Keeping Kids in School and Out of Work: Compulsory Schooling and Child Labor in Turkey

Meltem Dayıoğlu
Murat Güray Kırdar

DISCUSSION PAPER SERIES

Keeping Kids in School and Out of Work: Compulsory Schooling and Child Labor in Turkey

Meltem Dayıoğlu
Middle East Technical University

Murat Güray Kırdar
Boğaziçi University, American University of Beirut and IZA

ABSTRACT

Keeping Kids in School and Out of Work: Compulsory Schooling and Child Labor in Turkey*

We examine the effects of a compulsory schooling reform on child labor in Turkey, which extended the duration of schooling from 5 to 8 years while substantially improving the schooling infrastructure. We employ four rounds of Child Labor Surveys with a very rich set of outcomes. The reform reduces child labor by 4.8 percentage points (28 percent) for 12- to 17-year-olds and by 1.7 percentage points (81-percent) for 7- to 11-year-olds. For girls, the probability of spending long hours on household chores also reduces. We find that school enrollment and child labor are highly substitutable in rural areas, but not as much in urban areas. The policy effect at first increases but then sharply declines in parental income, which is consistent with the luxury axiom. Favorable effects of the reform on a large range of child labor outcomes suggest that incapacitation effects of a compulsory schooling policy (combined with investment in schooling infrastructure) can be more successful than child labor laws in combatting child labor—as monitoring school enrollment is much easier.

Corresponding author:
Murat Güray Kırdar
Department of Economics
Boğaziçi University
Bebek
Istanbul 34342
Turkey

E-mail: murat.kirdar@boun.edu.tr

1. Introduction

Child labor remains a concern in many parts of the developing world. The latest estimates of the ILO suggest that there are 152 million child laborers worldwide, making up 9.6 percent of the child population (ILO, 2017). Several adverse effects of child labor have been reported on children's human capital accumulation (Baland and Robison, 2000; Beegle et al., 2009), learning outcomes (Emerson et al., 2017), health (O`Donnell et al., 2005), and future labor market outcomes (Emerson and Souza, 2011; Beegle et al., 2009). In this paper, we examine the effect on child labor of a policy in Turkey that increased the duration of compulsory schooling with a substantial investment in schooling infrastructure.

In 1997, the duration of compulsory schooling was extended from five to eight years in Turkey. At the same time, the government improved the schooling infrastructure significantly via two major policy tools: (i) bussing students in small villages to larger villages/towns, (ii) construction of boarding schools. The policy made a substantial impact on completed years of schooling, especially in rural areas—because of both the high drop-out rate at the end of compulsory schooling and the length of the extension. Kırdar et al. (2016, 2018) report that the policy increased the average completed years of schooling by more than a year. During this time period, child labor was pervasive in Turkey. In 1994, a few years before the extension of compulsory schooling, 15.3 percent of 6-17-year olds or 2.5 million children were employed; moreover 6-14-year-olds made up 40 percent of this group (TurkStat, 1997).[1]

Compared to the previous literature on the effects of schooling interventions on child labor, our study has two main advantages. First, we have a very rich and broad set of variables to account for different forms of child labor. We use four rounds of Child Labor Force Surveys of Turkey—applied to 6- to 17-year-old children, which are conducted as ad-hoc modules of the Household Labor Force Surveys of Turkey. Hence, we have employment definitions that are consistent with those in the standard labor force surveys. In addition, we have a very rich set of outcomes on type of employment (wage work or unpaid family work) and sector of employment (agriculture, manufacturing, and services). We also have information on age at first employment and hours of work. The latter variable allows us to examine part-time and full-time employment, as well as long

---

[1] Conditional on its income level, Turkey has a high level of child labor (Figure 1 in Edmonds and Pavcnik [2005]).

hours of employment and hazardous employment. In addition, we have detailed information on time spent on household chores—which is typically not available in standard labor surveys. We also generate variables for various combinations of schooling with employment and with time spent on home chores.

The second advantage of our study is the nature of the compulsory schooling policy we use, which provides us methodological and substantive advantages. First, the timing of the reform is plausibly exogenous to child labor outcomes, as well as schooling outcomes, because its motivation was political. Second, the policy affects a large fraction of the population because about half of the population did not continue beyond compulsory schooling before its implementation in 1997. Third, since the policy has a large impact on schooling outcomes, it becomes easier to assess the degree of substitutability between child labor and schooling. Finally, although the target population of the policy was 12- to 14-year-olds, the policy has strong spillover effects on the school enrollment of both younger and older children, especially the latter. Hence, we can analyze the policy effect on employment of various age groups of children.

In estimating the effect of the schooling reform on child labor, we employ a difference-in-differences methodology using pre- and post-policy data. We identify the impact of the schooling reform by making use of the fact that not all birth cohorts of children are affected from the change in the compulsory schooling law. We conduct the analysis for 7- to 11-year-old children (primary school ages) and 12- to 17-year-old children (middle school and high school ages) separately. Moreover, for each age group, we provide estimates by rural and urban status and by gender.

Our results indicate that the policy decreases the incidence of child labor by 4.8 percentage points (28 percent) for 12- to 17-year-olds and by 1.7 percentage points (81-percent) for 7- to 11-year-olds. The policy effect on child labor is stronger in rural areas and for girls—the groups for which the policy has larger effects on school enrollment. It is part-time unpaid family work in agriculture that is eliminated the most by the schooling reform. Wage employment in urban areas also falls among 12- to 17-year-old children, by 2.3 percentage points (20 percent) for boys and by 1.8 percentage points (40 percent) for girls. Furthermore, the policy changes boys' type of employment in urban areas; a transition is observed from wage employment to unpaid family work for 12- to 17-year-olds and from full-time to part-time employment for 7- to 11-year-olds. The reform also

substantially reduces the probability of spending long periods of time on home chores (16 hours or more per week) for 12- to 17-year-old girls both in urban and rural areas, but not for boys.

Our paper makes a number of contributions to the literature. The first one is to the important discussion in the child-labor literature on whether interventions aimed at increasing education cause a drop in child work as much as they cause a rise in schooling. Ravallion and Wodon (2000) and Edmonds and Pavcnik (2005) argue that child labor and schooling are imperfect substitutes. Kondylis and Manacorda (2014) note that many children in Africa are neither in school nor in employment; therefore, an increase in schooling does not necessarily translate into a fall in child labor. A number of studies, in fact, find strong evidence for this.[2]

We find that, for 12- to 17-year-old children, the drop in child labor is as large as the rise in school enrollment in rural areas, but smaller in urban areas. For 7- to 11-year-old children, our results are even more surprising. The policy effect on child labor is stronger than the policy effect on school enrollment in rural areas. This finding is related to the tools used in the implementation of the Turkish schooling reform. The facts that many rural children are bussed to schools far away from their villages and that many others are housed in boarding schools reduce their exposure time to family-farm work. Our findings are also interesting in the way that the policy effect is stronger for girls than for boys among both age groups—which is contrary to the finding of most studies in this literature.[3]

Our second contribution is to the literature on the efficacy of minimum working-age and compulsory schooling laws on schooling and child labor. Edmonds and Shrestha (2012), using micro-data from 59 developing countries find that minimum age of employment explains less than

---

[2] Ravallion and Wodon (2000) find that a targeted enrollment subsidy in rural Bangladesh that reduces the cost of schooling increases schooling by far more than it reduces child labor. Bourguignon et al. (2003) and Cardoso and Souza (2009) find that conditional income transfers in Brazil increase schooling but have no significant effect on child labor. Other studies that find a much smaller impact on child labor than schooling of education-focused interventions include Attanasio et al. (2010), Levy and Ohls (2007), de Hoop and Rosati (2014). On the contrary, Alam et al. (2011) find that a school stipend program targets girls in Pakistan reduces child labor without increasing schooling—which also signals that child labor and work are not perfect substitutes.

[3] Reviewing a number of studies on the effect of cash transfers on child labor by gender, de Hoop and Rosati (2014) conclude that the policy effect is on average 3.3 percentage points higher for boys.

1 percent of the variation in child participation in paid employment. In the US context, studies looking at historical data such as Lleras-Muney (2002) and Goldin and Katz (2003) find that the increase in the minimum age of employment in the US in the early 20th century (1915-1935) only marginally increased schooling but did not reduce child labor.[4] The evidence on the efficacy of compulsory schooling laws is, however, mixed. Lleras-Muney (2002) and Goldin and Katz (2003) also find small effects of compulsory schooling laws in the US. Goldin and Katz (2003) attribute the modest effect of these laws to the fact that these laws were not pro-education but antitruancy and antivagrancy. On the other hand, compulsory schooling programs have been much more successful in improving enrollment in other countries. For instance, Oreopoulos (2006) reports that as the UK increased the minimum school leaving age from 14 to 15 in 1947, the fraction leaving school at age 14 fell from 57 to 5 percent. Goldin and Katz (2003) attribute the success in the UK to increased educational access and more spending. While resources such as schools and teachers were already available in the US, it was not the case in the UK.[5] Brunello, Fort and Weber (2009) report that the increase in the minimum school leaving age in 12 European countries, enacted mostly in the second half of the 20th century, increased schooling by about 0.3 years with little variation across countries.[6]

---

[4] Studying an earlier period in the US (1880-1910), Moehling (1999) argues that the decline in child labor allowed the minimum working age law to be instituted at the time, rather than vice versa. Essentially, Moehling (1999) argues that labor demand and supply factors reduced child labor and reforms came afterwards, as formalized in a model by Doepke and Zilibotti (2005).

[5] In a theoretical contribution, Cigno (2012) shows that in the face of imperfect credit and insurance markets and when children's time-use and intra-family transfers are private information, compulsory schooling accompanied by transfers constitutes the second-best policy in increasing child schooling and reducing child labor.

[6] Substantial positive effects of compulsory schooling policies, many of which are complemented with investment in schooling infrastructure, are reported for several other countries. Black, Devereux and Salvanes (2005) find that the 1959 compulsory-schooling reform in Norway, which increased access to schools via additional funds for teachers and buildings, raised schooling duration by 0.12 years. Fang et al. (2012) report that the compulsory education law of 1986 in China—where local governments could collect education taxes to implement the program—increased the average duration of schooling by 0.8 years. Osili and Long (2008) find that the universal primary education program in Nigeria—which planned to increase classroom capacity by 40 percent—increased the duration of schooling by 1.54 years for women. Elsayed (2017) finds that the extension of compulsory schooling by one year in Egypt in 2004 increased total years of schooling by 0.6 to 0.8 years

Our study shows that combining a compulsory schooling policy with substantial investment in infrastructure not only increases school enrollment—as in the European context—but it also reduces child labor. In fact, this is the first study—to the best of our knowledge that shows the causal impact of a compulsory schooling policy on child labor.[7] In addition, given the evidence in the literature on the lack of success of minimum age of employment laws, our study implies that compulsory schooling policies—coupled with investment in infrastructure—could be much more successful in reducing child labor because schooling is easier to monitor than child labor.

Our third contribution is to the literature on the effects of school infrastructure and commuting costs on child labor. Foster and Rosenzweig (2004) find that school construction in India during the Green Revolution increased school enrollment while decreasing child labor.[8] A number of other studies that directly examine the effect of distance to school on child labor arrive at mixed results. Siddiqi and Patrinos (1995) and Bhalotra and Tzannatos (2003) find that distance to school increases child labor. On the other hand, Kondylis and Manacorda (2014) find that while distance to school affects school enrollment, no evidence of an effect on child labor exists. We find that the reduction in commuting costs has a strong negative effect on child labor in Turkey.[9]

Our final contribution is with regards to the luxury axiom introduced in the seminal paper of Basu and Van (1998), according to which children only work when their parents' income is below a subsistence income. We examine how the policy effect varies by parental education and find a nonlinear relationship between the policy effect and parental education, where the policy effect increases in parental education at low levels but disappears completely once a threshold—that

---

[7] Dayıoğlu (2005) descriptively compares the level of child labor in Turkey before and after the 1997 policy; however, it does not measure the causal impact of the policy. Dincer and Erten (2015) examine the causal effect of a later compulsory schooling policy in Turkey—implemented after 2012 that increased compulsory schooling to 12 years—on the employment of youth (ages 15 and above), using the Turkish Household Labor Force Surveys.

[8] Duflo (2001) and Handa (2002) find strong positive effects of school construction on enrollment.

[9] Kondylis and Manacorda (2014) argue that an initial reduction in commuting costs make it feasible for children to combine schooling with work. However, this is not possible in our setting because neither bussing nor boarding schools increases the available time for work for children in Turkey. This could partly explain the difference between the findings.

corresponds to subsistence income—is passed. These findings are consistent with the luxury axiom.

