

# Removing Cultural Barriers to Education: State-run Islamic Schools and Girls' Education in Turkey\*

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## Abstract

This paper studies the impact of access to state-run modern Islamic schools on girls' educational attainment, fertility, and labor market participation in Turkey. In contrast to secular schools, Islamic schools in Turkey offered a hybrid curriculum that also included religious instruction, a more conservative school environment, and a more tolerant attitude toward the use of headscarves. Islamic schools expanded rapidly in the mid-1970s, and girl students achieved the legal right to attend these schools after a 1976 Council of State ruling. Exploiting the variation in exposure to Islamic schools across district centers and cohorts, I find that girls exposed to Islamic schools were more likely to complete lower and upper secondary school, while the corresponding effects for boys were small and nonsignificant. Moreover, affected girl cohorts had lower fertility and higher labor force participation during early adulthood. My results suggest that making educational institutions inclusive toward culturally marginalized groups by eliminating cultural barriers to education help keep them in school and integrate into public life.

**JEL Classification:** I24, I25, J13, J16, J22, Z12

**Keywords:** Culture, Religion, Education, Women's Empowerment, Islam

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# 1 Introduction

During the age of secular mass schooling, the world has experienced a substantial increase in educational participation. However, progress in low-income and developing countries lags significantly behind that in the developed world, and the gender gap in education persists (UNESCO, 2015). Women in developing countries often leave school after primary education, marry, and give birth at a young age. Addressing such behaviors associated with adverse outcomes is therefore essential for women's empowerment and economic development (Duflo, 2012; Doepke et al., 2012). Policies increasing education at large and keeping women in school, in particular, are central issues of economic and policy interest.

While a vast number of empirical studies evaluate the impact of various education policy interventions, we have limited knowledge about how cultural constraints embedded in educational institutions affect households' decisions on participation in education.<sup>1</sup> Besides its vital role in developing human capital, which benefits individuals in the labor market, education is a way to impart cultural identities and norms through institutions (Alesina and Reich, 2015; Ansell and Lindvall, 2013; Bandiera et al., 2019; Cantoni et al., 2017). At the same time, parents seek to transmit their own cultural and religious traits to their offspring (Bisin and Verdier, 2000, 2001). A growing body of theoretical literature shows that parents may resist education by keeping their children out of schools when the cultural identity promulgated by educational institutions differs from their own (Akerlof and Kranton, 2000, 2002; Carvalho and Koyama, 2016). Policies mitigating culture-related barriers by making educational institutions more inclusive toward culturally excluded groups may reverse this backlash and lead to an increase in educational attainment in such cases. However, to date, no causal empirical studies have shown whether such policies can effectively increase

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<sup>1</sup>See Evans and Yuan (2019) and Evans and Mendez Acosta (2021) for recent surveys on interventions related to girls' education.

educational participation and keep women in school.

This paper explores the consequences of popular efforts in Turkey to make religion-friendly, state-run, secondary-level “Imam Hatip” schools (Islamic schools henceforth) available as an alternative to secular schools in the 1970s. In practice, this policy change removed several religion-based barriers that stemmed from the strictly secular nature of the Turkish education system and created an education system that was inclusive toward religious conservatives. I find that access to Islamic schools had an empowering effect for women by keeping girls from religious families within the school system and incorporating them into public life.

The setting of 1970s Turkey proves ideal for exploring this question since—with its strictly secular institutions and remarkably religious population—it represents a unique example among Muslim countries. This paradox may have created direct and indirect culture-related barriers to children’s educational participation among conservative families. In addition, the voluntary nature of attendance in education after primary school during this period enabled parents to keep their children out of secondary schools in such cases. Access to Islamic schools eliminated several cultural barriers, such as lack of religious instruction, a nonconservative school environment, coeducation, and the headscarf ban for girl students.

Religious schooling was reintroduced in 1950 when the government reopened secondary-level modern Islamic schools—which had been shut down during the top-down secularization effort of the 1920s—as vocational schools. However, these schools were primarily located in province capitals (administrative centers of first-level subdivisions) and were available only to men. Between 1974 and 1977, the Islamic school network expanded into district centers (administrative centers of second-level subdivisions) due to bottom-up community efforts. As a result, the number of Islamic schools increased from 71 to 350 in a short period. Girl students only achieved the legal right to attend Islamic schools in 1977 after a Council of State ruling. Surprisingly, the

decision to make Islamic schools available to women came from this highly secular Turkish judicial institution.

To empirically assess the impacts of access to Islamic schools, I construct a new data set that contains the locations and founding years of the Islamic schools built by 1980 and combine it with a nationally representative 5% microsample of the 1990 population census. Then, I employ a difference-in-differences strategy by relying on variation both within cohorts (comparing district centers with and without an Islamic school) and within district centers (comparing cohorts who came of secondary school age after access to Islamic schools became available with older cohorts).

I find that access to Islamic schools increased the likelihood of attaining a lower secondary degree for exposed girl cohorts by 2.1 p.p. (s.e.=0.8 p.p.), corresponding to a relative increase of 6%. The effect of treatment was small in both absolute and relative terms for exposed boy cohorts, with a statistically nonsignificant increase of 1 p.p. (s.e.= 0.6 p.p.), corresponding to a relative increase of 2%. The treatment also increased the likelihood of having an upper secondary degree among women by 1.7 p.p. (s.e.= 0.5 p.p.), corresponding to a relative increase of 7%. The likelihood of having a primary school degree among both genders was unaffected, as expected since Islamic schools operated only at the secondary level. Examining official annual school enrollment data at the national level, I show that Islamic school enrollments were the driving force behind the accelerating growth in total lower secondary schooling during this period. A back-of-an-envelope calculation suggests that while 75 to 90 percent of girls who attended Islamic schools would not continue their secondary education in the absence of Islamic schools, this number was only 10 percent for boys. Further, the heterogeneity in the treatment effect by gender corresponds to a decrease of 1.2 p.p. (s.e.=0.8 p.p.) in the gender gap in lower and upper secondary school completion rates, representing a relative reduction in this gap of 9%, albeit estimated less precisely. The estimated coefficient on the gender gap for a placebo test in which access to Islamic schools is

assumed to have happened twenty years before, in 1957, are negative, which indicates that the gender gap had been on the rise in favor of men among older cohorts in treated district centers. Access to Islamic schools reversed this pattern and decreased the gender gap in education.

Next, I examine how access to Islamic schools affected the early adulthood fertility outcomes of exposed girl cohorts. There are three sets of related results. First, I find that exposed girl cohorts display lower numbers of births, even though the probability of ever giving birth remains unaffected. Second, I present evidence that this reduction is mainly a result of these cohorts staying in education. I argue that affected women who remained in schooling due to access to Islamic schools—who otherwise would have married unofficially before age 18 and given birth to their first child as teen mothers—postponed their first pregnancy. To support this argument, I show that the decrease in fertility is primarily driven by a lower likelihood of having two or more childbirths by early adulthood (by the age of 18-25). This result is consistent with my argument, as having given birth several times at ages within this range would require girls to have started giving birth in adolescence. Last, I construct an imperfect measure of age at first birth by using the “relation to household head” information in the census. In line with previous evidence, exposed girl cohorts are associated with older age at first childbirth.

Finally, I explore whether access to Islamic schools impacted women’s labor market outcomes during early adulthood. Although around one-third of the Islamic schools’ curriculum contains religious content at the upper secondary level, Islamic schools had one extra year of schooling to compensate for this. Such exposure to secular secondary school content at a level similar to that of secular schools and having a secondary school degree in a population with low levels of education may have benefited women in the labor market, as the outside option was no secondary education. Consistent with this argument, I find that exposed girl cohorts were more likely to participate in the labor

market and to have worked in the week prior to the census.

Overall, my results suggest that access to Islamic schools in Turkey during the 1970s substantially increased women's overall education levels but that the increase for men was small and statistically nonsignificant. These results imply that while Islamic schools effectively induced religious parents to keep their daughters in the education system, they mainly enabled parents to substitute secular schools with Islamic ones for their sons. Religion-based barriers to participation in education that stemmed from secular institutions in Turkey were more rigidly binding for women, potentially due to stricter gender roles and social norms in Islam and lower anticipated returns to girls' education among parents. Keeping girls in school was also accompanied by outcomes associated with women's empowerment and economic development. Affected women had lower fertility in early adulthood, suggesting delayed marriages and pregnancies, and higher labor force participation rates. These results indicate that relaxing strictly secular institutions, which excluded religion from the public sphere, managed to empower women, which was one of the original aims of the Turkish republic's secularization efforts.

This paper contributes to several strands of the literature. It first relates to the literature on educational policies and cultural backlash. A body of theoretical works suggest that institutional policies targeted toward assimilating minorities with marginalized identities can lead to a backlash and result in resistance to education. [Akerlof and Kranton \(2002\)](#) and [Carvalho and Koyama \(2016\)](#) show that marginalized groups can underinvest in education when the identity transmitted by institutions threatens them with assimilation. [Carvalho and Koyama \(2016\)](#) predict that culturally inclusive policies that mitigate the threat of identity assimilation for marginalized communities can lead to an increase in the overall rate of education within the population.<sup>2</sup> Prior empirical studies primarily focus on assimilationist educational

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<sup>2</sup>Apart from education, [Carvalho \(2013\)](#) further shows that headscarf bans, in particular, can inhibit social integration among pious women and increase their religiosity.

policies and their impact on identity or schooling due to cultural backlash (Abdelgadir and Fouka, 2020; Bazzi et al., 2020; Fouka, 2020; Sakalli, 2019). This paper is, to my knowledge, the first to provide empirical evidence that culturally inclusive policies may reverse such a cultural backlash and increase the education levels of culturally marginalized communities.

This study also relates to the literature on the roots of educational inequality. In particular, it is related to the literature on social norms and the origins of gender and religious inequality in educational participation in developing contexts (Alesina et al., 2020; Jayachandran, 2015). Examining the unification of traditional and modern education systems in Egypt, Saleh (2016) shows that public policies may play a role in mitigating inter-religious educational inequalities. I contribute to this literature by showing that providing culturally inclusive educational institutions may decrease educational inequalities affecting marginalized groups when the interaction between exclusionary institutions and social norms acts as a source of these inequalities. Therefore, I provide evidence that inclusive changes to schooling that take into account cultural sensitivities can mitigate educational inequalities by cultural or religious background.

This paper also contributes to the literature studying the impacts of educational policy interventions on outcomes related to women's empowerment in developing countries (Duflo, 2012; Doepke et al., 2012; Jayachandran, 2021). Specifically, it is related to the literature on creating a safer schooling experience for girl students by adjusting educational institutions' infrastructure or characteristics (Adukia, 2017; Bandiera et al., 2020; Burde and Linden, 2013; Kazianga et al., 2013; Kim et al., 1999; Muralidharan and Prakash, 2017). I add to this literature by showing that providing a culturally safer school environment that eliminates religion-based barriers to education can increase girls' schooling and lead to women's empowerment in a conservative and low-income context where girls' participation in secondary education is strikingly low. In this

literature, my paper is the first to study the causal link between modern Islamic schools and the outcomes related to women's empowerment.

Finally, this paper relates a broader literature on the role of culture in economic development (Alesina and Giuliano, 2015; Barro and McCleary, 2003; Guiso et al., 2006; Tabellini, 2010). In particular, it refers to those studies examining the relationship between religion and institutions.<sup>3</sup> Examining Catholicism in France during the Second Industrial Revolution, Squicciarini (2020) shows that religiosity can hamper economic development through religious schooling. I contribute to this literature by showing that the interaction between religion as an informal institution and education systems as a formal institution can play a vital role in parents' decisions related to human capital investment, especially for daughters. I show that when the outside option is resistance to status quo educational institutions, state-run religious schooling may effectively integrate girls from religious families into public life and lead to economic development driven by women's empowerment. One article related to mine is Meyersson (2014), which focuses on political institutions' effect on women's empowerment in Turkey.<sup>4</sup> Meyersson (2014) documents the positive impact of Islamic mayors in Turkey on girls' secular upper secondary school participation by using a regression discontinuity (RD) design based on the 1994 elections. He acknowledges that Turkish secular educational institutions impose several barriers to entry into education among religious women, including coeducation, a secular curriculum, and a headscarf ban. His explanation of the increase in secular schooling for women is that Islamic mayors effectively circumvent the previously mentioned and still-prevailing barriers to secular education. My paper adds to previous findings by disentangling the role of participation constraints in

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<sup>3</sup>See Iannaccone (1998) and Iyer (2016) for surveys of the economics of religion. See Kuran (2018) for a survey specific to Islam.

<sup>4</sup>In a similar empirical setting to Meyersson (2014), Corekcioglu (2021) disentangles one of the potential mechanisms behind the impact of local Islamist political rule on women's empowerment and finds that repealing the headscarf ban increased women's employment in Islamist municipalities in Turkey. She also shows that Islamist mayors employ fewer women than secular mayors when there is a ban on headscarf use in workplaces.

education by directly focusing on a specific educational policy change that removed these cultural barriers and led to an increase in religious schooling. Therefore, I show that culturally inclusive designs of public education systems can be effective in keeping girls in schooling regardless of the characteristics of the local political leadership.

The remainder of the paper is organized as follows. Section 2 provides historical and institutional background information on secular institutions and Islamic schools in Turkey. Section 3 presents and summarizes the data. Section 4 presents the empirical strategy and main results. Section 5 provides the robustness checks. Section 6 concludes.

## 2 Historical and Institutional Background

### 2.1 History of Secular Education in Turkey

After the fall of the Ottoman Empire, the founders of the new Turkish republic, led by Mustafa Kemal Atatürk, initiated broad-scale reforms in various fields to secularize and modernize the country's institutions. Education was one of the most crucial domains of the reform movement. Its first step was to instill the secular and nationalist values of the new republic in younger generations ([Kaplan, 2006](#)). This effort was also an efficient way to curb religious identities held over from the Ottoman Empire. Under this government program, the intent was to "adopt western civilization as a whole including western secular culture, to improve the nation to the contemporary western level, and avoid the superstition, mystical feelings, scholastic ideas, and out-of-date principles of life, adopting positivism" ([Zaim, 1987](#), p.501).

To achieve its secularization goals, the government implemented several radical and top-down reforms in education during the 1920s. Some of these reforms directly targeted a decrease in the role of religion in education. The 1924 Unification of Education Law (Tehvid-i Tedrisat) abolished all traditional Islamic education institutions, including *medreses*, and unified all educational instruction under the Ministry of Education. Even

though the law allowed a few numbers of Imam and Preacher (Imam Hatip) training schools to operate, these schools eventually shut down in 1930. The Arabic alphabet that had been used under the Ottoman Empire was replaced with the Latin alphabet. Religion courses were removed from the curriculum of lower secondary schools in 1927 and upper secondary schools in 1924. Religious instruction was nonexistent in Turkey until a freshly elected conservative government reintroduced Islamic schools in 1950.

At the same time, education was gender segregated due to the religious nature of former institutions. Investment in girls' education was poor, with boys' schools the main body of the school network under the Ottoman Empire. To achieve universal access to secular education regardless of gender, the new government aimed to increase the educational participation of girls and made mixed-gender schooling universal with few exceptions ([Durakbaşa and Karapehlivan, 2018](#)). It also introduced compulsory education for 5 years, making participation in secondary education voluntary. Between 1923 and 1931, the share of girls among enrolled students in primary schools increased from 18.4% to 35% ([Szyliowicz, 1973](#)). Despite this significant increase in primary education, educational participation in secondary education remained low, and the gender gap persisted. Secondary education became compulsory at the lower secondary level only in 1997 with the extension of compulsory schooling to 8 years.

## 2.2 The Rise of Islamic Schools and the 1976 Council of State Ruling

After the re-establishment of Islamic schools in 1950, these schools experienced a period of ups and downs until 1973. This instability was mainly due to the involvement of the secular army in politics. The number of Islamic schools opened by the state remained modest, and most of them were located only in district centers that are also province capitals. Due to the reluctance of governments to open Islamic schools in relatively less populated district centers, communities started to form charity foundations to finance the construction of Islamic schools within their localities ([Öcal, 2013](#)). The government

blocked these efforts by introducing a law in 1967 that imposed a minimum population threshold of 50,000 as a prerequisite for the opening of Islamic schools. Only a handful of district centers had populations greater than 50,000 during this period, which made the expansion of Islamic schools nearly impossible.<sup>5</sup> Another blow to Islamic schools came after the 1971 Turkish military memorandum. Religion courses were removed from the curriculum of lower secondary Islamic schools, ultimately leading to the closure of some of these schools in 1971 due to insufficient demand. Islamic schools continued to operate at the upper secondary level. Even though the 1973 Basic Education Law prepared by a technocratic government reversed this decision, the temporary closure of Islamic lower secondary schools led to a temporary reduction in the number of students attending Islamic schools. Another drop in the number of students attending Islamic schools occurred during the military rule between 1981 and 1983. However, the number quickly recovered after the civil government was established, as seen in Figures 2 and 3. The 1973 Basic Education Law also brought some favorable changes to Islamic schooling that made Islamic schools an alternative to secular schools. Maybe the most important of these was to make Islamic school degrees equivalent to secular school degrees. This allowed Islamic school students to apply for higher education programs in various fields of social sciences after completing their secondary education.<sup>6</sup>

The rise of Islamic schools started after the 1973 general elections, when an Islamist party, Milli Selamet (“National Salvation”) Partisi (MSP), entered parliament for the first time in the history of the republic. MSP received 11.8% of votes nationally and earned 48 seats (9% of total seats), which made it the third largest political party within parliament. As the rest of the parties failed to form a single-party government, MSP had a favorable position in coalition talks as the strongest candidate for the minor coalition partner position. MSP ended up participating in several coalitions during the 1973-1978 period

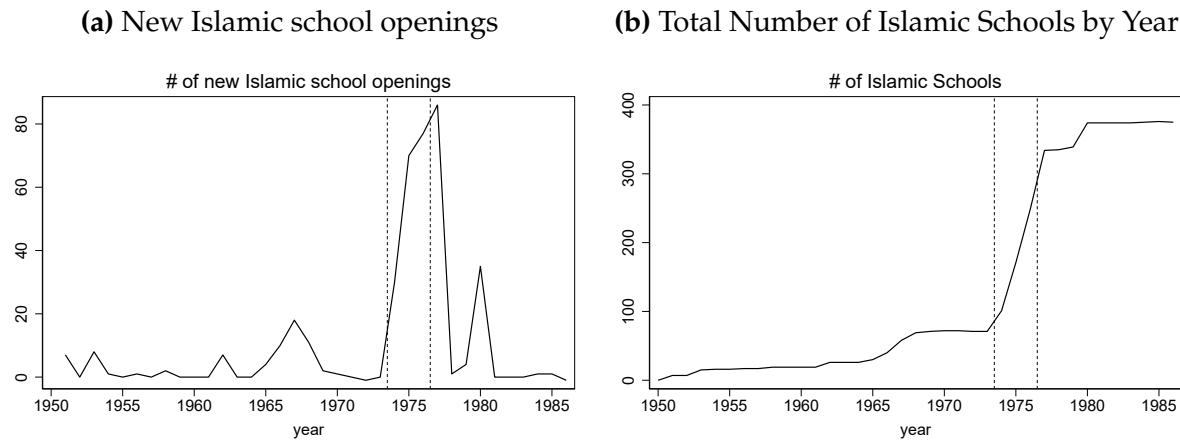
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<sup>5</sup>Resmi Gazete, 8 August 1967, Number 12668; MEB Tebligler Dergisi, 11 September 1967, Number 1469 pg. 313-314.

<sup>6</sup>This is because Islamic schools were teaching only the literature track of the academic path, and the science track was required to attend natural and applied science programs.

with both secularist-left and center-right parties separately.<sup>7</sup> One of the main items on the MSP agenda was to enable Islamic schools to become an alternative to secular schools in Turkey (Landau, 1976). In all coalitions, MSP advocated the opening of Islamic schools that had already been built or were under construction through initiatives by local foundations. Many schools had been waiting for permission to open for years but had failed to do so due to the population threshold requirement and disputes with secular groups. The expansion of Islamic schools, therefore, was fast paced. As early as the beginning of the 1977 school year, a total of 334 Islamic schools were operating. When the expansion ended in 1980, there were 374 Islamic schools in total, as seen in Figure 1.

**Figure 1:** Evolution of Islamic School Numbers

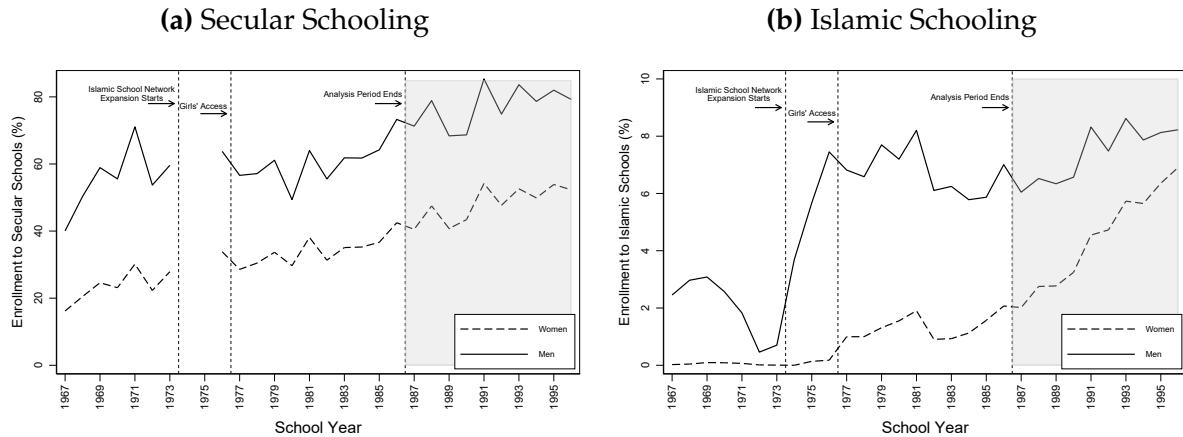


*Notes:* Panel a shows the distribution of opening years of all Islamic lower secondary schools in Turkey. Panel b shows the total number of open Islamic lower secondary schools in Turkey in a given year.

The expansion of the Islamic school network led to a sharp increase in the share of boy students registered in Islamic schools among new registrations in 6th grade. This proportion had increased from 5% to 15% within three years after the network's opening (see Figure 2). An important feature of this expansion was that the newly opened schools registered students for 6th grade only and opened subsequent grades annually. Therefore, registration for intermediate grades was not possible.

<sup>7</sup>During this period, the Islamist party was not in charge of the Ministry of Education.

**Figure 2: Enrollment Rates to 6th Grade by School Type and Gender**



*Notes:* This figure shows the evolution of enrollment rates to 6th grade in a given school year by school type and gender. Enrollment rates are calculated by dividing the total new students registered by the theoretical cohort size of 6th graders for a given school year measured based on population censuses from between 1970 and 1995.

Even though there were no legal restrictions on girls' participation in Islamic schools prior to 1973, participation of girls was almost non-existent, as Islamic schools were seen by the government as a means of training imams and preachers (vocations exclusive to men).<sup>8</sup> Against the push toward making Islamic schools as an alternative for secular schools, a gender rule was introduced for registration to Islamic schools: being a boy was added as a requirement for attending Islamic schools in 1973.<sup>9</sup> The doors of Islamic schools remained shut to girl students despite the expansion of these schools. Although the Islamist party was a coalition member during this period, it did not attempt to abolish the gender rule. Girl students only achieved the legal right to attend Islamic schools after an unanticipated ruling by the Council of State in 1976.<sup>10</sup> The highly secular high court of the judiciary ruled that the gender requirement violated equality of access to schooling and lifted the law. This unexpected development resulted in a substantial increase in the number of girl students attending Islamic schools in the 1977 school year. The growth in the share of girls registered in Islamic schools increased

<sup>8</sup>Resmi Gazete, 22 May 1972, Number 141193.

<sup>9</sup>See MEB Tebligler Dergisi, 29 May 1972, Number 1700 pg. 185.

<sup>10</sup>The court case was filed by a father whose daughter was rejected from registration at an Islamic school in Kayseri. See Council of State Ruling nr. 1976/4374, 15 December 1976, for more detail.

throughout the years and even caught up with the share of boy students registered in Islamic schools in the late 1990s(see Figure 2). An exception to this increasing trend occurred between 1981 and 1984, when registrations of girls in Islamic schools dropped sharply during the military rule years. The evidence on the gender ratio in Islamic schools and secular-to-Islamic ratio among girls' registrations in Panel b of Appendix Figure A.6 and Panel A of Appendix Figure A.8, respectively, show that military rule depressed girls' Islamic school registrations, resulting in girls' Islamic school registrations underperforming its potential trend.

### 2.3 Islamic Schools in Turkey: Imam Hatip Schools

Islamic schools in Turkey have a unique nature, as they differ in many dimensions from their counterparts in other Muslim countries.<sup>11</sup> Like secular schools, they are tuition-free state schools. The Ministry of Education (MOE) is the responsible authority that determines and inspects all curriculum and textbook contents and appoints school staffs. Therefore, only the MOE itself has control and power over the management of these schools. The involvement of religious foundations and organizations occurs only in the context of financial support through charity and extracurricular social events under the monitoring of the ministry. The schools have vocational school status, as they initially aimed to educate imams and preachers for mosques. They were available as lower secondary schools from grades 6 to 8 and as upper secondary schools from grades 9 to 12 between 1950 and 1997.<sup>12</sup>

The secular nature of education, combined with cultural social norms and beliefs about girls' education, often creates direct or indirect barriers to participation in voluntary education in religious communities. Islamic schools have several advantages over secular schools in attracting religious parents' children by eliminating primarily

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<sup>11</sup>See Ozgur (2012) and Pak (2004) for in-depth ethnographic analyses of Imam Hatip schools.

