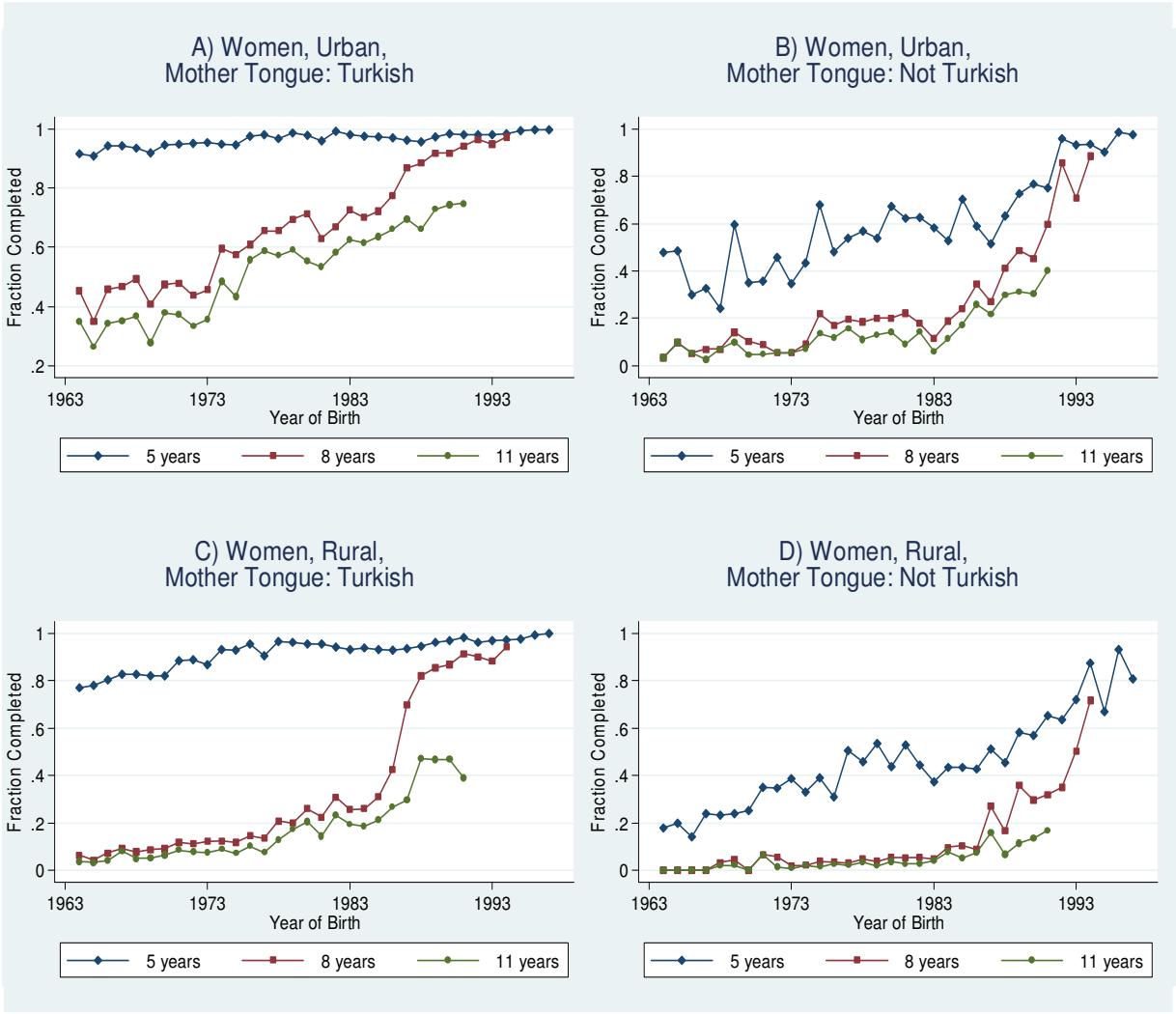

Figure 4: Fraction Women Completing Selected Grades by Mother's and Father's Educational Attainment