The paper is organized as follows. Section 2 gives a brief account of child schooling and employment outcomes in Turkey, as well as of the 1997 education reform. Section 3 provides a conceptual framework. Section 4 describes the data and Section 5 presents the identification method and estimation. The results are presented in Section 7. Section 8 concludes.

2. Background Information

2.1 Schooling Outcomes and the 1997 Reform

Prior to 1997, compulsory schooling in Turkey consisted of 5 years of primary schooling. Children typically start school at age 6 so that they were out of school by age 12. Middle school and high school education were non-compulsory. In 1997, compulsory schooling was extended to 8 years by merging primary and middle schools under the umbrella of basic education, effectively increasing the school leaving age to 15. The law was passed in August 1997, via amendments made to the Basic Education Law (no.4306), and was immediately put into force in the 1997-1998 school year. Children who would be fifth graders in the 1997-1998 school year were required to stay in school for an additional three years before they could earn a basic education diploma.

The timing of the policy was not related to children's school enrollment and employment outcomes at that time; instead, it was a result of political developments. The extension of compulsory schooling had long been an issue of discussion. The secular-minded government, which came to power at that time, seized this opportunity and made middle school part of compulsory education, seeing the extension of compulsory schooling as a mechanism to curtail religious education—an education track that would be available only upon the completion of compulsory schooling.

Figure A1 in the Appendix shows the effect of this policy on the number of students in grades 1 to 8 by rural and urban status. Between the 1997-98 school year and the 2000-01 school year, the number of urban students in grades 1 to 8 increased by 13.7 percent (from 6.75 to 7.67 million) compared to the 1.8-percent increase in the preceding 3-year interval and the number of rural students in grades 1 to 8 rose by 20 percent (from 2.35 to 2.8 million) compared to the 1.4-percent fall in the preceding 3-year interval (due to rural to urban migration).

The law change was accompanied by measures that were intended to make the newly mandated schooling levels accessible to all children, particularly those living in sparsely populated or remote rural areas who would have to travel to the nearest town to attend school. The most important measure in this regard was the expansion of the bussing system and the construction of boarding schools. Within a very short-time from the 1996-1997 school year to the 1999–2000 school year, the number of children bussed to school increased nearly by five folds—from 127,683 to 621,986. Similarly, from the 1996-97 school year to the 2001-02 school year, the number of students accommodated in boarding schools, free of charge, increased from 34,465 to 281,609 (Kırdar et al., 2016). Although all schooling levels were (and continue to be) tuition-free, prior to the reform, students were expected to meet their own travel expenses to attend (then) non-compulsory 6th through 8th grades. Furthermore, to accommodate the increasing student population, the Ministry of Education increased the number of classrooms in the existing schools and hired more teachers so that the pupil teacher ratio remained at around the pre-reform level. The share of the Ministry of Education in the public investment budget increased from 14.7 percent to 37.3 percent in a single year from 1997 to 1998 and remained at around 30 percent until 2000 (Kırdar et al., 2016).

Studies that investigate the impact of the 1997 school reform on various labor and demographic outcomes (but not on child labor) find strong positive effects of the reform on the schooling attainment of boys and girls for the years that they are mandated to stay in school (see Kırdar et al., 2016, 2018; Aydemir and Kırdar, 2017; Aydemir et al., 2019). In addition, although the 1997 reform targeted middle school aged children (12 to 14-year-olds), the above studies also find sizeable spill-over effects onto high school as well. Kırdar et al. (2016) estimates the overall improvement in schooling by age 17 to be 1.4-1.5 years for rural children and 0.7-0.8 of a year for urban children. The strong effect of the policy results not only from the long duration of the extension (3 years) but also from the high drop-out rates after finishing compulsory schooling at that time. In fact, in 1997, the net enrollment rate in middle school—the first level of non-compulsory schooling—was only 52 percent (World Bank, 2013).

2.2 Child Labor in Turkey

In this section, we review the institutional structure on child labor in Turkey and provide brief information on the patterns of child labor. While minimum working-age laws have been in effect in Turkey, they do not have practical significance. Prior to 1997—when the compulsory schooling

reform was implemented—children younger than 12 were not allowed to work (Labor Law no. 1475). However, due to ineffective enforcement and the concentration of children in small establishments and in family farms and businesses that fell outside of the jurisdiction of labor inspection, children even younger than 12 worked. For instance, according to the 1994 Child Labor Survey, 4.4 percent of all and 8.3 percent of rural 7- to 11-year-old children were employed. Also prior to 1997, the minimum working-age limit was higher (15 years) in certain sectors such as industry. However, of 12- to 14-year-old boys living in urban areas in 1994, 3.9 percent worked in industry (1994 CLS).

In 2003, a new Labor Law (no. 4857) was passed and the minimum age of employment was set at 15. However, similar to the previous Labor Law (no. 1475), agricultural establishments employing less than 50 workers, small non-agricultural establishments employing three or fewer workers, family businesses and farms and apprentices were exempt from the provisions of this law (Exemption clauses, no. 4). As will be discussed shortly, the concentration of working children in family-run establishments and farms, and small-scale businesses places them outside the jurisdiction of the labor law. Nonetheless, 2.8 percent of all and 3.3 percent of urban 12- to 14-year-old children were employed in non-agricultural sectors according to the 2006 Child Labor Force Survey. In essence, laws exist to protect children but they are not enforced.

The latest statistics on child labor that are based on the 2012 Child Labor Survey of the Turkish Statistical Institute indicate that there are 893 thousand employed children in Turkey making up 5.9 percent of 6-17-year-olds. Child workers are mostly composed of older children (i.e. 15-17-year age group with a share of 67.3 percent), boys (68.8 percent) and rural children (55 percent). Agriculture is the main sector of employment for children. In 2012, 44.1 percent of working children were employed in agriculture, a quarter in industry and a third in services. The dominance of agriculture is to do with the prevalence of small-scale family farms, where children are employed as unpaid family workers. Although wage work is more prevalent among children employed in industry and services, where 88 percent of working children were found in 2012, in agriculture the overwhelming majority (84.5 percent in 2012) are contributing family workers. All young children (age less than 15) are employed informally, which is also true for the majority (80.7 percent in 2012) of 15-17-year-olds.

Children work for very long hours; nearly three quarters of children in 2012 worked over 15 hours per week, with nearly a half working for 40 or more hours per week. Naturally, such long hours make it very difficult for children to combine work with schooling with the result that only a half of working children in 2012 were enrolled in school. Note that apprentices, who work under a formal engagement and typically for 4 or 5 days a week and who attend school only one day a week, are considered 'students'. Children who are neither in school nor in employment or training, the NEET group, constituted 5.6 percent of 15-17-year-olds in 2012. This group is mostly composed of girls (64.4 percent) because the NEET definition ignores household chores. When household chores are also taken into account, the 'inactive' children reduce to 2.1 percent of all children, with girls having a lower rate of inactivity than boys.

3. Conceptual Framework

We view a child's time to be divided between school, labor market work, home production (household chores or more formally, unpaid household services), and leisure—see Edmonds (2010) for an explicit model. A change in the cost-benefit structure as a result of the change in the duration of compulsory schooling will change the optimal allocation of time among these activities.

First, the reform lowers the cost of 8-year basic education via the establishment of a massive bussing system and the construction of many boarding schools. Schooling costs in grades 6 to 8 particularly fall because previously these levels were not provided in several locations, such as small villages. In addition, across all locations, the reform also increases the cost of non-attendance in 6th through 8th grades due to the monetary fines introduced for non-enrollment and absenteeism (though these measures were not perfectly enforced) and the psychic costs of not abiding by the law.

Since the fall in schooling costs and the resulting rise in net family income decreases the marginal utility of income obtained from children's market employment and the marginal utility of children's home production, a corner solution for market employment and home production becomes more likely in parents' decision problem on allocating their children's time across these activities and schooling. In the case of an interior solution, time spent on market work and home

production would decrease to make up for the fall in the marginal utility obtained from them. Put differently, market and house work would decline both in the extensive and intensive margins.

Second, the reform changes how various levels of education affect child's future welfare. In the choice between alternative educational levels (primary school = 5 years, middle school = 8 years, high school = 11 years), the policy substantially lowers the return to completing 5 years of schooling because this level of schooling does not yield a diploma after the policy—eradicating the sheepskin effects of primary school.[10] Hence, the marginal benefit of completing middle school over 5 years of schooling and the marginal benefit of completing high school over 5 years of schooling both increase—encouraging children to complete longer years of schooling.[11]

These changes in the cost and benefit structure would affect the groups of children by gender and by rural and urban status differently due to a number of reasons. First, the drop in schooling costs in rural areas is sharper because the bussing scheme and the construction of new boarding schools particularly affect these areas.[12] In addition, the price elasticity of schooling demand varies across groups. Price elasticity of schooling is higher for poorer families to the degree that financial constraints bind, which is more likely in rural than urban Turkey.[13] This implies that not only is the level of fall in schooling costs higher in rural areas but also the level of response for a given amount of fall is bigger. Therefore, we would expect a bigger change in parents' decision on their children's time allocation across schooling, work, and leisure in rural areas—especially in grades 6 to 8, where the fall in schooling costs is most substantial.

---

[10] The sheepskin effects of completing 8 years of schooling (compared to no schooling) would also fall because this group used to distinguish themselves from those with 5 years of schooling as well as those with no school degrees before the policy. After the policy, however, they can distinguish themselves only from the latter group. A similar argument applies to high school graduates. However, for children completing 8 years of schooling or high school— who still have diplomas after the policy—these loses in sheepskin effects would not be as much as those for children completing 5 years of schooling, who do not have any diploma after the policy.

[11] Obviously, these changes in the benefit structure matter to the degree that parents care about the child's future welfare (versus the current standard of living).

[12] Glewwe and Jacoby (1994), Alderman et al. (1996), Lavy (1996), and Glick (2008) report negative association between distance to school and educational outcomes in various developing countries.

[13] Orazem and King (2008) report that the elasticity of school demand with respect to distance is higher in rural areas.

The price elasticity of schooling demand also varies by gender. Alderman and Gertler (1997) show that—under the same assumptions on market incentives and parental preferences that yield higher educational attainment for boys than girls—the price elasticity of schooling demand is higher for girls. These assumptions certainly hold in the Turkish setting as well. Orazem and King (2008), in their review article, report that empirical studies in the context of South Asia and Middle East— where girls have lower educational attainment—generally find a higher price elasticity of schooling demand for girls. Hence, we expect the response to the fall in schooling costs to be larger for girls than for boys.

On the other hand, the change in the benefit structure to schooling via the sheepskin effects would be more important for boys and in urban areas. A big gender gap in labor market participation exists in Turkey, and formal employment is much higher in urban than rural Turkey.[14] These facts yield returns to education to be more important for boys and in urban areas.

Finally, stronger enforcement of compulsory schooling—which came with the reform—would make a bigger difference for rural areas and for girls, because many of the reasons for suboptimal schooling decisions of parents (liquidity constraints,[15] the agency problem, and the information problem) are more relevant in these cases. For instance, in the agency problem, adverse cultural and social norms for the schooling of girls that influence parents' decision make it more likely that what is best for parents is not best for girls. Moreover, financial constraints and the lack of information about returns to education are more likely in rural areas.

4. Data

The data come from four rounds of the Child Labor Surveys (CLS) of the Turkish Statistical Institute (TurkStat), which are nationally representative. The CLS, which is a module of the regularly administered Household Labor Force Surveys (HLFS), was first conducted in 1994, followed by the 1999, 2006 and 2012 rounds. In the first CLS, the target group was 6-14 year-olds.

---

[14] Wolpin (1977) and Glewwe (2002) find stronger sheepskin effects in wage employment compared to self-employment and agricultural work.

[15] Baland and Robinson (2000) and Ranjan (2001) illustrate how liquidity constraints play a role in models of child labor supply and Edmonds (2006) provides empirical evidence for this.

In later applications, this target group was extended to cover children aged 6-17 years. Although children aged 15-17 were not covered in the 1994 CLS, information on their school and work outcomes can be obtained from the 1994 HLFS. Hence, we have nationally representative samples of 6- to 17-year-old children for years 1994, 1999, 2006 and 2012. This forms our core sample.