<sup>12</sup>See Appendix Figure A.3 for a look at the education system in Turkey in the 1970s.

culture-related barriers. First, these schools address the lack of religious education in secular schools. Islamic schools in Turkey teach a hybrid curriculum that combines secular with religious subjects.<sup>13</sup> Although about one-third of the educational content at the upper secondary level is religion related, Islamic school students spend one more year to compensate for this emphasis. Therefore, upper secondary Islamic schools do not teach religion courses in the expense of secular content.<sup>14</sup> Second, Islamic schools alleviate both secular peer and secular teacher role model effects that may concern some religious parents. Islamic schools primarily attract students with religious and conservative family backgrounds. Therefore, peers in Islamic schools are less likely to transmit secular ideas to each other than peers in secular schools. As almost one-third of the curriculum involves religious subjects, teachers who teach these courses also come from a religious background.<sup>15</sup> Islamic schools can also alleviate religious parents' concerns about mixed-gender schooling. These schools have a more conservative environment than secular schools. Interaction between girls and boys is limited due to visible and invisible barriers ([Ozgur, 2012](#)). For example, girls and boys either sit on different sides of the classroom or participate in courses in separate classrooms, if possible. In some cases, girls and boys receive education on separate floors or in different buildings within the school complex. Due to women's seclusion in Islamic culture, which restricts the interpersonal relations of women with men outside the family, it is a norm in these schools to have a lower level of interaction between students of different genders. The last—and probably the foremost—advantage of Islamic schools for religious parents is the lax application of Turkey's headscarf ban.<sup>16</sup> In the context of the ban, parents who wanted their daughters to veil after puberty had to choose between

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<sup>13</sup>See Appendix A for the curriculum of Islamic schools in 1975.

<sup>14</sup>The curriculum in upper secondary-level Islamic schools has a similar share of common courses as the literature track in upper secondary secular schools.

<sup>15</sup>Teachers of religion-related courses must be graduates of theology departments of universities or institutions. Other teachers are graduates of faculties of education.

<sup>16</sup>Use of the headscarf during religion courses in Islamic schools has been excluded from the ban since 1983. The headscarf ban was abolished for all type of schools in 2013.

their daughters' education and veiling. Loose application of this ban was a prominent advantage of Islamic schools over secular schools for a long time in terms of attracting girl students from conservative and religious families.

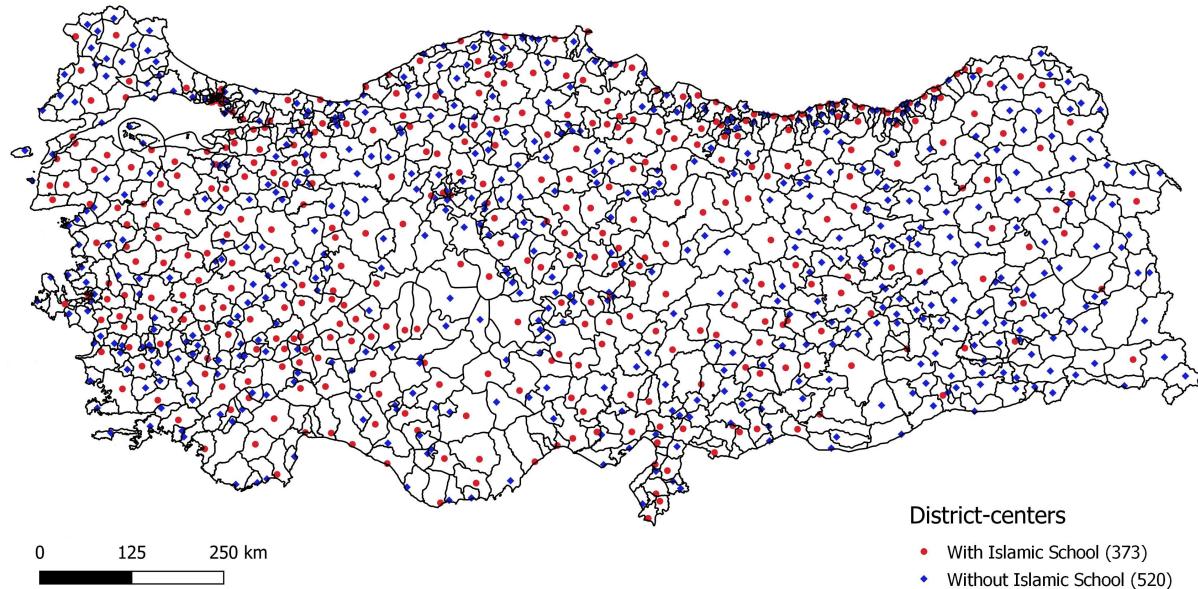
### 3 Data and Summary Statistics

The data used in this paper come primarily from the Turkish Statistical Institute's 5% microsample of the 1990 population census. Census data provide the necessary information for the main analysis, including individuals' gender, birth year, district of residence in 1990, locality status, province of birth, and highest educational degree completed. Unfortunately, there is no information on whether the degree obtained is from an Islamic school. Census data also contain information on individuals' marital status, fertility, and labor market involvement to study the effect of access to Islamic schools on related outcomes.

Another crucial piece of information needed to conduct the analysis is the locations and establishment years of Islamic schools. The National Educational Statistics of the MOE provide only annual information on the total number of Islamic schools by province. Since it is not possible to locate district centers with an Islamic school from the official sources, I constructed a new data set using web sources that contain information on the establishment years and locations of each Islamic school opened before 1981. I validated my data by cross-checking them with province-level official statistics and a source that lists Islamic school locations in 1990 ([Özüdoğru, 1991](#)). In 1980, there were 374 Islamic schools located in 373 district centers. With one exception, each district center had only one Islamic school. Figure 3 provides information on the locations of Islamic schools in 1980. Finally, I merged the school location data with individual-level census data to identify individuals exposed to Islamic schools. I restrict my main analysis to the subpopulation of residents living in district centers in 1990 since Islamic

schools were available only in district centers. However, I also utilize the rural subpopulation as a placebo sample in my analysis since Islamic schools were out of the registration areas of rural residents.

**Figure 3:** Locations of Islamic Schools



*Notes:* Map of Turkey showing the geographic locations of Islamic schools in 1980. Each dot represents a district center as of 1990.

Panel A of Table A.1 provides summary statistics on related outcomes for exposed and nonexposed cohorts in district centers with and without an Islamic school. I present summary statistics separately for the boy and girl subsamples. Panel C of Table A.1 provides information on available district center characteristics included as controls, such as population size in 1970 and 1990 and Islamic party vote shares in 1973. In 1990, there were 894 district centers located in 71 provinces. District centers with Islamic schools had, on average, significantly higher population sizes in 1970, higher Islamic

party vote shares in 1973 and more province capitals than district centers without Islamic schools. However, the difference in Islamic party vote shares is not statistically significant.

## 4 Empirical Analysis

### 4.1 Empirical Strategy and Descriptive Evidence

My first objective is to evaluate the impact of access to Islamic schools on the educational participation of men and women. My main outcomes of interest are indicators for whether an individual has completed lower or upper secondary school, education levels that were available in Islamic schools. My identifying variation is an individual's exposure to access to Islamic schools, which is jointly determined by the date of birth and locality of residence.

In Turkey during the 1970s, children generally attended lower secondary schools starting from age 11. Therefore, children aged 11 or younger during years with access to Islamic schools were fully exposed to the treatment. When the Islamic school network expansion started in 1974, newly established schools registered students only for sixth grade and introduced upcoming grades sequentially over the next years. In theory, the staggered introduction of grades made registration for older cohorts not possible. For women, I consider children aged 11 years or younger in 1977, the year that they earned the legal right to attend Islamic schools, to be fully exposed cohorts and older children to be nonexposed cohorts. For men, I consider children aged 11 years or younger in 1974, the year when the expansion of Islamic schools started, to be fully exposed cohorts and older children to be nonexposed cohorts.<sup>17</sup> I exclude individuals aged 12 from my analysis since some children may have been fully exposed to the treatment due to the

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<sup>17</sup>A few individuals from older cohorts may have been exposed to the treatment due to entry in primary schooling at later ages or grade repetition. The results are robust to excluding these cohorts.

calendar effect.<sup>18</sup>

Islamic schools were available in only some district centers, so not everyone had access to these schools. Since my data do not include the district center in the education information of an individual, I assign individuals to treatment with respect to individuals' locality of residence during the 1990 census. Therefore, I implicitly assume that people lived in the same district center about 10 years prior to the census. To alleviate concerns about this assumption made regarding mobility, I conduct a series of robustness checks in Section 5.5.

I use a difference-in-differences empirical strategy to estimate the impact of access to Islamic schools. My empirical strategy is based on comparing cohorts of secondary school age with cohorts too old to be in school in district centers with and without an Islamic school. My main identifying assumption is that in the absence of access to Islamic schools, the outcomes of girl (boy) cohorts living in a district center with an Islamic school would otherwise have changed similarly, on average, to those of girl (boy) cohorts residing in a district center without an Islamic school.

Figure 4 presents descriptive evidence in support of my identifying assumption using raw data on lower secondary school completion rates in treated district centers and comparison district centers over the analysis period.<sup>19</sup> The lower secondary school completion rates of both groups follow a similar trend for boy and girl cohorts too old to benefit from access to Islamic schools. Nonexposed cohorts also have similar levels of education, overall, among both genders. The trend in lower secondary school completion rates for girl cohorts breaks in favor of district centers with Islamic schools right after the expansion of access, and these treated centers have relatively higher completion rates for all treated cohorts. The trend for boy cohorts remains similar even

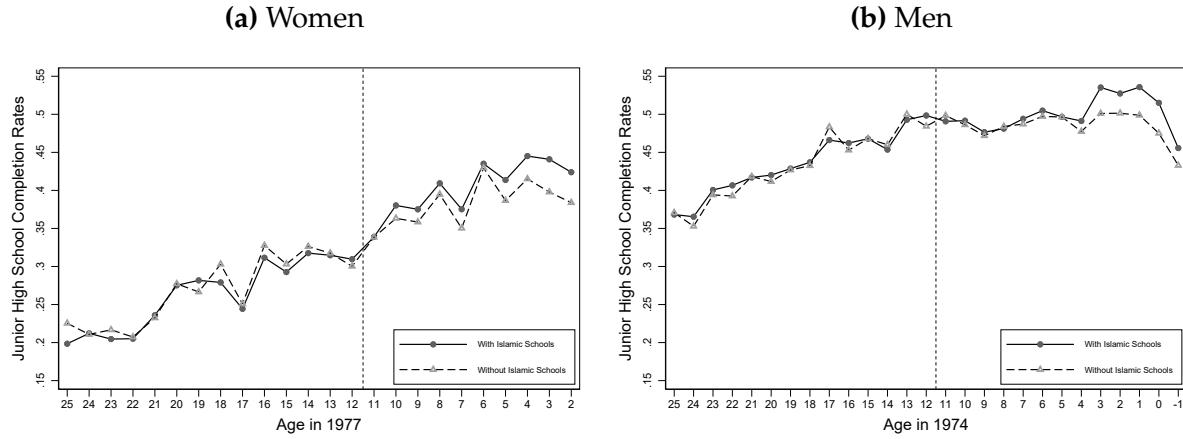
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<sup>18</sup>During the 1970s, the cutoff month for starting primary schooling was September. Therefore, most of the children born after September in a given year may have started primary school the next school year. However, including 12-year-olds in my analysis does not change the results.

<sup>19</sup>In Appendix Figure A.5, I also present the evolution of the outcome means instead of the overall trend. The main takeaways remain similar to those from the overall level trends.

after the expansion of the Islamic school network, and the break in favor of district centers with Islamic schools occurs later.

**Figure 4:** Lower Secondary School Completion Rates – Raw Data



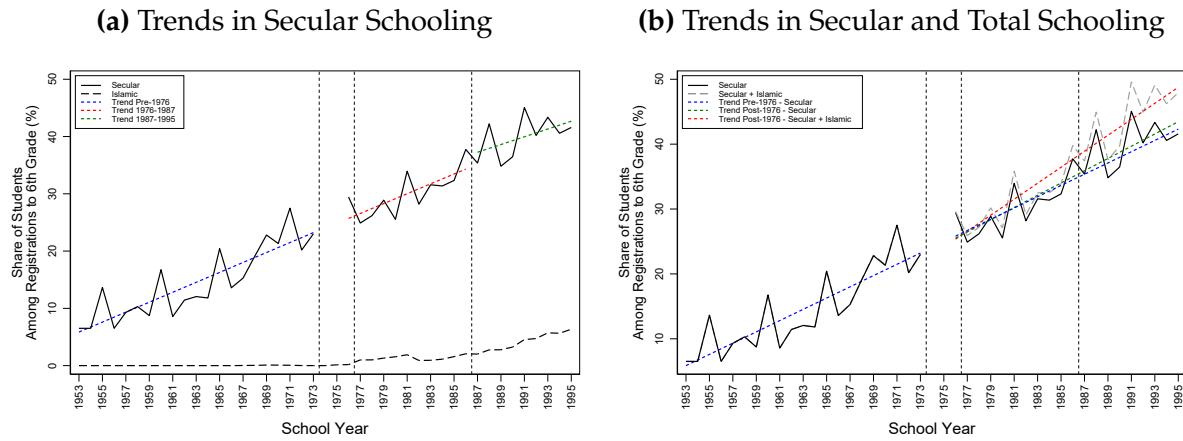
*Notes:* This figure shows the fraction of individuals who have completed lower secondary school residing in district centers with and without an Islamic school in 1980. Panels a and b restrict the sample to women and men, respectively. Cutoff years differ by gender, as girl students achieved legal rights to attend Islamic schools in 1977, three years after the expansion of the Islamic school network. Cohorts on the right side of the vertical dotted lines are fully exposed cohorts.

As I do not observe the type of school that a student graduated from, I would like to learn whether the increase in educational participation of women is driven by Islamic school enrollment or a strategic response of the secular schooling system or secular parents.<sup>20</sup> During my analysis period, the Turkish state had a monopoly over education provision, and private Islamic schools were not allowed in Turkey. This setting implies that the strategic supply-side response would have to have occurred only on the part of the state, which provided both types of education. One way to investigate the possibility of strategic secular supply- and demand-side responses is to check the overall patterns in official school enrollment trends by school type before and after expansion of access to Islamic schools. As seen from Panel a of Figure 5, the slope of the increasing trend in secular school enrollments remains precisely the same for the period after access to Islamic schools was provided during my analysis period. If anything, it becomes slightly

<sup>20</sup>Bazzi et al. (2020) document a strategic response of the private Islamic schooling sector to the construction of secular public primary schools. Islamic private secondary schools entered areas more affected by the secular primary school expansion.

lower at the point where Islamic enrollments substantially increased after 1987. Panel b of Figure 5 provides further encouraging evidence that Islamic schooling was the driver behind the positive change in the trend of total school enrollments. While this trend remained almost the same over forty school years, Islamic school enrollments added to secular school enrollments and increased the overall growth rate of total school enrollments after 1977. Therefore, general enrollment patterns by school type motivates that Islamic school enrollments were the main driver behind the differential increase in educational participation of women in treated district centers.<sup>21</sup>

**Figure 5:** Evolution of School Enrollment Rates to 6th Grade for Women



*Notes:* This figure shows the evolution of enrollment rates and its trends to 6th grade in a given school year by school type. Enrollment rates calculated by dividing the total new girl students registered with respect to school type by the theoretical girl cohort size of 6th graders for a given school year measured by using population censuses from between 1950 and 1995.

## 4.2 Islamic Schools and Educational Attainment

### 4.2.1 Regression Framework

While the previous results offer descriptive evidence on the impact of access to Islamic schools, they could be subject to district center- or cohort-level confounders. Next, I

<sup>21</sup>I present the case for boys' school enrollments in Appendix Figure A.7. In this case, the general patterns in enrollment rates imply that Islamic school enrollments depressed secular school enrollments for men.

estimate separately for the boy and girl subsamples a more demanding econometric specification similar to that in [Duflo \(2001\)](#), which allows for the inclusion of controls:

$$y_{ipdc} = \gamma_d + \delta_c + \sum_k \beta_k (I_c^k \times Islamic_{pd}) + \sum_c \alpha_c \log(pop70)_{pd} + \eta_{pc} + \epsilon_{ipdc}, \quad (1)$$

where  $y_{ipdc}$  is the outcome of interest (educational attainment, marriage and fertility, labor market) of individual  $i$  residing in district center  $d$  of province  $p$  and belonging to 3-age cohort  $c$ .  $Islamic_{pd}$  is a dummy indicating whether district center  $d$  had an Islamic school in 1980.  $I_c^k$  is a dummy indicating whether the individual belongs to 3-age cohort  $k$ .<sup>22</sup>  $\gamma_d$  and  $\delta_c$  are a full set of district center and age-cohort fixed effects. In my preferred specification, I replace the age cohort fixed effects with  $\eta_{pc}$ , a set of province-by-cohort fixed effects, and include interactions between cohort dummies and  $\log(pop70)_{pd}$ , the natural log of the population size of district center  $d$  in 1970. The omitted category corresponds to individuals aged 14-16 during the period of access to Islamic schools. I cluster standard errors at the level of the district center of residence.

This dynamic difference-in-differences (DID) specification allows the effects of having access to Islamic schools to vary flexibly and across cohorts. Cohort fixed effects control for all factors common to all individuals in a cohort, such as nationwide shocks. District center fixed effects control for all time-invariant factors common to all individuals residing in a district center. Table A.1 and Figure 2 show differences in population sizes and regional distribution between treated and comparison groups. Introducing province-by-cohort fixed effects and interactions between cohort dummies and initial population sizes allows cohorts to have differential trends across provinces and cohort trends to be related to the initial population size of the district center.  $\beta_k$  represents the 3-age-cohort-specific DID estimates identified from

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<sup>22</sup>I use 3-age cohorts instead of single-age cohorts in my main analysis for two reasons. The first is to deal with substantial cases of age heaping visible in the data (see Figure A.3 in the appendix). The second is to gain statistical power in my regressions. However, I present the results with single-age cohorts in the appendix for all the outcomes used in my main analysis.

within-cohort-variation across districts centers with and without an Islamic school conditional on cohort-specific population size and province trends. For nonexposed cohorts, I expect  $\beta_k = 0$ . For fully exposed cohorts, I expect  $\beta_k > 0$  if access to Islamic schools positively affects the likelihood of completing lower or upper secondary school. For the likelihood of completing primary school, which is a natural placebo outcome due to the lack of primary-level teaching in Islamic schools, I expect  $\beta_k = 0$ .

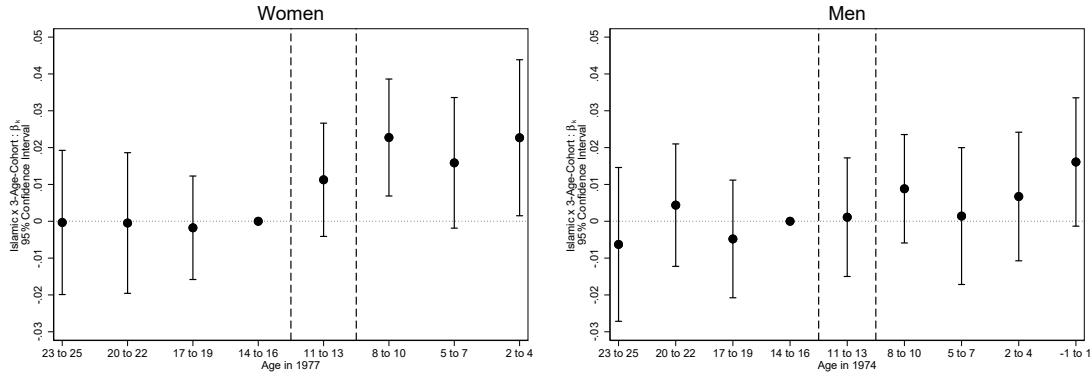
Figure 6 plots the estimates of the 3-age-cohort-specific treatment effects for my preferred specification separately for boy and girl subsamples.<sup>23</sup> The dependent variable is a dummy that captures whether an individual has completed lower secondary school (in Panel A), upper secondary school (in Panel B), or primary school (in Panel C). For all outcomes, the estimates for nonexposed cohorts are close to 0 and do not follow any specific trend as expected. A lack of pretrends for both genders provides supportive evidence on my main identifying assumption. In Panel A, the estimates for women become positive, starting with cohorts aged 11-13, who are half exposed and half nonexposed. The estimates stay positive and become significant for fully exposed cohorts, with the exception of cohorts aged 5 to 7 in 1977, who were affected by military rule. This result is expected since girls' enrollments dropped sharply during the period of military rule, as I already mentioned in 2.2. These results indicate an increase in the likelihood of completing lower secondary school among women after the expansion of access to Islamic schools and are also in line with the overall trend in Islamic school enrollment in the official data in Figure 2. For the boy subsample, the estimates for fully exposed cohorts are smaller in magnitude and statistically indistinguishable from 0. The results are similar for the likelihood of completing upper secondary school, as seen in Panel B. This outcome suggests that some of the girl students who attended Islamic lower secondary schools continued their education at upper secondary level as well.

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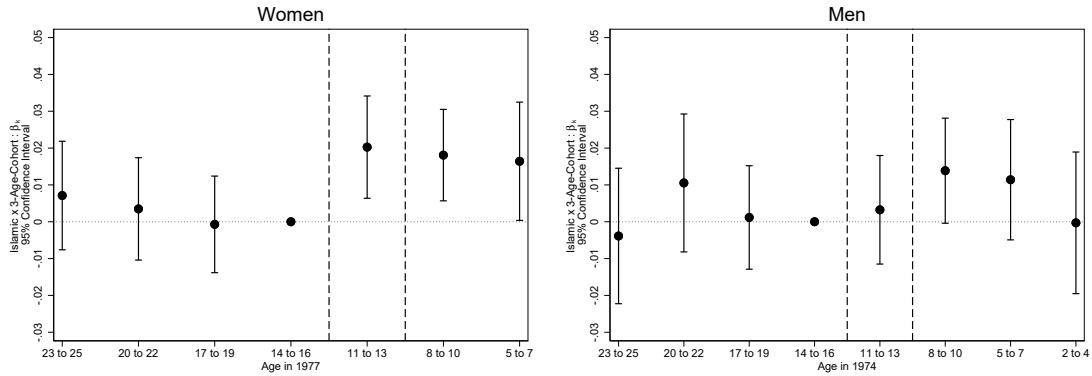
<sup>23</sup> Appendix Figures A.12, A.13 and A.14 present results on the specification with only district center and age-cohort fixed effects included for all outcomes.

**Figure 6:** Access to Islamic Schools and Education – Effects by 3-Age Cohorts

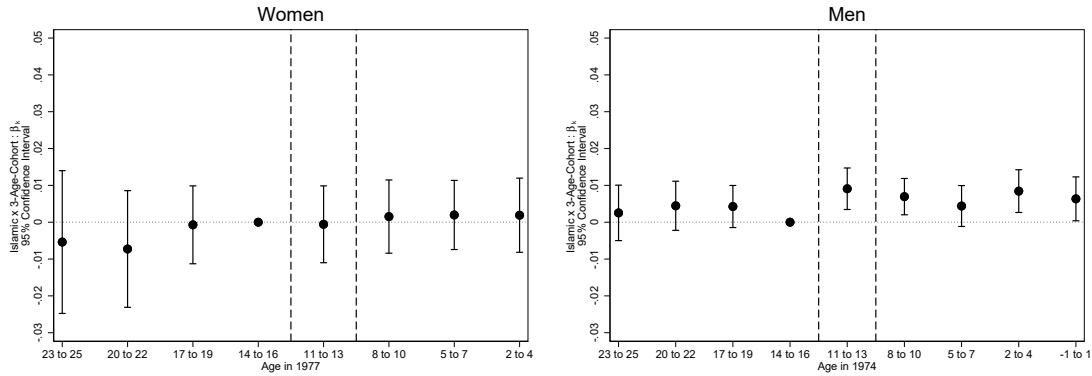
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed



(c) Dep. Var.: Primary School Completed (Placebo)



*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals for equation (1) for the subsamples of women and men, respectively. The sample contains only individuals resident in district centers in 1990. Islamic refers to district centers with an Islamic school in 1980. The dependent variables include an indicator equal to one if the individual has completed lower secondary school in Panel a, upper secondary school in Panel b, and primary school in Panel c. All specifications include district center and province-by-cohort fixed effects and the log of the 1970 population of the district center interacted with cohort dummies. Cohorts between two vertical lines include half-exposed and half-nonexposed cohorts. Cohorts on the right side of the second vertical lines are fully exposed. Cohorts aged between 14 and 16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district center of residence.

In Panel C, the estimates on the likelihood of completing primary school are close to 0 for fully exposed girl cohorts, and the trend remains flat. This result is in line with expectations, as there was no primary-level education in Islamic schools. Although it seems there is a significant increase in the likelihood of completing primary school for boys, it is mainly driven by the reference group being exceptionally low. Its pooled DID estimates are also small and statistically nonsignificant.

#### 4.2.2 Main Regression Estimates

In this section, I present the main regression estimates to assess the overall magnitude and significance of the impact of access to Islamic schools on education levels. I estimate the following generalized difference-in-differences specification separately for the subsamples of men and women:

$$y_{ipdc} = \gamma_d + \delta_c + \beta(Young_c \times Islamic_{pd}) + \sum_c \alpha_c \log(pop70)_{pd} + \eta_{pc} + \epsilon_{ipdc}. \quad (2)$$

This specification replaces the 3-age-cohort-specific  $\beta_k$  treatment effects in equation (1) with a single interaction of the  $Young_c$  dummy and  $Islamic_{pd}$ . The  $Young_c$  dummy equals 1 for cohorts fully exposed to the treatment—that is, individuals aged 11 or younger in 1977 for women and in 1974 for men—and equals 0 for nonexposed cohorts. Otherwise, the specification remains unchanged from equation (1). I exclude individuals aged 12 in 1977 for women and in 1974 for men as they may include members of the exposed and nonexposed cohorts together due to the calendar effect. Nonexposed cohorts are the last ten cohorts older than age 12 during the year of expansion of access.<sup>24</sup> I cluster standard errors at the level of the district center of residence. Under the parallel trends assumption and in the absence of time-varying confounding factors, the estimated  $\beta$  is the coefficient of interest, which reflects the average causal effect of access to Islamic schools on exposed

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<sup>24</sup>For the robustness of the results to different bandwidth selections, see Appendix Table A2.

cohorts.

Table 1 displays the main results on the effect of access to Islamic schools on the completed educational level of individuals. The odd columns present results from the simpler specification that includes only district center and age cohort fixed effects. Even columns present the preferred specification mentioned previously, where I insert province-by-cohort fixed effects and the initial population size of district centers interacted with cohort dummies, in addition to district center fixed effects. In columns 1 and 2 of Panels a and b, I investigate the effect on the likelihood of completing lower secondary school. With the expansion of access to Islamic schools, the likelihood of completing lower secondary school of exposed girl cohorts increases by 2.1 p.p., which is about 6.2% relative to the mean. For men, if anything, the likelihood of completing lower secondary school increases by 1 percentage point, which is about 2.1% relative to the mean, but the change is statistically indistinguishable from 0 and economically small in magnitude. Column 4 shows similar results on the likelihood of completing upper secondary school for both genders. While the likelihood of completing upper secondary increases for exposed girl cohorts by 1.7 p.p., which is about 7.2% relative to the mean, there is no statistically significant effect for men.