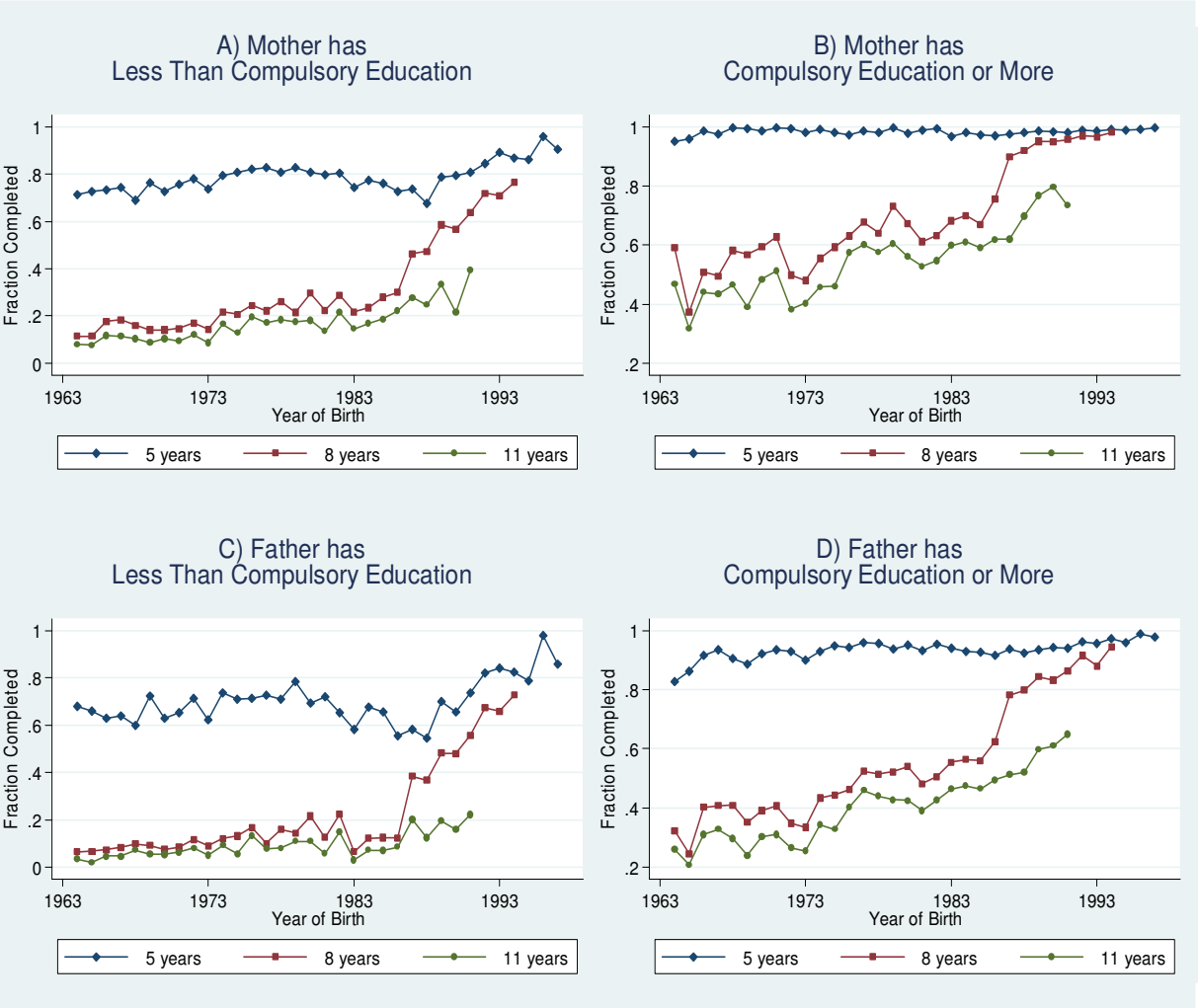

Table 1: Descriptive Statistics

	A) Male Sample		B) Female Sample	
	Mean	No. Obs.	Mean	No. Obs.
Geographical Region at Age 12				
West	0.317	11,116	0.338	20,799
South	0.111	11,116	0.128	20,799
Center	0.151	11,116	0.155	20,799
North	0.150	11,116	0.138	20,799
East	0.271	11,116	0.240	20,799
Type of Location at Age 12				
Large City (Urban)	0.363	11,109	0.387	20,781
Small City (Urban)	0.211	11,109	0.203	20,781
Village (Rural)	0.426	11,109	0.410	20,781
Mother Tongue				
Turkish	0.786	9,868	0.812	20,357
Kurdish	0.191	9,868	0.165	20,357
Arabic	0.023	9,868	0.022	20,357
Parental Education				
Mother: Less Than Compulsory Level	--	--	0.563	19,850
Mother: Compulsory Level or More	--	--	0.437	19,850
Father: Less Than Compulsory Level	--	--	0.262	18,680
Father: Compulsory Level or More	--	--	0.738	18,680

Notes: The female sample is based on 2003 and 2008 waves of TDHS, whereas the male sample is based on 2008 wave of TDHS only because information on location of residence at age 12 is not available for men in the 2003 survey. Information on parental education is also not avaiable for men.

Table 2: Effect of the Education Policy by Gender in Urban and Rural Areas

Dependent Variable: Grade Completion										
	A) Urban Area at Age 12					B) Rural Area at Age 12				
	Policy		Policy * Woman			Policy		Policy * Woman		
Grade	Coef.	S.E.	Coef.	S.E.	No. Obs.	Coef.	S.E.	Coef.	S.E.	No. Obs.
1	0.148	0.647	0.582	0.774	11,522	0.410	0.399	-0.709*	0.386	8,604
2	-0.455	0.657	1.122	0.763	11,522	0.407	0.421	-0.728	0.459	8,604
3	0.020	0.649	0.638	0.699	11,522	0.402	0.459	-0.663	0.484	8,604
