Compulsory Schooling in Turkey, Educational Attainment, and the Gender Gap

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Compulsory schooling in Turkey was increased in 1997 from five years to eight years. We examine the effect of this change on educational attainment, and in particular investigate whether there was a differential effect of this change on females relative to males.

Turkey is a middle-income country, with a population of about 70 million. It is predominantly Muslim, but with a secular system of government and law. There are large differences across regions in both the level of educational attainment and in the gender gap in education. The east is the least developed and it has lower educational attainment and the largest gender gap in education.

Tansel (2002) examines determinants of schooling attainment of girls and boys using 1994 Turkish Household Budget Survey data, and emphasizes the large gender gap in the southeast region. Her approach requires limiting the sample to children of the household head, which she concedes can bias the sample, as those who left home young will be omitted.

Dayıoğlu, Kırdar and Tansel (2009) use data from the 1998 Turkish Demographic Health Survey (DHS) to examine school enrollment. They find a persistent gender gap in school enrollment in Turkey, even in urban areas, and that birth order, sibship composition, and household wealth are important determinants of enrollment.

Female educational attainment lags behind that of males in many less developed countries. Compulsory schooling may decrease the gender gap in schooling, as the constraint may be binding for more girls than boys. An increase in compulsory schooling will have a similar effect. We examine empirically whether there was a decrease in the gender gap in educational attainment coincident with the increase in compulsory schooling in Turkey.

I. Theoretical Background

We assume a unitary household model in which parents make decisions regarding the education of their children. Benefits of education include higher wages or productivity in the family business. Due to limited labor market opportunities for women and persistent traditional gender roles, this benefit applies mainly to males. In Turkey, parents expect sons to live close by and to care for them in old age. A daughter may live further away after marriage and is obligated primarily to her husband's family. Thus benefits of education may be perceived as lower for girls than for boys. Education may also increase marriage market prospects, and confer higher social status on the family.

Costs of education include the opportunity cost of children's time, which may be substantial for both boys and girls. Children may contribute to household production and income in various ways in both urban and rural settings. School-related transportation costs may include bus fare or substantial time spent walking. Those in rural areas may have to walk some distance to school or to a point where they can catch a bus. In cities, children may still travel some distance to school if they wish to attend a particular school. There is a system of apprenticeship in may occupations in Turkey that also competes with formal schooling for (especially male) children's time. However, an apprenticeship may have labor market returns not unlike those of formal education, so this may decrease both the costs and benefits of formal schooling for boys. This therefore has an ambiguous effect on the level of formal schooling of boys relative to girls.

There may be additional psychic costs to parents of sending their children to school, particularly daughters. If schools are far away, parents may be more reluctant to send girls than boys due to concerns about their security. Religiously conservative girls in Turkey wear a headscarf outside their homes beginning sometime before or around adolescence. Until 2010, wearing of a headscarf in schools and government buildings was forbidden. This creates a

psychic cost of education for parents of adolescent girls. While all schools are co-educational in Turkey, some conservative families prefer single-sex schools, especially for their daughters.

We've argued that the perceived costs and benefits of schooling both differ for girls and boys in ways that will generate higher desired schooling for boys than girls. In addition to these arguments about real costs and benefits, there may be additional effects due to persistent cultural norms that result in slow progress in closing the gender gap in education, even when the gender gap in earnings prospects and return to education in the labor market narrow. Families may vary in the extent to which these cultural norms and psychic costs affect them. If the distribution of desired schooling for boys is rightward of that for girls, as in Figure 1, then introduction of compulsory schooling or an increase in the compulsory requirement can generate a binding constraint for more girls than boys and result in a larger increase in schooling for girls than boys.

