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Islamic Rule and the Emancipation of the Poor and Pious

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Abstract

I estimate the impact of Islamic rule on secular education and labor market outcomes with a new and unique dataset of Turkish municipalities. Using a regression discontinuity design, I compare elections where an Islamic party barely won or lost municipal mayor seats. The results show that Islamic rule has had a large positive effect on education, predominantly for women. This impact is not only larger when the opposing candidate is from a secular left-wing, instead of a right-wing party; it is also larger in poorer and more pious areas. The participation result extends to the labor market, with fewer women classified as housewives, a larger share of employed women receiving wages, and a shift in female employment towards higher-paying sectors. Part of the increased participation, especially in education, may come through investment from religious foundations, by providing facilities more tailored toward religious conservatives. Altogether, my findings stand in contrast to the stylized view that more Islamic influence is invariably associated with adverse development outcomes, especially for women. One interpretation is that limits on religious expression, such as the headscarf ban in public institutions, raise barriers to entry for the poor and pious. In such environments, Islamic movements may have an advantage over secular alternatives.

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1. Introduction

Does Islamic rule prevent or facilitate development? On the one hand, research in both economics and political science has documented a negative association between more Islamic influence and various development outcomes (see, for example Barro and McCleary [5]; and Kuran [25]). Women are often singled out as particularly vulnerable to Islamic rule (Fish [15]; and Donno and Russett [11]), raising the question whether they are specifically constrained from participating in education and the labor market. Indeed, many Muslim countries rank poorly in gender equality comparisons because of limited participation, especially in secondary education as well as in the labor force.¹

On the other hand, a different branch of research documents Islamic organizations' effectiveness in improving the living conditions of underrepresented groups (see, for example Arat [2], Hefner [20], Yavuz [45], and White [40]). This may occur especially when restrictions on religious expression make participation more difficult for religious conservatives.² In such circumstances, religious political movements may have a distinct advantage over secular alternatives.

Turkey is a particularly good testing ground for evaluating these contradicting views. It is one of the few countries that have experienced Islamic party participation in the democratic process for a long period. Despite the country being founded as a secular republic, recent migration from rural and socially conservative areas into the cities has made the urban voter poorer and more pious (Rabasa et al. [35]). As a result, Turkey experienced a seismic political change in the 1994 local elections when an Islamic party became the second largest receiver of votes nationally, winning metropolitan mayor offices in both Istanbul and Ankara. This gave political Islam unprecedented representation in the democratic system and accelerated a debate on religious expression in public spaces, which has continued until today.

I study the consequences of this political change using a new and unique dataset of Turkish municipal elections in 1994 and outcomes from the 2000 Population Census. This dataset allows me to track circa 2,700 municipalities, and ask if having a mayor from an Islamic party had any effects on education and labor market outcomes.

Naturally, it is difficult to isolate the causal effect of Islamic rule on development outcomes such as education. Since it is hard to disentangle the effect of Islamic political representation from the

¹ Women's Empowerment: Measuring the Global Gender Gap, World Economic Forum, www.weforum.org/pdf/Global_Competitiveness_Reports/Reports/gender_gap.pdf

² Such restrictions include the ban on wearing headscarves for women in Turkey and other European countries like France (Saul [37]). But they may also include restrictions of to what extent Islamic organizations can participate in the political process. In both Algeria and Turkey, electorally successful Islamic parties have been banned for being too religious (Roy [36]).

effect of underlying demographic trends, an estimate of the causal impact has remained elusive. However, as many local elections are determined with a thin margin for the winning party, a regression discontinuity (RD) design can be implemented. This allows me to estimate a meaningful causal treatment effect by comparing outcomes after elections where an Islamic mayor barely won or barely lost. A convenient consequence of this particular RD design is that the definition of closeness in an electoral environment with many parties provides a heterogeneous group of close elections with varying underlying political support. This makes it possible to think of the ensuing estimates as representative and meaningful for a highly relevant subset of elections.

My results show that Islamic rule in Turkey led to substantially higher education, in particular for women. A municipality that in 1994 received a near-randomly assigned Islamic mayor had, six years later, a 3 percentage point higher share of women with high school degrees in the ages 15-20 than secular-run municipalities. I find similar impacts on enrollment but in contrast, I find no evidence of any causal effect on neither religious education, which exists as a voluntary alternative to secular secondary education in Turkey, nor primary education, which is mandatory.