Next, I focus on the educational outcome that was not the direct target of access to Islamic schools, namely, the likelihood of completing primary school, which acts as a natural falsification test. Islamic schools were not available at the primary school level, so one would not expect access to Islamic schools to significantly increase the likelihood of completing primary school. In line with expectations, column 6 of both panels in Table 1 shows no significant effect of access to Islamic schools on the probability of completing primary school for either gender.

Overall, my results suggest that access to Islamic schools increased the overall education of affected women. When considered together with the evidence from official registrations reported in Figure 2, the results indicate that many of the girl students

**Table 1:** Access to Islamic Schools and Educational Attainment

(a) Panel A. Women

	Outcome: [...] School Completed					
	Lower Secondary		Upper Secondary		Primary	
	(1)	(2)	(3)	(4)	(5)	(6)
Islamic x Young	0.016*	0.021***	0.011	0.017***	-0.000	0.006
	(0.009)	(0.008)	(0.007)	(0.005)	(0.007)	(0.005)
Outcome Mean	0.342	0.342	0.236	0.236	0.867	0.867
R <sup>2</sup>	0.090	0.096	0.072	0.077	0.164	0.175
N	299544	299544	229053	229053	299544	299544
Clusters	894	894	894	894	894	894
District-center FE	✓	✓	✓	✓	✓	✓
Cohort FE	✓		✓		✓	
Province-by-cohort FE		✓		✓		✓
1970 Population Control		✓		✓		✓

(b) Panel B. Men

	Outcome: [...] School Completed					
	Lower Secondary		Upper Secondary		Primary	
	(1)	(2)	(3)	(4)	(5)	(6)
Islamic x Young	0.010	0.010	-0.000	0.003	0.000	0.003
	(0.007)	(0.006)	(0.006)	(0.006)	(0.002)	(0.002)
Outcome Mean	0.476	0.476	0.336	0.336	0.960	0.960
R <sup>2</sup>	0.042	0.049	0.037	0.045	0.055	0.062
N	374830	374830	295617	295617	374830	374830
Clusters	894	894	894	894	894	894
District-center FE	✓	✓	✓	✓	✓	✓
Cohort FE	✓		✓		✓	
Province-by-cohort FE		✓		✓		✓
1970 Population Control		✓		✓		✓

*Notes:* This table reports estimates of equation (2) separately for women and men. The sample contains only individuals residing in a district center in 1990. Islamic refers to district centers with an Islamic school in 1980. Young refers to cohorts aged less than 11 in 1977 for women and in 1974 for men. The population control includes the log of the 1970 district center population sizes interacted with cohort dummies. Odd columns include only for district center and age cohort fixed effects as controls. Even columns include district center and province-by-cohort FE and population size in 1970.

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01. Robust standard errors clustered by district center of residence.

registered in Islamic schools would not have continued on to secondary education without access to Islamic schools.<sup>25</sup> In contrast, the increase in overall education for men is systematically smaller and statistically nonsignificant. As seen from official registrations reported in Figure 2, although boys' registrations in Islamic schools were substantially larger than girls' registrations, this difference did not lead to an increase in education levels among men. This result indicates that most of the boy students registered in Islamic schools were substituting secular with Islamic schooling. My results, therefore, suggest asymmetries by child gender in conservative and religious parents' level of trust toward secular schools.

### 4.3 Effects on Family and Labor Market Outcomes

As Islamic schools attracted girl students mainly from religious and conservative families, another interesting set of outcomes to analyze are marriage and fertility behaviors among exposed girl cohorts. There is a vast amount of literature that examines the impacts of educational interventions on marriage and fertility decisions due to access to secular education. However, the consequences of an educational intervention providing access to Islamic schooling may have differential results. On the one hand, staying in secondary education might make teenage girls postpone their marriage or fertility decisions until after graduation. Since the target group was religious women, the effect may be substantial. On the other hand, attending an Islamic school and exposure to Islamic teaching might lead them to engage in more conservative marriage and fertility behaviors (Ali, 2010). However, the plausibility of the latter mechanism is ambiguous in my context, as girl students who otherwise would have dropped out of school were exposed to a substantial amount of secular content as well. In this paper, focusing on girls' early adulthood, I present evidence only on the argument regarding

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<sup>25</sup>Anecdotally, Pak (2004, p.333) states, "In fact, many of the parents I interviewed mentioned that they would not have sent their daughters to upper secondary school at all unless it was an Imam Hatip school."

postponement of fertility and marriage among affected girl cohorts. Unfortunately, analyzing lifetime fertility behavior is not possible due to data limitations and the timing of the census and is therefore beyond the scope of this paper.

To analyze the effect of access to Islamic schools on marital and fertility decisions, I estimate the same dynamic difference-in-differences specification as in equation (1) by using marital and fertility outcomes as my outcomes of interest. Here, I focus on cohorts aged 18 or older, the legal marriage age in Turkey.<sup>26</sup> To achieve a better counterfactual, I also exclude the eastern and southeastern regions of Turkey, which have very high fertility rates and mostly existed in my control group.<sup>27</sup> Everything else in the specification remains the same.

Ideally, one would like to have information on the age at first marriage and first childbirth as well as information about marriage status and the total number of births. However, the census does not include information on age at first marriage or first childbirth. Therefore, I analyze several related outcomes to link access to Islamic schools to delayed fertility and marriage behaviors. I start my analysis by using an indicator variable that provides information on whether the individual has ever married. Panel A of Figure 7 shows that access to Islamic schools is associated with a higher likelihood of ever marrying among the exposed girl cohorts; however, the estimates are highly noisy and statistically nonsignificant. This increase in marriages, which is both noisy and small in magnitude, may be due to the addition of value to the marriage market, particularly the one for religious and conservative individuals, from the expansion of education access to women.<sup>28</sup>

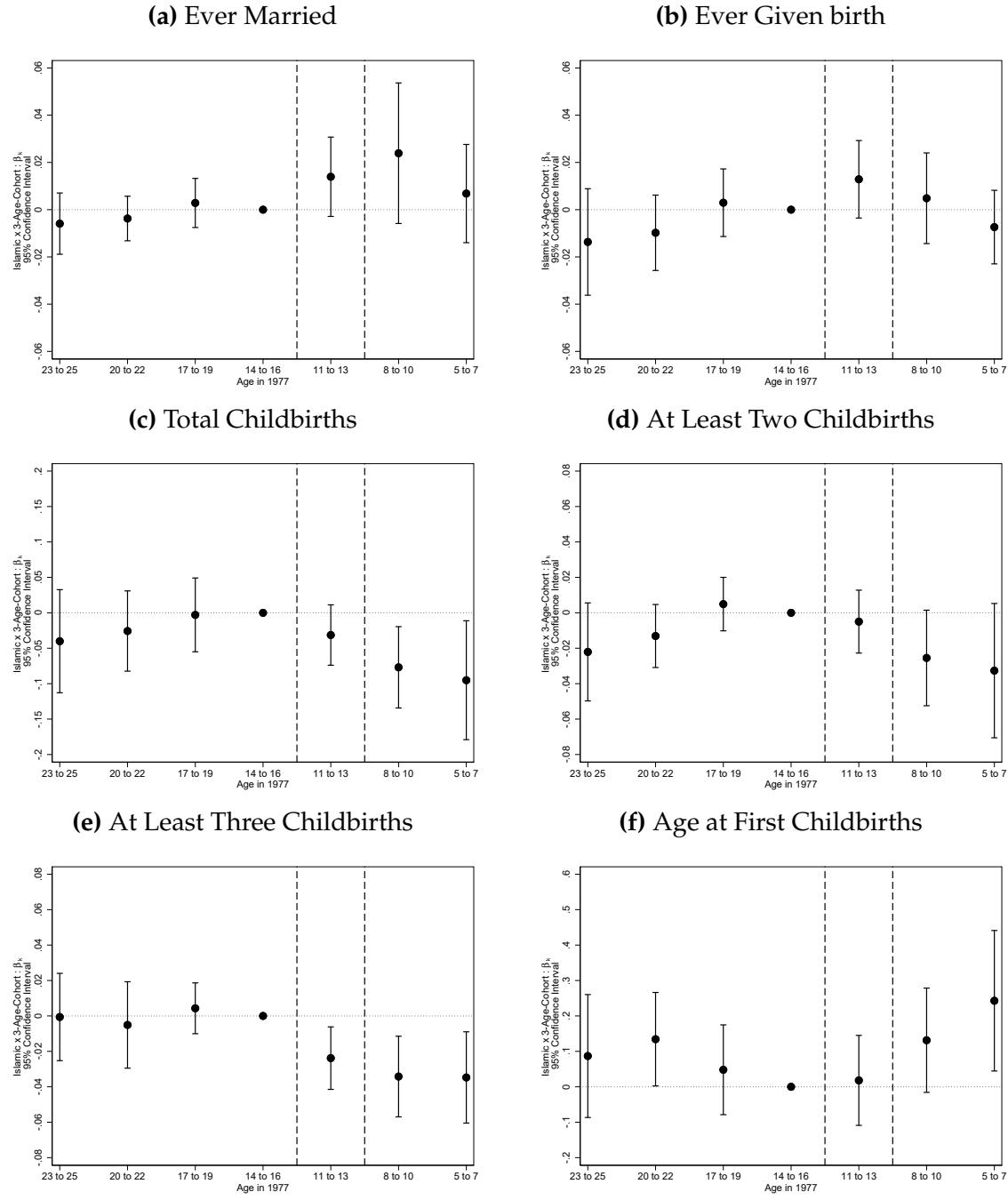
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<sup>26</sup>Although the legal marriage age is 18 in Turkey, teen marriage is a common phenomenon, as it is possible to have a religious marriage performed by an imam at earlier ages. However, this type of marriage is not recognized by the state, and marrying before age 18 is a punishable crime by law.

<sup>27</sup>Nevertheless, I provide the results on family outcomes based on the full sample in Appendix Figure A.15 and on labor market outcomes in Appendix Figure A.16.

<sup>28</sup>Consistent with this finding, Ashraf et al. (2020) find that school constructions in Indonesia had a large positive effect on the educational participation of women among ethnic groups with the bride price custom, while it had no effect among groups without the bride price custom. They show that this is due to an increase in the value of brides resulting from more education.

**Figure 7: Access to Islamic Schools and Family Outcomes – Effects by 3-Age Cohorts**



*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals for equation (1) for the subsample of women. The sample contains women aged 18 and older who resided in district centers in 1990, excluding centers in eastern and southeastern Turkey. The dependent variables include an indicator equal to one if the individual has ever married in Panel a, has ever given birth in Panel b, has given birth at least twice in Panel d, and has given birth at least three times in Panel e. The dependent variables measure the total number of childbirths in Panel c and the age at first birth in Panel f. All specifications include district center and province-by-cohort fixed effects and the log of the 1970 population of district center interacted with cohort dummies. Cohorts between two vertical lines include half-exposed and half-nonexposed cohorts. Cohorts on the right side of the second vertical lines are fully exposed. Cohorts aged between 14 and 16 in 1977 serve as the reference group. Standard errors clustered by district center of residence.

Second, I use the likelihood of ever giving birth as an outcome. Panel B of Figure 7 shows that differences in the likelihood of ever giving birth remain similar for exposed cohorts.

Next, I use the total number of childbirths by an individual as my outcome. As shown in Panel c of Figure 7, there are negative but declining pretreatment differences before the provision of Islamic school access. With the treatment, the trend reverses, and exposed girl cohorts show a decreasing trend in the total number of births. I provide further evidence that links the decrease in total fertility to fertility postponement. I use two different indicators identifying whether an individual has a minimum of a particular number of childbirths, namely, two or more and three or more births. Panel b has already shown that the likelihood of giving birth at least once does not change for the exposed cohorts. Panel d shows a picture similar to that for total childbirths for the likelihood of giving birth two or more times, as there are negative but declining differences before the treatment, and the trend reverses in favor of exposed girl cohorts after the provision of Islamic school access. Finally, we see a sharp decrease in the likelihood of giving birth at least three times or more for exposed cohorts in Panel e.

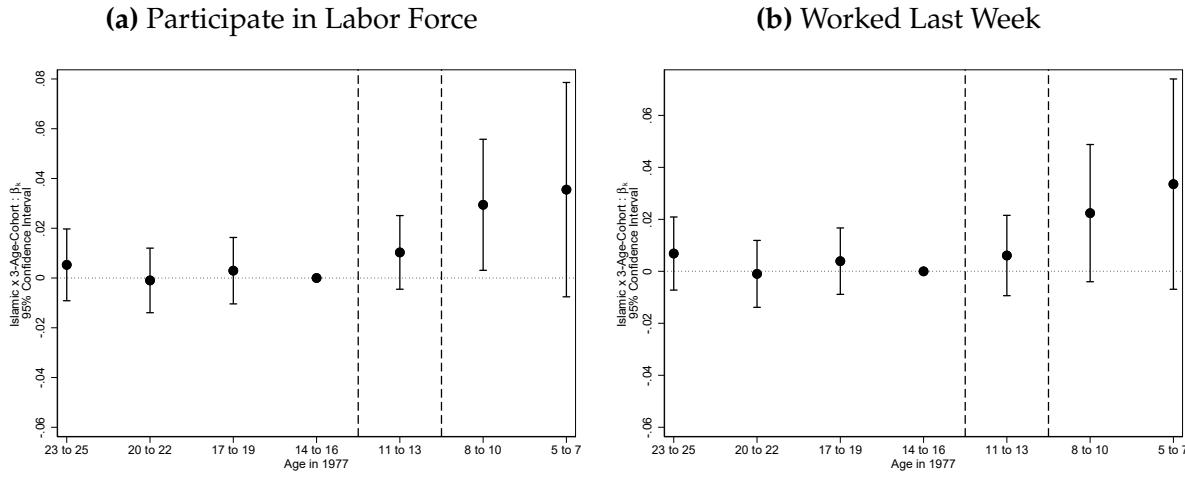
I argue that the reduction in early adulthood fertility is due to the postponement of fertility and marriage behaviors. Girls who potentially would have left school in the absence of the treatment might have married unofficially in a religious marriage and started giving birth at an early age. Therefore, by ages 18 to 25, they might have given birth twice or more, while those who stayed in schools due to access to Islamic schools would only be giving birth for the first or second time. Finally, I create an imperfect measure of age at first birth by using the information on the relationship to the family head in the census data.<sup>29</sup> Then, I run the same analysis with the constructed indicator of age at first birth as my outcome by restricting the sample to women who have given birth and present the results in Panel f. Similar to the previous analysis, while there are

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<sup>29</sup>Using the relationship to household head information, I first determine the mother and children in a household. Then, I calculate the mother's age at first birth by subtracting the oldest child's age from the mother's age.

negative but overall relatively declining pretreatment differences before Islamic school access, the trend reverses sharply for fully exposed cohorts after the expansion of access to Islamic schools. Therefore, the main takeaway remains unchanged and confirms the previous evidence.

**Figure 8:** Access to Islamic Schools and Labor Outcomes – Effects by 3-Age Cohorts



*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for the subsample of women. The sample contains women aged 18 and older who resided in district centers in 1990, excluding centers in eastern and southeastern Turkey. The dependent variables include an indicator equal to one if the individual participates in the labor force in Panel a and had worked the week prior to the census in Panel b. All specifications include district center and province-by-cohort fixed effects and the log of the 1970 population of the district center interacted with cohort dummies. Cohorts between two vertical lines include half-exposed and half-nonexposed cohorts. Cohorts on the right side of the second vertical lines are fully exposed. Cohorts aged between 14 and 16 in 1977 serve as the reference group. Standard errors clustered by district center of residence.

In Turkey, women's labor force participation has been persistently low throughout the history of the Turkish Republic (Özsoy and Atlama, 2009). This makes increasing the labor force participation of women a central issue in policy-making. Having a secondary degree in a developing country with low levels of education may increase labor market returns and incentivize women to participate in the labor market. To examine the effect of access to religious schools on labor market outcomes for women, I estimate the dynamic DID specification in equation (1) where the outcome variables are indicators whether the individual had participated labor force or was working one week prior to the census. I exclude the eastern and southeastern regions of Turkey, as in the family-related analysis. Figure A.35 shows no differences in outcomes for nonexposed

cohorts. After the expansion of access to Islamic schools, exposed cohorts became more likely to participate in the labor force and to have worked one week prior to the census. These results indicate that the increase in the overall education levels of women paid off in the labor market as well.

Table 2 reports the corresponding pooled differences-in-differences estimates for family and labor market outcomes for women. Overall, my results on education, family, and labor market outcomes indicate an empowering effect of access to Islamic schools among conservative religious women. The exclusionary nature of secular institutions in Turkey, combined with social norms and strict gender roles, erected cultural barriers to the educational participation of pious women and excluded them from public life. Removing cultural barriers and making the education system more inclusive through expansion of access to religion-friendly state-run Islamic schools induced religious parents to keep their daughters in secondary school after the girls' five-year compulsory education and led to women's empowerment and integration into public life.

## 5 Robustness Checks

### 5.1 No Evidence of Pre-existing Trends or Confounding Policies or Shocks

The main identifying assumption behind my empirical strategy is that in the absence of access to Islamic schools, the outcomes of girl (boy) cohorts living in a district center with an Islamic school would otherwise have changed similarly, on average, to those of girl (boy) cohorts residing in a district center without an Islamic school. Even though this assumption is untestable, the nonexistence of pretrends offers evidence in support of my parallel trends assumption. Note that the results presented in Figures 4 and 6 support this assumption. The point estimates of nonexposed cohorts for both genders are close to zero

**Table 2:** Access to Islamic School and Impacts on Family and Labor Outcomes

(a) Panel A. Full Sample

Outcome:	Ever Married (1)	1+ births (2)	Total Births (3)	2+ births (4)	3+ births (5)	Age at First birth (6)	Participate Labor Force (7)	Worked Last Week (8)
Islamic x Young	0.015 (0.012)	0.004 (0.006)	-0.063* (0.035)	-0.021* (0.012)	-0.031** (0.013)	0.050 (0.077)	0.029** (0.014)	0.025* (0.014)
Outcome Mean:	0.741	0.644	1.539	0.463	0.232	21.15	0.221	0.190
R <sup>2</sup>	0.315	0.347	0.390	0.381	0.257	0.104	0.039	0.043
N	219389	219289	219289	219289	219289	115514	219400	219381
Clusters	750	750	750	750	750	749	750	750
District-Center FE	✓	✓	✓	✓	✓	✓	✓	✓
Province-by-Cohort FE	✓	✓	✓	✓	✓	✓	✓	✓
1970 Population Control	✓	✓	✓	✓	✓	✓	✓	✓
Small Sample								

(b) Panel B. Small Sample

Outcome:	Ever Married (1)	1+ births (2)	Total Births (3)	2+ births (4)	3+ births (5)	Age at First birth (6)	Participate Labor Force (7)	Worked Last Week (8)
Islamic x Young	0.014 (0.011)	-0.001 (0.005)	-0.077** (0.033)	-0.026* (0.014)	-0.032*** (0.011)	0.010 (0.069)	0.030** (0.015)	0.027* (0.014)
Outcome Mean:	0.671	0.555	1.248	0.347	0.146	20.514	0.223	0.184
R <sup>2</sup>	0.276	0.303	0.342	0.313	0.196	0.121	0.039	0.044
N	164126	164052	164052	164052	164052	72097	164136	164119
Clusters	750	750	750	750	750	735	750	750
District-Center FE	✓	✓	✓	✓	✓	✓	✓	✓
Province-by-Cohort FE	✓	✓	✓	✓	✓	✓	✓	✓
1970 Population Control	✓	✓	✓	✓	✓	✓	✓	✓
Small Sample	✓	✓	✓	✓	✓	✓	✓	✓

*Notes:* This table reports estimates of equation (2) for the subsample of girls. The sample contains only individuals residing in a district center in 1990, excluding district centers in the eastern and southeastern regions of Turkey. Islamic refers to district centers with an Islamic school in 1980. Young refers to cohorts aged less than 11 and older than 4 in 1977. The full sample includes age-cohort 22 and younger in 1977, while the small sample includes age-cohort 17 and younger in 1977. The population control includes the log of the 1970 district center population sizes interacted with cohort dummies. All specifications include district center and province-by-cohort FE and population size in 1970.

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01. Robust standard errors clustered by district center of residence.

and do not follow any specific trends.

Another concern for my identification is the possibility of confounding policies or shocks that may overlap with the expansion of access to Islamic schools. As depicted in Figure A.30, the positive jump in the estimated coefficients for both genders happens right after the expansion of access for the first exposed cohorts and stays consistently positive for women. To my knowledge, there were no other policy changes or time-variant shocks that could have differentially affected district centers with an Islamic school and the comparison group beginning from the year of extension of Islamic school access and persisting through the analysis period. The trend for exposed girl cohorts is also similar to that observed in the official registration data plotted in Figure 2.

## 5.2 Additional Robustness Checks

Here, I conduct several other robustness checks and present them in Panels a and b of Figure A.23 for women and men, respectively. The first rows of each gender panel present my main results on the likelihood of completing lower secondary school for comparison. The second rows include as controls the average value of the dependent variable for the nonexposed cohorts interacted with cohort dummies. The third rows include Islamic party vote shares in the 1973 election interacted with cohort dummies as a proxy control for religiosity. The results remain robust and suggest that my main estimates are unlikely to be driven by religious or low-educated district centers experiencing a differential evolution of lower secondary school completion rates over cohorts.

The fourth rows exclude district centers located in eastern and southeastern Turkey, where availability of religious schools was rare and girls' education levels were remarkably low. The results are robust, suggesting that the evolution of lower secondary school completion rates in those regions does not drive my results. The fifth rows drop cohorts who came of secondary school age during military rule. The estimated

coefficients become slightly larger and more significant for women. The sixth and seventh rows exclude relatively large and small district centers, respectively, and the estimates remain unchanged. The eighth rows exclude schools opened after the 1977 court ruling. The ninth rows exclude district centers with an Islamic school prior to the school expansion and groups of military service age in the boy subsample. Finally, I show that my results on education are not sensitive to different bandwidth selections in Appendix Table A.4. Overall, all results are highly robust to the multiple checks conducted in this section.

### 5.3 Alternative Estimator

A growing literature in DID methodology raises concerns about the bias in two-way fixed effect (TWFE) estimators due to staggered adoption designs and negative weights or treatment effect heterogeneity. This paper uses a generalized DID design that lets the treatment status change only at a single point in time for all treated cohorts while the comparison group's treatment status remains unchanged. Thus, the former concern is irrelevant to my design.<sup>30</sup> However, as suggested by De Chaisemartin and d'Haultfoeuille (2020), there may still be bias in the TWFE estimator from the existence of treatment heterogeneity. To alleviate these concerns, I utilize the DIDM estimator developed by De Chaisemartin and d'Haultfoeuille (2020) for education outcomes and present the results in Appendix Figure A.17 with baseline controls and Appendix Figure A.18 without controls. Both figures show that the estimates and trends from the DIDM estimator are largely similar to those from the TWFE estimator, albeit with a slight loss of precision under the DIDM estimator. Consequently, this robustness check offers reassurance that my results are not sensitive to the treatment heterogeneity.

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<sup>30</sup>I further check for the existence of any negative weights in my estimation using the *twowayfeweights* Stata command introduced by De Chaisemartin and d'Haultfoeuille (2020) and find no negative weights in my TWFE estimation.

## 5.4 Rural Sample as a Placebo

Islamic schools were located in cities with district center status, and the registration area of these schools was narrow, as the road and transportation network was limited. Most of the rural towns and villages fell outside the purview of Islamic schools. Although there were some schools, mostly located in province capitals, which had dormitories to accommodate students from rural areas, these dormitories were available only for boy students. For individuals in rural areas outside the registration area of Islamic schools, one would not expect to find any significant effect of access to Islamic schools on educational attainment. I explore this by estimating equation 2 for the sample of rural residents as a placebo test. Table 3 reports the estimated coefficients for the boy and girl subsamples separately. For rural girls, all the estimates are small in magnitude and statistically highly nonsignificant. For rural men, the estimates are relatively larger and similar to those of the district center sample. This may be due to the availability of dormitories for boy students.<sup>31</sup> There is no effect on the likelihood of completing any schooling or being literate, as Islamic schools did not operate at the primary level. I further present the dynamics of the treatment effect for all outcomes in Appendix Figures A.9, A.10 and A.11 from equation (1) for the rural sample.

## 5.5 Migration and Province-level Evidence

A central concern regarding identification is that the effects are driven by mobility related to migration. Ideally, one would like to assign individuals to treatment based on where they resided at age 11, when the decision over their participation in secondary education was made. Since I do not have information about individuals' migration history, I define the assignment to treatment with respect to where they resided during the 1990 census, assuming that they did not move after being of schooling age. This is

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<sup>31</sup>In fact, more than half of the registrations in Islamic lower secondary schools from between 1967 and 1973 correspond to students from rural villages (DIE, 1977). This information is not available for my analysis period.

**Table 3:** Access to Islamic School and Educational Attainment for Rural Sample (Placebo Test)

**(a) Panel A. Women**

	Outcome: [...] School Completed		
	Lower Secondary (1)	Upper Secondary (2)	Primary (3)
Islamic x Young	0.003 (0.004)	0.004 (0.003)	-0.006 (0.007)
Outcome Mean	0.078	0.045	0.742
R <sup>2</sup>	0.073	0.050	0.317
N	189762	132520	189762
Clusters	888	887	888
District-center FE	✓	✓	✓
Province-by-cohort FE	✓	✓	✓
1970 Population Control	✓	✓	✓

**(b) Panel B. Men**

	Outcome: [...] School Completed		
	Lower Secondary (1)	Upper Secondary (2)	Primary (3)
Islamic x Young	0.009 (0.006)	0.009* (0.005)	-0.000 (0.004)
Outcome Mean	0.225	0.137	0.920
R <sup>2</sup>	0.072	0.046	0.137
N	207484	156142	207484
Clusters	890	890	890
District-center FE	✓	✓	✓
Province-by-cohort FE	✓	✓	✓
1970 Population Control	✓	✓	✓

*Notes:* This table reports estimates of equation (2) separately for women and men. The sample contains only individuals residing in rural areas of districts in 1990. Islamic refers to district centers with an Islamic school in 1980. Young refers to cohorts aged less than 11 in 1977 for women and in 1974 for men. The population control includes the log of 1970 district-center population sizes interacted with cohort dummies. All specifications include district center and province-by-cohort FE and population size in 1970.