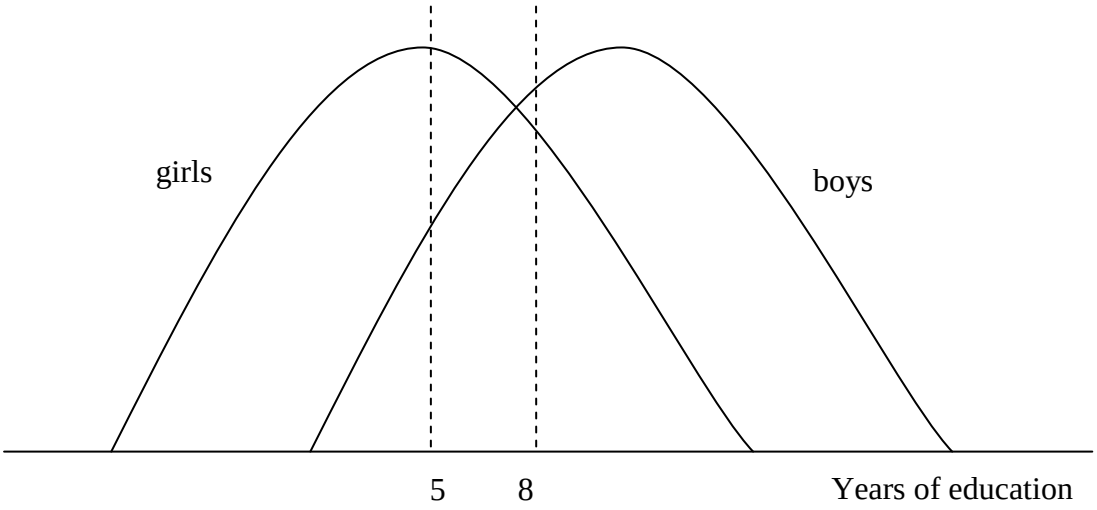


Figure 1: Distributions of Desired Education Levels for Boys and Girls

If compulsory schooling at five years is perfectly enforced, then individuals left of five years in the distribution of desired schooling will be lumped at five years attained. Thus, we expect a larger spike at five years for girls than for boys in the distribution of actual schooling

attainment prior to the increase in compulsory schooling in Turkey. After the increase, with perfect enforcement, we would expect a larger increase in the probability of completing eight years of schooling among treated girls relative to their untreated counterparts than among treated boys relative to their untreated counterparts. This is the primary hypothesis that we aim to test.

An alternative possible effect of the change in law is that it may have provided a signal about the changing educational requirements in an evolving labor market. If so, then education of males would increase, due to the importance of the labor market return on education for them. Such a signaling effect would also impact children who were not directly constrained by the new law. This may result in increases over several cohorts of children, some of whom were not directly affected by the law. We would still expect effects on cohorts directly affected to be stronger, but we are less to find such effects empirically, and less likely to find a differential positive effect for females relative to males, if this signaling effect is important.

Previous studies find that the gender gap in education is smaller among families with higher wealth (e.g., Tansel 2002, Kırdar 2009, Dayıoğlu, Kırdar and Tansel 2009). These studies, and others in other country contexts, have also found that gender gaps in schooling tend to be higher in poor families than in those with fewer resource constraints. These are important considerations that we will account for in our empirical models.

IV. Background on Turkey and Compulsory Schooling

Prior to the change in law increasing compulsory schooling in 1997, schools were divided into primary (five years), middle school (three years), and high school, consisting of either three or four years. Most high schools are three years and are either general or vocational in nature. Technical high schools are for university preparation, and are four years. Examinations after the eighth year determine which high schools one may attend, should one desire to continue.

Rules indicate that children should start school after their fifth birthday. However, there is apparent flexibility regarding the school starting age in practice. Using DHS data for 1993, 1998, and 2003, we calculated enrollment rates for children aged six, seven, or eight in the survey year (shown in Table 1). There were no children reported to be enrolled who were age five in any of these three survey years, perhaps due to a survey design issue. However, attainment of children aged six, seven and eight indicate that a few did enter at age five. Over time, enrollment rates at the earlier ages have increased.