The sample size of the CLS has expanded over time. While the sample sizes of 1994 and 1999 CLS were 14,729 and 16,728 children aged 6-17, the sample sizes increased to 28,975 and 27,118 in the 2006 and 2012 rounds, respectively. The four CLS have a combined sample size of 87,550 children aged 6-17. From this sample, we drop 6-year-olds because regardless of the survey round they come from, they are all affected by the 1997 school reform. Furthermore, delayed school entry is not uncommon. Hence, the size of our operational sample generated from four rounds of CLS is 81,417 observations consisting of 7-17-year olds.

The core schooling and employment questions in CLS include school enrollment, employment status, sector and type of employment, and hours of work. Using the first three pieces of information, we generate dummy variables for the following: enrolled, employed, wage earner, own account worker, unpaid family worker, employed in agriculture, employed in manufacturing, employed in services. For instance, for school enrollment, the dependent variable takes the value of 1 if the child is enrolled in school and zero otherwise. Using the information on hours of (market) work, we generate three dummy variables: (i) part-time employed to indicate work for less than 30 hours per week, (ii) full-time employed to indicate 30 or more hours of work per week, and (iii) long hours of work as 43 or more hours per week.

Age at first employment is another variable we are interested in, which is defined only for employed individuals. This information was not elicited in the 2012 CLS and it was capped at age 15 in the 1994 CLS; hence, we use this variable only from the 1999 and 2006 rounds of the CLS—unlike all other dependent variables, which are available in all four rounds of the CLS.

Following ILO (2013), we also define 'hazardous employment' based on hours of work. This variable takes the value of 1 for all employed children among 7-11-year-olds, for those who work for 14 or more hours per week among 12-14-year-olds, and for those who work for 43 or more hours per week among 15-17-year-olds; otherwise, it takes the value of zero. This aged based definition of hazardous work follows the rationale that employment even for one hour per week below a minimum age (12 years) can have "adverse effects on the child's safety, health (physical

14

or mental) and moral development" (ILO, 2013, p.45). For older children, these effects are likely to arise when they are engaged in 'long' hours of work defined as above.[16]

Another set of variables that are included in the CLS concern the amount of time children spend on household chores. We generate three alternative definitions for this variable in the form of dummy variables for spending 8 hours or more per week, 16 hours or more per week, and 30 hours or more per week for the reason that the information on this variable are provided as a categorical variable in some rounds of the CLS. In addition, using the information on enrollment, employment including part-time and full-time status, and hours spend on home chores, we also generate variables for various combinations of market work with schooling and house work with schooling.

The CLS also provides important information on parental background that we utilize as control variables. These include age and educational attainment of the household head and household size. In addition, since some children in the household are not the children of the household head, we use a control for whether or not the household head is a parent of the child.

A key variable for our analysis is urban and rural status of place of residence, as we conduct our empirical analysis by this status. TurkStat defines rural areas as locations with a population below 20,000. Note that rural areas do not have to be villages; several district centers, as well as other towns, have a population that is below this threshold.

4.1 Descriptive Statistics

Descriptive statistics are provided for the sample of 12- to 17-year-old children in Table 1 and for the sample of 7- to 11-year-old children in Table 2.[17] In each sample, about 40 percent of children live in rural areas. The compulsory schooling policy affects 52.7 percent of children in the older group and 73.6 percent of children in the younger group. Among 12- to 17-year-old children, the average school enrollment rate is 70 percent, with about an 18 percentage-point gap between urban and rural children. Boys fair better, their enrollment rate being 11 percentage points higher than

---

[16] Hazardous work also includes children engaged in hazardous industries and occupations and those working under hazardous conditions. We were not able to incorporate these aspects of hazardous work because only the CLS include work conditions and the industry and occupation categories released in public-use data files are too broad to allow for the identification of hazardous industries and occupations.

[17] We use sampling weights throughout the paper.

that of girls. Among 7- to 11-year-old children, the school enrollment rate is 97.7 percent. The enrollment rate in urban areas is 1.1 percentage point higher than that in rural areas, and the gender gap is 1.6 percentage points in favor of boys.

As can be seen in Table 1, among 12- to 17-year-olds, about 17 percent are employed. The employment rate is higher for boys (21.1 percent) than girls (12.5 percent), and is much higher in rural areas (26.2 percent) than urban areas (10.5 percent). The higher employment rate of boys than girls is more pronounced in urban areas than rural areas. Full-time employment is more common than part-time work. Of the employed children, about 69 percent work full-time. The fraction of full-time employed in all employed children is also higher for boys (72 percent) and for urban areas (84 percent). Also of the employed children, about 48 percent work for long-hours and almost 60 percent are engaged in hazardous work. The probabilities of long hours of work and hazardous employment among employed children are also higher for boys and for urban areas. Nonetheless, the levels of long hours of work and hazardous work are still higher in rural areas than urban areas due to the higher level of total employment.

As discussed earlier, while in rural areas children commonly work in agriculture as unpaid family workers, in urban areas wage work in industry and services is more common. Table 1 shows that 78.5 percent of employed children in rural areas are unpaid family workers while 80.5 percent of employed children in urban areas are wage workers. In rural areas, 81.1 percent work in agriculture; this ratio is especially high for girls at 91.3 percent. In urban areas, employment is roughly evenly split between manufacturing and services.

As can also be seen from Table 1, girls are much more likely to spend long hours on household chores; while 16.6 percent of girls do household chores for 16 hours or more per week, the corresponding rate among boys is 1.9 percent. Time spent on household chores is higher in rural areas regardless of gender. As noted earlier, the incidence of combining work and school is low; only 0.8 percent combine school with full-time work and 2.5 percent combine school with part-time work. The probability of combining school with part-time work rises to 4.2 percent in rural areas and to 5.9 percent for rural boys. However, a larger proportion of children, 12.1 percent, combine work and household chores, when the latter is defined as 8 hours or more per week of chores. This proportion is higher for rural girls at 17.2 percent and urban girls at 18.4 percent.

Next, we turn to Table 2 for the employment outcomes of 7- to 11-year-old children. For this group, the employment rate stands at 2.1 percent, with a large rural-urban gap but a small gender gap. While 4.5 percent of rural children are employed, only half a percent of urban children are. Unlike the older group, part-time employment is much more common; 81 percent of all employed children in this group are part-time workers. As for the older group, most employed children in rural areas are unpaid family workers (97 percent) and work in agriculture (97 percent) whereas wage work and employment in industry and especially services are more common in urban areas. The gender gap in time spent on home chores exists for this group as well. While 11.1 percent of girls spend 8 hours or more per week on this activity, 3.8 percent of boys do.

Figure 1 shows the prevalence of child labor in Turkey over time. As can be seen in panel (A), which presents the profiles for the two age groups, child labor falls sharply between 1994 and 2006 for the 12-17 age group whereas the drop in child labor is limited to the 1994-99 period for the 7-11 age group. These patterns are consistent with the timing of the policy and how it affected the two age groups differently. Since the policy was implemented in the 1997-98 school year and its impact takes three years to phase out (until the 2000-01 school year), the policy impact on the 12-17 age group is realized both between 1994 and 1999 and between 1999 and 2006 in Figure 1. On the other hand, between 2006 and 2012 —the only interval the policy does not make a difference for the 12-17 age group—child labor does not fall for this age group. For the 7-11 age group, unlike that for the older age group, everybody is affected by the policy in the 1999 survey. Hence, the policy impact is restricted to the interval between 1994 and 1999. In fact, this is the period where the drop in child labor occurs for this age group while the profile is rather constant after 1999.

Obviously, the above discussion is only suggestive. There could be secular time trends that would contribute to the downward sloping parts of the profiles in panel (A) of Table 1. In the identification of the policy effect, it will be critical to disentangle the policy effect from such potential time effects. Panel (B) of Figure 1 further shows that the decline in child labor is observed for all groups by gender and rural/urban status. However, the drop is particularly sharp for rural areas—which is in line with the stronger effect of the compulsory schooling policy in rural areas. In addition, within rural areas, the drop between 1994 and 2006 is somewhat larger for girls than boys despite a lower starting level for girls.

5. Identification Method and Estimation

The effects of the 1997 reform on children's schooling and work outcomes are identified by using the variation across birth cohorts of children in the exposure to the new policy. The 1997 reform that increased compulsory schooling from 5 to 8 years affected children who were in the 4th or earlier grades in the 1996-1997 school year. Children typically start school at age 6 – the statuary school start age – so that children born in 1987 or later were required to stay in school for an additional 3 years but not those who were born earlier.

We use the following difference-in-differences regression

$$y_{iat} = \beta_0 + \beta_1 P_{iat} + X'_{iat}\beta_2 + \mu_t + \gamma_a + \rho_{\hat{a}t} + e_{iat}, \tag{1}$$

where i indexes the child, a the age of the child and t the survey round. The dependent variable, enrollment and various employment outcomes, is denoted by y_{iat}. The main variable of interest in all regressions is a dummy variable P_{iat} that shows whether the child is affected from the 1997 schooling reform or not. Other control variables (X_{iat}) include child's age, sex, and relationship to the household head (son or daughter of the head), household characteristics that include household head's age and education, household size and location (rural or urban residence). We control for year and age effects through year (μ_t) and age (γ_a) dummies. In addition, we allow the year effects to vary across age groups ($\hat{a}$ = 7-11, 12-14, 15-17) by interacting a linear time trend with these age group dummies. Standard errors are clustered at the birth-level.

We run equation (1) using ordinary least squares regression, separately for 12- to 17-year-old and 7- to 11-year-old children. This grouping of ages has two reasons. First, children in the former group are directly affected by the policy. The newly mandated years of schooling, grades 6 to 8, correspond to ages 12 to 14. In addition, as mentioned earlier, strong spillover effects of the policy on high school completion are found by previous studies. Hence, we combine ages 15 to 17, which correspond to high school years, with ages 12 to 14. On the other hand, the 7-11 age group are only indirectly affected via the policy tools of construction of boarding schools and the expansion of student-bussing to schools in central areas, as well as better enforcement of the policy. Second, employment levels of 7- to 11-year-old children are much lower and the trend in employment over time for this younger age group is much flatter—as can be seen in Figure 1. In theory, we could also carry out the analysis separately for 12-14 and 15-17 year-olds. However, since we have only

four survey years, our data become quite sparse and the identification of the policy effect (separately from age and year effects) becomes difficult if we further make this separation.[18]

For each age group, we estimate equation (1) separately for 9 subgroups: boys, girls, all children; boys, girls, and all in urban areas; and boys, girls, and all in rural areas. The dependent variables are school enrollment, employment status, age at first employment, hours of employment (part-time, full-time, excessive and hazardous employment), sector of employment (agriculture, industry and services), type of employment (wage employment and unpaid family work), involvement in unpaid household services (whether they are engaged in household chores for a period longer than three alternative thresholds: 8, 16 or 30 hours per week or more). In addition, our dependent variables include combinations of school and market work and of school and home chores.

6. Results

We first present the results on the policy impact for the sample of 12-17 year-olds, followed by the results for 7-11-year-olds. Then, we discuss the heterogeneity in the policy impact by parental education for both age groups of children.

6.1 Policy Effect for 12- to 17-year-old Children

We present the policy impact of the school reform on 12-17-year-olds in Table 2, which also includes the mean values of the outcome variables to be able to better assess the magnitude of the effects. Here, we allow the time trends in the outcome variable to differ for the 12-14 and 15-17 age groups. In Table 2, the dependent variable is given in column (1). While columns (2) to (4) in panel (A) show the results for the full sample, columns (5) to (7) in panel (B) give the results only for rural areas and columns (8) to (10) in panel (C) only for urban areas. In each panel, the results are given by gender, in addition to the total sample. Columns (2), (5), and (8) present the results for the total sample, whereas columns (3), (6), (9) show it only for boys and columns (4), (7), and (10) only for girls. The same format is used in all tables.

The results indicate a strong policy impact on the school enrollment of children. The effect for the total sample, given in column (2), is 7.4 percentage points, or 10.6 percent (given the mean value

of the dependent variable at 70 percent). The policy effect is stronger on girls than boys and on rural than urban children. It increases enrollment by 4.5 percentage points for boys compared to 10.4 percentage points for girls and by 12.6 percentage points in rural areas compared to 4.1 percentage points in urban areas. The most favorable effects are observed for rural girls, the most disadvantaged group in terms of school enrollment, for whom enrollment probability increases by 17.1 percentage points or by about 34 percent. These results corroborate the findings in the literature discussed earlier.