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01. Robust standard errors clustered by district of residence.

not likely to be the case, as migration has been a common phenomenon in Turkey since the 1980s. If migration trends are unrelated with access to Islamic schools, then it should only attenuate the results toward 0 since it should introduce random measurement error into the treatment variable. If migration trends are related with access to Islamic schools, then the bias could go in either direction.

To alleviate concerns related to mobility, I conduct several robustness checks. First, I use another identification strategy, defining assignment to treatment with respect to the individuals' birth locations instead of their locality of residence in the 1990 census. As all the affected girl cohorts (and most of the exposed boy cohorts) were already born prior to the expansion of access to Islamic schools, location of birth and access to Islamic schools are unlikely to be endogenous to each other. Even though it is not possible to identify the district center of birth for individuals, I can identify the province of birth and whether individuals were born in any of the district centers within their province. I restrict my sample to individuals born in any district center. I construct an intensity variable to measure the exposure to treatment at the province level. Intensity is the number of Islamic schools within province  $p$  in 1980 divided by the average size in young cohort by gender in province  $p$  cohort  $c$  scaled by 1000. I employ a dynamic difference-in-differences strategy as before and estimate the following equation separately for both the boy and girl subsamples:

$$y_{ipc} = \gamma_p + \delta_c + \sum_k \beta_k (I_c^k \times \text{Intensity}_{pc}) + \epsilon_{ipc}, \quad (3)$$

where  $y_{ipc}$  is my main outcome variable of interest: the likelihood of completing lower secondary school.  $\gamma_p$  and  $\delta_c$  are the full sets of province of birth and birth cohort fixed effects.  $I_c^k$  is an indicator for 3-age cohorts. I cluster standard errors at the level of province of birth.

Appendix Figure A.28 presents the estimated coefficient of equation (3) for both

genders.<sup>32</sup> There are no pretreatment differences in the estimated coefficients for unexposed cohorts of either gender. The coefficients are close to 0 and statistically highly nonsignificant for women. For men, there is a slight upward trend prior to the treatment, and it seems that it continues after the expansion of access as well. The estimates become positive and statistically significant for the exposed girl cohorts, with a consistent upward trend after the expansion of access to Islamic schools. These results support that it is unlikely that my results are mainly driven by mobility.

I conduct additional checks to mitigate concerns over selective migration and present them in Appendix Figure A.24. The first rows in each gender panel present my main results on the likelihood of completing lower secondary school for comparison. Migration from rural areas to urbanized district centers has been the most common migration pattern observed in Turkey since the 1950s. To rule out differential trends in rural-to-urban migration as a driver of the effect, I drop all individuals born in rural areas from my sample. The estimated coefficients are unaffected for the subsample of boys and grow even larger for the subsample of girls. Second, I drop all interprovince movers from my sample. The estimated coefficients are nearly identical to those in the baseline. Thus, interprovince mobility is not the driving force behind my results. Last, I drop all individuals who report having moved from where they lived five years ago, and the coefficients again remain similar.

Finally, I utilize a piece of information from the 1990 census that records individuals' residency in 1985. I assign individuals to treatment based on their residency in 1985 instead of 1990. By doing this, I assign individuals to the locations where they lived when they were closer to schooling age, especially treated younger cohorts. However, this method involves two potential biases. First, people may misreport where they lived five years ago, and some might record this location as unknown and therefore be excluded from the analysis. This would lead to an attenuation bias if misreporting is

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<sup>32</sup> Appendix Figure A.29 presents relevant estimates for my placebo sample consisting only of rural-born individuals.

random. Second, there may be sampling bias since sampling is conducted according to 1990 census locations, so some areas may be oversampled. Nevertheless, I do the same analysis for all outcomes and present them in the appendix. Appendix Table A.2 reports the estimates from the standard DID specification in equation 1 by assigning individuals to treatment according to their residency in 1985. Although the magnitude of the likelihood of completing lower secondary school is slightly less pronounced for both genders, the remaining estimates are similar to those in the main analysis. I further present the dynamics of the treatment effects in Appendix Figures A.25, A.26 and A.27. Overall, the trends and main takeaways remain unchanged, and this exercise provides further evidence that my results are unlikely to be mainly driven by mobility.

## 5.6 Only a Supply Effect or More? Evidence on the Gender Gap in Education

Access to Islamic schools comes bundled with an increase in the supply of schooling, as the latter is a natural consequence of the former. Thus, one may be concerned that the effects are merely driven by the supply of additional schools in district centers instead of access to Islamic schooling per se, which eliminates direct and indirect barriers posed by strictly secular institutions to religious communities. If there are no capacity constraints that prevent school-age individuals from participating in secondary education, then the supply effect would be less of a concern. District centers are the most urbanized centers in their vicinity, with full access to primary, lower secondary, and upper secondary schools during the period of analysis. However, Table A.1 shows that older girl cohorts are about 45% less likely to have completed lower secondary school than older boy cohorts. While this gap decreases for younger cohorts, we still see a substantial difference between boys' and girls' secondary education completion rates. Since there were no gender-related institutional restrictions on participation in secular schools, the gender gap in education cannot be solely explained by capacity constraints.

To analyze this phenomenon further, I benefit from the growing access to Islamic schools that happened around the same period for both men and women to reveal heterogeneity in the effect of the treatment between genders. Here, I focus on exposed cohorts aged 11 or younger in 1977. Therefore, I exclude the first three fully exposed boy cohorts from this analysis, as women of same cohorts had no access to Islamic schools. I use a specification akin to a triple-differences strategy by interacting every term in equation (2) with the  $I_g$  variable indicating the gender of an individual and estimate the following equation on the pooled sample of men and women:

$$y_{ipdc} = \beta(Young_c \times Islamic_{pd} \times I_g) + \theta^m(Young_c \times Islamic_{pd}) + \gamma_d I_g + \eta_{pc} I_g + \sum_c \alpha_c \log(pop70)_{pd} I_g + \epsilon_{ipdc}, \quad (4)$$

where  $\beta = \theta^f - \theta^m$  is the coefficient of interest that captures the change in gender differences in educational attainment after the expansion of access to Islamic schools. As I interact every term in equation (2) with  $I_g$ ,  $\gamma_d I_g$  and  $\eta_{pc} I_g$  are full sets of gender-specific fixed effects. I also include interactions between cohort dummies, the gender indicator and  $\log(pop70)_{pd}$ , the natural log of the population size of district center  $d$  in 1970. I cluster standard errors at the district center level.

Table 4 presents the estimates of the triple-differences specification outlined in equation (4) on educational attainment at different levels of education. Column 1 in Panel A shows that exposed girl cohorts are 1.2 p.p. (s.e=0.8 p.p.) more likely to have completed lower secondary school than exposed boy cohorts who experienced expanding access to Islamic schools around the same period. This effect corresponds to a 9% reduction in the gender gap in relative terms. The estimated coefficients for upper secondary school completion rates are similar in magnitude and more precisely estimated. As one would expect, the estimated coefficients for the likelihood of completing primary school in column 3 are nonsignificant and similar to the placebo

**Table 4:** Heterogeneous Effects on Education by Gender

(a) Panel A. Islamic school access in 1977

	Outcome: [...] School Completed		
	Lower Secondary (1)	Upper Secondary (2)	Primary (3)
Islamic x Young x Female	0.012 (0.008)	0.012* (0.006)	0.004 (0.007)
Islamic x Young	0.010 (0.007)	0.005 (0.007)	0.002 (0.002)
Outcome Mean (Men - Women)	0.142	0.112	0.107
R <sup>2</sup>	0.095	0.077	0.180
N	608829	459125	608829
Clusters	894	894	894
District-center FE	✓	✓	✓
Province-by-cohort FE	✓	✓	✓
1970 Population Control	✓	✓	✓

(b) Panel B. Placebo Islamic school access in 1957

	Outcome: [...] School Completed		
	Lower Secondary (1)	Upper Secondary (2)	Primary (3)
Islamic x 1957 Placebo x Female	-0.011 (0.008)	-0.006 (0.007)	0.007 (0.010)
Islamic x 1957 Placebo	0.011 (0.008)	0.009 (0.007)	0.004 (0.006)
Outcome Mean (Men - Women)	0.185	0.134	0.279
R <sup>2</sup>	0.137	0.113	0.261
N	331266	331266	331266
Clusters	894	894	894
District-center FE	✓	✓	✓
Province-by-cohort FE	✓	✓	✓
1970 Population Control	✓	✓	✓

*Notes:* This table reports estimates of equation (4). The sample contains only individuals residing in district centers in 1990. Islamic refers to district centers with an Islamic school in 1980. Young refers to cohorts aged between 2 and 11 in 1977 for the main experiment in Panel a. In Panel b, 1957 Placebo refers to cohorts aged between 2 and 11 in 1957. The Young and 1957 Placebo dummies take 0 for cohorts aged between 13 and 22 in 1977 for the main experiment and in 1957 for the placebo experiment. Female is an indicator of an individual's gender. All specifications include the interaction of the gender indicator *Female* with district center and province-by-cohort fixed effects and the log of the 1970 population of the district center interacted with cohort dummies.

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01. Robust standard errors clustered by district center of residence.

coefficients. Access to Islamic schools reduces the gender gap only for the level of education targeted by the treatment. As shown in Panel b, there is no statistically significant effect found in the placebo test that posits an imagined expansion of access to Islamic schools happening 20 years earlier in 1957. The coefficient in column 1 is negative, indicating that the gender gap at that time was in fact enlarging in favor of men. The expansion of access to Islamic schools in 1977 reverted this trend and decreased the gender gap in favor of women. The evidence on the gender gap supports that the mere supply of additional schools did not drive the effect; rather, it was due to eliminating cultural barriers to participation in secondary education and boosting the inclusiveness of institutions toward girl students from religious and conservative families.

## 6 Concluding Remarks

This paper studies the impacts of a culturally inclusive policy change that removed the religion-based barriers to education posed by strictly secular institutions in Turkey by providing Islamic schools as an alternative to secular schools. Using cohort variation in exposure and district center-level variation in the availability of Islamic schools, I estimate the effects of access to Islamic schools in Turkey during the 1970s and 1980s. The results reveal that being seen as religion-friendly schools, Islamic schools managed to induce women from religious communities to stay in school and led to an overall increase in secondary education levels . The effect for men was small and nonsignificant, implying that men primarily substituted secular schools with Islamic schools. The results further reveal that women staying in school was accompanied by outcomes that corresponded to the initial aims of the secularization effort of the new Turkish Republic, such as lower fertility at early adulthood, delayed pregnancies, and higher labor force participation.

The findings of this article have two main implications. First, this paper implies that

cultural constraints play a remarkable role in parents' decisions about their children's educational participation under specific circumstances. Differential effects by gender further indicate that cultural constraints to participating in education were binding primarily for girl children from religious families in the Turkish context. This outcome suggests an asymmetry in parents' trust in secular schools by child gender. Second, it shows that when a cultural backlash exists, culturally inclusive policies that eliminate cultural barriers can effectively reverse the backlash and increase overall levels of education within the population. Although Islamic schools were habitually inclusive toward the pious, providing a safer school environment that removes a mixture of gender- and religion-related barriers may be sufficient to keep girls in school regardless of schools' religious status. Nevertheless, cultural exclusion is a reality for groups with marginalized identities, including those based on ethnicity, sexual orientation, migration, displacement, and race ([United Nations Educational and Organization, 2020](#)). It is therefore essential that policies for the design of educational institutions be of a culturally inclusive nature.

At this point, it is vital to highlight limitations related to my study's external validity. Particularly, I analyze the impact of access to Islamic schools in the Turkish context during a period when institutions were strongly secular and secondary education was low and voluntary. Thus, my results cannot be generalized automatically to the expansion of the Islamic school network in Turkey that happened during the last decade. Modern-day Turkey legally mandates twelve years of compulsory education and has remarkably high participation of girls in education. The strictness of secular institutions has also significantly loosened under Islamist AKP party rule in comparison to level in my analysis period.<sup>33</sup> Notwithstanding, the findings reported here are mostly relevant for low-income Muslim countries with highly religious populations and strongly secular institutions, so further investigations are needed in other institutional settings.

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<sup>33</sup>Many of the laws that restrict the role of religion in public life have been changed during the rule of the Islamist AKP since 2002.

Non-Arabic Muslim countries in Africa with the world's lowest levels of education among girls may be relevant contexts for study, as these countries have both religion- and ethnicity-based cultural constraints due to their history of colonial assimilation.<sup>34</sup> Therefore, more investigation is needed concerning cultural barriers toward groups with other sorts of cultural identities.

Another direction for future work is to investigate further the impacts of Islamic schools, particularly state-run schools, on outcomes such as the shaping of religious and political identities. Finally, future work may examine the causal effects of Islamic schooling on academic performance. One implication of this paper is that men mainly substituted secular schooling with Islamic schooling. Although the religious content of curriculum was not emphasized at the expense of the secular content in my context, it often replaces a portion of secular content in many others. Therefore, it is important to learn about the general welfare effects of Islamic schooling on societies.

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<sup>34</sup>The role of culture in education in Africa has been a focal point in various fields of social sciences (e.g., Brenner, 2007; Csapo, 1981; Moumouni, 1968; Nduka, 1964; Niles, 1989; Platas, 2018).

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## A Online Appendix - Additional Tables

**Table A.1:** Summary Statistics

**(a) Panel A. Women**

	Old Cohorts			Young Cohorts		
	Obs.	Mean	S.D.	Obs.	Mean	S.D.
Lower Secondary School Completed	137644	0.28	0.45	161900	0.40	0.49
Upper Secondary School Completed	137644	0.21	0.40	91409	0.28	0.45
Primary School Completed	137644	0.83	0.38	161900	0.90	0.30
Ever Married	123542	0.92	0.27	95847	0.51	0.50
Total Births	123484	2.29	1.63	95805	0.57	0.91
1+ Births	123484	0.86	0.35	95805	0.37	0.48
2+ Births	123484	0.71	0.45	95805	0.15	0.35
3+ Births	123484	0.38	0.49	95805	0.04	0.19
Age at First Birth	88243	21.23	3.56	21746	19.25	2.38
Participate Work Force	123547	0.21	0.41	95853	0.24	0.43
Worked Last Week	123539	0.20	0.40	95842	0.18	0.39

**(b) Panel B. Men**

	Old Cohorts			Young Cohorts		
	Obs.	Mean	S.D.	Obs.	Mean	S.D.
Lower Secondary School Completed	144172	0.45	0.50	230658	0.50	0.50
Upper Secondary School Completed	144172	0.33	0.47	151445	0.35	0.48
Primary School Completed	144172	0.96	0.20	230658	0.96	0.19

**(c) Panel C. Distict-centers**

	Without Islamic School					With Islamic School				
	Obs.	Mean	Min	Max	S.D.	Obs.	Mean	Min	Max	S.D.
1970 Population	521	8934	358	418082	29518	373	27491	1318	417662	47436
1990 Population	521	19624	802	712304	60662	373	61935	2250	1328276	123352
1973 Islamist Vote	521	0.10	0.00	0.75	0.11	373	0.11	0.00	0.52	0.09
Province Capital	521	0.05	0	1	0.21	373	0.22	0	1	0.41

*Notes:* The table reports summary statistics on education-related outcomes of old cohorts (aged between 13 and 22 in 1977 for women and in 1974 for men) and young cohorts (aged between 2 and 11 in 1977 for women and aged between -1 and 11 in 1974 for men) in Panels A and B. In Panel A, the table reports summary statistics on family and labor outcomes for women, excluding individuals residing in southeastern and eastern Turkey. Panel C reports district center-level characteristics based on the 1970 and 1990 population censuses and 1973 general elections data.

**Table A.2:** Access to Islamic Schools and Educational Attainment – Assigned according to 1985 Residency

(a) Panel A. Women

	Outcome: [...] School Completed					
	Lower Secondary (1)	Upper Secondary (2)	Upper Secondary (3)	Upper Secondary (4)	Primary (5)	Primary (6)
Islamic x Young	0.018** (0.009)	0.015* (0.008)	0.017** (0.007)	0.015*** (0.005)	-0.001 (0.007)	0.004 (0.004)
Outcome Mean	0.343	0.343	0.238	0.238	0.868	0.868
R <sup>2</sup>	0.096	0.103	0.075	0.080	0.175	0.186
N	292292	292292	223363	223363	292292	292292
Clusters	894	894	894	894	894	894
District-center FE	✓	✓	✓	✓	✓	✓
Cohort FE	✓		✓		✓	
Province-by-cohort FE		✓		✓		✓
1970 Population Control		✓		✓		✓

(b) Panel B. Men

	Outcome: [...] School Completed					
	Lower Secondary (1)	Upper Secondary (2)	Upper Secondary (3)	Upper Secondary (4)	Primary (5)	Primary (6)
Islamic x Young	0.010 (0.007)	0.006 (0.007)	0.008 (0.006)	0.005 (0.006)	-0.001 (0.002)	0.001 (0.002)
Outcome Mean	0.477	0.477	0.337	0.337	0.961	0.961
R <sup>2</sup>	0.041	0.047	0.036	0.042	0.056	0.063
N	367962	367962	291159	291159	367962	367962
Clusters	894	894	894	894	894	894
District-center FE	✓	✓	✓	✓	✓	✓
Cohort FE	✓		✓		✓	
Province-by-cohort FE		✓		✓		✓
1970 Population Control		✓		✓		✓

Notes: This table reports estimates of equation (2) separately for women and men. The sample contains only individuals residing in a district center in 1985. Islamic refers to district centers with an Islamic school in 1980. Individuals are assigned to the treatment variable *Islamic* according to their residency in 1985. Young refers to cohorts aged less than 11 in 1977 for women and in 1974 for men. The population control includes the log of the 1970 district center population sizes interacted with cohort dummies. Odd columns include only district center and age-cohort fixed effects as controls. Even columns include district center and province-by-cohort FE and population size in 1970.

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01. Robust standard errors clustered by district center of residence.

**Table A.3:** Heterogeneous Effects on Education by Islamist Party Vote Share

(a) Women

	Outcome: [...] School Completed					
	Lower Secondary		Upper Secondary		Primary	
	(1)	(2)	(3)	(4)	(5)	(6)
Islamic x Young	0.025*** (0.010)	0.019** (0.009)	0.013* (0.008)	0.009 (0.007)	0.007 (0.008)	0.008** (0.004)
Islamic x Young x Islamist V.S. Above Median	-0.003 (0.015)	-0.004 (0.012)	0.012 (0.010)	0.012 (0.009)	-0.002 (0.010)	-0.000 (0.006)
R <sup>2</sup>	0.100	0.100	0.080	0.081	0.180	0.182
N	299503	299503	229014	229014	299503	299503
Clusters	894	894	894	894	894	894
District-Center FE	✓	✓	✓	✓	✓	✓
Province-by-Cohort FE	✓	✓	✓	✓	✓	✓
1970 Population Control	✓	✓	✓	✓	✓	✓
Old Cohorts Education Control		✓		✓		✓

(b) Men - Conscription Cohorts Excluded

	Outcome: [...] School Completed					
	Lower Secondary		Upper Secondary		Primary	
	(1)	(2)	(3)	(4)	(5)	(6)
Islamic x Young	0.002 (0.008)	-0.001 (0.008)	-0.003 (0.008)	-0.005 (0.008)	-0.000 (0.003)	0.001 (0.002)
Islamic x Young x Islamist V.S. Above Median	0.014 (0.011)	0.011 (0.010)	0.022** (0.011)	0.015 (0.010)	0.003 (0.004)	0.003 (0.003)
R <sup>2</sup>	0.052	0.052	0.048	0.048	0.067	0.069
N	321990	321990	242780	242780	321990	321990
Clusters	894	894	894	894	894	894
District-Center FE	✓	✓	✓	✓	✓	✓
Province-by-Cohort FE	✓	✓	✓	✓	✓	✓
1970 Population Control	✓	✓	✓	✓	✓	✓
Conscription Cohorts Excluded	✓	✓	✓	✓	✓	✓
Old Cohorts Education Control		✓		✓		✓

Notes: This table reports estimates of equation (4). The sample contains only individuals residing in district centers in 1990. Islamic refers to district centers with an Islamic school in 1980. Young refers to cohorts aged between 2 and 11 in 1977 for women and in 1974 for men. Islamist V.S. Above Median indicates whether the district center had an above-median Islamist vote share in the 1973 election. All specifications include district center fixed effects and interactions of the above-median Islamist vote share indicator with province-by-cohort fixed effects and the log of the 1970 population of the district center interacted with cohort dummies.

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01. Robust standard errors clustered by district center of residence.

**Table A.4:** Access to Islamic Schools and Educational Attainment – Robustness to Different Bandwidths

(a) Panel A. Women

	Outcome: [...] School Completed							
Bandwidth:	Lower Secondary			Upper Secondary		Primary		
	N=10 (1)	N=7 (2)	N=4 (3)	N=7 (4)	N=4 (5)	N=10 (6)	N=7 (7)	N=4 (8)
Islamic x Young	0.021*** (0.008)	0.020*** (0.007)	0.021*** (0.007)	0.017*** (0.005)	0.019*** (0.006)	0.006 (0.005)	0.005 (0.004)	0.005 (0.004)
Outcome Mean	0.342	0.341	0.333	0.236	0.235	0.867	0.872	0.876
R <sup>2</sup>	0.096	0.086	0.075	0.077	0.070	0.175	0.170	0.154
N	299544	208701	101254	229053	143199	299544	208701	101254
Clusters	894	894	888	894	892	894	894	888
District-center FE	✓	✓	✓	✓	✓	✓	✓	✓
Province-by-cohort FE	✓	✓	✓	✓	✓	✓	✓	✓
1970 Population Control	✓	✓	✓	✓	✓	✓	✓	✓

(b) Panel B. Men

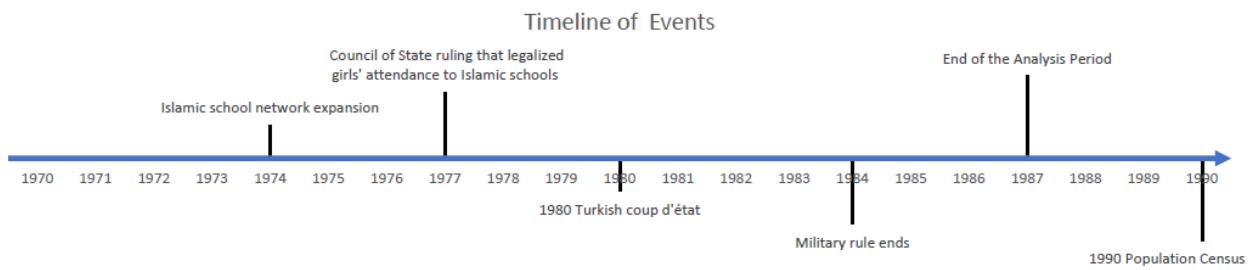
	Outcome: [...] School Completed								
Bandwidth (Pre & Post):	Lower Secondary			Upper Secondary			Primary		
	N=10 N=13 (1)	N=7 N=10 (2)	N=4 N=7 (3)	N=10 (4)	N=7 (5)	N=4 (6)	N=10 N=13 (7)	N=7 N=10 (8)	N=4 N=7 (9)
Islamic x Young	0.010 (0.006)	0.009 (0.006)	0.008 (0.006)	0.003 (0.006)	0.011** (0.006)	0.002 (0.007)	0.003 (0.002)	0.003 (0.002)	0.002 (0.002)
Outcome Mean	0.476	0.481	0.483	0.336	0.340	0.344	0.960	0.962	0.964
R <sup>2</sup>	0.049	0.048	0.046	0.045	0.044	0.045	0.062	0.063	0.063
N	374830	277593	176098	295617	204921	114073	374830	277593	176098
Clusters	894	894	894	894	894	894	894	894	894
District-center FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Province-by-cohort FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
1970 Population Control	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: This table reports estimates of equation (2) separately for women and men. The sample contains only individuals residing in a district center in 1990. Islamic refers to district centers with an Islamic school in 1980. Young refers to cohorts aged less than 11 in 1977 for women and in 1974 for men. The population control includes the log of 1970 district center population sizes interacted with cohort dummies. All specifications include district center and province-by-cohort FE and population size in 1970.

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01. Robust standard errors clustered by district center of residence.

## B Online Appendix - Additional Figures

**Figure A.1:** Timeline of Events



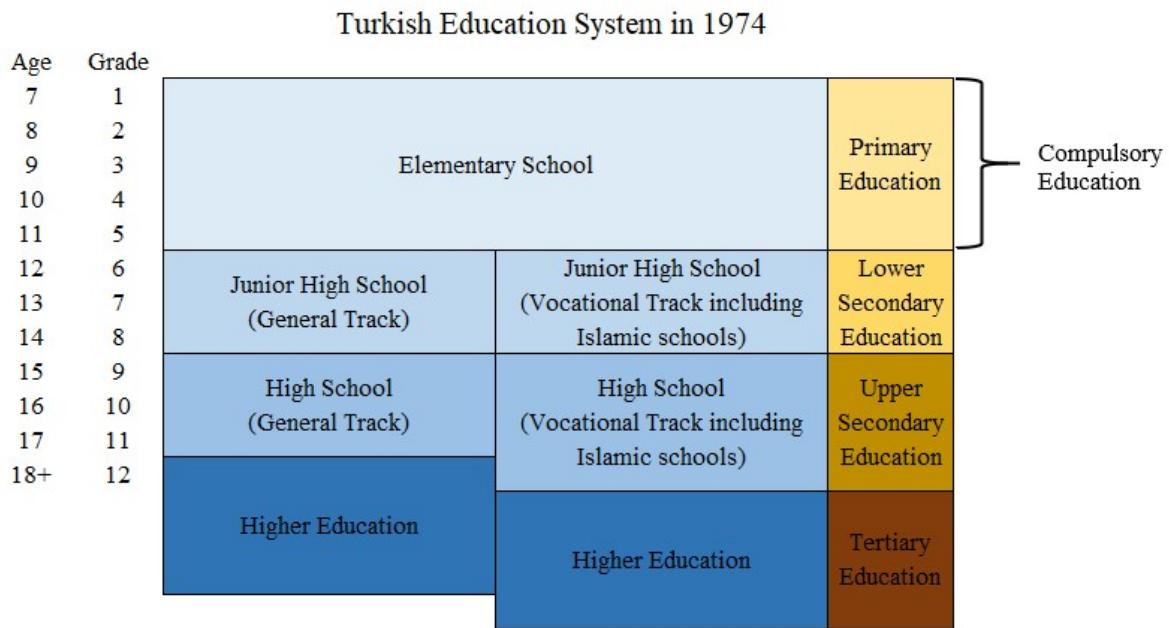
Source: Author's own illustration.