Table 1: Percent Enrolled by Age in DHS Survey Years, Ages 6-8

	1993		1998		2003	
	Girls	Boys	Girls	Boys	Girls	Boys
age 6	21	19	28	29	52	49
age 7	60	64	69	70	88	88
age 8	90	92	82	91	90	97

In August 1997, the new law increasing compulsory education from five years to eight years was instituted. The first cohort affected by the new rule is students who would have completed the fourth year of primary school in the 1996-97 academic year. These students will be required to continue and to complete the eighth grade. Assuming they started school on time, the first cohort of students affected were born October 1986 through September 1987. However, given that very few enroll at age five, identifying the treated (affected by the policy) and the untreated is not so straightforward.

Those who enrolled in school for the first time in fall of 1993 would complete the fourth year of school just prior to the policy change, and thus be the first cohort to be affected. In 1993, only 21 percent of girls and 19 percent of boys were enrolled at age six, while 60 and 64 percent of seven-year-olds were enrolled, and 90 and 92 percent of eight-year-olds. If the pattern was the same in the two years prior, then about 40 percent of these seven-year-olds enrolled for the

first time when they were seven, i.e., in 1993. Those plus the 40 percent of girls and 36 percent of boys among that birth cohort who have not yet enrolled by 1993 will therefore be part of the treated group. Therefore, 80 percent of the seven-year-olds in 1993 will be affected by the policy change. We therefore include this birth cohort, which is aged 17 in 2003, as the first treated cohort for our analysis. Those 18 and older in 2003 are considered the untreated (control) group. Assuming the enrollment rate pattern by age was the same in 1991-1993, we can deduce from Table 1 that two-thirds of those aged eight in 1993 who were enrolled by that time had enrolled prior to 1993, and would thus not be affected by the policy change. This implies that one-third or slightly more of them will have first enrolled in 1993 or after, and therefore be affected by the policy. Since less than half are so affected, we will put them in the control group. Some of them being treated will only serve to dampen our findings.