The school reform reduces employment of 12- to 17-year-old children by 4.8 percentage points or by 28 percent, as can be seen from column (2) of Table 2. The policy effect on employment is bigger for girls, especially when the average employment rates of the two groups are taken into account. Employment of girls in this age group drops by 5.4 percentage points (by 43.2 percent) while boys' employment falls by 4.9 percentage points (23.2 percent). The policy impact on child labor is almost completely driven by rural areas. The incidence of child labor falls by 11.7 percentage points (45 percent) in rural areas. Both in urban areas and in rural areas, larger effects are found for girls. The stronger employment effects for girls and in rural areas are consistent with the stronger enrollment effects for these groups.

Among all groups of children, rural girls are affected the most from the school reform; their employment probability drops by 12.6 percentage points or by a staggering 55.5 percent. In urban areas, the policy leads to a small absolute decline in girls' employment probability (1.1 percentage points) but because of low levels of employment among girls in urban areas this effect translates into a 21.2-percent reduction.

The age at which children start working for the first time (for the sample of employed children) increases by 0.74 years with the policy. However, this is driven mostly by the policy effect in rural areas. In fact, the policy increases the age at first employment by more than a year for girls and by almost one and a half years for boys in rural areas; whereas, the policy effect in urban areas is much smaller and statistically insignificant at the conventional levels. In other words, the school reform not only lowers the incidence of employment in rural areas, but it also changes the composition of child labor force towards older children.

When we examine the effect of the policy on full-time vs. part-time employment, we observe a larger reduction in part-time employment for rural areas and for the total sample, but a larger

reduction in full-time employment for urban areas. For the full sample, while full-time employment decreases by 1.3 percentage points (11 percent), part-time employment falls by 3.6 percentage points (68 percent). The drop in part-time employment is particularly sharp in rural areas, at 9.6 percentage points; in fact, the policy almost eradicates part-time employment in rural areas for 12- to 17-year-old children. Full-time employment also drops in rural areas, but this is relatively smaller at 2.2 percentage points (14 percent). In urban areas, on the contrary, the fall in full-time employment is larger, but imprecisely estimated except for urban girls.

Long hours of work and hazardous work could be especially detrimental for the development of children. While no evidence exists of a fall in the incidence of long hours of work, the probability of engaging in hazardous work falls by 3.2 percentage points for all children (32 percent). This drop is bigger for girls, 4.1 percentage points or 64 percent, than for boys, 2.7 percentage points or 20 percent. Most of this drop, regardless of gender, is driven by rural areas, where the reduction is 6.1 percentage points (46 percent) for all children.

As noted earlier, the dominant form of employment for children is wage work in urban areas and unpaid family work in rural areas. The policy effects observed are consistent with this pattern. In rural areas, the probability of unpaid family work drops by 13.3 percentage points or 65 percent for all children, which is consistent with the fall in part-time work. However, this time, the fall is larger for boys both in absolute terms (15.0 vs. 11.8 percentage points) and in percentage terms (69 vs. 60 percent), as some boys make a transition from unpaid family work to wage work. In fact, the incidence of wage work among rural boys increases by 3.0 percentage points, which is likely to be a result of the higher human capital of 15- to 17-year old children resulting from the policy. In urban areas, the probability that children are employed as wage earners reduces by 1.8 percentage points or 21 percent. While this reduction is larger for boys in absolute terms, it is larger for girls in percentage terms. At the same time, unpaid family work increases for urban boys, suggesting that some boys who cannot combine wage employment with school start working as unpaid family workers.

When we come to the sector of employment, the results suggest a substantial drop in the probability of agricultural employment in rural areas, as well as a drop in employment in services for urban girls. The drop in the probability of agricultural employment for rural children is 11.9 percentage points (56 percent), which tallies with the overall reduction in employment in rural areas. Stronger

21

policy effects are again observed for girls (61 percent) as compared to boys (51 percent). These findings are in line with the findings for unpaid family work and part-time work.

As a result of the compulsory schooling policy, we might expect an increase in the incidence of children combining work with schooling. However, as can be seen from Table 2, no such evidence exists. On the contrary, for rural boys, the incidence of combining part-time work with schooling decreases. This is likely to result from the bussing of children to schools located in bigger and more central villages and enrollment in boarding schools.

Next, we move on to examine the policy effect on time spent on household chores by children. The results are given in Table 3. Three different minimum thresholds are taken for the number of hours spent on household chores: 8 hours, 16 hours, and 30 hours, in accordance with the grouping structure in the dataset. For girls, the policy reduces the incidence of spending long hours on household chores. In fact, the probability of spending 16 hours or more per week decreases by 10.7 percentage points (65 percent), and the probability of spending 30 hours or more per week is virtually eradicated. The reduction in long work hours at home for girls is stronger in rural areas, in accordance with the higher increase in school enrollment in these areas.

Among boys, however, an interesting nonlinear pattern emerges. While no evidence of a policy effect on working for long hours at home exists (16 hours or more), the policy in fact increases the incidence of working for 8 hours or more per week. In other words, as boys are driven out from market work by the policy, they complement their schooling with more time spent on household chores—although the time spent on household chores does not extend beyond a certain limit.

Finally, we examine how the policy affects the incidence of combining schooling with home chores. The fraction of children who combines school with home chores that take 8 hours or more per week increases for all groups. On the other hand, the fraction of children who combines school with home chores that take 16 hours or more per week increases only in rural areas for both boys and girls. Among girls, while the policy decreases the fraction that spends 16 or more hours on household chores as discussed in the above paragraph, some of the girls who do not become less likely to spend 16 or more hours on household chores become more likely to combine 16 or more hours of household chores with schooling.

6.2 Policy Effect for 7- to 11-year-old Children

In this subsection, we restrict our analysis to 7- to 11-year-old children. The results are given in Tables 4 and 5, which correspond to Tables 2 and 3, respectively. As can be seen in Table 4, the policy effect on school enrollment of 7- to 11-year-old children is also positive despite the already high pre-treatment levels. It increases the enrollment of all children in this age group by 1.3 percentage points from a baseline level of 97.7 percent. The positive effect is larger again for girls than for boys, both in rural and urban areas, and is larger in rural areas than in urban areas— although it is imprecisely estimated in rural areas. This finding that the policy increases enrollment even in the already-mandatory grades 1 to 5 is consistent with that in Kırdar et al. (2016), who attribute it to the stricter enforcement of compulsory schooling polices after the new policy and to the sharp increase in the number of children bussed to school and those accommodated in boarding schools.

Table 4 also shows a significant reduction in child labor for these younger children. The policy reduces child labor by 1.7 percentage points, which is equivalent to an 81-percent reduction. While girls' employment is virtually eradicated, boys' employment falls by more than 60 percent. These effects originate from rural areas; in fact, child labor in rural areas drops by 3.5 percentage points (78 percent). It is important to note that no evidence exists that the increase in school enrollment translates into a fall in child labor in urban areas, where pre-policy employment rates are very low to begin with. On the contrary, in rural areas, the fall in employment rates are even higher than the rise in enrollment rates. The reason for this fact in rural areas is interesting. The education reform not only increased school enrollment of rural children, but also changed their school locations. As detailed in Kırdar et al. (2016), the reform led to the closure of some village schools because they were not able to offer all eight mandatory grade levels and instead, many children in small villages were bussed to schools in larger villages where schools that could accommodate all eight grade levels were available. Where bussing was less feasible, many others enrolled in newly-established boarding schools far away from their village. Consequently, some children who could combine school and work in their own village were not able to do so.

In terms of full-time vs. part-time employment, the patterns of the policy effect for 7- to 11-year-old children is different from those for older children. The policy effect on full-time employment is much stronger for younger children; the policy virtually eradicates full-time employment for

this age group. Its effect on part-time employment is relatively smaller—which is just the opposite pattern to that observed for older children shown in the previous subsection. Still, the policy effect on part-time employment is large; which is reduced by 1.1 percentage points (65 percent). An interesting feature is the rise in part-time employment in urban areas along with the fall in full-time employment, which suggests that some children switch from full-time to part-time employment that is more compatible with school attendance. In accordance with the fall in full-time employment, the incidence of long hours of employment—which is equivalent to hazardous work for this age group—also falls.

Almost all of the fall in the employment of 7- to 11-year-old children stems from the elimination of unpaid family work— a dominant form of employment for this age group. Also in line with this is the fact that the jobs eliminated are exclusively in the agricultural sector. A surprising positive effect on services is also observed; however, both the effect and the mean levels are very small and hence this could be just a result of randomness. It could also result from some children substituting agricultural work with certain service jobs.

Table 5 presents the policy effect on time spent on home chores for 7- to 11-year-old children. The policy reduces the incidence of spending 8 or more hours per week on home chores by almost 50 percent across all children in this age group. While this effect is larger in terms of percentage points for girls, it is larger for boys as a percent reduction. The effect is stronger in rural areas both in terms of percentage-point drop and percent reduction. The policy also reduces the probability of spending 16 hours or more per week on home chores in rural areas, whereas it increases this probability in urban areas, which is unexpected. However, as the baseline probabilities are very low (about 1 percent), we interpret this unexpected result to arise from randomness. Table 5 also shows that the incidence of combining schooling with home chores that are 8 hours or more per week drops significantly, which is consistent with the drop in the incidence of spending 8 hours or more per week on household chores.

6.3 Heterogeneity in Policy Impact by Parental Education

Here, we examine whether the policy effect is observed for all groups of children in terms of their parental background or whether the policy effect is restricted to children on the margin. For parental background, we use the total educational attainment of both parents in terms of years of

schooling, which we take as a measure of household permanent income.[19] In accordance with the luxury axiom of Basu and Van (1998), we expect children to be under a higher risk of employment in households below a subsistence level of income. This axiom also implies that the policy effect is strongest for children from households that are just below the subsistence income level (as the fall in schooling costs push them above subsistence consumption). The results are given in Table 6 for 12- to 17-year-old children and in Table 7 for 7- to 11-year-old children in four panels according to the total years of schooling of parents: 0-5 years in panel (A), 6-10 years in panel (B), 11-18 years in panel (C), and more than 18 years in panel (D).

Table 7 shows that the magnitude of the policy effect on school enrollment of 12- to 17-year-old children is nonlinear in parents' schooling. The policy increases school enrollment by 7.2 percentage points for all children in panel (A), whereas the increase is 10.8 percentage points in panel (B) despite the higher initial level. In panel (C), the effect decreases to 3.4 percentage points and becomes statistically insignificant and it becomes negative and close to zero in panel (D). This nonlinear patterns holds for both urban and rural areas. In rural areas, the positive effect in panel (C) is also statistically significant.

The policy decreases the probability of child labor for 12- to 17-year-olds by 6.8 percentage points (27 percent) in panel (A), by 6.0 percentage points (34 percent) in panel (B), and by 1.9 percentage points (28 percent) in panel (C), whereas no such fall is observed in panel (D). While the magnitude of the drop in terms of percentage points decreases in parental education, the percent drop again exhibits a nonlinear pattern—where children with low to medium levels of parental education benefit the most from the policy. This pattern also holds when we restrict the sample to rural areas; the percent reduction in child labor is 38 percent in panel (A), 50 percent in panel (B), and 45 percent in panel (C). However, it is less clear in urban areas; while child labor falls by 2.2 percentage points (13 percent) in panel (A), no evidence of a fall exists in panel (B), but it also falls by 1.1 percentage points (19 percent) in panel (C).

The patterns in Table 8 for 7- to 11-year-old children are similar. School enrollment rises by 2.0 percentage points in panel (A) and by 1.9 percentage points in panel (B), although the baseline

---

[19] For ease of reference, we refer to household head and his/her spouse as children's parents, which, as shown in Table 1, is true for the overwhelming majority of children.

level is much higher in panel (B). Accordingly, while child labor falls by 2.7 percentage points (71 percent) in panel (A), it falls by 2.1 percentage points (91 percent) in panel (B). No evidence of a reduction in child labor is observed in panels (C) and (D). In other words, again, a nonlinear pattern in the relationship between the policy impact and parental schooling is observed where children with low to medium parental education levels benefit the most.

These findings for both age groups are consistent with Basu and Van's luxury axiom. First, the policy effect increases at low levels of household income (parental schooling) and reaches a peak at the level of subsistence income—where total years of schooling of parents is 6 to 10 years. Second, the policy effect drops quite precipitously beyond this subsistence income.

Finally, the first panel of Table 8 is interesting in another way: it corroborates a finding in Section 6 in a stronger way. In rural areas, no evidence of a policy impact on enrollment is observed, whereas strong effects on child labor exists. In urban areas, on the contrary, while the policy increases school enrollment, no evidence of an impact on child labor is observed—although the effect is negative. We attribute the latter finding in urban areas to the low initial employment levels. In rural areas, the strong policy effect on child labor despite the lack of evidence on enrollment results from the tools of the implementation of the schooling reform in Turkey. As discussed earlier, underprivileged children in rural areas became more likely to attend boarding schools and to be bussed to schools in larger villages—which decrease their probability of working on their family farm.