**Figure A.2:** Curriculum of Islamic Schools in 1975

Islamic Junior High Schools		Islamic High Schools	
Common Courses	Cumulative	Common Courses	Cumulative
Turkish	15	Turkish Language and Literature	15
Maths	12	History	6
Social Studies	10	Art History	1
Science	9	Geography	6
Foreign Language	9	Maths	10
Arts	3	Physics	7
Music	3	Chemistry	5
Physical Education	3	Biology	5
Morals	3	Psychology	2
		Philosophy	6
		Morals	2
		Foreign Language	12
		Physical Education	3
		National Security	3
<b>Total</b>	<b>67 (72%)</b>	<b>Total</b>	<b>83 (60%)</b>
Religion Courses		Religion Courses	
Cumulative		Cumulative	
Quran	9	Quran	16
Arabic	9	Arabic	14
Religion Studies	8	Doctrines	2
		Islamic Theology	2
		Religious Studies	6
		Islamic Jurisprudence	2
		Quranic Exegesis	6
		Prophetic Tradition	6
		Life of Prophet	1
		Public Speaking	2
<b>Total</b>	<b>26 (28%)</b>	<b>Total</b>	<b>57 (40%)</b>

Source: Öcal (2013).

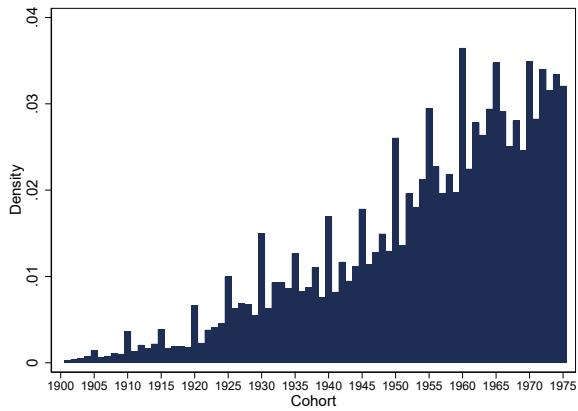
**Figure A.3:** Turkish Education System in the 1970s



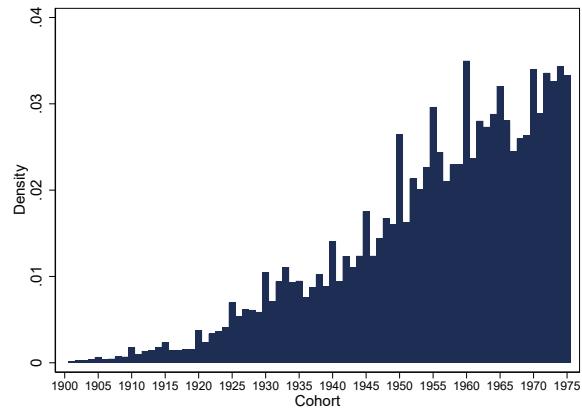
Source: Author's illustration from the 1973 Basic Education Law.

**Figure A.4:** Cohort Size Histograms

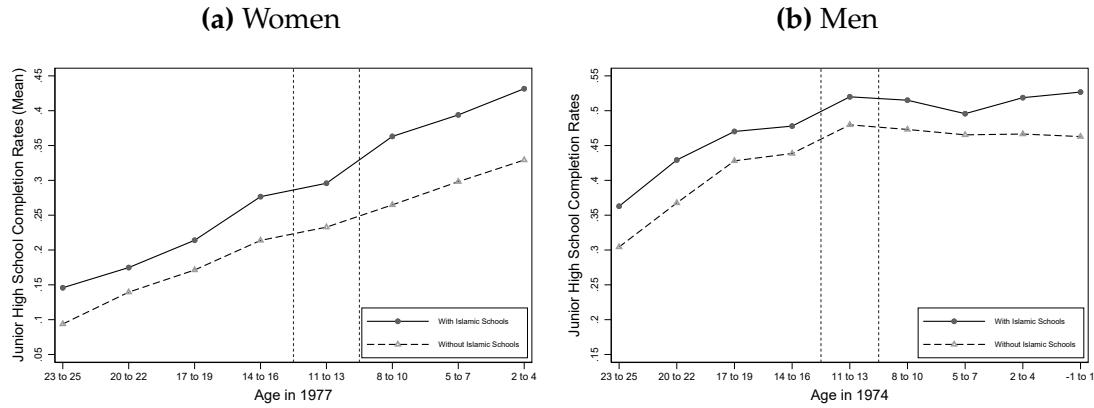
**(a) Women**



**(b) Men**



**Figure A.5: Lower Secondary School Completion Rates in Means - Raw Data**



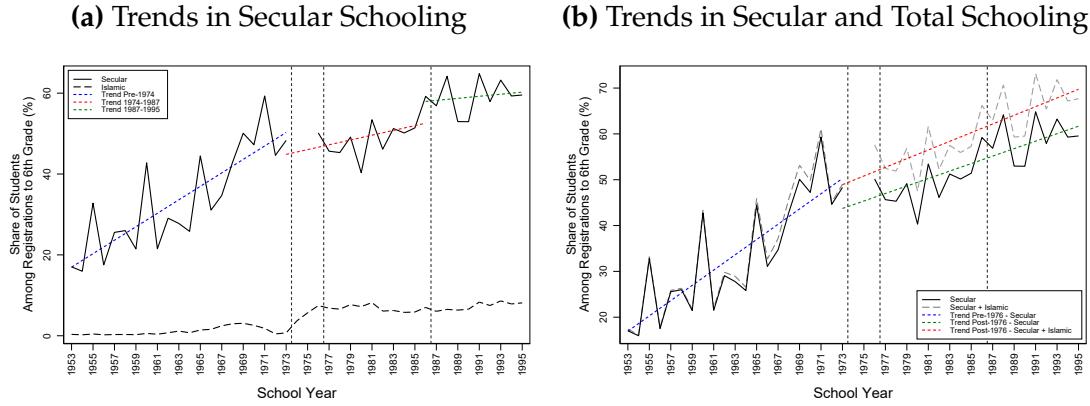
*Notes:* This figure shows mean lower secondary school completion rates in district centers with and without an Islamic school in 1980. Panel (a) and panel (b) restrict the sample to women and men, respectively. Cutoff years differ by gender as female students achieved legal rights to attend Islamic schools in 1977, three years after the expansion of Islamic school network. Cohorts on the right side of vertical dotted lines are fully exposed cohorts.

**Figure A.6: Evolution of Islamic School Enrollment Rates to 6th Grade**



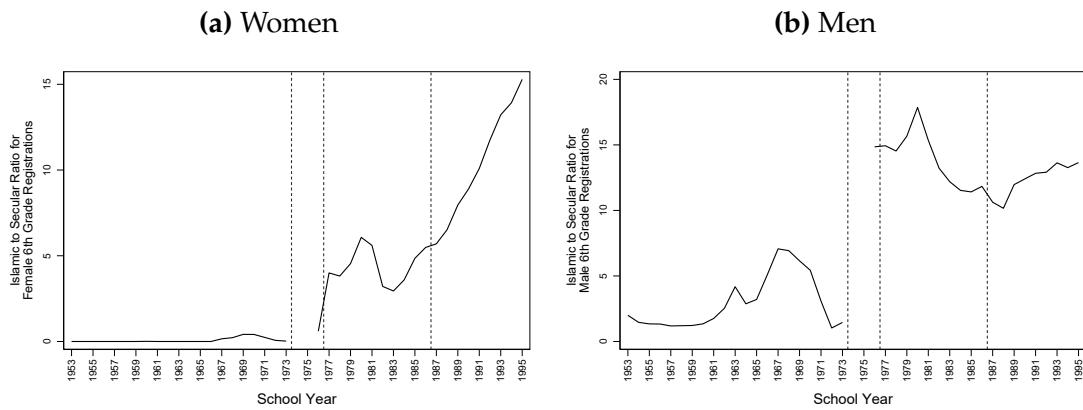
*Notes:* This figure shows the evolution of Islamic school 6th grade enrollment rates in a given school year. Enrollment rates calculated by dividing the Islamic school students registered to 6th grade by the theoretical cohort size of 6th graders for a given school year measured by using population censuses between 1950-1995.

**Figure A.7: Evolution of School Enrollment Rates to 6th Grade for Men**



*Notes:* This figure shows the evolution of enrollment rates and its trends to 6th grade in a given school year by school type. Enrollment rates calculated by dividing the total new male students registered with respect to school type by the theoretical male cohort size of 6th graders for a given school year measured by using population censuses between 1950-1995.

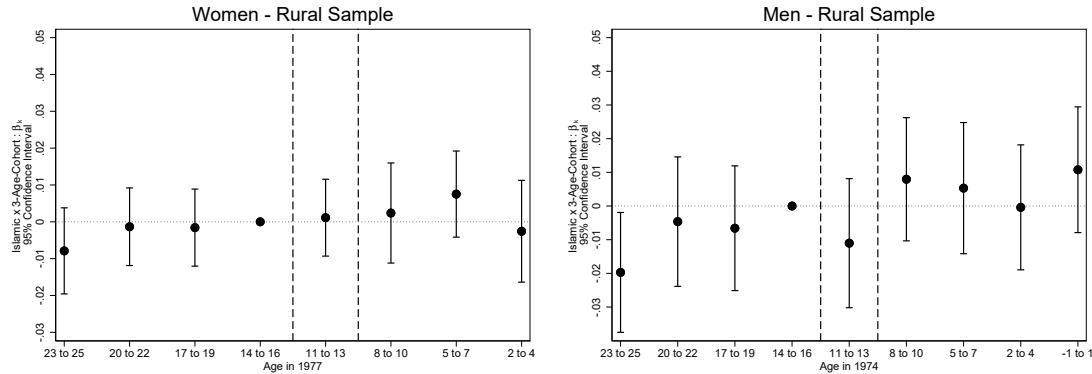
**Figure A.8: Secular to Islamic 6th Grade Enrollment Ratio**



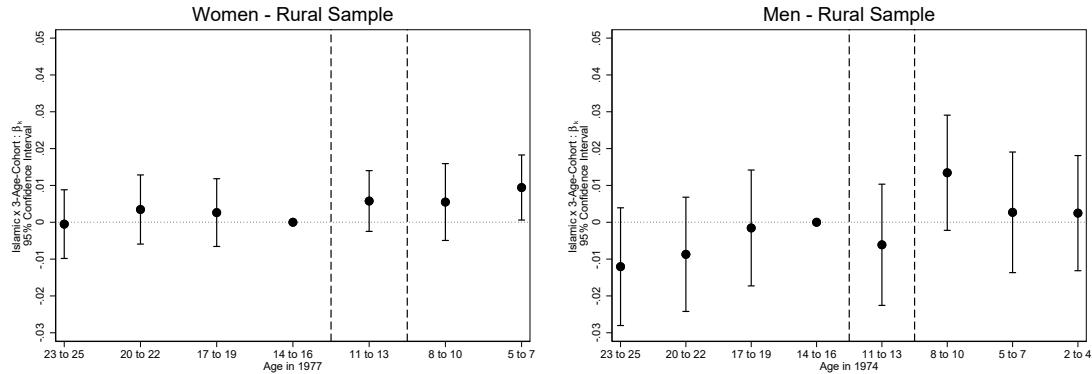
*Notes:* This figure shows the evolution of ratios in enrollment rates to 6th grade in a given school year by school type. Enrollment ratios calculated by dividing Islamic school enrollments to secular school enrollments for a given schooling year for each gender.

**Figure A.9:** Access to Islamic Schools and Education in Rural Sample (Placebo) - Effects by 3-Age-Cohorts

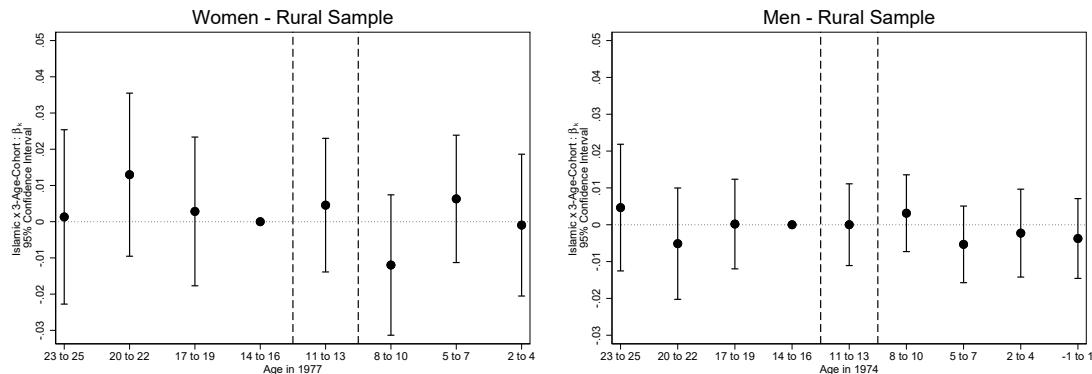
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed

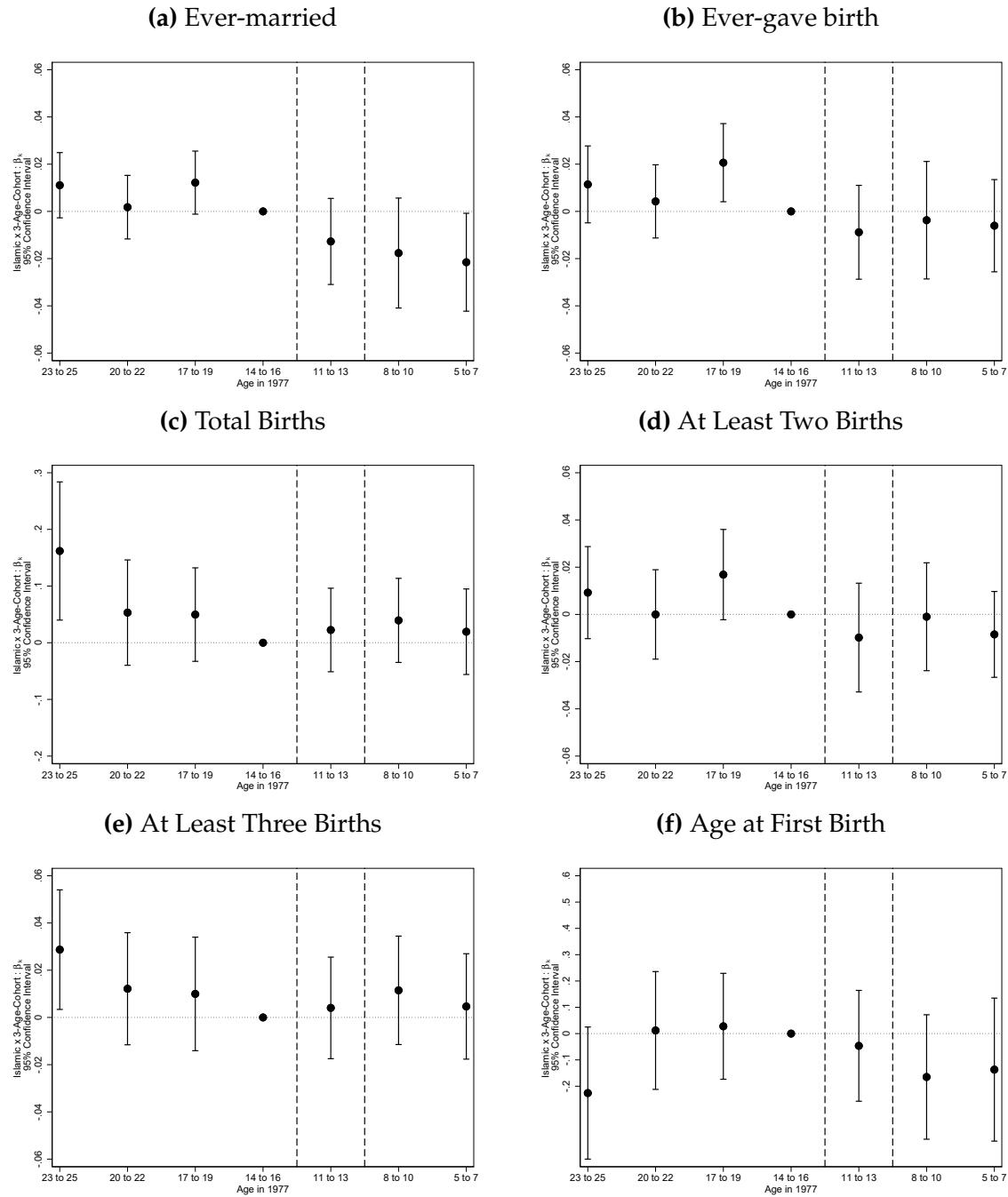


(c) Dep. Var.: Primary School Completed



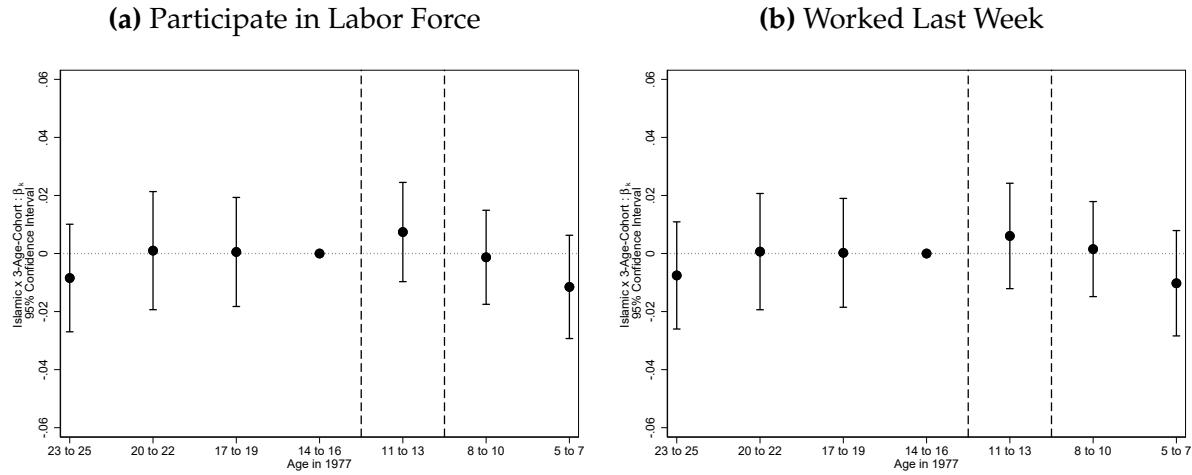
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women and men subsamples, respectively. The sample contains only the individuals reside in rural areas of districts in 1990. Islamic refers to areas that its district-center had an Islamic school in 1980. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts between two vertical lines include half fully-exposed and half non-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district of residence.

**Figure A.10:** Access to Islamic Schools and Family Outcomes in Rural Sample (Placebo) - Effects by 3-Age-Cohorts



*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in rural areas of districts in 1990, excluding Eastern and Southeastern Turkey. The dependent variables include an indicator equal to one if the individual has ever married in panel (a), ever gave birth in panel (b), given two or more births in panel (d), and given three or more births in panel (e). The dependent variables measure the total number of birth given in panel (c), and the age at first birth in panel (f). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts between two vertical lines include half fully-exposed and half non-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district of residence.

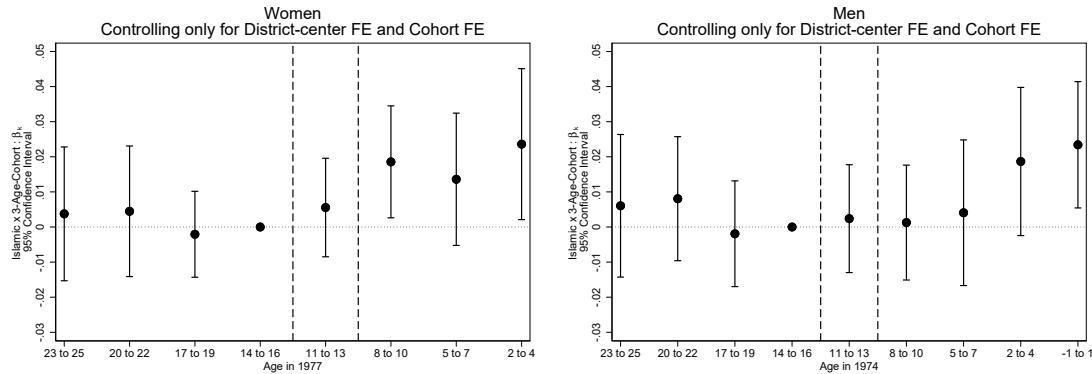
**Figure A.11:** Access to Islamic Schools and Labor Outcomes in Rural Sample (Placebo) - Effects by 3-Age-Cohorts



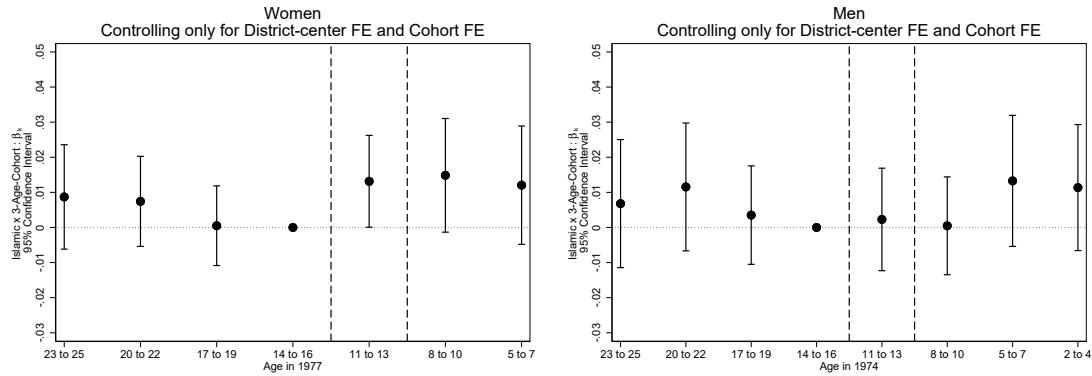
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in rural areas of districts in 1990, excluding Eastern and Southeastern Turkey. The dependent variables include an indicator equal to one if the individual participates labor force in panel (a), and was working the week prior to census in panel (b). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts between two vertical lines include half fully-exposed and half non-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district of residence.

**Figure A.12:** Access to Islamic Schools and Education without controls - Effects by 3-Age-Cohorts

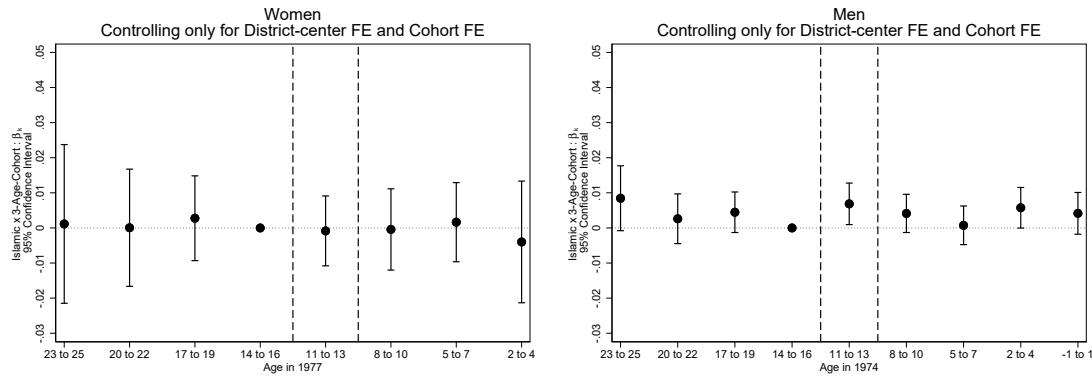
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed

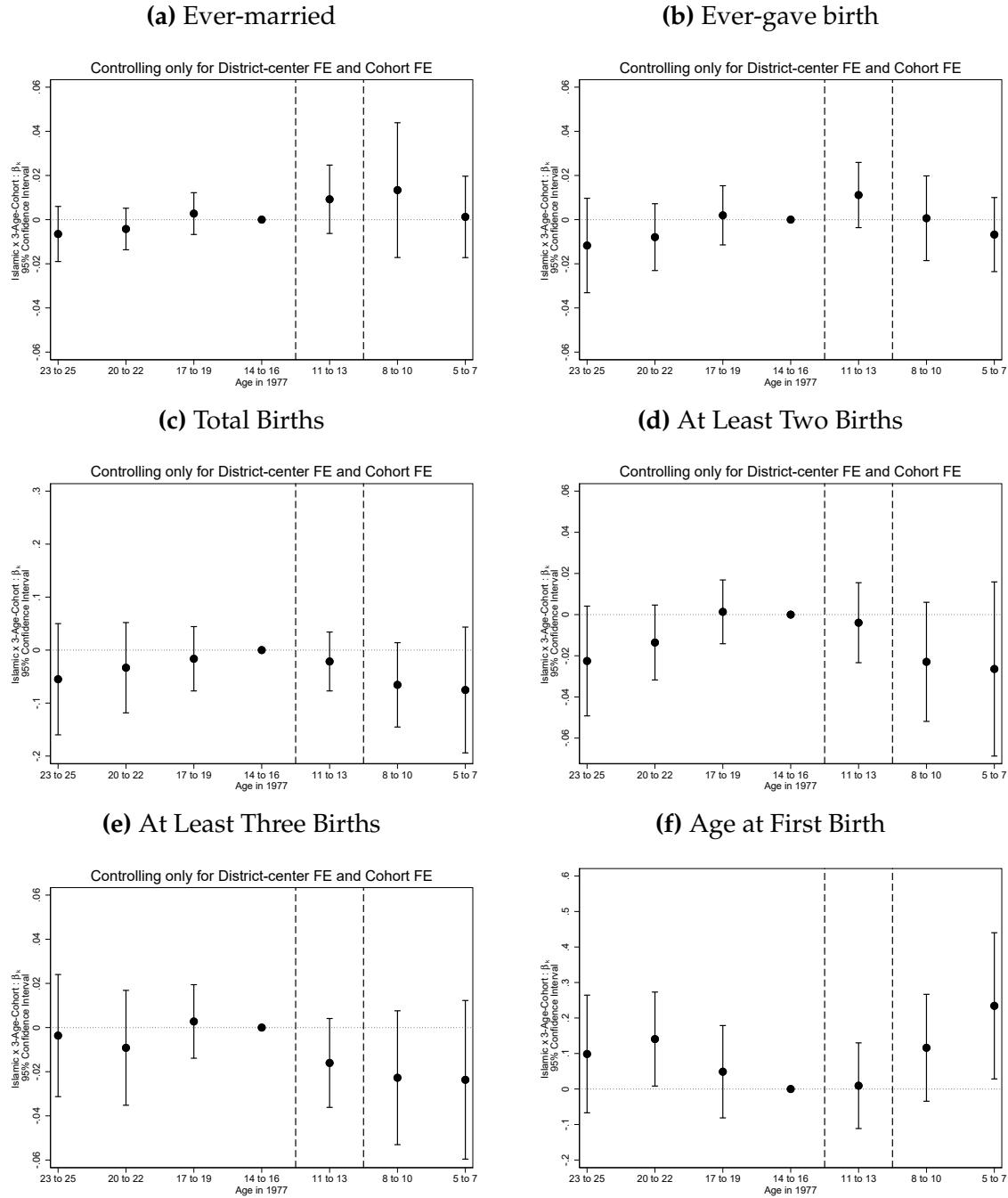


(c) Dep. Var.: Primary School Completed (Placebo)



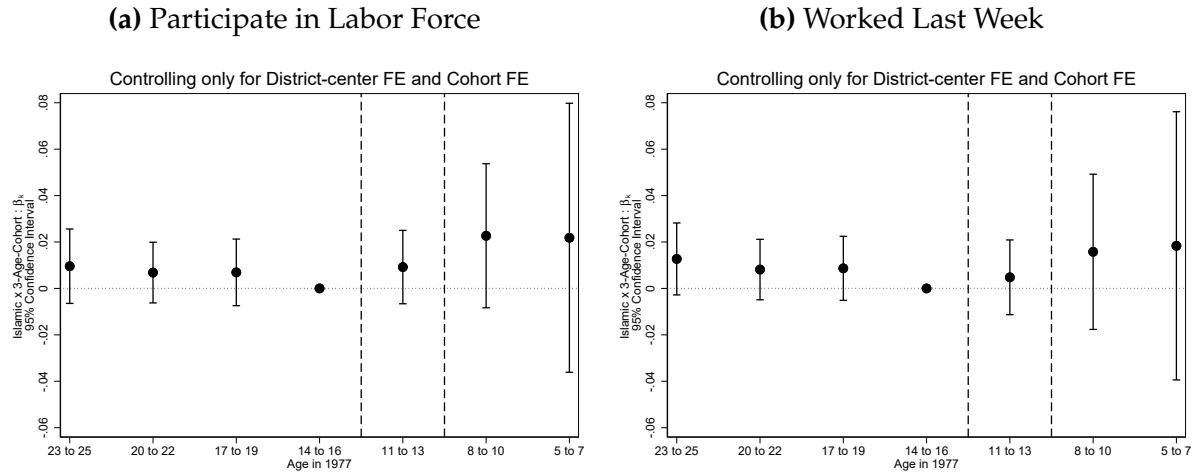
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women and men subsamples, respectively. The sample contains only the individuals reside in district centers in 1990. Islamic refers to district centers with an Islamic school in 1980. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). All specifications include district-center and age-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district center of residence.