4	0.225	0.555	0.438	0.596	11,522	0.703	0.449	-0.924**	0.451	8,604
5	-0.074	0.596	0.662	0.648	10,995	0.437	0.341	-0.820**	0.332	8,309
6	2.255***	0.288	-0.663**	0.321	10,447	2.224***	0.234	-0.339	0.261	8,049
7	2.146***	0.250	-0.681**	0.282	9,907	2.074***	0.225	-0.227	0.280	7,787
8	1.995***	0.226	-0.630**	0.272	9,395	1.875***	0.191	-0.138	0.269	7,502
9	0.853***	0.177	-0.407**	0.202	8,891	0.602***	0.184	0.016	0.292	7,255
10	0.534***	0.171	-0.187	0.179	8,369	0.452***	0.167	0.073	0.284	6,939
11	0.510***	0.193	-0.218	0.192	7,823	0.424**	0.178	0.132	0.292	6,627

Notes: A separate logit regression is run at each school year level. In addition to the key variables of interest (interactions of the policy dummy variable with both genders), the regressions in both panels (a) and (b) also include controls for linear time trends that differ by gender, female dummy variable, controls for location of residence at age 12 in terms of 5 geographical regions, and ethnicity dummies. The regressions in panel (a) also control for type of location of residence at age 12 in terms of small city and large city. Since information on type of location of residence for men is available only in the 2008 survey, all regressions are based on 2008 survey only. The sample includes all 1964 to 1998 birth cohorts, except for the 1985 to 1988 birth cohorts; of these cohorts, 1989 to 1998 birth cohorts are affected by the policy whereas 1964 to 1984 birth cohorts are not affected. Standard errors are clustered at the level of year of birth. Statistical significance is *** at 1 percent level, ** at 5 percent level, * at 10 percent level.