7 Conclusion

The 1997 school reform in Turkey that increased compulsory schooling from 5 to 8 years not only increased children's school enrollment but also reduced child labor substantially. We find that the employment of 12- to 17-year-old children fell by 4.8 percentage points (28 percent) and that of 7- to 11-year-old children by 1.7 percentage points (81-percent). For both age groups, the drop in child labor is stronger for girls. Also for both age groups, the policy effect on child labor is mostly driven by rural areas—where the fall in child labor is 11.7 percentage points (45 percent) for the 12-17 age group and 3.5 percentage points (78 percent) for the 7-11 age group. The fact that the policy effect is stronger in rural areas and for girls is consistent with the stronger policy effect on enrollment of these groups.

In rural areas, the fall in child labor in rural areas comes mostly from part-time jobs as unpaid family workers in agriculture for both age groups, although full-time employment also decreases in rural areas for both age groups. Among 12- to 17-year-olds in urban areas, wage employment falls by 2.3 percentage points (20 percent) for boys and by 1.8 percentage points (40 percent) for girls. Moreover, in urban areas, the policy brings about compositional changes in types of employment held by children. A shift from full-time to part-time employment for the younger group and from wage work to unpaid family work for boys in the older group is observed. In addition, the policy also reduces children engaged in hazardous work, which can be especially detrimental for their development.

The reform also alters children's time allocation on household chores. Among 12- to 17-year-old girls, the probability of spending long hours on home chores (16 hours or more per week) decreases by 10.7 percentage points (65 percent). While this effect holds for both urban and rural girls, it is stronger for the latter. On the other hand, the probability of combining schooling with 16 or more hours on home chores per week increases for both boys and girls in rural areas. Among 7- to 11-year-old children, a reduction in time spent on home chores is observed for girls in both urban and rural areas and for boys in rural areas only—but only above a lower threshold of 8 hours.

Examining how the policy impact varies by parental income—proxied by parental schooling—this study shows that the policy impact on child labor at first increases in parental income but precipitously decreases after a certain income level is reached. These results are very much in line with the luxury axiom of Basu and Van (1998), where child labor exists below a subsistence income level.

This study finds that a policy that aims to improve schooling outcomes reduces child labor as much as it increases school enrollment in rural areas. This implies that child labor and school enrollment are highly substitutable in rural Turkey. However, in urban areas, the substitutability is lower as the fall in child labor lags behind the rise in school enrollment. An interesting finding is that for 7- to 11-year-old children in rural areas, the fall in child labor is even higher than the rise in school enrollment. We attribute this finding to the fact that the policy reduced the exposure time of these children to family-farm work via two key tools of its implementation: housing many students in boarding schools and bussing others to schools in larger villages. This feature of the policy also

reduces the probability of combining schooling with employment and with long hours on home chores for 7- to 11-year-old children in rural areas regardless of gender.

This study also shows that a compulsory schooling policy complemented with a significant investment in schooling infrastructure can be highly successful in reducing child labor, as well as in increasing school enrollment. In this sense, our findings are different from those in the US context, where modest effects of compulsory schooling policies on school enrollment are reported, but similar to that in the UK where an extension of compulsory schooling also with investment in infrastructure increased school enrollment substantially.

Given the findings in the literature that minimum working-age laws are generally unsuccessful in reducing child labor, the huge success of a compulsory schooling policy is remarkable. This results from the enforceability of enacted laws and the incentives they offer. Monitoring school enrollment is much easier than monitoring child labor, hence, enforcing compulsory schooling is less costly than enforcing child labor bans. Furthermore, child labor laws often impose a cost on establishments employing children but not on parents who put their children to work. Schooling laws, on the other hand, when accompanied by appropriate measures as was the case in Turkey, have the potential to change the cost-benefit structure in a way that make schooling the preferred choice over work.

As it has been for European countries in the middle of the 20th century and for Turkey at the end of it, as well as for developing countries like China and Nigeria, implementing compulsory schooling polices—complemented with substantial investment in schooling infrastructure—have been highly successful in improving educational attainment. This paper shows that these policies could be as successful in reducing child labor. In fact, they could be even more successful in less-developed rural areas/countries where it is quite difficult to monitor child labor via minimum-age working laws (as many children work on family farms) and where schooling infrastructure needs more investment. At the same time, given the finding that children from the poorest families do not benefit as much as those from families with income closer to the subsistence level, these policies should be complemented with other programs particularly targeting the very poor.

References

Alam, A., Baez, J. E. and X. Del Carpio (2011), "Does Cash for School Influence Young Women's Behavior in the Longer Term? Evidence from Pakistan." Policy Research Working Paper 5669. World Bank, Policy Research Department, Washington, DC.

Alderman, H., Behrman, J.R., Ross, D. and R. Sabot (1996). "The Returns to Endogenous Human Capital in Pakistan's Rural Wage Labor Market," *Oxford Bulletin of Economics and Statistics* 58(1): 29-55.

Alderman H. and P. Gertler (1997). "Family Resources and Gender Differences in Human Capital Investments: The Demand for Children's Medical Care in Pakistan," in L. Haddad, J. Hoddinott and H. Alderman (eds.), Intrahousehold Resource Allocation in Developing Countries. Baltimore, MD: The Johns Hopkins University Press.

Attanasio, O., Fitzsimons, E., Gomez, A., Gutiarrez, M.A., Meghir, C. and Mesnard, A. (2010) "Children's Schooling and Work in the Presence of a Conditional Cash Transfer Program in Rural Colombia", *Economic Development and Cultural Change* 58 (2):181-210.

Aydemir A. and M.G. Kirdar (2017), "Low Wage Returns to Schooling in a Developing Country: Evidence from a Major Policy Reform in Turkey," *Oxford Bulletin of Economics and Statistics* 79(6): 1046-1086.

Aydemir A. Kirdar, M.G. and Torun, H. (2019), "The Effect of Education on Geographic Mobility: Incidence, Timing, and Type of Migration", CReAM Discussion Paper Series 1914, University College London.

Baland, J.M. and J.A Robinson (2000). "Is child labor inefficient?" *Journal of Political Economy* 108(4): 663-679.

Basu, K. and P.H. Van (1998), "The Economics of Child Labor", *American Economic Review* 88: 412-427.

Bhalotra, S. and Z. Tzannatos (2003), "Child Labor: What Have We Learnt?" Discussion Paper 0317, Social Protection Unit. Washington, D.C: World Bank.

Beegle K., Dehejia, R. and R. Gatti (2009) "Why Should We Care about Child Labor? The Education, Labor Market, and Health Consequences of Child Labor", *Journal of Human Resources*, 44(4): 871-889.

Bourguignon F., Ferreira F. and P. Leite (2003), "Conditional Cash Transfers, Schooling, and Child Labor: Micro-Simulating Brazil's Bolsa Escola Program*," World Bank Economic Review* 17(2): 229-254.

Black, S., Devereux, P. and K. Salvanes (2005), "Why the Apple Doesn't Fall Far: Understanding Intergenerational Transmission of Human Capital", *American Economic Review* 95(1): 437-449.

Brunello, G., Fort, M. and G. Weber (2009), "Changes in Compulsory Schooling, Education and the Distribution of Wages in Europe," *Economic Journal* 119: 516-539.

Cardoso E. and A.P. Souza (2009), "The Impact of Cash Transfers on Child Labour and School Enrollment in Brazil" In: P. Orazem, Z. Tzannatos, and G. Sedlacek. Child Labor and Education in Latin America: An Economic Perspective. Palgrave Macmillan.

Cigno, A. (2012), "How to Deal with Covert Child Labor and Give Children an Effective Education, in a Poor Developing Country", *World Bank Economic Review* 26(1): 61-77.

Dayioglu, M. (2005) "Patterns of Change in Child Labor and Schooling in Turkey: The Impact of Compulsory Schooling", *Oxford Development Studies* 33(2): 231-246.

Doepke, M. and F Zilibotti (2005), "The Macroeconomics of Child Labor Regulation", *American Economic Review* 95: 1492-1524.

de Hoop, J. and F.C. Rosati (2014), "Cash Transfers and Child Labor", *World Bank Research Observer* 29 (2): 202-234.

Dincer, M.A. and B. Erten (2015), "An Early Assessment of Compulsory School Attendance in Turkey: Evidence from a Natural Experiment", Working paper.

Duflo, Esther (2001), "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment", *American Economic Review* 91(4): 795-813.

Edmonds, E. (2006). "Child labor and schooling responses to anticipated income in South Africa," *Journal of Development Economics* 81: 386-414.

Edmonds, E. (2010), "Child Labor", Handbook of Development Economics. T.P. Shultz and J. Strauss (Eds). Oxford: North Holland.

Edmonds, E. and N. Pavcnik (2005) "Child Labor in the Global Economy", *Journal of Economic Perspectives* 19(1): 199-220.

Edmonds, E. and M. Shrestha (2012). "The Impact of Minimum Age of Employment Regulation on Child Labor and Schooling," *IZA Journal of Labor Policy*, December.

Elsayed A. (2017). "Keeping Kids in School: The Long-Term Effects of Extending Compulsory Education," *Education Finance and Policy* 14(3): 1-57.

Emerson, P., Ponczek, V. and A.P. Souza (2017). "Child Labor and Learning," *Economic Development and Cultural Change* 65(2): 265-296.

Emerson, P. and A.P. Souza (2011), "Is Child Labor Harmful? The Impact of Starting to Work as a Child on Adult Earnings," *Economic Development and Cultural Change* 59(2): 345-385.

Fang, H., Eggleston, K., Rizzo, J.A., Rozelle, S. and R. Zeckhauser (2012), "The Returns to Education in China: Evidence from the 1986 Compulsory Education Law", NBER Working Paper 18189.

Foster, Andrew and Mark Rosenzweig (2004), "Technological Change and the Distribution of Schooling: Evidence from Green Revolution in India." *Journal of Development Economics* 74: 87-112.

Glewwe, P. (2002). "Schools and Skills in Developing Countries: Education Policies and Socioeconomic Outcomes," *Journal of Economic Literature* XL, pp. 436-482.

Glewwe, P. and J. Jacoby (1994). "Student Achievement and Schooling Choice in Low Income Countries: Evidence from Ghana," *Journal of Human Resources* 29(3): 842-864.

Glick, P. (2008). "What Policies will Reduce Gender Schooling Gaps in Developing Countries: Evidence and Interpretation," *World Development* 36(9): 1623-1646.

Goldin, C. and Katz, L., 2003. "Mass Secondary Schooling and the State: The Role of State Compulsion in the High School Movement," NBER Working Paper 10075.

Handa, S. (2002) "Raising Schooling Enrollment in Developing Countries: the Relative Importance of Supply and Demand", *Journal of Development Economics* 69(1): 103-128.

ILO. 2017. Global Estimates of Child Labor: Results and Trends 2012-2016, International Labor Office, Geneva.

ILO. 2013. Marking Progress Against Child Labor: Global Estimates and Trends 2000-2012, International Labor Office, Geneva.

Kırdar, G.M., Dayıoğlu, M. and Koc, I. 2016. "Does Longer Compulsory Education Equalize Schooling by Gender and Rural/Urban Residence?" *World Bank Economic Review*, 30(3): 549-579.

Kırdar, G.M., Dayıoğlu, M. and Koc, I. 2018. "The Effects of Compulsory Schooling Laws on Teenage Marriage and Births in Turkey" *Journal of Human Capital*, 12 (4): 640-668.

Kondylis, F. and M. Manacorda (2012), "School Proximity and Child Labor: Evidence from Rural Tanzania", *Journal of Human Resources* 47(1): 32-63.

Lavy, V. (1996). "School Supply Constraints and Children's Educational Outcomes in Rural Ghana," *Journal of Development Economics* 51: 291-314.

Levy, D. and J. Ohls (2010). "Evaluation of Jamaica's PATH Conditional Cash Transfer Programme," *Journal of Development Effectiveness* 2(4): 421-441.

Lleras-Muney, A. (2002), "Were Compulsory Attendance and Child Labor Laws Effective? An Analysis from 1915 to 1939", *Journal of Law and Economics* 45: 401–35.

Moehling, C. M. (1999), "State Child Labor Laws and the Decline of Child Labor", *Explorations in Economic History* 36: 72-106.