**Figure A.13: Access to Islamic Schools and Family Outcomes without controls - Effects by 3-Age-Cohorts**



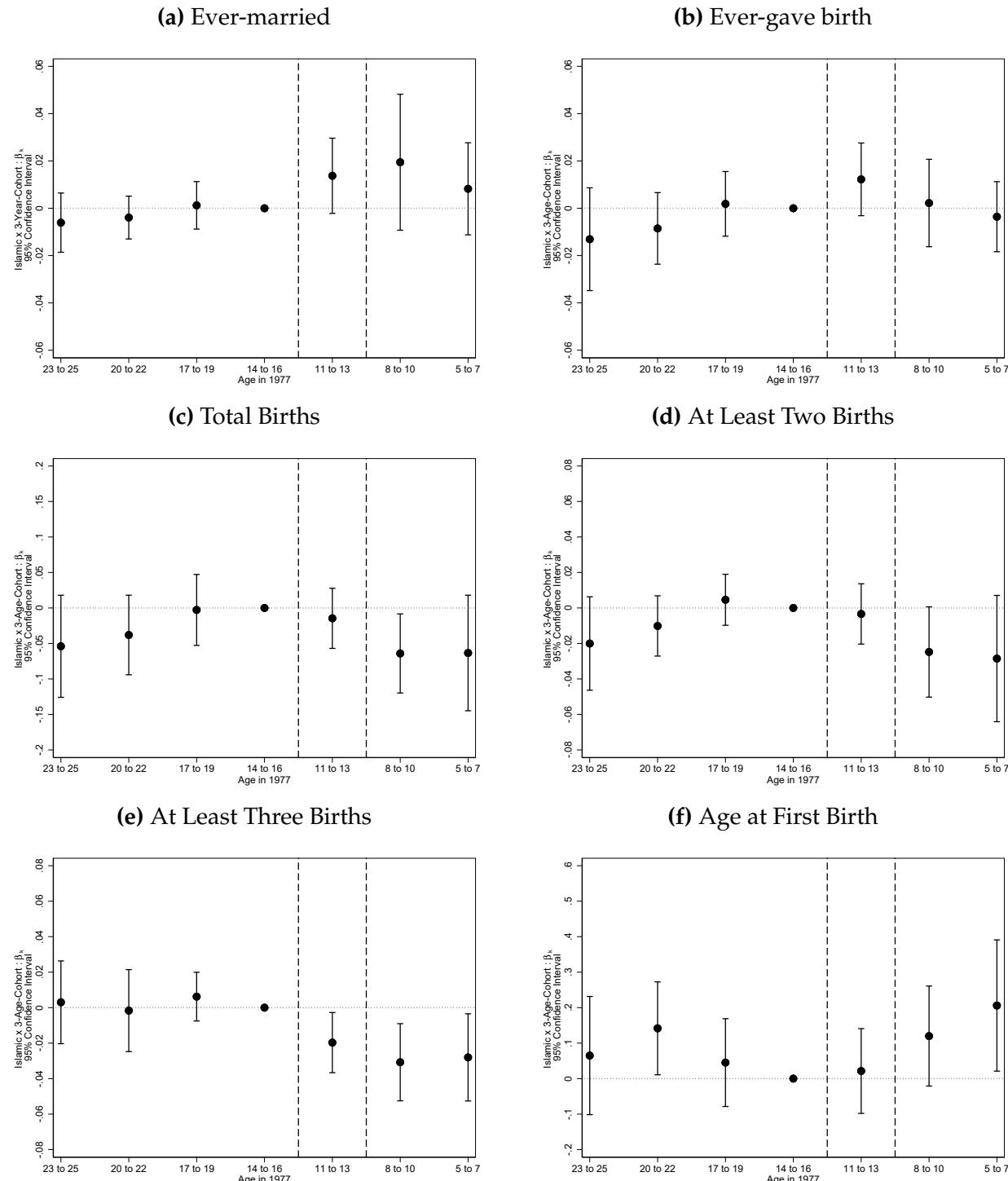
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in district centers in 1990, excluding Eastern and Southeastern Turkey. The dependent variables include an indicator equal to one if the individual has ever married in panel (a), ever gave birth in panel (b), given two or more births in panel (d), and given three or more births in panel (e). The dependent variables measure the total number of birth given in panel (c), and the total number of child mortality in panel (f). All specifications include district-center and age-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 serve as the reference group. Robust standard errors clustered by district center of residence.

**Figure A.14:** Access to Islamic Schools and Labor Outcomes without controls - Effects by 3-Age-Cohorts



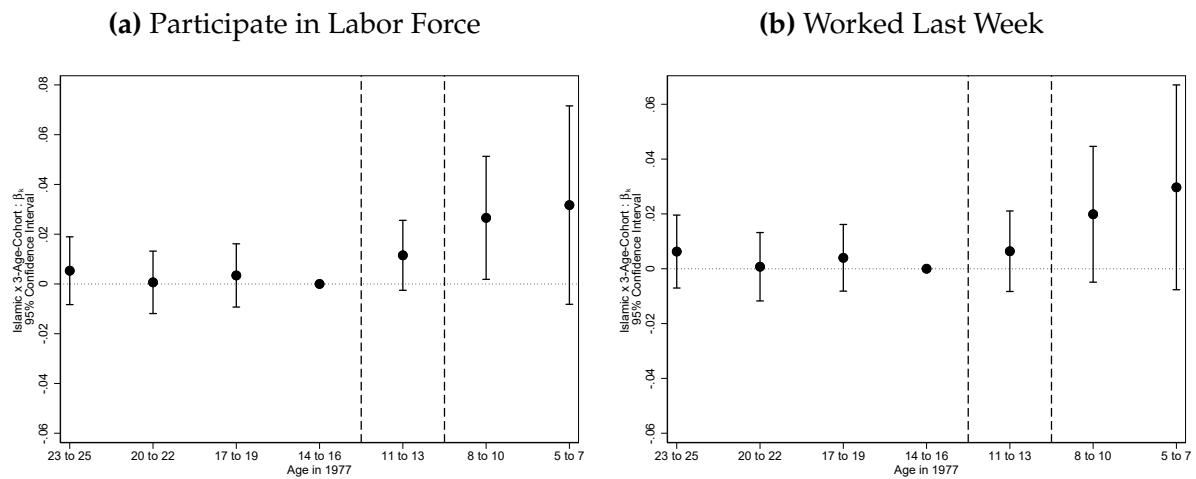
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in district centers in 1990, excluding Eastern and Southeastern Turkey. The dependent variables include an indicator equal to one if the individual participates labor force in panel (a), and was working the week prior to census in panel (b). All specifications include district-center and age-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 serve as the reference group. Robust standard errors clustered by district center of residence.

**Figure A.15: Access to Islamic Schools and Family Outcomes - Effects by 3-Age-Cohorts - Full Sample**



*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in district centers in 1990. The dependent variables include an indicator equal to one if the individual has ever married in panel (a), ever gave birth in panel (b), given two or more births in panel (d), and given three or more births in panel (e). The dependent variables measure the total number of birth given in panel (c), and the age at first birth in panel (f). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts between two vertical lines include half fully-exposed and half non-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district center of residence.

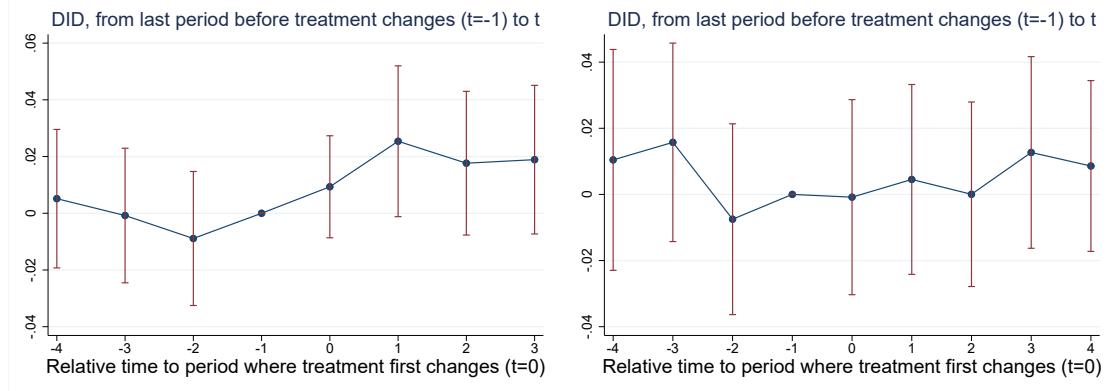
**Figure A.16:** Access to Islamic Schools and Labor Outcomes - Effects by 3-Age-Cohorts - Full Sample



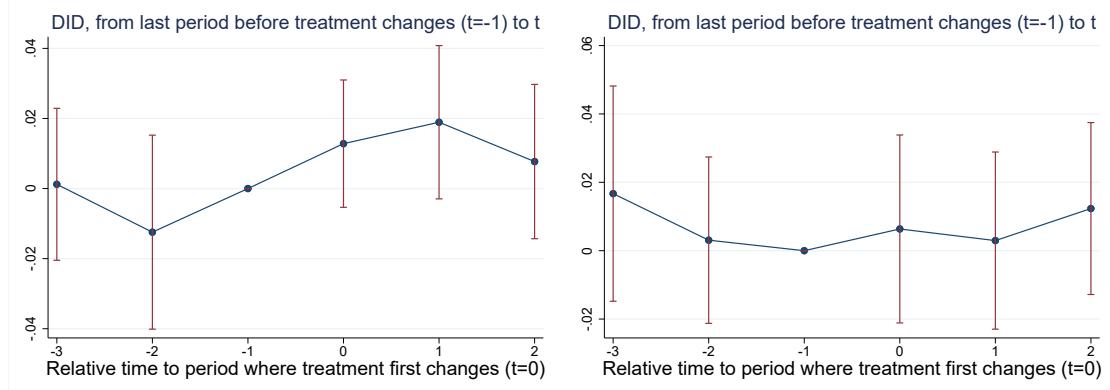
Notes: This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in district-centers in 1990. The dependent variables include an indicator equal to one if the individual participates labor force in panel (a), and was working the week prior to census in panel (b). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts between two vertical lines include half fully-exposed and half non-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977. Standard errors clustered by district center of residence.

**Figure A.17:** Access to Islamic Schools and Education with  $DID_M$  estimator

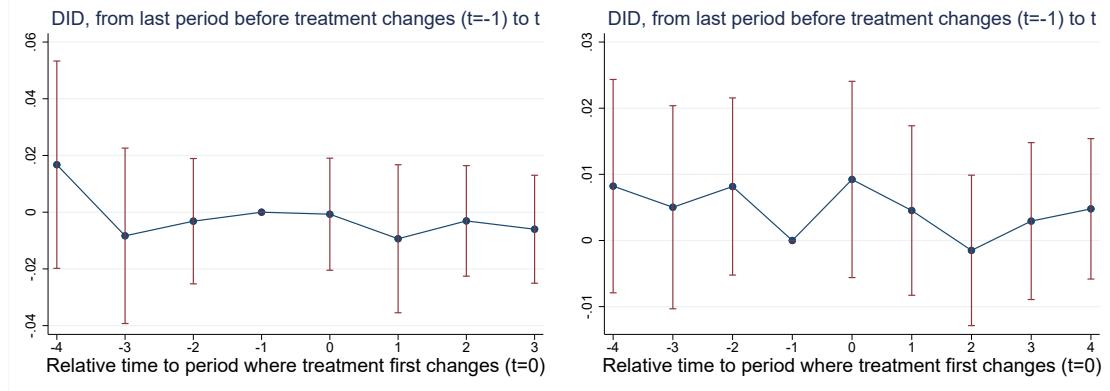
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed



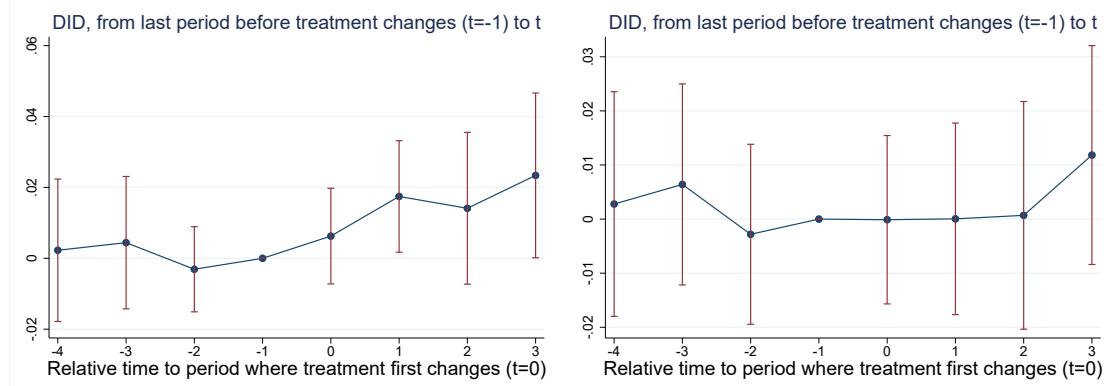
(c) Dep. Var.: Primary School Completed (Placebo)



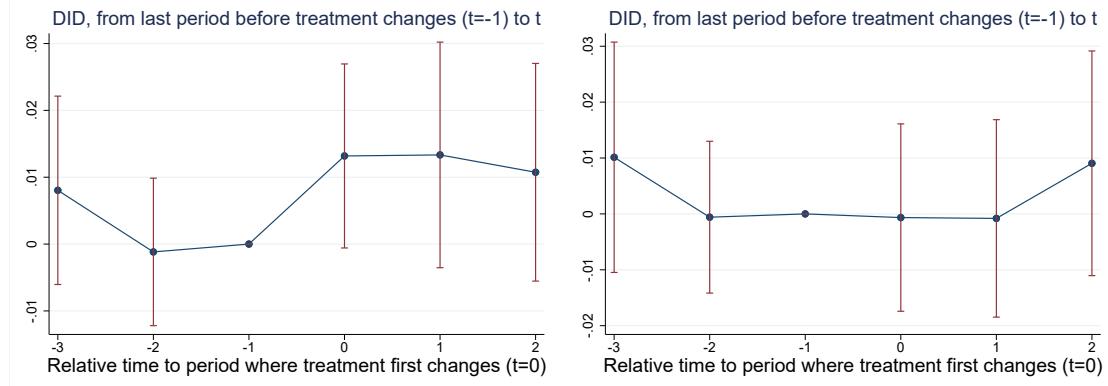
*Notes:* This figure reports coefficients and 95% confidence intervals of the  $DID_M$  estimators according to [De Chaisemartin and d'Haultfoeuille \(2020\)](#) methodology using `did_multipleGT` command in Stata for women and men subsamples, respectively. The sample contains only the individuals reside in district centers in 1990. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). All specifications include log of the 1970 population of district center and non-parametric province trends as controls. Standard errors clustered by district center of residence.

**Figure A.18:** Access to Islamic Schools and Education with  $DID_M$  estimator - No controls

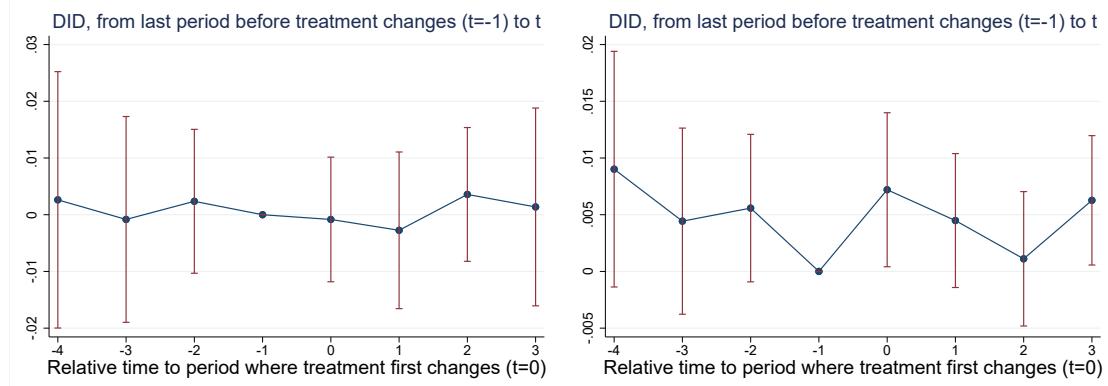
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed

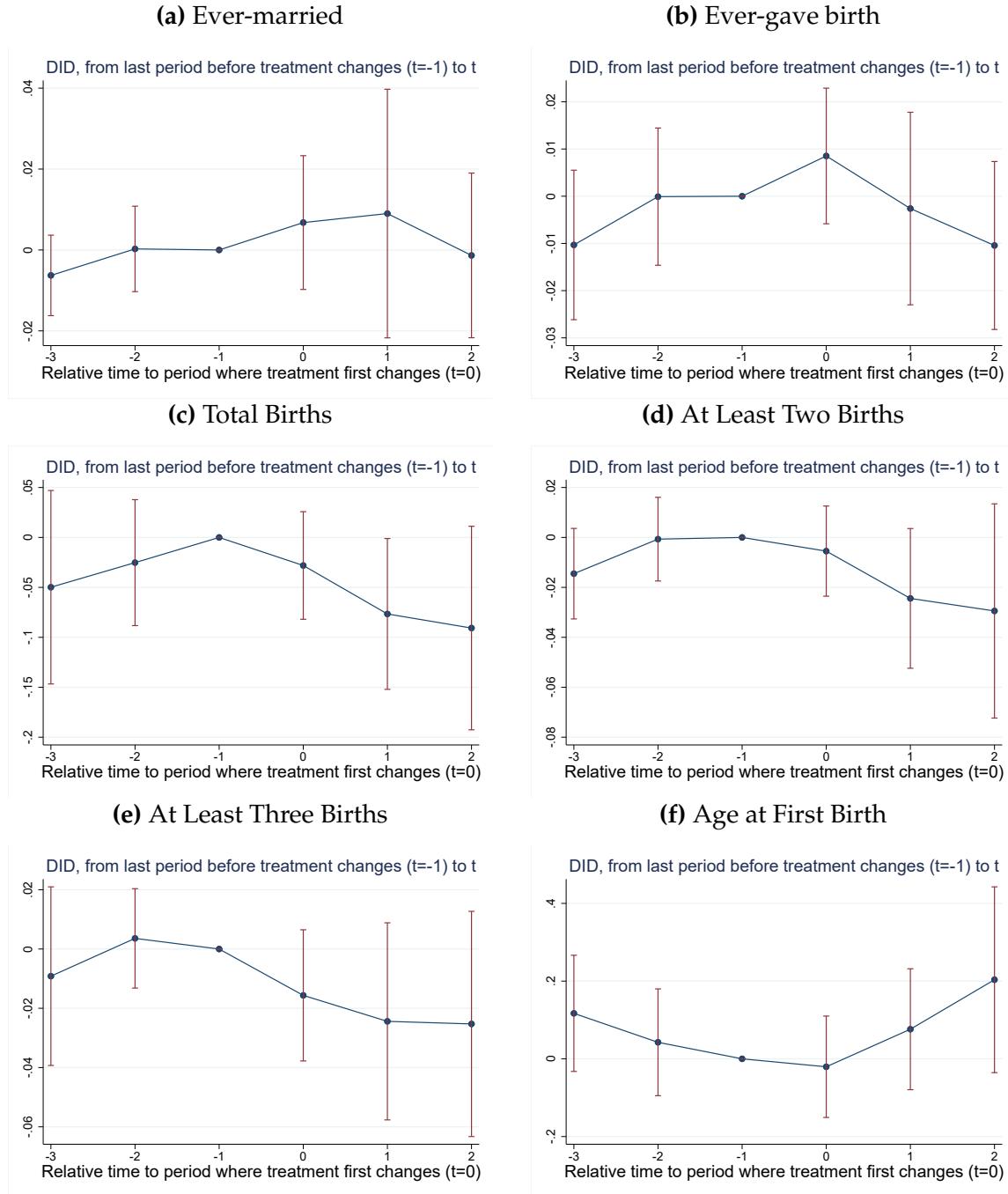


(c) Dep. Var.: Primary School Completed (Placebo)



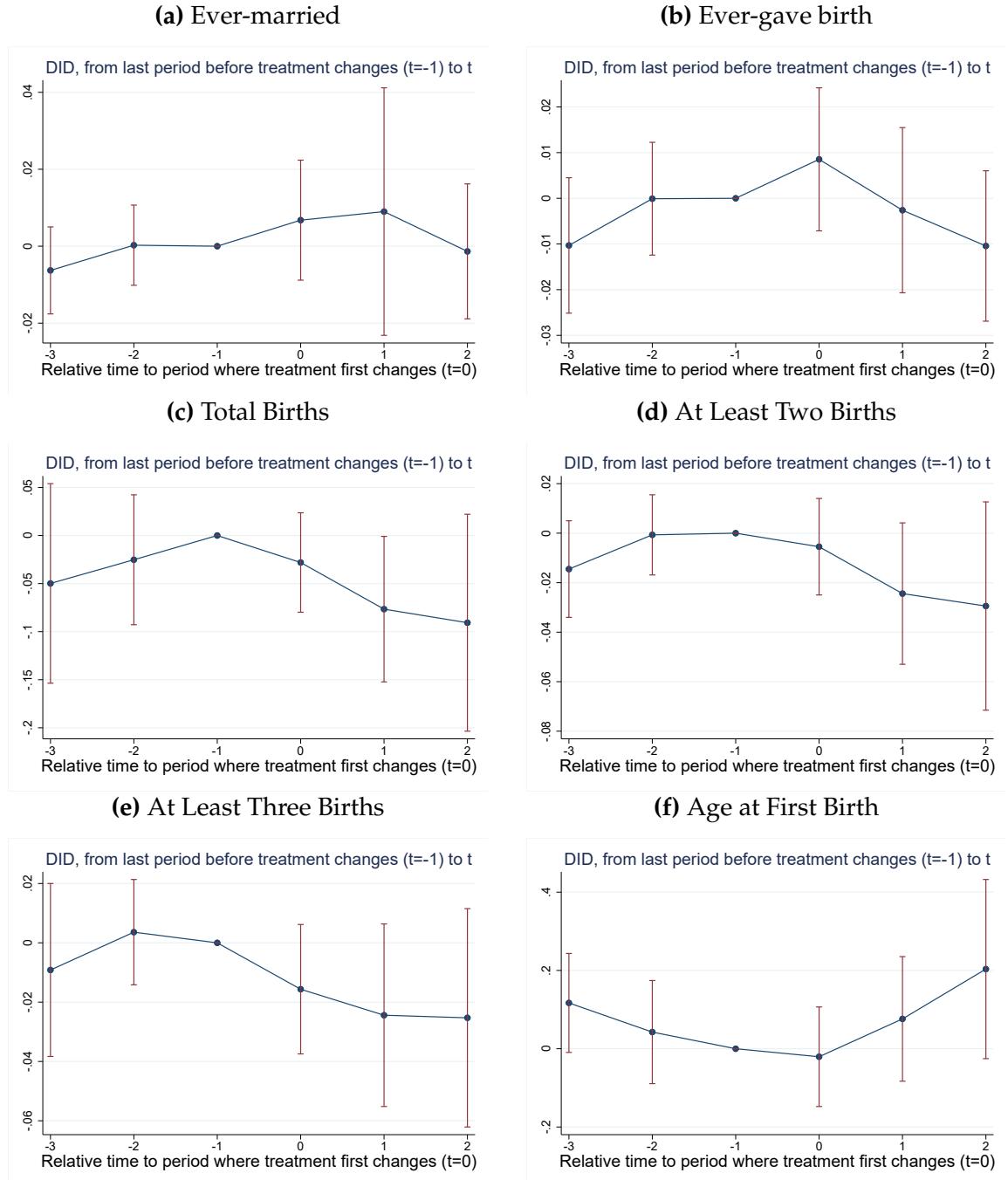
Notes: This figure reports coefficients and 95% confidence intervals of the  $DID_M$  estimators according to De Chaisemartin and d'Haultfoeuille (2020) methodology using did\_multipleGT command in Stata for women and men subsamples, respectively. The sample contains only the individuals reside in district centers in 1990. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). Standard errors clustered by district center of residence.