Table 3: Effect of Policy on Grade Completion Probability by Gender in Urban and Rural Areas

A) Urban Area										
	Men				Women				Gender Gap		
Grade	Baseline	Policy			Baseline	Policy			Baseline	Policy	
1	0.997	0.998			0.985	0.993	**		0.012	0.005	*
2	0.997	0.996			0.982	0.991	**		0.015	0.005	**
3	0.995	0.995			0.980	0.989	*		0.016	0.006	*
4	0.993	0.995			0.973	0.986	*		0.020	0.008	
5	0.994	0.993			0.970	0.983	*		0.024	0.010	
6	0.812	0.976	***		0.711	0.924	***		0.101	0.053	
7	0.771	0.967	***		0.700	0.910	***		0.071	0.057	
8	0.764	0.960	***		0.699	0.901	***		0.066	0.059	
9	0.657	0.818	***		0.630	0.726	***		0.027	0.092	*
10	0.645	0.756	***		0.610	0.689	***		0.035	0.068	
11	0.622	0.733	***		0.607	0.674	**		0.015	0.059	
B) Rural Area										
	Men				Women				Gender Gap		
Grade	Baseline	Policy			Baseline	Policy			Baseline	Policy	
1	0.993	0.995			0.963	0.950			0.030	0.045	
2	0.991	0.994			0.960	0.946			0.031	0.048	
3	0.989	0.993			0.951	0.937			0.038	0.055	
4	0.981	0.991			0.937	0.922			0.044	0.068	
5	0.980	0.987			0.926	0.896			0.053	0.091	*
6	0.613	0.936	***		0.298	0.737	***		0.315	0.199	***
7	0.586	0.919	***		0.277	0.709	***		0.309	0.210	*
8	0.582	0.901	***		0.283	0.691	***		0.299	0.209	*
9	0.440	0.589	***		0.202	0.320	***		0.238	0.269	
10	0.413	0.525	***		0.203	0.301	***		0.210	0.224	
11	0.403	0.508	**		0.201	0.304	***		0.202	0.204	

Notes: Predictions are given for the 1989 birth cohort, based on the estimates presented in Table 2. In other words, in panel (a), all other variables are set at their mean values for 1989 birth cohort who resided in an urban area at age 12; and, in panel (b), all other variables are set at their mean values for the 1989 birth cohort who resided in a rural area at age 12 according to the 2008 TDHS.

Table 4: Effect of the Education Policy by Ethnicity for Men in Urban and Rural Areas

Dependent Variable: School Year Completion							
A) Urban Area at Age 12							
	Policy		Policy * {Mother Tongue: Kurdish}		Policy * {Mother Tongue: Arabic}		
Grade	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	No. Obs.
1	-0.304	0.878	0.701	1.126	--	--	5,235
2	-1.083	0.925	1.112	1.185	--	--	5,235
3	-0.464	0.748	0.884	1.396	--	--	5,235
4	-0.522	0.738	1.451	1.429	--	--	5,235
5	-0.826	0.800	1.450	1.330	--	--	4,949
6	1.981***	0.321	0.729	0.611	--	--	4,663
7	1.965***	0.279	0.388	0.498	--	--	4,395
8	1.854***	0.271	0.310	0.479	--	--	4,149
9	0.701***	0.201	0.659	0.465	-0.796	0.751	3,953
10	0.384*	0.202	0.827*	0.472	-0.209	0.745	3,720
11	0.337	0.217	0.942**	0.429	-0.656	0.798	3,466
B) Rural Area at Age 12							
	Policy		Policy * {Mother Tongue: Kurdish}		Policy * {Mother Tongue: Arabic}		
Grade	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	No. Obs.
1	1.395*	0.816	-1.181	0.917	-5.254**	2.432	4,487
2	1.189	0.781	-0.981	0.944	-2.944	2.278	4,487
3	1.073	0.740	-0.788	0.922	-2.828	2.269	4,487
4	1.080	0.669	-0.480	0.954	-1.711	2.240	4,487
5	0.971	0.609	-0.635	0.786	-1.387	1.799	4,332
6	2.485***	0.290	-0.481	0.363	-0.626	0.818	4,188
7	2.294***	0.282	-0.298	0.337	-0.962	0.791	4,042
8	2.054***	0.233	-0.179	0.311	-0.765	0.786	3,871
9	0.374*	0.205	1.070***	0.237	-0.820	0.926	3,729
10	0.243	0.190	1.127***	0.206	-0.777	0.897	3,569
11	0.196	0.205	1.145***	0.198	0.105	0.766	3,414