O'Donnell, O., Dooarslaer, E. and F. Rosati (2005), "Health Effects of Child Work: Evidence from Rural Vietnam," *Journal of Population Economics* 18(3):437-467.

Orazem, P.F. and E.M. King (2008). "Schooling in Developing Countries: The Roles of Supply, Demand and Government Policy." In Handbook of Development Economics, J. Strauss and D. Thomas (eds.) Vol. 4: 3475-3559.

Oreopoulos, P. (2006), "Estimating Average and Local Average Treatment Effects of Education When Compulsory Schooling Laws Really Matter", *American Economic Review* 96(1): 152-175.

Osili U.O. and B.T. Long (2008), "Does Female Schooling Reduce Fertility? Evidence from Nigeria", *Journal of Development Economics* 87: 57-75.

Ranjan, P. (2001), "Credit constraints and the phenomenon of child labor," *Journal of Development Economics* 64(1): 81-102.

Ravallion, M. and Q. Wodon (2000), "Does Child Labor Displace Schooling? Evidence on Behavioral Responses to an Enrollment Subsidy", *Economic Journal* 110: C158-175.

Siddiqui, F. and H.A. Patrinos (1995), "Child Labor Issues, Causes and Interventions", World Bank Human Capital and Operations Policy Working Paper 56. Washington, D.C: The World Bank.

Turkish Statistical Institute (TurkStat). 1997. Child Labor 1994. Ankara.

Wolpin, K.I. (1977). "Education and Screening," *American Economic Review* 67(5): 949-958.

World Bank. World Development Indicators. http://data.worldbank.org/data-catalog/world-developmentindicators, accessed on August 2013.

Figures

Figure 1 Prevalence of Child Labor

Source: Child Labor Statistics, TurkStat
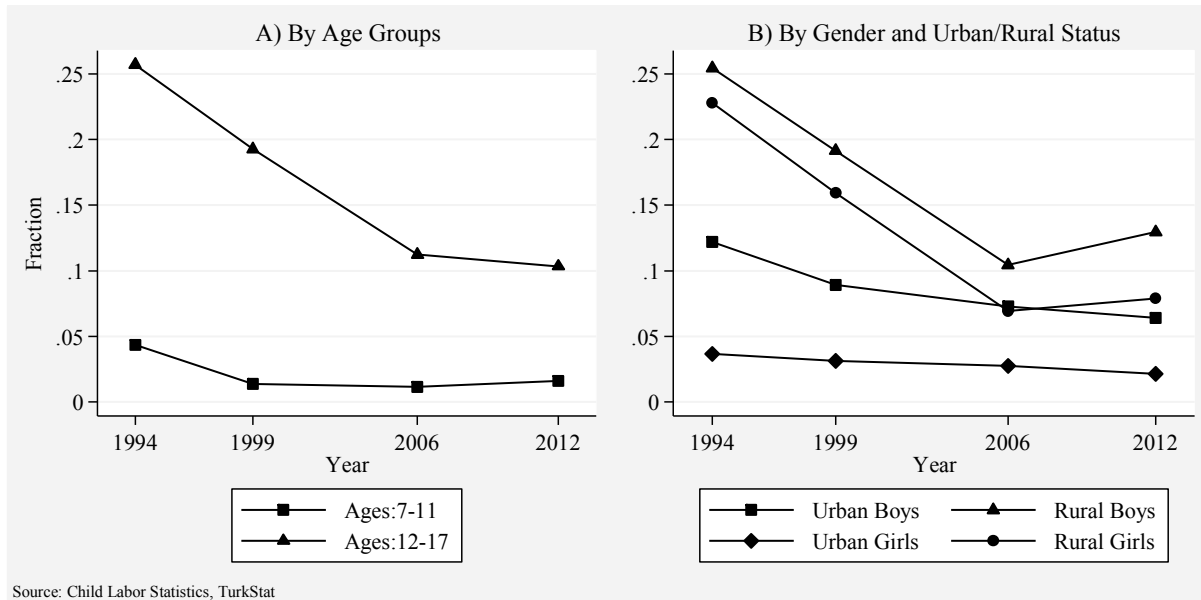
Tables

Table 1: Descriptive Statistics for 12- to 17-year-old Children

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A) Rural and Urban			B) Rural Only			C) Urban Only		
	All	Male	Female	All	Male	Female	All	Male	Female
Age	14.5 (1.7)	14.5 (1.7)	14.5 (1.7)	14.4 (1.7)	14.4 (1.7)	14.5 (1.7)	14.5 (1.7)	14.5 (1.7)	14.5 (1.7)
Male	0.507			0.491			0.518		
Rural Residence	0.407	0.394	0.420						
Policy	0.527	0.523	0.530	0.477	0.470	0.483	0.561	0.557	0.565
Enrolled	0.700	0.754	0.644	0.592	0.680	0.508	0.774	0.803	0.742
Employed	0.169	0.211	0.125	0.262	0.299	0.227	0.105	0.154	0.052
Age at first employment	12.5 (2.6)	12.7 (2.5)	12.3 (2.8)	11.8 (2.7)	12.0 (2.7)	11.5 (2.7)	13.6 (2.1)	13.4 (2.1)	14.2 (1.9)
Full-time employed	0.116	0.153	0.078	0.157	0.187	0.128	0.088	0.131	0.042
Part-time employed	0.053	0.058	0.047	0.106	0.112	0.099	0.017	0.023	0.009
Employed long-hours	0.080	0.112	0.048	0.090	0.114	0.068	0.074	0.111	0.033
Hazardous work	0.101	0.138	0.064	0.133	0.166	0.102	0.079	0.119	0.036
Wage earner	0.072	0.104	0.038	0.053	0.077	0.030	0.084	0.122	0.044
Unpaid family worker	0.094	0.101	0.086	0.206	0.217	0.196	0.017	0.026	0.006
Agriculture	0.091	0.090	0.091	0.213	0.219	0.207	0.007	0.007	0.006
Industry	0.039	0.056	0.021	0.025	0.038	0.012	0.048	0.068	0.027
Services	0.039	0.064	0.014	0.025	0.042	0.008	0.050	0.079	0.018
Home chores >= 8hrs	0.254	0.107	0.406	0.318	0.135	0.495	0.210	0.088	0.341
Home chores >=16hrs	0.091	0.019	0.166	0.125	0.027	0.220	0.068	0.014	0.126
Home chores >=30hrs	0.028	0.003	0.053	0.041	0.005	0.075	0.019	0.001	0.037
School and full-time work	0.008	0.012	0.004	0.009	0.012	0.006	0.007	0.011	0.003
School and part-time work	0.025	0.035	0.015	0.042	0.059	0.026	0.013	0.019	0.007
School and home chores(>=8hrs)	0.121	0.064	0.179	0.120	0.065	0.172	0.121	0.063	0.184
School and home chores(>=16hrs)	0.026	0.011	0.041	0.026	0.012	0.039	0.026	0.010	0.043
Age of household head	45.2 (9.2)	45.1 (9.1)	45.3 (9.4)	46.4 (10.3)	46.3 (10.1)	46.5 (10.4)	44.4 (8.3)	44.3 (8.3)	44.4 (8.4)
Total yrs of sch. of head and spouse	9.6 (6.2)	9.6 (6.3)	9.5 (6.2)	7.5 (4.8)	7.6 (4.8)	7.5 (4.8)	10.9 (6.7)	10.9 (6.7)	10.9 (6.7)
Household size	5.5 (1.9)	5.4 (1.9)	5.6 (1.9)	6.0 (2.0)	5.9 (2.0)	6.1 (2.0)	5.2 (1.7)	5.1 (1.7)	5.3 (1.8)
Marrital status: single	0.987	0.994	0.979	0.984	0.994	0.975	0.988	0.994	0.982
Son/daughter of household head	0.927	0.934	0.920	0.901	0.911	0.892	0.945	0.949	0.940

Notes: The sample includes 12-17 year-old children in the 1994, 1999, 2006, and 2012 CLS. Standard errors are given in paranthesis for non-binary variables. The minimum and maximum values are 7 and 17 for age variable, 14 and 97 for age of head, 1 and 31 for household size, 0 and 30 for total years of schooling of household head and spouse. The sample includes 45,402 observations in column (2), 22,885 in column (3), 22,517 in column (4), 14,476 in column (5), 17,081 in column (6), 7,395 in column (7), 30,926 in column (8), 15,804 in column (9), and 15,122 in column (10). Since the information on age at first employment is available only for 1999 and 2006, the sample size for this variable is 22,972 in column (2), 11,592 in column (3), 11,380 in column (4), 7,271 in column (5), 3,511 in column (6), 3,760 in column (7), 15,701 in column (8), 8,081 in column (9), and 7,620 in column (10).

Table 2: Descriptive Statistics for 7- to 11-year-old Children

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A) Rural and Urban			B) Rural Only			C) Urban Only		
	All	Male	Female	All	Male	Female	All	Male	Female
Age	9.0 (1.4)	9.0 (1.4)	9.0 (1.4)	9.0 (1.4)	9.0 (1.4)	9.0 (1.4)	9.0 (1.4)	9.0 (1.4)	9.0 (1.4)
Male	0.510			0.511			0.510		
Rural Residence	0.405	0.406	0.404						
Policy	0.736	0.733	0.739	0.688	0.686	0.691	0.768	0.766	0.770
Enrolled	0.977	0.985	0.969	0.971	0.983	0.959	0.982	0.986	0.977
Employed	0.021	0.023	0.020	0.045	0.046	0.044	0.005	0.007	0.003
Full-time employed	0.004	0.004	0.004	0.007	0.007	0.008	0.002	0.002	0.001
Part-time employed	0.017	0.019	0.016	0.038	0.040	0.035	0.004	0.005	0.002
Employed long-hours	0.002	0.001	0.002	0.002	0.001	0.003	0.001	0.002	0.001
Wage earner	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.003	0.002
Unpaid family worker	0.019	0.020	0.018	0.044	0.045	0.042	0.002	0.003	0.001
Agriculture	0.018	0.019	0.018	0.044	0.045	0.042	0.001	0.001	0.001
Industry	0.001	0.001	0.001	0.001	0.000	0.001	0.002	0.002	0.001
Services	0.002	0.003	0.001	0.001	0.001	0.000	0.003	0.004	0.001
Home chores >= 8hrs	0.074	0.038	0.111	0.093	0.045	0.144	0.060	0.033	0.088
Home chores >=16hrs	0.014	0.006	0.023	0.018	0.004	0.032	0.011	0.007	0.016
Home chores >=30hrs	0.002	0.001	0.003	0.003	0.001	0.005	0.002	0.001	0.002
School and full-time work	0.002	0.003	0.002	0.004	0.005	0.004	0.000	0.001	0.000
School and part-time work	0.016	0.018	0.014	0.035	0.038	0.032	0.003	0.005	0.002
School and home chores(>=8hrs)	0.068	0.037	0.100	0.086	0.044	0.129	0.056	0.033	0.080
School and home chores(>=16hrs)	0.012	0.005	0.018	0.015	0.004	0.026	0.010	0.006	0.013
Age of household head	41.5 (9.9)	41.3 (9.9)	41.6 (9.9)	43.1 (11.4)	42.8 (11.3)	43.4 (11.4)	40.4 (8.6)	40.3 (8.7)	40.4 (8.6)
Total yrs of sch. of head and spouse	10.4 (6.6)	10.5 (6.6)	10.4 (6.6)	8.2 (5.2)	8.3 (5.3)	8.0 (5.0)	11.9 (6.9)	11.9 (6.9)	12.0 (6.9)
Household size	5.6 (1.9)	5.5 (1.8)	5.6 (1.9)	6.1 (2.0)	6.0 (2.0)	6.3 (2.0)	5.2 (1.7)	5.1 (1.6)	5.2 (1.7)
Marrital status: single	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Son/daughter of household head	0.911	0.913	0.908	0.863	0.869	0.856	0.943	0.943	0.943

Notes: The sample includes 7-17 year-old children in the 1994, 1999, 2006, and 2012 CLS. Standard errors are given in paranthesis for non-binary variables. The minimum and maximum values are 7 and 17 for age variable, 14 and 97 for age of head, 1 and 31 for household size, 0 and 30 for total years of schooling of household head and spouse. The sample includes 36,015 observations in column (2), 18,492 in column (3), 17,523 in column (4), 11,584 in column (5), 5,994 in column (6), 5,590 in column (7), 24,431 in column (8), 12,498 in column (9), and 11,933 in column (10).