**Figure A.19:** Access to Islamic Schools and Fertility with  $DID_M$  estimator



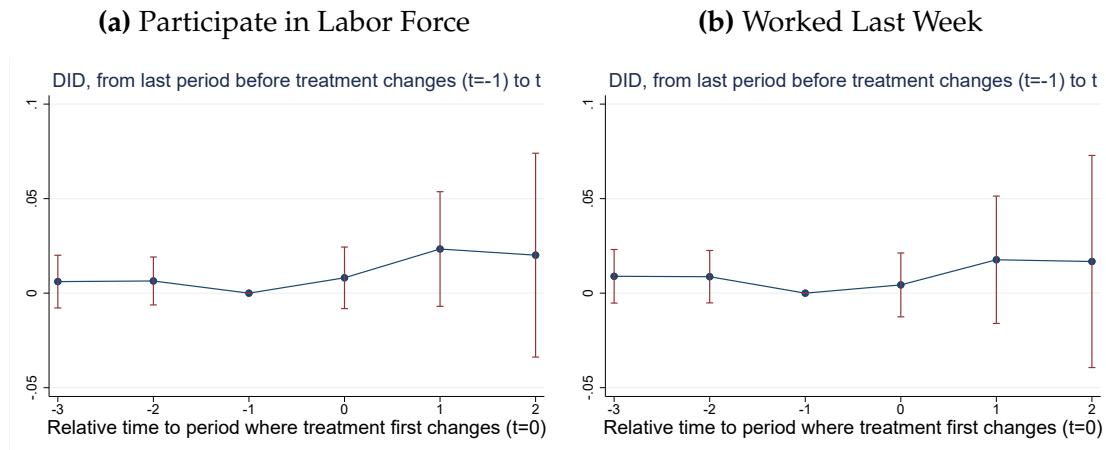
*Notes:* This figure reports coefficients and 95% confidence intervals of the  $DID_M$  estimators according to [De Chaisemartin and d'Haultfoeuille \(2020\)](#) methodology using `did_multipleGT` command in Stata for girl subsample. The sample contains only the individuals reside in district centers in 1990. The dependent variables include an indicator equal to one if the individual has ever married in panel (a), ever gave birth in panel (b), given two or more births in panel (d), and given three or more births in panel (e). The dependent variables measure the total number of birth given in panel (c), and the age at first birth in panel (f). Standard errors clustered by district center of residence.

**Figure A.20:** Access to Islamic Schools and Fertility with  $DID_M$  estimator - No controls



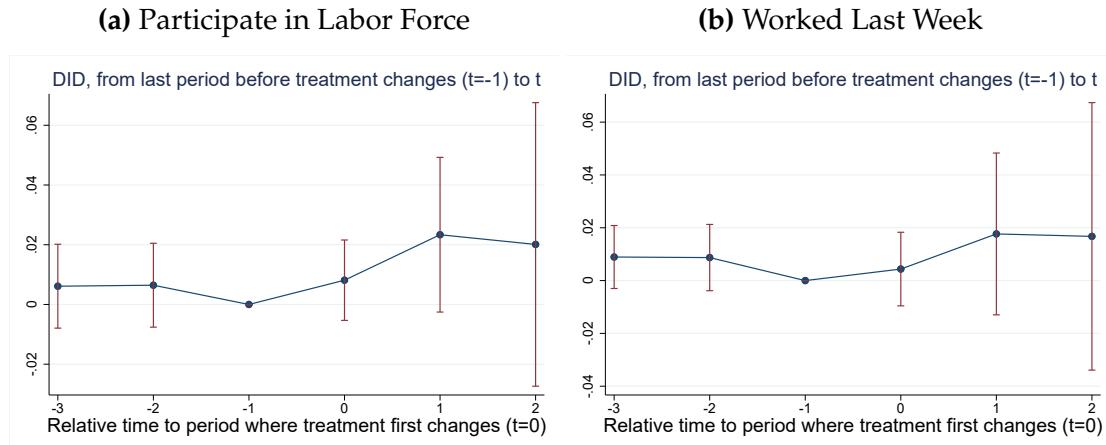
*Notes:* This figure reports coefficients and 95% confidence intervals of the  $DID_M$  estimators according to De Chaisemartin and d'Haultfoeuille (2020) methodology using did\_multipleGT command in Stata for girl subsample. The sample contains only the individuals reside in district centers in 1990. The dependent variables include an indicator equal to one if the individual has ever married in panel (a), ever gave birth in panel (b), given two or more births in panel (d), and given three or more births in panel (e). The dependent variables measure the total number of birth given in panel (c), and the age at first birth in panel (f).

**Figure A.21:** Access to Islamic Schools and Labor Market with  $DID_M$  estimator



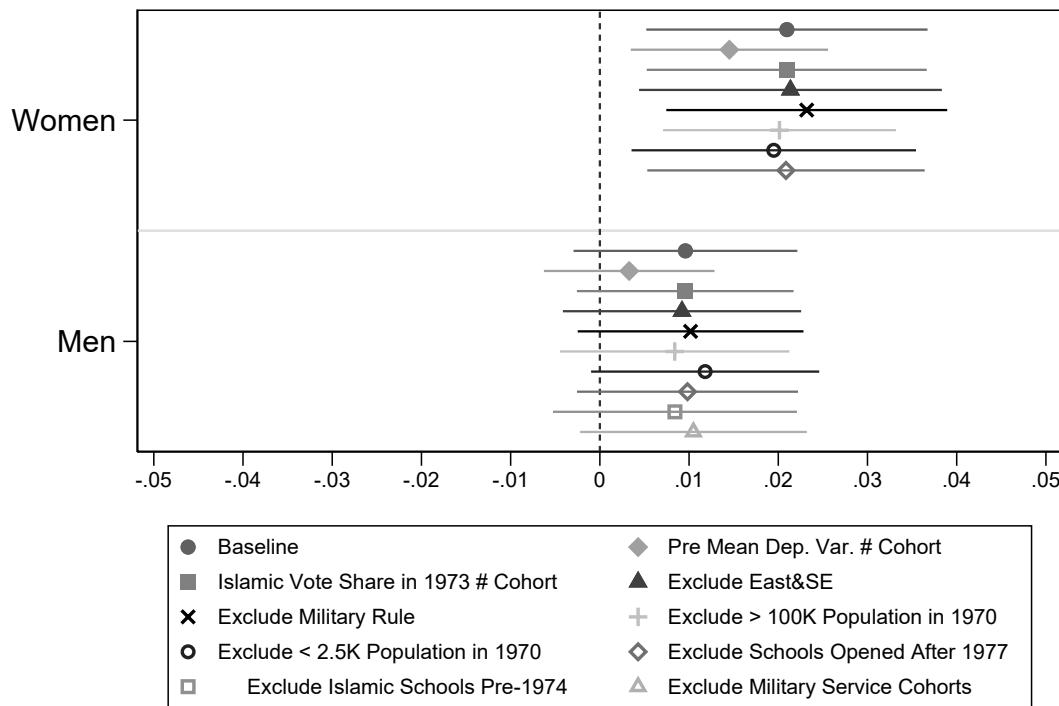
*Notes:* This figure reports coefficients and 95% confidence intervals of the  $DID_M$  estimators according to [De Chaisemartin and d'Haultfoeuille \(2020\)](#) methodology using `did_multipleGT` command in Stata for girl subsample. The sample contains only the individuals reside in district centers in 1990. The dependent variables include an indicator equal to one if the individual participates labor force in panel (a), and was working the week prior to census in panel (b).

**Figure A.22:** Access to Islamic Schools and Labor Market with  $DID_M$  estimator - No controls



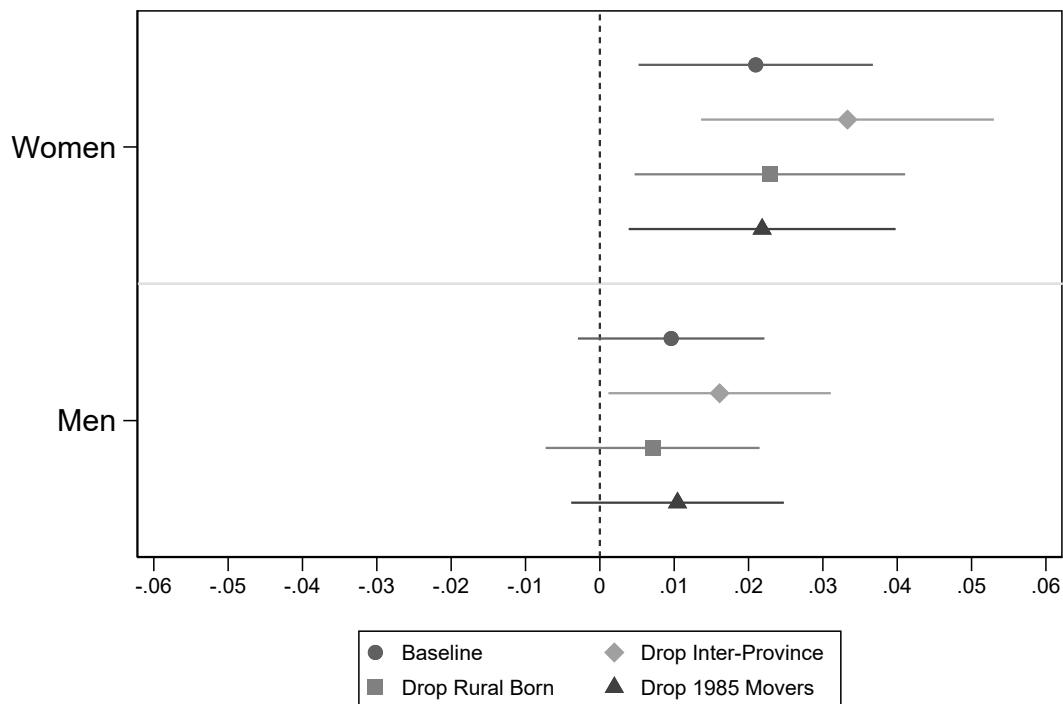
*Notes:* This figure reports coefficients and 95% confidence intervals of the  $DID_M$  estimators according to [De Chaisemartin and d'Haultfoeuille \(2020\)](#) methodology using `did_multipleGT` command in Stata for girl subsample. The sample contains only the individuals reside in district centers in 1990. The dependent variables include an indicator equal to one if the individual participates labor force in panel (a), and was working the week prior to census in panel (b).

**Figure A.23: Additional Robustness Checks**



*Notes:* This graph reports estimates of equation (2) on several robustness checks separately for women and men, respectively. The sample contains only the individuals reside in a district-center in 1990. The dependent variable include an indicator equal to one if the individual has ever completed lower secondary school for all coefficients. All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Standard errors clustered by district center of residence.

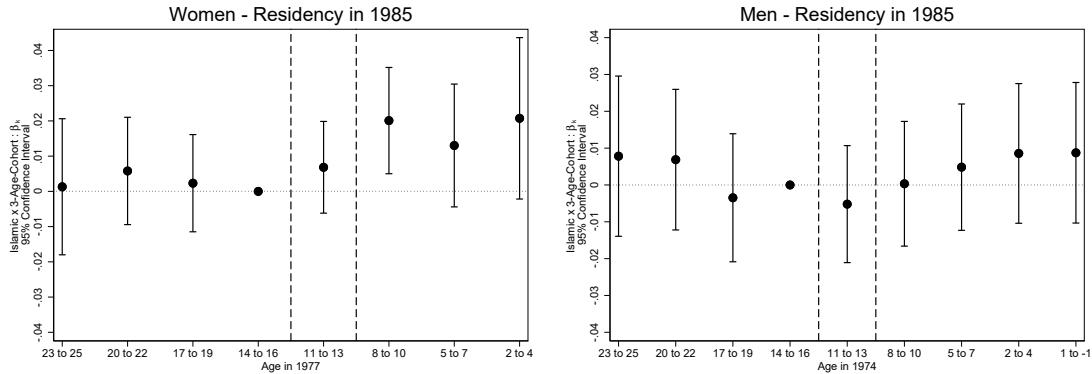
**Figure A.24:** Robustness checks for mobility



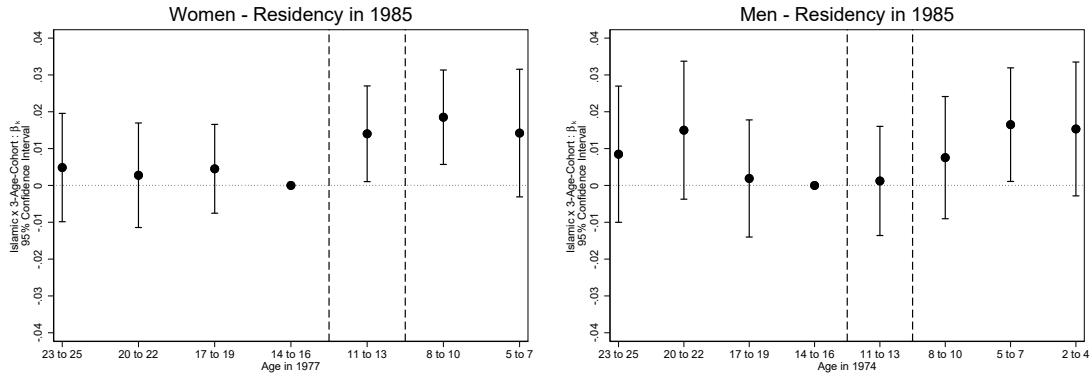
*Notes:* This graph reports estimates of equation (2) on several mobility robustness checks separately for women and men, respectively. The sample contains only the individuals reside in a district-center in 1990. The dependent variable include an indicator equal to one if the individual has ever completed lower secondary school for all coefficients. All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Standard errors clustered by district center of residence.

**Figure A.25:** Access to Islamic Schools and Education - Assigned treatment according to 1985 residency - Effects by 3-Age-Cohorts

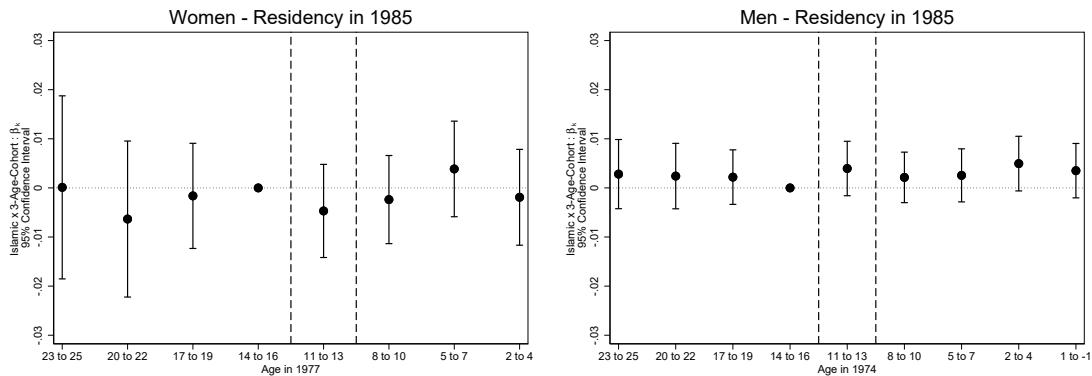
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed

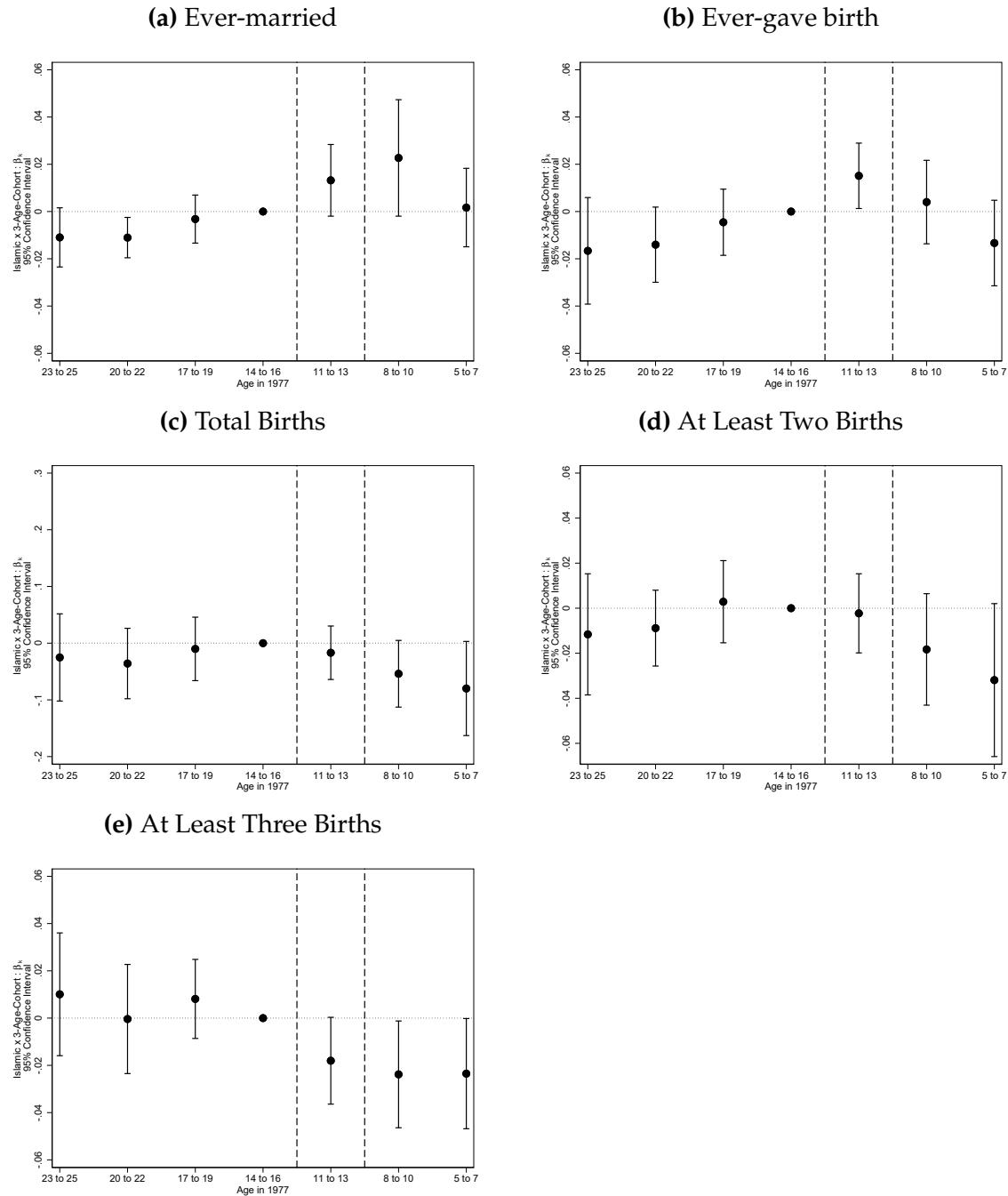


(c) Dep. Var.: Primary School Completed (Placebo)



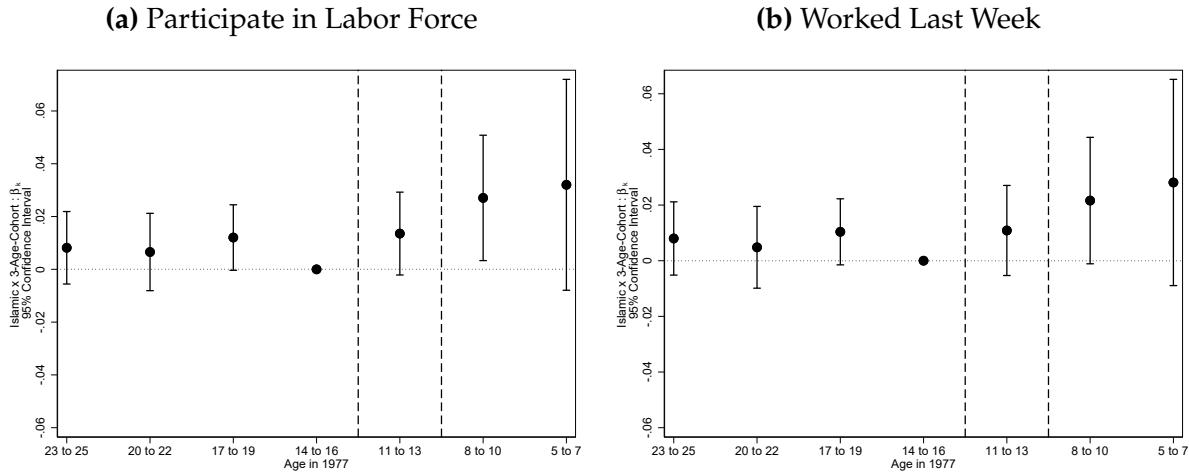
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women and men subsamples, respectively. The sample contains only the individuals reside in a district-center in 1985. Islamic refers to district centers with an Islamic school in 1980. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). All specifications include district center of residence and age-cohort fixed effects, log of the 1970 population of district center interacted with cohort dummies, and province-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district center of residence in 1985.

**Figure A.26: Access to Islamic Schools and Family Outcomes - Assigned treatment according to 1985 residency - - Effects by 3-Age-Cohorts**



*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains only women reside in a district-center in 1985, excluding Southeastern and Eastern Turkey. Islamic refers to district centers with an Islamic school in 1980. The dependent variables include an indicator equal to one if the individual has ever married in panel (a), ever gave birth in panel (b), given two or more births in panel (d), and given three or more births in panel (e). The dependent variables measure the total number of birth given in panel (c), and the total number of child mortality in panel (f). All specifications include district center of residence and age-cohort fixed effects, log of the 1970 population of district center interacted with cohort dummies, and province-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 serve as the reference group. Robust standard errors clustered by district center of residence in 1985.

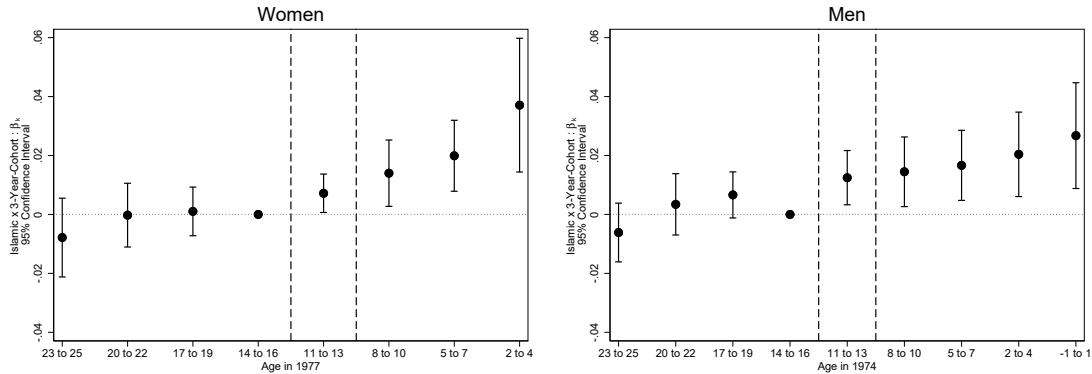
**Figure A.27:** Access to Islamic Schools and Labor Outcomes - Assigned treatment according to 1985 residency - Effects by 3-Age-Cohorts



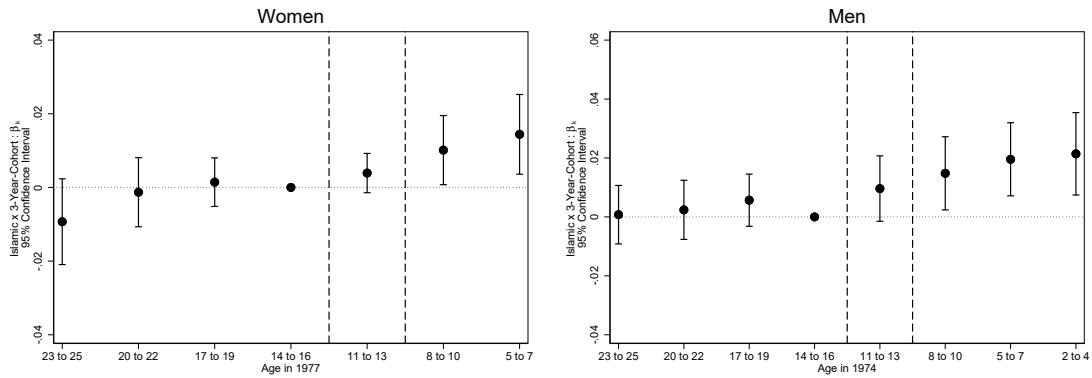
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains only women reside in a district-center in 1985, excluding Southeastern and Eastern Turkey. Islamic refers to district centers with an Islamic school in 1980. The dependent variables include an indicator equal to one if the individual participates labor force in panel (a), and was working the week prior to census in panel (b). All specifications include district center of residence and age-cohort fixed effects, log of the 1970 population of district center interacted with cohort dummies, and province-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 serve as the reference group. Robust standard errors clustered by district center of residence in 1985.