Notes: A separate logit regression is run at each school year level. In addition to the key variables of interest (interactions of the policy dummy variable with ethnicity dummies), the regressions in both panels (a) and (b) also include controls for linear time trends that differ by ethnicity, controls for location of residence at age 12 in terms of 5 geographical regions, and ethnicity dummies. The regressions in panel (a) also control for type of location of residence at age 12 in terms of small city and large city. Since information on type of location of residence for men is available only in the 2008 survey, all regressions are based on 2008 survey only. The sample includes all 1964 to 1998 birth cohorts, except for the 1985 to 1988 birth cohorts; of these cohorts, 1989 to 1998 birth cohorts are affected by the policy whereas 1964 to 1984 birth cohorts are not affected. Standard errors are clustered at the level of year of birth. There are not enough observations for ethnic Arabic men in urban areas in the first 8 rows of panel (a). Statistical significance is *** at 1 percent level, ** at 5 percent level, * at 10 percent level.

Table 5: Effect of the Policy on Grade Completion Probability by Ethnicity for Men in Urban and Rural Areas

A) Urban Area

	Mother Tongue: Turkish			Mother Tongue: Kurdish			Gap for Ethnic Kurds			Mother Tongue: Arabic			Gap for Ethnic Arabs	
Grade	Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy
1	0.996	0.994		0.988	0.992		0.008	0.002		--	--		--	--
2	0.997	0.990		0.989	0.989		0.008	0.001		--	--		--	--
3	0.994	0.990		0.976	0.984		0.018	0.006		--	--		--	--
4	0.993	0.988		0.957	0.983		0.036	0.005		--	--		--	--
5	0.993	0.985		0.962	0.979		0.031	0.006		--	--		--	--
6	0.827	0.972	***	0.561	0.951	***	0.266	0.022	***	--	--		--	--
7	0.789	0.964	***	0.511	0.917	***	0.278	0.047	**	--	--		--	--
8	0.781	0.958	***	0.497	0.896	***	0.284	0.062	**	--	--		--	--
9	0.683	0.813	***	0.405	0.726	***	0.279	0.087	*	0.633	0.611		0.051	0.203
10	0.676	0.754	*	0.371	0.664	***	0.305	0.090	**	0.609	0.650		0.067	0.104
11	0.654	0.725		0.352	0.661	***	0.302	0.065	**	0.588	0.509		0.066	0.217

B) Rural Area

	Mother Tongue: Turkish			Mother Tongue: Kurdish			Gap for Ethnic Kurds			Mother Tongue: Arabic			Gap for Ethnic Arabs	
Grade	Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy
1	0.988	0.997		0.980	0.984		0.008	0.013		0.999	0.971		-0.012	0.026
2	0.986	0.996		0.975	0.979		0.011	0.016		0.996	0.979		-0.010	0.016
3	0.987	0.996		0.967	0.975		0.020	0.021		0.996	0.979		-0.009	0.016
4	0.979	0.993		0.951	0.972		0.028	0.020		0.990	0.982		-0.012	0.011
5	0.978	0.992		0.942	0.958		0.037	0.034		0.986	0.979		-0.007	0.013
6	0.693	0.964	***	0.401	0.832	***	0.292	0.132	**	0.520	0.874	**	0.173	0.090
7	0.672	0.953	***	0.361	0.806	***	0.312	0.147	***	0.516	0.802		0.156	0.151
8	0.662	0.939	***	0.364	0.789	***	0.299	0.150	***	0.496	0.781		0.166	0.157
9	0.546	0.636	*	0.181	0.483	***	0.365	0.152	***	0.446	0.340		0.099	0.296
10	0.528	0.588		0.146	0.402	***	0.382	0.186	***	0.467	0.340		0.060	0.248
11	0.521	0.570		0.138	0.380	***	0.383	0.190	***	0.346	0.417		0.175	0.153

Notes: Predictions are given for the 1989 birth cohort, based on the estimates presented in Table 4. In other words, in panel (a), all other variables are set at their mean values for men who were born in 1989 and resided in an urban area at age 12; and, in panel (b), all other variables are set at their mean values for men who were born in 1989 and resided in a rural area at age 12 according to the 2008 TDHS.