Table 3: Policy Effect on School Enrollment and Employment Outcomes – Ages 12-17

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A) Rural and Urban			B) Rural Only			C) Urban Only		
	All	Male	Female	All	Male	Female	All	Male	Female
Enrolled	0.074***	0.045**	0.104***	0.126***	0.062**	0.171***	0.041**	0.034	0.050**
	(0.020)	(0.021)	(0.024)	(0.027)	(0.025)	(0.035)	(0.020)	(0.020)	(0.022)
Mean	0.700	0.754	0.644	0.592	0.680	0.508	0.774	0.803	0.742
Employed	-0.048***	-0.049**	-0.054***	-0.117***	-0.111**	-0.126***	-0.007	-0.009	-0.011*
	(0.013)	(0.018)	(0.012)	(0.027)	(0.043)	(0.025)	(0.007)	(0.010)	(0.006)
Mean	0.169	0.211	0.125	0.262	0.299	0.227	0.105	0.154	0.052
Age at First Employment	0.736***	0.979***	0.735***	1.220***	1.476***	1.163***	0.417	0.328	0.408
	(0.085)	(0.086)	(0.228)	(0.115)	(0.078)	(0.262)	(0.244)	(0.298)	(0.284)
Mean	12.530	12.665	12.294	11.783	12.003	11.498	13.624	13.406	14.240
Full-time Emloyed	-0.013*	-0.017*	-0.014	-0.022**	-0.022	-0.024	-0.010	-0.011	-0.013*
	(0.007)	(0.009)	(0.010)	(0.010)	(0.017)	(0.022)	(0.007)	(0.010)	(0.007)
Mean	0.116	0.153	0.078	0.157	0.187	0.128	0.088	0.131	0.042
Part-time Employed	-0.036***	-0.032**	-0.040***	-0.096***	-0.089***	-0.102***	0.003	0.002	0.002
	(0.008)	(0.012)	(0.007)	(0.021)	(0.030)	(0.015)	(0.002)	(0.002)	(0.003)
Mean	0.053	0.058	0.047	0.106	0.112	0.099	0.017	0.023	0.009
Long Hours (>=43 hours per week)	0.002	0.004	-0.007	0.007	0.017	-0.009	-0.003	-0.004	-0.007
	(0.004)	(0.006)	(0.005)	(0.007)	(0.013)	(0.011)	(0.006)	(0.010)	(0.007)
Mean	0.080	0.112	0.048	0.090	0.114	0.068	0.074	0.111	0.033
Hazardhous Job	-0.032***	-0.027*	-0.041***	-0.061***	-0.040	-0.081***	-0.006	-0.006	-0.010
	(0.010)	(0.015)	(0.008)	(0.016)	(0.027)	(0.011)	(0.007)	(0.011)	(0.007)
Mean	0.101	0.138	0.064	0.133	0.166	0.102	0.079	0.119	0.036
Wage Worker	-0.008	-0.006	-0.015**	0.010	0.030**	-0.010	-0.018**	-0.023**	-0.018***
	(0.006)	(0.010)	(0.006)	(0.007)	(0.012)	(0.008)	(0.007)	(0.011)	(0.006)
Mean	0.072	0.104	0.038	0.053	0.077	0.030	0.084	0.122	0.044
Unpaid Family Worker	-0.044***	-0.048***	-0.041**	-0.133***	-0.150***	-0.118***	0.009***	0.011***	0.005
	(0.011)	(0.015)	(0.016)	(0.030)	(0.043)	(0.031)	(0.002)	(0.001)	(0.003)
Mean	0.094	0.101	0.086	0.206	0.217	0.196	0.017	0.026	0.006
Agriculture	-0.042***	-0.038***	-0.045***	-0.119***	-0.111***	-0.127***	0.001	0.000	0.002
	(0.009)	(0.012)	(0.013)	(0.026)	(0.037)	(0.027)	(0.002)	(0.003)	(0.002)
Mean	0.091	0.090	0.091	0.213	0.219	0.207	0.007	0.007	0.006
Manufacturing	0.001	-0.001	-0.000	0.005	0.007	0.003	-0.001	-0.003	-0.001
	(0.002)	(0.004)	(0.002)	(0.006)	(0.012)	(0.002)	(0.005)	(0.008)	(0.004)
Mean	0.039	0.056	0.021	0.025	0.038	0.012	0.048	0.068	0.027
Services	-0.007	-0.010	-0.008***	-0.004	-0.008	-0.002	-0.008	-0.006	-0.012***
	(0.004)	(0.007)	(0.003)	(0.007)	(0.012)	(0.002)	(0.005)	(0.007)	(0.004)
Mean	0.039	0.064	0.014	0.025	0.042	0.008	0.050	0.079	0.018
School and Full-time Work	0.002	0.002	0.001	0.001	-0.000	0.002	0.002	0.003	-0.000
	(0.002)	(0.004)	(0.001)	(0.002)	(0.005)	(0.002)	(0.002)	(0.004)	(0.001)
Mean	0.008	0.012	0.004	0.009	0.012	0.006	0.007	0.011	0.003
School and Part-time Work	-0.007	-0.016*	0.002	-0.019	-0.043**	0.003	0.001	0.002	-0.000
	(0.005)	(0.008)	(0.004)	(0.011)	(0.020)	(0.009)	(0.002)	(0.003)	(0.003)
Mean	0.025	0.035	0.015	0.042	0.059	0.026	0.013	0.019	0.007

Notes: The sample includes 12-17 year-old individuals in the 1994, 1999, 2006 and 2012 CLS. The sample includes 45,400 observations in column (2), 22,883 in column (3), 22,517 in column (4), 14,474 in column (5), 7,079 in column (6), 7,395 in column (7), 30,926 in column (8), 15,804 in column (9), and 15,122 in column (10). Each cell comes from a separate regression of the dependent variable, specified in column (1) on the policy dummy and the control variables. The control variables include year dummies, age dummies, age group (12-14/15-17) and year trend interactions, a gender dummy in columns (2), (5), and (8), a rural dummy in panel (A), household head's age and education, household size, and child's relation to household head (son/daughter). Standard errors are clustered at the year of birth level. Statistically significant *** at the 1 percent level, ** at the 5 percent level, * at the 10 percent level.

Table 4: Policy Effect on House Work – Ages 12-17

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A) Rural and Urban			B) Rural Only			C) Urban Only		
	All	Male	Female	All	Male	Female	All	Male	Female
Home Chores>=8 hrs/week	0.032***	0.057**	-0.001	0.041***	0.045*	0.017	0.019	0.063***	-0.024**
	(0.010)	(0.022)	(0.011)	(0.008)	(0.022)	(0.018)	(0.013)	(0.021)	(0.010)
Mean	0.254	0.107	0.406	0.318	0.135	0.495	0.210	0.088	0.341
Home Chores>=16 hrs/week	-0.050***	0.006	-0.107***	-0.080***	0.009	-0.158***	-0.032***	0.005	-0.068***
	(0.012)	(0.005)	(0.025)	(0.021)	(0.008)	(0.041)	(0.007)	(0.004)	(0.015)
Mean	0.091	0.019	0.166	0.125	0.027	0.220	0.068	0.014	0.126
Home Chores>=30 hrs/week	-0.040***	-0.001	-0.080***	-0.072***	-0.001	-0.133***	-0.019***	-0.000	-0.038***
	(0.009)	(0.002)	(0.017)	(0.014)	(0.003)	(0.025)	(0.007)	(0.001)	(0.013)
Mean	0.028	0.003	0.053	0.041	0.005	0.075	0.019	0.001	0.037
Home Chores>=8 hrs/week AND in School	0.082***	0.040***	0.116***	0.158***	0.054***	0.224***	0.030***	0.032***	0.029*
	(0.013)	(0.010)	(0.022)	(0.020)	(0.014)	(0.038)	(0.010)	(0.010)	(0.014)
Mean	0.121	0.064	0.179	0.120	0.065	0.172	0.121	0.063	0.184
Home Chores>=16 hrs/week AND in School	0.020***	0.011***	0.030***	0.048***	0.026***	0.070***	0.001	0.003	0.002
	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)	(0.007)	(0.002)	(0.002)	(0.005)
Mean	0.026	0.011	0.041	0.026	0.012	0.039	0.026	0.010	0.043

Notes: The sample includes 12-17 year-old individuals in the 1994, 1999, 2006 and 2012 CLS. The sample includes 45,400 observations in column (2), 22,883 in column (3), 22,517 in column (4), 14,474 in column (5), 7,079 in column (6), 7,395 in column (7), 30,926 in column (8), 15,804 in column (9), and 15,122 in column (10). Each cell comes from a separate regression of the dependent variable, specified in column (1) on the policy dummy and the control variables. The control variables include year dummies, age dummies, age group (12-14/15-17) and year trend interactions, a gender dummy in columns (2), (5), and (8), a rural dummy in panel (A), household head's age and education, household size, and child's relation to household head (son/daughter). Standard errors are clustered at the year of birth level. Statistically significant *** at the 1 percent level, ** at the 5 percent level, * at the 10 percent level.

Table 5: Policy Effect on School Enrollment and Employment Outcomes – Ages 7-11

(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		A) Rural and Urban			B) Rural Only			C) Urban Only		
		All	Male	Female	All	Male	Female	All	Male	Female
Enrolled		0.013*	0.010	0.017**	0.017	0.011	0.023*	0.010**	0.008*	0.013**
		(0.006)	(0.006)	(0.008)	(0.010)	(0.009)	(0.013)	(0.004)	(0.004)	(0.004)
	Mean	0.977	0.985	0.969	0.971	0.983	0.959	0.982	0.986	0.977
Employed		-0.017***	-0.014***	-0.021***	-0.035***	-0.025**	-0.046***	-0.001	-0.000	-0.001
		(0.004)	(0.004)	(0.005)	(0.009)	(0.009)	(0.012)	(0.001)	(0.002)	(0.001)
	Mean	0.021	0.023	0.020	0.045	0.046	0.044	0.005	0.007	0.003
Full-time Emloyed		-0.007**	-0.007**	-0.006**	-0.012**	-0.013**	-0.011	-0.002**	-0.003	-0.002**
		(0.003)	(0.003)	(0.003)	(0.006)	(0.006)	(0.006)	(0.001)	(0.002)	(0.001)
	Mean	0.004	0.004	0.004	0.007	0.007	0.008	0.002	0.002	0.001
Part-time Employed		-0.011***	-0.007**	-0.015***	-0.023***	-0.012*	-0.036***	0.002**	0.002**	0.001
		(0.002)	(0.003)	(0.003)	(0.005)	(0.006)	(0.007)	(0.001)	(0.001)	(0.001)
	Mean	0.017	0.019	0.016	0.038	0.040	0.035	0.004	0.005	0.002
Long Hours (>=43 hours per week)		-0.002*	-0.002	-0.002*	-0.002	-0.001	-0.003	-0.002**	-0.003	-0.001
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
	Mean	0.002	0.001	0.002	0.002	0.001	0.003	0.001	0.002	0.001
Wage Worker		0.000	0.000	0.000	0.001*	0.003**	0.000	-0.001	-0.001	-0.000
		(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	Mean	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.003	0.002
Unpaid Family Worker		-0.017***	-0.014***	-0.022***	-0.036***	-0.027***	-0.046***	0.001	0.002*	-0.001
		(0.004)	(0.004)	(0.006)	(0.009)	(0.009)	(0.012)	(0.001)	(0.001)	(0.001)
	Mean	0.019	0.020	0.018	0.044	0.045	0.042	0.002	0.003	0.001
Agriculture		-0.019***	-0.017***	-0.021***	-0.038***	-0.030***	-0.047***	-0.001	-0.001	-0.001
		(0.004)	(0.004)	(0.005)	(0.009)	(0.009)	(0.012)	(0.000)	(0.001)	(0.001)
	Mean	0.018	0.019	0.018	0.044	0.045	0.042	0.001	0.001	0.001
Manufacturing		-0.000	0.001	-0.001**	0.001	0.003*	-0.001	-0.001	-0.001	-0.002**
		(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
	Mean	0.001	0.001	0.001	0.001	0.000	0.001	0.002	0.002	0.001
Services		0.002***	0.002**	0.002***	0.002***	0.003***	0.001*	0.001*	0.001	0.002***
		(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
	Mean	0.002	0.003	0.001	0.001	0.001	0.000	0.003	0.004	0.001
School and Full-time Work		-0.003**	-0.003	-0.002**	-0.006**	-0.008	-0.003*	0.000	0.001	0.000
		(0.001)	(0.002)	(0.001)	(0.003)	(0.005)	(0.002)	(0.000)	(0.001)	(0.000)
	Mean	0.002	0.003	0.002	0.004	0.005	0.004	0.000	0.001	0.000
School and Part-time Work		-0.009***	-0.006**	-0.013***	-0.020***	-0.009*	-0.032***	0.002**	0.002	0.002**
		(0.002)	(0.002)	(0.003)	(0.005)	(0.005)	(0.006)	(0.001)	(0.001)	(0.001)
	Mean	0.016	0.018	0.014	0.035	0.038	0.032	0.003	0.005	0.002

Notes: The sample includes 7-11 year-old individuals in the 1994, 1999, 2006 and 2012 CLS. The sample includes 36,014 observations in column (2), 18,492 in column (3), 17,522 in column (4), 11,583 in column (5), 5,994 in column (6), 5,589 in column (7), 24,431 in column (8), 12,498 in column (9), and 11,933 in column (10). Each cell comes from a separate regression of the dependent variable, specified in column (1) on the policy dummy and the control variables. The control variables include year dummies, age dummies, a gender dummy in columns (2), (5), and (8), a rural dummy in panel (A), household head's age and education, household size, and child's relation to household head (son/daughter). Standard errors are clustered at the year of birth level. Statistically significant *** at the 1 percent level, ** at the 5 percent level, * at the 10 percent level.