**Figure A.28:** Access to Islamic Schools and Education with province-level evidence - Effects by 3-Age-Cohorts

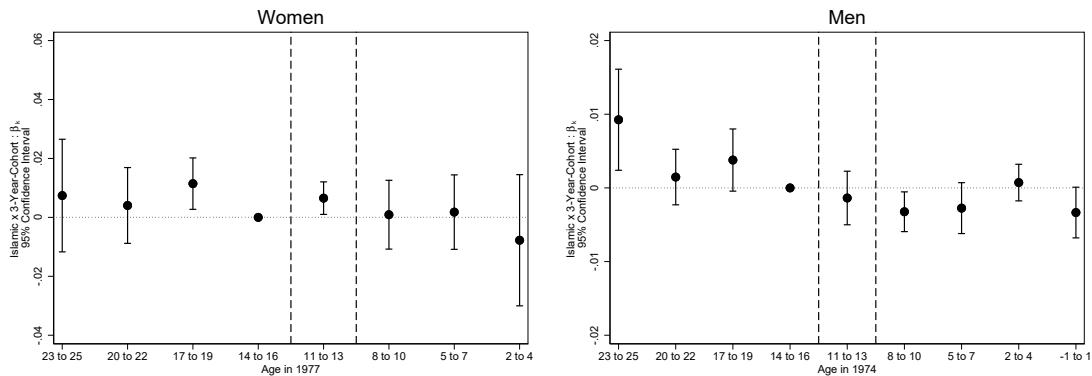
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed



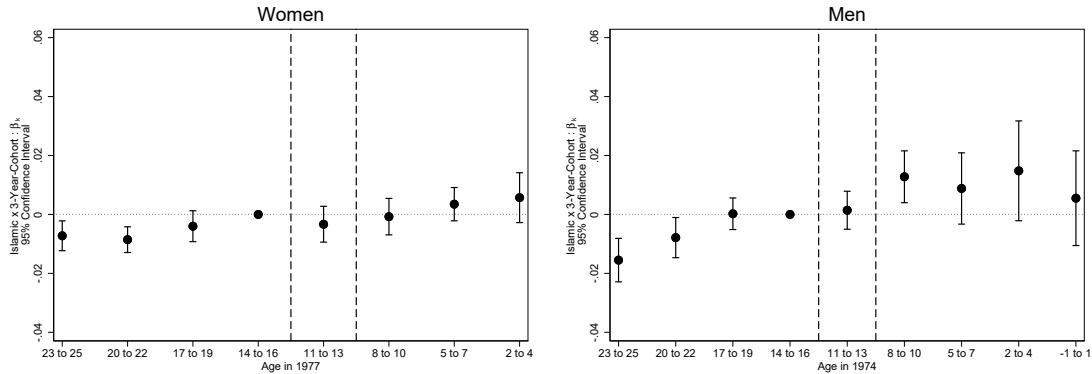
(c) Dep. Var.: Primary School Completed (Placebo)



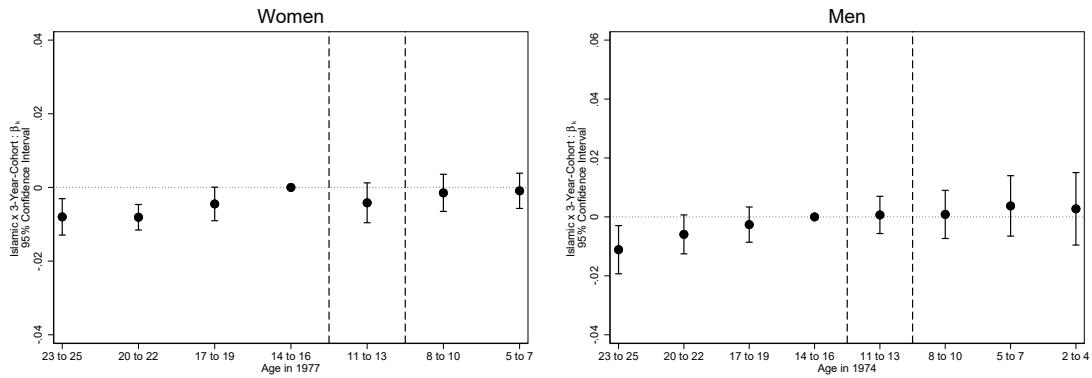
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (3) for women and men subsamples, respectively. The sample contains only the individuals born in district centers. Islamic refers to intensity of treatment of each province as explained in section 5.5. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). All specifications include province of birth and age-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by province of birth.

**Figure A.29:** Access to Islamic Schools and Education with province-level evidence - Effects by 3-Age-Cohorts - Placebo Sample (Rural-borns)

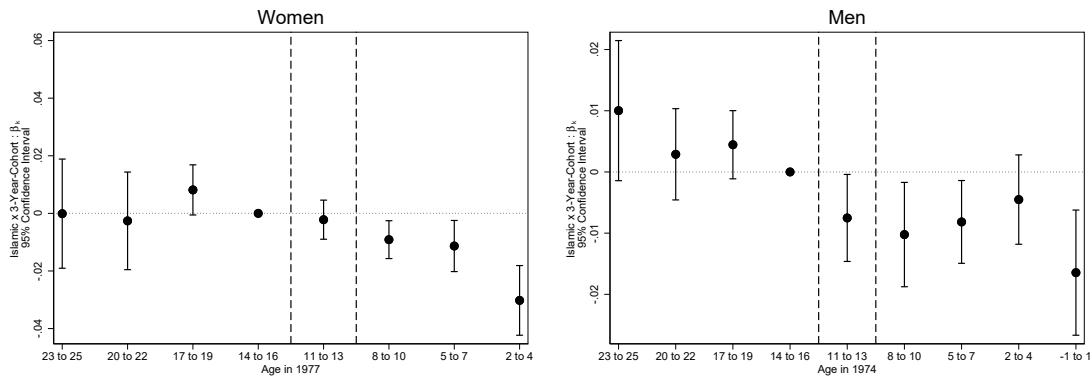
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed



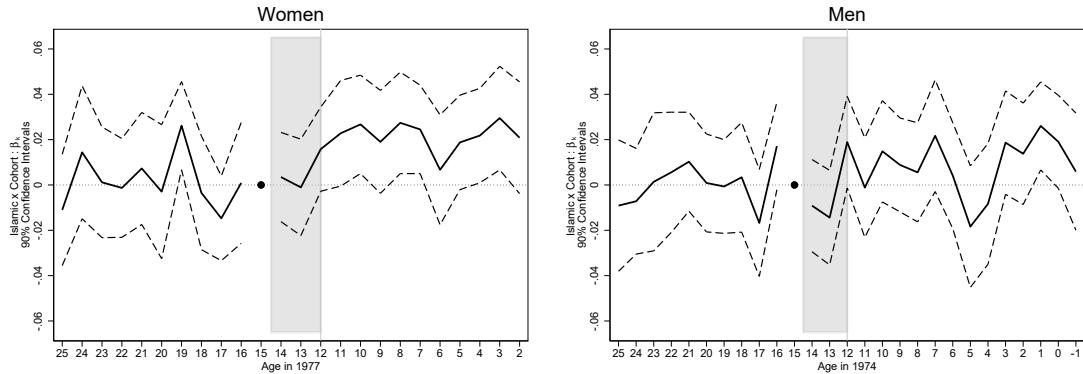
(c) Dep. Var.: Primary School Completed (Placebo)



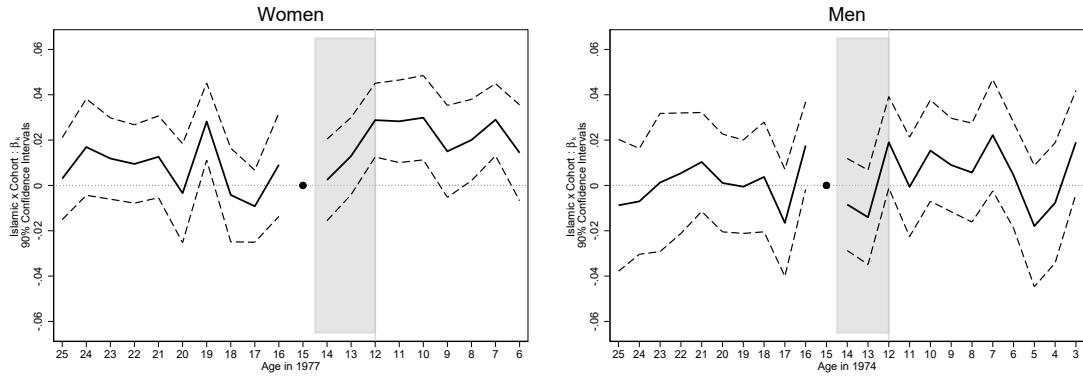
*Notes:* This figure reports 3-age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (3) for women and men subsamples, respectively. The sample contains only the individuals born in rural areas. Islamic refers to intensity of treatment of each province as explained in section 5.5. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). All specifications include province of birth and age-cohort fixed effects. Cohorts between two vertical lines include half fully-exposed and half partially-exposed cohorts. Cohorts on the right side of the second vertical lines are fully-exposed. Cohorts aged between 14-16 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by province of birth.

**Figure A.30:** Access to Islamic Schools and Education - Effects by Single-Age-Cohorts

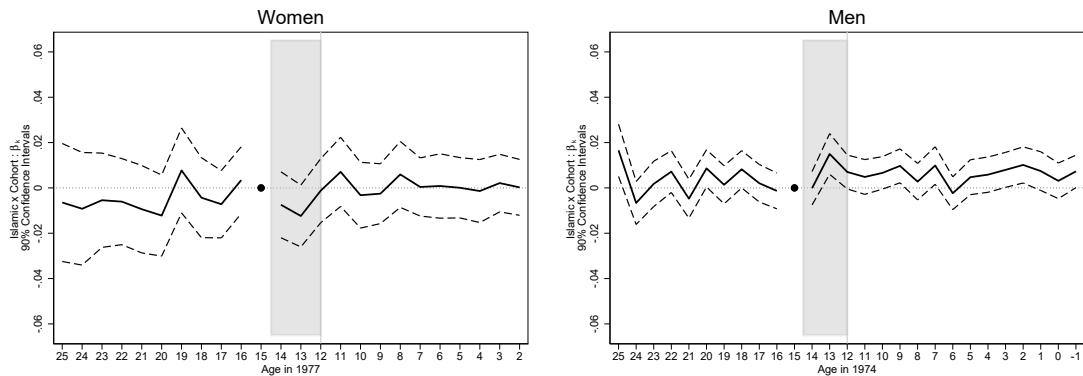
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed

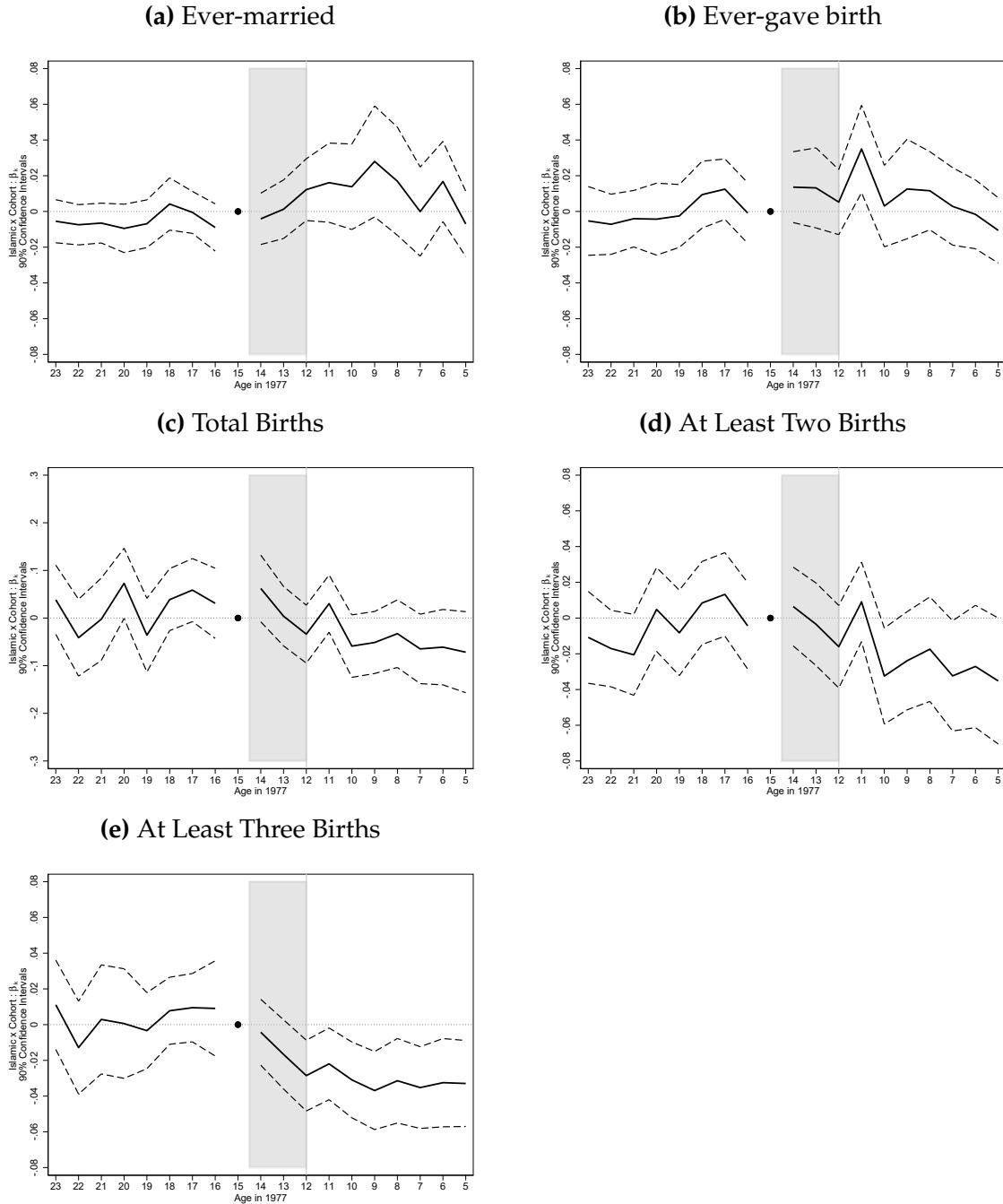


(c) Dep. Var.: Primary School Completed



*Notes:* This figure reports age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women and men subsamples, respectively. The sample contains only the individuals reside in district centers in 1990. Islamic refers to district centers with an Islamic school in 1980. The dependent variables include an indicator equal to one if the individual has ever completed lower secondary school in panel (a), upper secondary school in panel (b), and primary school in panel (c). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts on the right side of the vertical lines are fully-exposed. Cohorts aged 15 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district center of residence.

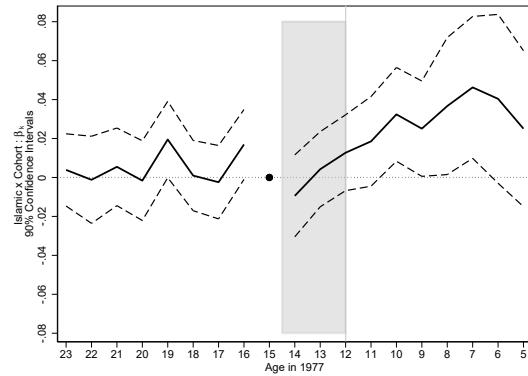
**Figure A.31: Access to Islamic Schools and Family Outcomes - Effects by Single-Age-Cohorts**



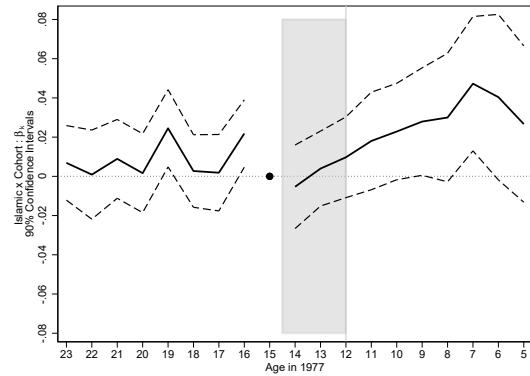
Notes: This figure reports age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in district centers in 1990, excluding Eastern and Southeastern Turkey. The dependent variables include an indicator equal to one if the individual has ever married in panel (a), ever gave birth in panel (b), given two or more births in panel (d), and given three or more births in panel (e). The dependent variables measure the total number of birth given in panel (c), and the age at first birth in panel (f). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts on the right side of the vertical lines are fully-exposed. Cohorts aged 15 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district center of residence.

**Figure A.32:** Access to Islamic Schools and Labor Outcomes - Effects by Single-Age-Cohorts

(a) Participate in Labor Force



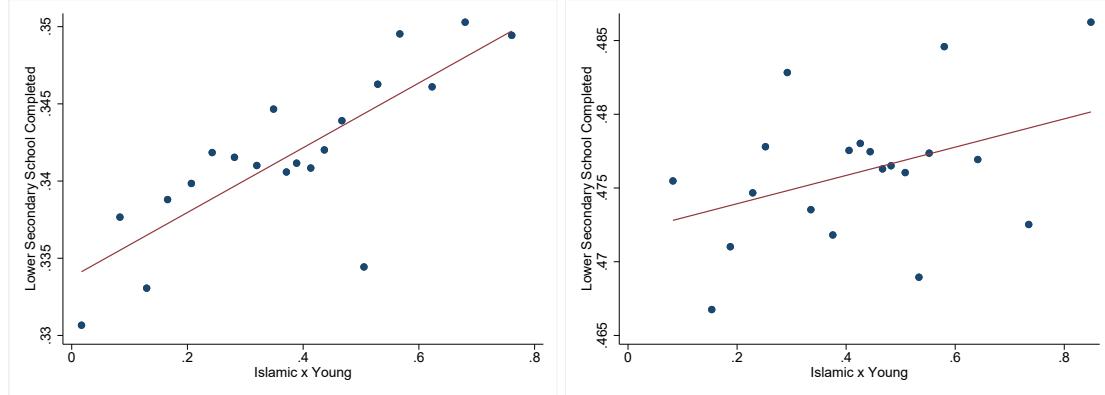
(b) Worked Last Week



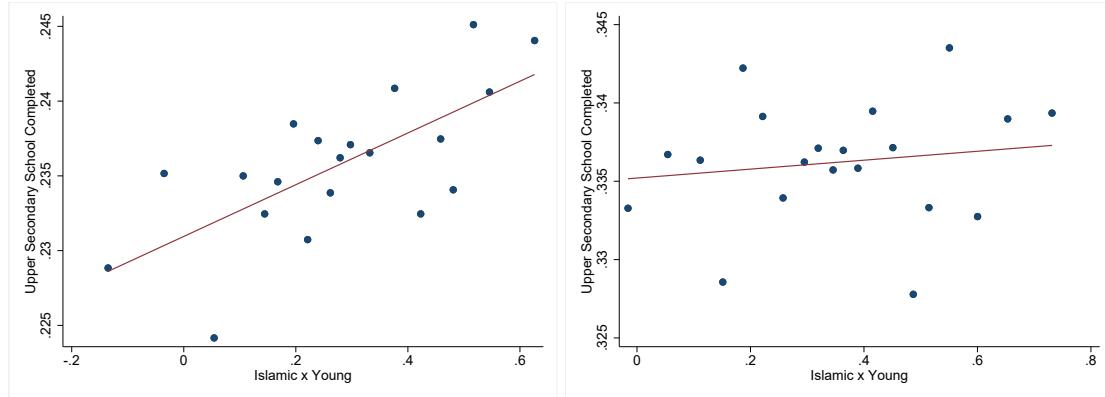
*Notes:* This figure reports age-specific estimates of  $\beta_k$  and 95% confidence intervals in equation (1) for women subsample. The sample contains the women aged 18 and older who reside in district-centers in 1990, excluding Eastern and Southeastern Turkey. The dependent variables include an indicator equal to one if the individual participates labor force in panel (a), and was working the week prior to census in panel (b). All specifications include district-center and province-by-cohort fixed effects, and log of the 1970 population of district center interacted with cohort dummies. Cohorts on the right side of the vertical lines are fully-exposed. Cohorts aged 15 in 1977 for women and in 1974 for men serve as the reference group. Standard errors clustered by district center of residence.

**Figure A.33: Added Variable Plots for Education Outcomes**

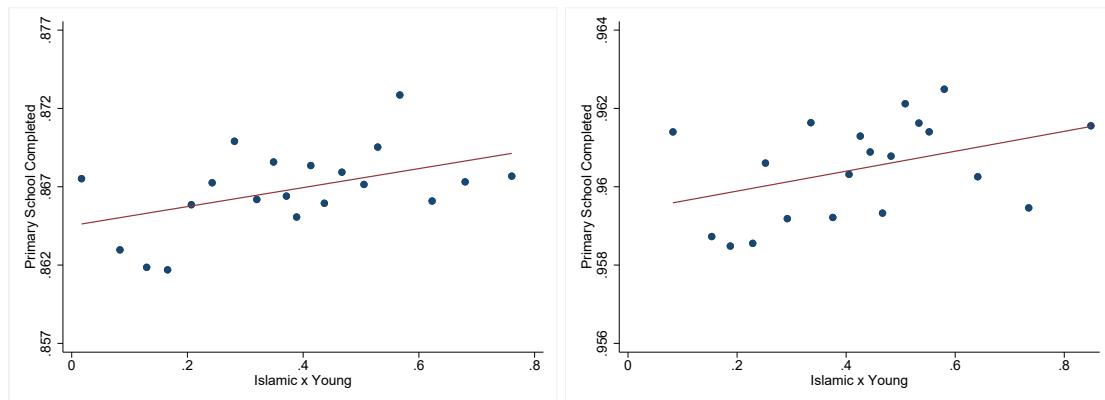
(a) Dep. Var.: Lower Secondary School Completed



(b) Dep. Var.: Upper Secondary School Completed

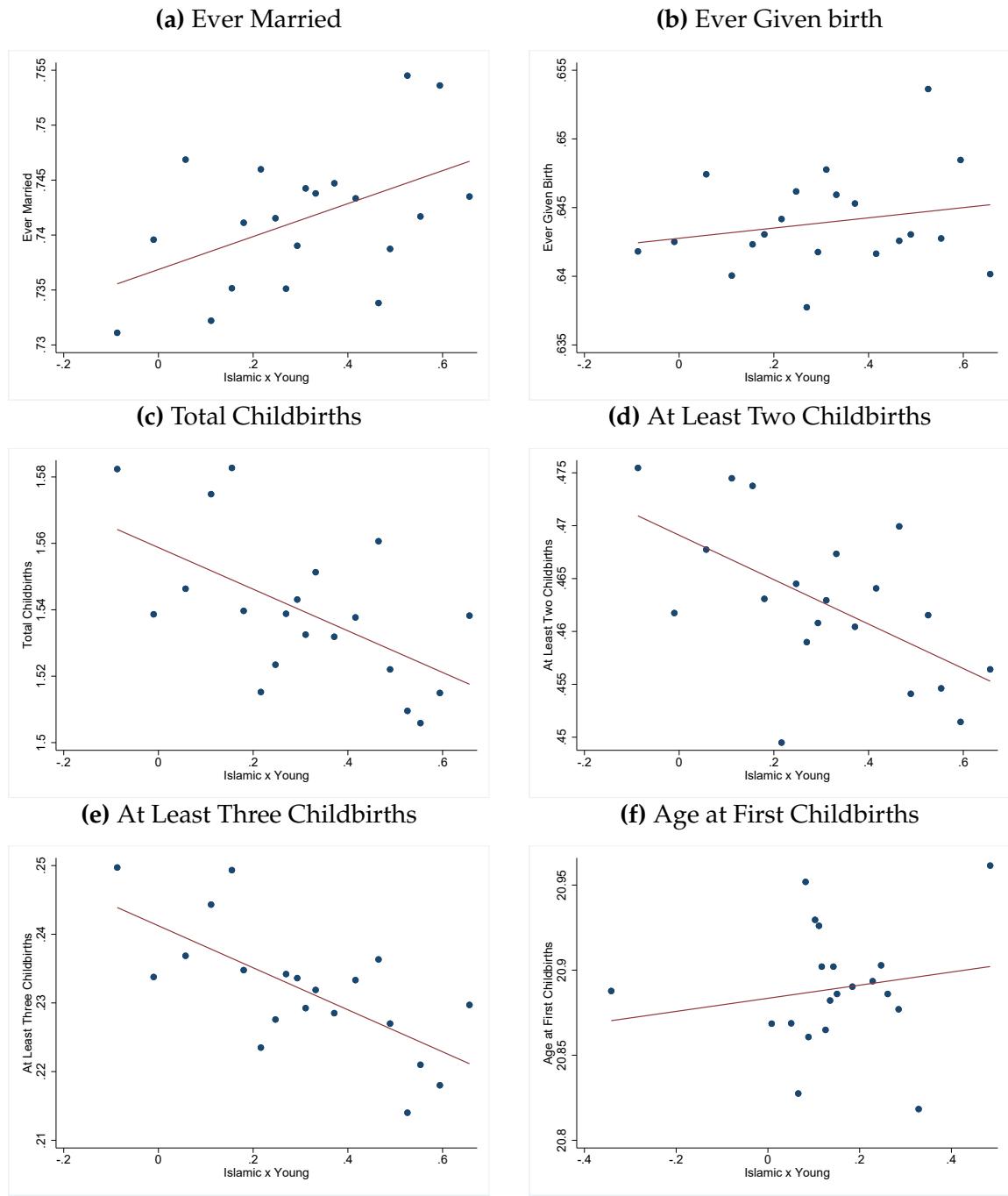


(c) Dep. Var.: Primary School Completed



*Notes:* This figure presents added variable plots that shows the relation between education outcomes and main parameter of interest "Islamic x Young" after accounting for controls in the main specification in equation 2.

**Figure A.34:** Added Variable Plots for Educational Outcomes

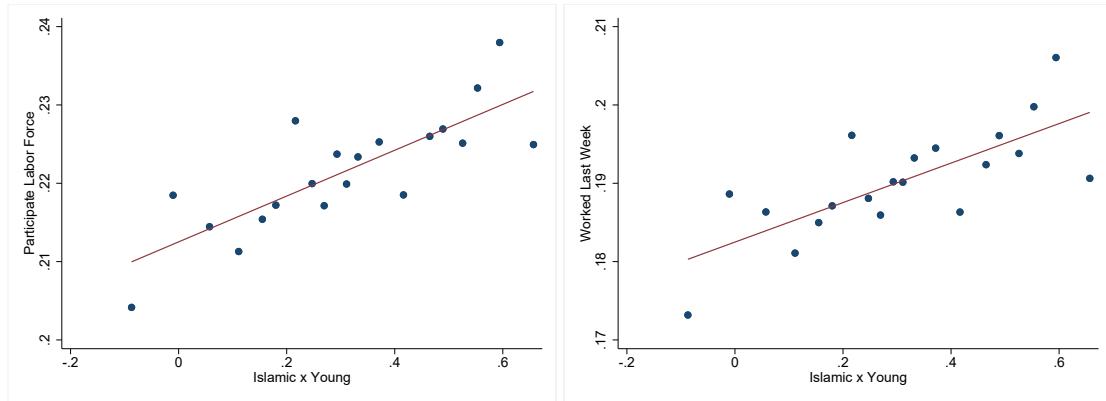


*Notes:* This figure presents added variable plots that shows the relation between family outcomes and main parameter of interest "Islamic x Young" after accounting for controls in the main specification in equation 2.

**Figure A.35:** Added Variable Plots for Labor Market Outcomes

(a) Participate in Labor Force

(b) Worked Last Week



*Notes:* This figure presents added variable plots that shows the relation between labor market outcomes and main parameter of interest "Islamic x Young" after accounting for controls in the main specification in equation 2.