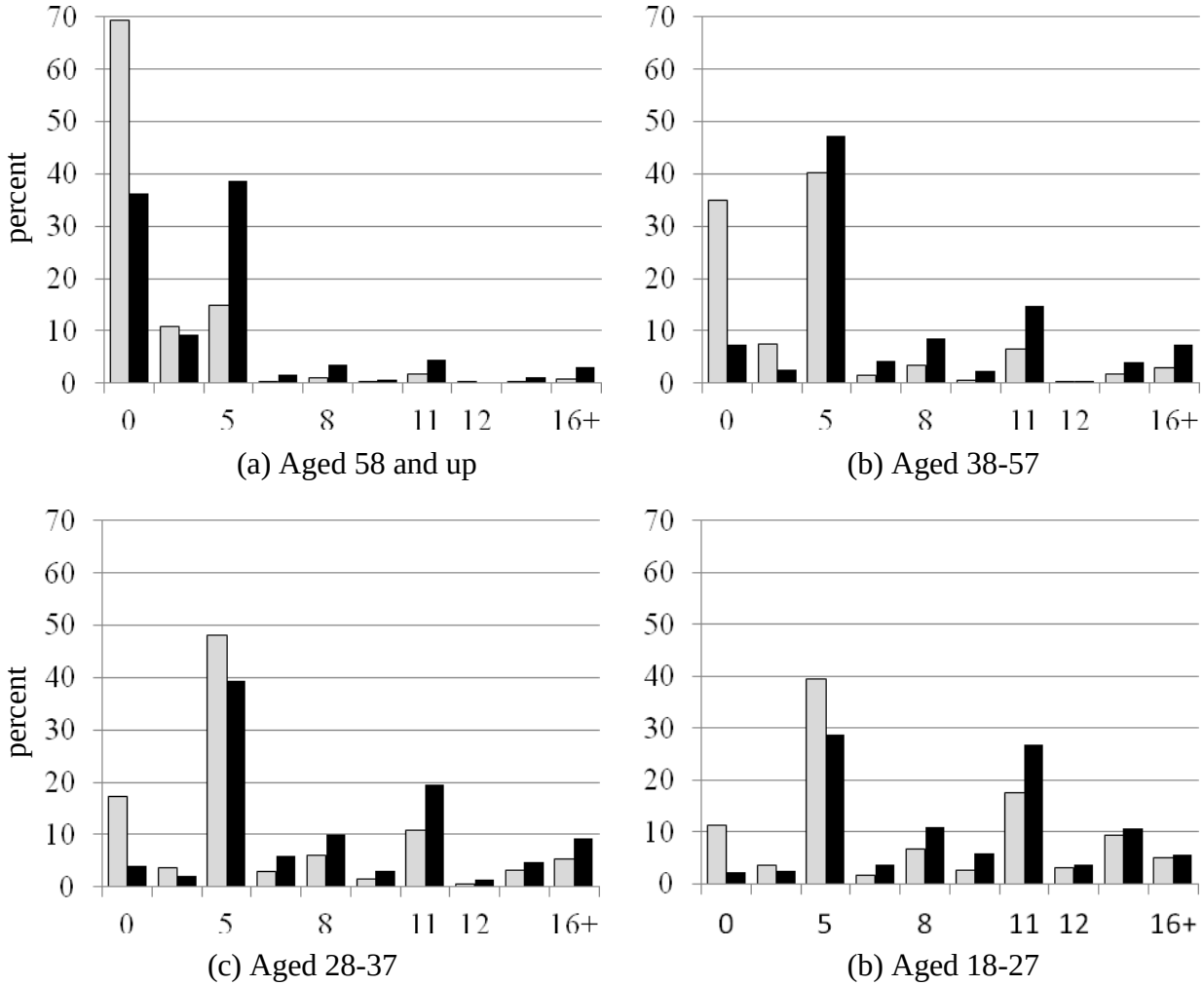
V. Data and Results

Demographic and Health Surveys (DHS) data was collected in Turkey in 1993, 1998, 2003, and 2008 (2008 data are not yet publicly available). We use the 2003 data for our analysis. We use individual-level data on both children and adults, along with household characteristics, such as household size (i.e., number of people living in the household), and household wealth (a normalized index based on assets and durable goods). We do not require information on sibship size, birth order, and other family of origin characteristics. Doing so would necessitate omitting individuals from the sample who have moved out of that family household, and would therefore provide a biased sample, especially among the older cohorts who serve as our control group.

We use data on educational attainment of adults old enough to have not been affected by the law change to examine distributions of schooling for males and females for four age groupings (Figure 2). In all four age groups females are more heavily represented in lower levels

of education and males in higher levels. A Kolmogorov-Smirnov test rejects equality of the distributions for males and females at one percent significance for each of the age groups.

We examine a continuous variable, years of education completed, as well as binary indicators of completion of five years and eight years of schooling. We should not expect to see an effect of the policy change on completion of five years if the prior rule is enforced, but we should see increased years of schooling and an increased probability of completing eight years. We first run a set of baseline multivariate regression models using least-squares (LS) and probit



(a) Aged 58 and up (b) Aged 38-57

(c) Aged 28-37 (b) Aged 18-27

Figure 2: Distribution of Years of Education by Gender and Birth Cohort

(standard errors are clustered by household) to verify that relationships of various variables to education in the pre-change period look reasonable (results not shown, available from the author). We find that females get significantly less education than males, children in households with higher wealth get more education, and children in the eastern region get less education.