Table 6: Policy Effect on House Work– Ages 7-11

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A) Rural and Urban			B) Rural Only			C) Urban Only		
	All	Male	Female	All	Male	Female	All	Male	Female
Home Chores>=8 hrs/week	-0.036***	-0.027***	-0.045***	-0.064***	-0.051***	-0.079***	-0.020***	-0.010	-0.029***
	(0.008)	(0.008)	(0.010)	(0.014)	(0.010)	(0.021)	(0.005)	(0.007)	(0.006)
Mean	0.074	0.038	0.111	0.093	0.045	0.144	0.060	0.033	0.088
Home Chores>=16 hrs/week	0.002	0.000	0.003	-0.008**	-0.006**	-0.009*	0.007***	0.004***	0.010***
	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)	(0.005)	(0.001)	(0.001)	(0.002)
Mean	0.014	0.006	0.023	0.018	0.004	0.032	0.011	0.007	0.016
Home Chores>=30 hrs/week	0.000	-0.002***	0.003**	-0.000	-0.003*	0.003	-0.000	-0.002**	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)
Mean	0.002	0.001	0.003	0.003	0.001	0.005	0.002	0.001	0.002
Home Chores>=8 hrs/week AND in School	-0.031***	-0.025***	-0.037***	-0.061***	-0.047***	-0.075***	-0.014***	-0.010	-0.018***
	(0.007)	(0.007)	(0.009)	(0.012)	(0.009)	(0.019)	(0.004)	(0.006)	(0.005)
Mean	0.068	0.037	0.100	0.086	0.044	0.129	0.056	0.033	0.080
Home Chores>=16 hrs/week AND in School	0.002*	0.000	0.004**	-0.008***	-0.006**	-0.010**	0.008***	0.005***	0.012***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)
Mean	0.012	0.005	0.018	0.015	0.004	0.026	0.010	0.006	0.013

Notes: The sample includes 7-11 year-old individuals in the 1994, 1999, 2006 and 2012 CLS. The sample includes 36,014 observations in column (2), 18,492 in column (3), 17,522 in column (4), 11,583 in column (5), 5,994 in column (6), 5,589 in column (7), 24,431 in column (8), 12,498 in column (9), and 11,933 in column (10). Each cell comes from a separate regression of the dependent variable, specified in column (1) on the policy dummy and the control variables. The control variables include year dummies, age dummies, a gender dummy in columns (2), (5), and (8), a rural dummy in panel (A), household head's age and education, household size, and child's relation to household head (son/daughter). Standard errors are clustered at the year of birth level. Statistically significant *** at the 1 percent level, ** at the 5 percent level, * at the 10 percent level.

Table 7: Policy Effect on Child's Employment Status by Parents' Total Years of Schooling – Age 12-17

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A) Rural and Urban			B) Rural Only			C) Urban Only		
	All	Male	Female	All	Male	Female	All	Male	Female
A) 0-5 years of total schooling									
Enrollment	0.072***	0.057***	0.083***	0.098***	0.066**	0.102**	0.042**	0.047**	0.029
	(0.018)	(0.019)	(0.027)	(0.022)	(0.023)	(0.039)	(0.020)	(0.020)	(0.026)
Mean	0.527	0.607	0.446	0.463	0.563	0.369	0.601	0.654	0.542
Employment	-0.068***	-0.070***	-0.083***	-0.122***	-0.119***	-0.143***	-0.022**	-0.015	-0.033***
	(0.012)	(0.017)	(0.013)	(0.020)	(0.029)	(0.023)	(0.009)	(0.013)	(0.010)
Mean	0.254	0.315	0.193	0.325	0.371	0.282	0.173	0.255	0.080
No of. Obs	13,530	6,799	6,731	6,031	2,910	3,121	7,499	3,889	3,610
B) 6-10 years of total schooling									
Enrollment	0.108***	0.055**	0.162***	0.147***	0.049	0.213***	0.072***	0.052**	0.096***
	(0.024)	(0.024)	(0.025)	(0.033)	(0.030)	(0.037)	(0.018)	(0.022)	(0.019)
Mean	0.705	0.762	0.646	0.636	0.726	0.546	0.759	0.790	0.727
Employment	-0.060***	-0.061**	-0.065***	-0.126***	-0.119**	-0.126***	0.005	0.007	0.000
	(0.020)	(0.027)	(0.021)	(0.036)	(0.051)	(0.040)	(0.009)	(0.014)	(0.009)
Mean	0.177	0.220	0.132	0.252	0.282	0.223	0.119	0.174	0.059
No of. Obs	18,444	9,348	9,096	6,359	3,160	3,199	12,085	6,188	5,897
C) 11-18 years of total schooling									
Enrollment	0.034	0.009	0.053	0.076*	0.046	0.123**	0.022	-0.002	0.044
	(0.027)	(0.030)	(0.033)	(0.038)	(0.045)	(0.055)	(0.026)	(0.023)	(0.032)
Mean	0.877	0.902	0.851	0.854	0.889	0.824	0.884	0.906	0.861
Employment	-0.019**	-0.010	-0.036***	-0.045*	0.007	-0.095***	-0.011*	-0.013	-0.018***
	(0.009)	(0.015)	(0.009)	(0.026)	(0.042)	(0.031)	(0.006)	(0.008)	(0.006)
Mean	0.068	0.095	0.042	0.099	0.136	0.066	0.058	0.082	0.033
No of. Obs	8,151	4,066	4,085	1,612	769	843	6,539	3,297	3,242
D) More than 18 years of total schooling									
Enrollment	-0.011	-0.007	-0.014	-0.029	-0.025	-0.096	-0.009	-0.008	-0.010
	(0.020)	(0.021)	(0.021)	(0.044)	(0.048)	(0.063)	(0.020)	(0.022)	(0.020)
Mean	0.959	0.966	0.950	0.950	0.965	0.934	0.960	0.967	0.953
Employment	0.006	0.006	0.002	0.003	0.020	-0.081	0.002	0.001	0.001
	(0.006)	(0.011)	(0.005)	(0.022)	(0.055)	(0.069)	(0.005)	(0.008)	(0.004)
Mean	0.016	0.021	0.010	0.043	0.058	0.028	0.012	0.016	0.008
No of. Obs	5,275	2,670	2,605	472	240	232	4,803	2,430	2,373

Notes: The sample includes 12-17 year-old individuals in the 1994, 1999, 2006 and 2012 CLS. Each cell comes from a separate regression of the dependent variable, specified in column (1) on the policy dummy and the control variables for various sub-groups of children defined on the basis of combined years of schooling of the head and his/her spouse. The control variables include year dummies, age dummies, age group (12-14/15-17) and year trend interactions, a gender dummy in columns (2), (5), and (8), a rural dummy in panel (A), household head's age, household size, and child's relation to household head (son/daughter). Standard errors are clustered at the year of birth level. Statistically significant *** at the 1 percent level, ** at the 5 percent level, * at the 10 percent level.

Table 8: Policy Effect on Child's Employment Status by Parents' Total Years of Schooling – Age 7-11

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A) Rural and Urban			B) Rural Only			C) Urban Only		
	All	Male	Female	All	Male	Female	All	Male	Female
A) 0-5 years of total schooling									
Enrollment	0.020*	0.012	0.028**	0.007	0.004	0.010	0.031***	0.019*	0.038**
	(0.010)	(0.010)	(0.013)	(0.015)	(0.013)	(0.017)	(0.010)	(0.010)	(0.015)
Mean	0.948	0.970	0.926	0.952	0.974	0.930	0.942	0.964	0.919
Employment	-0.027***	-0.019	-0.035***	-0.038**	-0.018	-0.057***	-0.006	-0.006	-0.006
	(0.009)	(0.012)	(0.009)	(0.013)	(0.018)	(0.015)	(0.007)	(0.011)	(0.008)
Mean	0.038	0.040	0.036	0.059	0.060	0.058	0.010	0.014	0.006
No of. Obs	9,331	4,813	4,518	4,474	2,299	2,175	4,857	2,514	2,343
B) 6-10 years of total schooling									
Enrollment	0.019*	0.013	0.026**	0.022	0.013	0.032*	0.017**	0.012	0.021**
	(0.010)	(0.008)	(0.012)	(0.013)	(0.009)	(0.018)	(0.008)	(0.008)	(0.008)
Mean	0.984	0.988	0.980	0.980	0.987	0.973	0.987	0.989	0.985
Employment	-0.021***	-0.015***	-0.029***	-0.046***	-0.030**	-0.062***	-0.000	0.001	-0.001
	(0.005)	(0.004)	(0.008)	(0.012)	(0.011)	(0.018)	(0.003)	(0.004)	(0.002)
Mean	0.023	0.025	0.021	0.045	0.047	0.043	0.006	0.008	0.004
No of. Obs	14,226	7,329	6,897	4,997	2,584	2,413	9,229	4,745	4,484
C) 11-18 years of total schooling									
Enrollment	0.002	-0.003	0.006	0.011*	-0.002	0.016	-0.001	-0.006**	0.003
	(0.003)	(0.002)	(0.005)	(0.006)	(0.007)	(0.011)	(0.002)	(0.002)	(0.005)
Mean	0.993	0.993	0.993	0.988	0.990	0.986	0.995	0.995	0.995
Employment	0.003	0.004	0.002	0.008	0.007	0.003	0.001	0.003	0.000
	(0.003)	(0.005)	(0.004)	(0.007)	(0.013)	(0.012)	(0.002)	(0.003)	(0.003)
Mean	0.007	0.008	0.005	0.015	0.018	0.010	0.004	0.005	0.003
No of. Obs	7,162	3,656	3,506	1,524	794	730	5,638	2,862	2,776
D) More than 18 years of total schooling									
Enrollment	-0.002	-0.000	-0.004**	-0.002	0.000	-0.005	-0.002	-0.000	-0.004**
	(0.003)	(0.005)	(0.002)	(0.001)	(0.000)	(0.004)	(0.003)	(0.005)	(0.002)
Mean	0.997	0.996	0.998	1.000	1.000	0.999	0.996	0.995	0.998
Employment	0.002*	0.002	0.000	0.012*	0.030	0.005	0.000	0.000	0.000
	(0.001)	(0.002)	(0.001)	(0.006)	(0.018)	(0.004)	(0.001)	(0.002)	(0.000)
Mean	0.002	0.003	0.001	0.009	0.011	0.006	0.001	0.002	0.000
No of. Obs	5,295	2,694	2,601	588	317	271	4,707	2,377	2,330

Notes: The sample includes 7-11-year-old individuals in the 1994, 1999, 2006 and 2012 CLS. Each cell comes from a separate regression of the dependent variable, specified in column (1) on the policy dummy and the control variables for various sub-groups of children defined on the basis of combined years of schooling of the head and his/her spouse. The control variables include year dummies, age dummies, age group (12-14/15-17) and year trend interactions, a gender dummy in columns (2), (5), and (8), a rural dummy in panel (A), household head's age, household size, and child's relation to household head (son/daughter). Standard errors are clustered at the year of birth level. Statistically significant *** at the 1 percent level, ** at the 5 percent level, * at the 10 percent level.

Appendix

Figure A1: Number of Students in Basic Education (Grades 1 to 8)