Table 6: Effect of the Education Policy by Ethnicity for Women in Urban and Rural Areas

Dependent Variable: School Year Completion							
A) Urban Area at Age 12							
	Policy		Policy * {Mother Tongue: Kurdish}		Policy * {Mother Tongue: Arabic}		
Grade	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	No. Obs.
1	0.138	0.380	0.384	0.580	-0.037	1.141	11,752
2	-0.181	0.440	0.702	0.586	0.137	1.115	11,752
3	-0.300	0.352	0.769	0.520	0.256	1.064	11,752
4	-0.441	0.311	0.992**	0.458	-0.027	0.945	11,752
5	-0.586**	0.273	1.061**	0.459	0.427	0.823	11,207
6	1.574***	0.169	-0.676	0.479	0.274	0.810	10,680
7	1.403***	0.139	-0.362	0.420	-0.078	0.695	10,154
8	1.271***	0.155	-0.243	0.420	0.122	0.729	9,574
9	0.267**	0.118	0.532	0.361	1.760*	0.954	9,056
10	0.097	0.099	0.690*	0.394	1.962**	0.950	8,767
11	0.071	0.091	0.726**	0.335	2.109**	1.003	8,475
B) Rural Area at Age 12							
	Policy		Policy * {Mother Tongue: Kurdish}		Policy * {Mother Tongue: Arabic}		
Grade	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	No. Obs.
1	0.985***	0.372	-1.223**	0.488	-0.324	0.855	5,446
2	0.776**	0.335	-1.009**	0.401	-0.268	0.739	5,446
3	0.457	0.407	-0.728*	0.414	-0.207	0.803	5,446
4	0.266	0.378	-0.345	0.422	-0.074	0.674	5,446
5	0.316	0.324	-0.206	0.305	0.351	0.500	5,169
6	2.722***	0.198	-1.211***	0.371	-1.716**	0.676	7,891
7	2.486***	0.144	-1.067***	0.328	-1.249**	0.582	7,639
8	2.246***	0.135	-0.931***	0.354	-1.592**	0.678	7,401
9	0.468***	0.178	0.211	0.516	-0.755	0.759	7,170
10	0.394**	0.176	0.248	0.498	-0.926	0.803	7,014
11	0.443**	0.185	0.197	0.506	-0.902	0.798	6,857

Notes: A separate logit regression is run at each school year level. In addition to the key variables of interest (interactions of the policy dummy variable with ethnicity dummies), the regressions in both panels (a) and (b) also include controls for linear time trends that differ by ethnicity, controls for location of residence at age 12 in terms of 5 geographical regions, and ethnicity dummies. The regressions in panel (a) also control for type of location of residence at age 12 in terms of small city and large city. Both 2003 and 2008 waves of TDHS are used in the estimation. The sample includes all 1964 to 1998 birth cohorts, except for the 1985 to 1988 birth cohorts; of these cohorts, 1989 to 1998 birth cohorts are affected by the policy whereas 1964 to 1984 birth cohorts are not affected. However, in the first five rows of panel (b), the sample is restricted to 1974 to 1998 birth cohorts (also excluding 1985 to 1988 birth cohorts) because, as can be seen in Figure 3c, the profile for the fraction completed 5 years of schooling is certainly not linear after 1963, but much closer to being linear after 1973. Standard errors are clustered at the level of year of birth. There are not enough observations for ethnic Arabic men in urban areas in the first 8 rows of panel (a). Statistical significance is *** at 1 percent level, ** at 5 percent level, * at 10 percent level.