We use individuals aged 14 to 17 as the treatment group and those aged 18 to 20 as the control group in our least squares and probit models estimating effects of the policy change. Our primary results are shown in Table 2. In years of schooling, we find that the overall effect of the policy is positive and significant, but that this significance is lost when we allow for a differential effect on females. The effect for females is large (about three-quarters of a year) and highly statistically significant. We include additional interaction terms with the female-post-policy-change variable to allow for differential effects by household wealth and region of the

Table 2: Estimates of Compulsory Schooling Change on Educational Attainment, Aged 14-20

	(1)	(2)	(3)	(4)	(5)	(6)
	Years of education (LS)		5 or more years (Probit)		8 or more years (Probit)	
After change	0.303**	-0.005	-0.105	-0.169	0.706***	0.587***
	(0.123)	(0.142)	(0.087)	(0.112)	(0.0639)	(0.071)
Female X after		0.73***		0.0701		0.384***
		(0.26)		(0.182)		(0.118)
Differential effect of policy for female interacted with						
South		-0.1		-0.0194		-0.149
		(0.35)		(0.231)		(0.162)
Central		0.0585		0.0209		0.145
		(0.299)		(0.278)		(0.153)
North		-0.259		0.0537		-0.153
		(0.329)		(0.355)		(0.184)
East		0.246		0.0457		-0.267**
		(0.294)		(0.175)		(0.134)
Wealth		-0.08***		-0.023**		-0.02***
		(0.0115)		(0.01)		(0.006)
$Wealth^2$		-0.002***		-0.001*		-0.0006
		(0.0005)		(0.0006)		(0.0004)
female	-1.3***	-0.91***	-0.78***	-0.42***	-0.55***	-0.39***
	(0.077)	(0.237)	(0.057)	(0.159)	(0.0358)	(0.102)
FemaleXsouth		0.0976		-0.00740		0.119

		(0.374)		(0.223)		(0.149)
FemaleXCentral		0.114		0.176		-0.0883
		(0.309)		(0.293)		(0.147)
FemaleXNorth		0.618*		0.238		0.192
		(0.343)		(0.366)		(0.179)
FemaleXEast		-1.336***		-0.460**		-0.238*
		(0.309)		(0.203)		(0.140)
HH wealth	0.109***	0.087***	0.055***	0.0572***	0.0477***	0.0444***
	(0.005)	(0.007)	(0.005)	(0.008)	(0.0025)	(0.0034)
Female X		0.0911***		0.0129		0.0185***
wealth		(0.0122)		(0.0092)		(0.0062)

7063 observations. Controls in all models include age, wealth squared, two of three rural/urban dummy variables (large urban is omitted), 4 of 5 dummy variables for region (west omitted), family size, and a constant term. Even numbered columns also include female interactions with wealth squared and the rural/urban dummy variables. Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

country. The negative wealth differential indicates that the positive effect of the policy for females is bigger for poor households than for wealthier ones. As previously discussed, wealthier households tend to have a lower gender gap in education, as is also found in Table 2.

In the probit model for five years, we do not see an effect of the policy overall or for females. However, the effects are positive and significant for the probability of completing eight years. The overall effect is smaller after we add the female differential effect to the model, but both are positive and significant. We again see the interaction of the policy and household wealth for females in this model – that the impact is bigger for those in households with less wealth. In this model we also see a disturbing negative differential effect of the policy for females in the eastern region. We might have hoped that females would benefit in places where they were most disadvantaged, such as the eastern part of the country. However, controlling for household wealth, there were differential positive effects of the policy change for females in all regions of the country *except* the east.

Note also in Table 2 that females have lower overall education than males, and that females in the eastern region suffer an even larger negative differential than in other regions. We

also find that higher wealth households confer higher education levels, and that the gender gap is systematically lower in higher wealth households.

VII. Conclusions

As we hypothesized there is an overall positive effect on attaining eight years of education, but not five years of education. Also as hypothesized, females were disproportionately beneficiaries of this policy change. However, we find a troubling persistent gender gap in the eastern part of the country, and that, controlling for other factors, females did not get the predicted differential boost there, as they did elsewhere in the country.

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