Table 7: Effect of the Policy on Grade Completion Probability by Ethnicity for Women in Urban and Rural Areas

A) Urban Area																	
	Mother Tongue: Turkish			Mother Tongue: Kurdish			Gap for Ethnic Kurds			Mother Tongue: Arabic			Gap for Ethnic Arabs		
Grade	Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy	
1	0.993	0.994		0.886	0.929		0.106	0.064		0.939	0.945		0.054	0.049	
2	0.992	0.990		0.884	0.928		0.108	0.062		0.938	0.936		0.053	0.054	
3	0.990	0.987		0.872	0.916		0.118	0.071		0.935	0.933		0.055	0.054	
4	0.988	0.982		0.855	0.911		0.133	0.071		0.933	0.897		0.055	0.085	
5	0.987	0.977	**	0.836	0.891		0.152	0.086		0.900	0.885		0.087	0.092	
6	0.789	0.947	***	0.489	0.702	*	0.299	0.246		0.479	0.854	***	0.309	0.094	
7	0.782	0.936	***	0.432	0.683	**	0.351	0.253		0.486	0.780	**	0.297	0.156	
8	0.783	0.928	***	0.408	0.658	**	0.375	0.270		0.439	0.759	**	0.344	0.169	
9	0.718	0.769	**	0.240	0.412	**	0.478	0.357	*	0.253	0.720	***	0.465	0.049	**
10	0.705	0.725		0.242	0.412	**	0.463	0.313	*	0.259	0.732	***	0.446	-0.008	**
11	0.703	0.717		0.202	0.360	***	0.500	0.357	**	0.266	0.763	***	0.436	-0.045	**
B) Rural Area																	
	Mother Tongue: Turkish			Mother Tongue: Kurdish			Gap for Ethnic Kurds			Mother Tongue: Arabic			Gap for Ethnic Arabs		
Grade	Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy		Baseline	Policy	
1	0.965	0.987	***	0.878	0.850		0.088	0.137		0.755	0.857		0.210	0.130	
2	0.964	0.983	**	0.868	0.839		0.096	0.144		0.769	0.847		0.196	0.137	
3	0.966	0.978		0.853	0.815		0.113	0.163		0.793	0.831		0.173	0.147	
4	0.959	0.968		0.813	0.801		0.146	0.168		0.775	0.807		0.184	0.161	
5	0.949	0.962		0.735	0.755		0.214	0.206		0.632	0.770		0.316	0.192	
6	0.383	0.904	***	0.170	0.481	***	0.213	0.423	***	0.222	0.438	**	0.161	0.467	**
7	0.379	0.880	***	0.156	0.433	***	0.223	0.446	***	0.157	0.391	**	0.222	0.489	***
8	0.380	0.853	***	0.155	0.407	***	0.225	0.446	***	0.197	0.320		0.184	0.533	***
9	0.291	0.396	***	0.107	0.191	*	0.184	0.205		0.164	0.129		0.127	0.267	
10	0.291	0.378	**	0.101	0.177	*	0.189	0.202		0.149	0.093		0.142	0.285	*
11	0.283	0.381	**	0.105	0.182	*	0.178	0.199		0.153	0.103		0.130	0.278	

Notes: Predictions are given for the 1989 birth cohort, based on the estimates presented in Table 4. In other words, in panel (a), all other variables are set at their mean values for women who were born in 1989 and resided in an urban area at age 12; and, in panel (b), all other variables are set at their mean values for women who were born in 1989 and resided in a rural area at age 12 according to the 2008 TDHS.

Table 8: Effect of the Policy by Parental Educational Attainment -Women Only

Dependent Variable: Grade Completion										
	A) Mother's Educational Attainment					B) Father's Educational Attainment				
	Policy		Policy * {Compulsory Schooling or More}			Policy		Policy * {Compulsory Schooling or More}		
Grade	Coef.	S.E.	Coef.	S.E.	No. Obs.	Coef.	S.E.	Coef.	S.E.	No. Obs.
1	-0.093	0.158	1.545***	0.503	19,199	0.276	0.479	-0.373	0.555	12,867
2	-0.100	0.158	1.312***	0.483	19,199	0.346	0.452	-0.557	0.508	12,867
3	-0.089	0.179	0.913**	0.444	19,199	0.292	0.488	-0.618	0.469	12,867
4	-0.057	0.207	0.697	0.461	19,199	0.358	0.488	-0.639	0.406	12,867
5	-0.116	0.183	0.340	0.466	18,388	0.364	0.466	-0.504	0.429	12,103
6	2.118***	0.186	0.600***	0.173	17,636	2.463***	0.396	-0.289	0.382	16,556
7	1.933***	0.157	0.549***	0.174	16,866	2.262***	0.375	-0.284	0.383	15,814
8	1.728***	0.191	0.726***	0.184	16,062	2.179***	0.380	-0.361	0.373	15,060
9	0.615**	0.260	0.177	0.307	15,330	0.986**	0.445	-0.444	0.433	14,369
10	0.522**	0.267	0.059	0.348	14,923	0.847*	0.470	-0.419	0.472	13,973
11	0.408	0.288	0.220	0.377	14,511	0.599	0.438	-0.211	0.445	13,578

Notes: A separate logit regression is run at each school year level. In addition to the key variables of interest (interactions of the policy dummy variable with parental educational attainment), the regressions in both panels (a) and (b) also include controls for linear time trends that differ by parental educational attainment, female dummy variable, controls for location of residence at age 12 in terms of 5 geographical regions, controls for type of location of residence at age 12 (large city, small city, village), and ethnicity dummies. Both 2003 and 2008 waves of the Turkish DHS are used; the sample includes all 1964 to 1998 birth cohorts, except for 1985 to 1988 birth cohorts; however, in the first five rows of panel (b), the sample is restricted to 1974 to 1998 birth cohorts, excluding 1985 to 1988, because the profile for fraction completed these schooling levels in Figure 4d is far from linear after 1963, but much closer to linear after 1973. Standard errors are clustered at the level of year of birth. Statistical significance is *** at 1 percent level, ** at 5 percent level, * at 10 percent level.

Table 9: Effect of Policy on Probability of Grade Completion by Parental Education – Women Only

A) Mother's Educational Attainment											
		Less Than Compulsory Schooling				Compulsory Schooling or More				Gap by Mother's Educational Attainment		
Grade		Baseline	Policy			Baseline	Policy			Baseline	Policy	
1		0.979	0.977			0.985	0.996	*		0.006	0.020	**
2		0.976	0.973			0.986	0.996	*		0.010	0.022	**
3		0.971	0.969			0.986	0.994			0.014	0.025	*
4		0.963	0.961			0.982	0.991			0.019	0.029	
5		0.955	0.949			0.984	0.987			0.029	0.038	
6		0.411	0.853	***		0.682	0.970	***		0.271	0.117	***
7		0.395	0.819	***		0.677	0.962	***		0.282	0.143	***
8		0.393	0.784	***		0.677	0.961	***		0.285	0.176	**
9		0.289	0.430	**		0.588	0.759	***		0.299	0.330	
10		0.272	0.387	*		0.582	0.714	***		0.310	0.327	
11		0.266	0.352			0.576	0.718	***		0.310	0.365	
B) Father's Educational Attainment												
		Less Than Compulsory Schooling				Compulsory Schooling or More				Gap by Father's Educational Attainment		
Grade		Baseline	Policy			Baseline	Policy			Baseline	Policy	
1		0.958	0.967			0.989	0.988			0.032	0.021	
2		0.950	0.964			0.988	0.986			0.038	0.021	
3		0.944	0.958			0.987	0.982			0.043	0.024	
4		0.926	0.947			0.983	0.978			0.057	0.031	
5		0.914	0.939			0.976	0.973			0.062	0.034	
6		0.311	0.841	***		0.616	0.934	***		0.305	0.093	***
7		0.290	0.797	***		0.607	0.918	***		0.317	0.121	**
8		0.290	0.783	***		0.607	0.905	***		0.317	0.122	**
9		0.185	0.378	**		0.513	0.644	***		0.328	0.266	
10		0.164	0.315	*		0.504	0.609	***		0.340	0.295	
11		0.153	0.248			0.498	0.594	***		0.345	0.346	

Notes: Predictions are given for the 1989 birth cohort, based on the estimates presented in Table 8. In other words, all other variables are set at their mean values for women who were born in 1989, according to 2003 and 2008 waves of TDHS.