I argue that this impact comes through the Islamic parties' advantage in mobilizing and increasing access to education for the poor and pious. Education in Turkey is highly correlated with economic status, where children from poorer households face higher opportunity costs of attending education as well as higher barriers to attend better schools.³ In addition, social constraints such as the ban on wearing the headscarf in public institutions further raise the barriers to participation in more religiously conservative areas.

Consistent with this, I find that the increase in educational attainment is higher in poorer and more pious areas. An analysis using quantile RD shows that the impact of Islamic rule was relatively larger in lower education quantiles. Furthermore, I use multiple measures of religiosity to show that Islamic rule had larger impacts in more religious areas. This is consistent with poor and pious women being more constrained by for example the headscarf ban, and the Islamic party being more capable in improving women's access to education.

While it is difficult to isolate precisely *how* the Islamic party is able to increase participation in education, an examination of urban planning policies suggests one plausible channel. Local governments have relatively little official responsibility for education policy and thus face a challenge of meeting local demands for this type of public goods. In this situation, economically powerful religious foundations, *vakıflar*, have become important allies of the Islamic party by building schools,

³ Admission to both high school and university education is partly determined by national exams. Performing well in such exams often requires private tuition, which not all students can afford (OECD, [33])

dormitories and in general targeting their activities to municipalities ruled by the Islamic party. Such infrastructure has often been seen with suspicion by secularists in Turkey.

I show that municipalities with an Islamic mayor did not significantly shift the allocation of urban space towards more education-related buildings. But they did experience a shift in the composition of education building ownership toward increased *vakıf* ownership. *Vakıf*-owned student dormitories, exempt from public monitoring by the Ministry of Education, often house prayer rooms and facilitate extra-curricular religious courses. Such private “add-on” features to the centrally-governed education system in Turkey may have played an important role in convincing relatively moderate Muslims to send their uncovered daughters to secular high school.

Islamic rule may have affected female participation in a broader fashion—not only by inducing education but also by providing better opportunities for the already educated. Examining economic activity, forms of income, and sector employment in Turkish cities, I find broad evidence of improvements for women in the labor market. Having an Islamic mayor led to fewer women classified as housewives, more salaried employed women, and sector shifts away from agriculture (for women) and construction (for men) towards the service sector.

While there exists a substantial literature on the economic effects of political parties (Ferreira and Gyorko [14], Lee et al. [28], Pettersson-Lidbom [34]), research on the consequence of Islamic rule is scarce. An exception is Henderson and Kuncoro ([19]). Focusing on Indonesia after the introduction of local democracy, they find that corruption decreased more rapidly between 2001 and 2004 in districts with more Islamic party representatives. The findings in this paper also resonate with recent research on local democracy in Muslim countries (see Cheema, Khwaja, and Qadir [8]; and Myerson [32]).

Below, section 2 describes the institutional framework, Section 3 describes the RD design I use to estimate the effect of Islamic mayors, and Section 4 presents the data used in the analysis. Section 5 shows the main empirical results on educational attainment and enrollment, and examines the validity of the RD design. Section 6 extends the analysis to heterogenous effects to examine whether impacts were different for the poor and pious. Section 7 presents evidence on the consequences of the Islamic party in the labor market. Finally, Section 8 discusses the results and concludes the paper.

2. Institutional Framework - Turkey

2.1. The Welfare Party, the Poor, and Political Islam

The period leading up to the electoral success of political Islam in 1994 had been characterized by economic liberalization policies and rapid urbanization from poor rural areas into the urban slums and lower middle-class neighborhoods. Once inside the cities, migrants often retained their social norms and customs, and for this reason the link between economic status and religious conservatism tightened. The party of the religious right, therefore, became the party of the urban poor.

This is illustrated by Figure 1, with data from a recent survey (Çarkoğlu and Toprak [7]). Figure 1a shows that individuals in poorer households rank themselves both more religious and more politically Islamist than those in richer households. Furthermore, according to Figure 1b, poorer women are more likely to wear some form of headcover; while on average more than 60 percent of the entire sample did so, the corresponding share was almost 90 percent among the poorest households. This relation also exists at regional level with poorer regions in Turkey being associated with a stronger influence of religion – as can be seen in the uppermost graph of Figure 2, poorer provinces have a higher proportion of mosques per population than richer ones.

The shifting demographic and political landscape ultimately came to tilt political power in favor of the poor and pious. The 1994 local election for the first time saw an Islamic party, *Refah Partisi* (eng. “The Welfare Party”, henceforth RP), receive nation-wide prominence as Islamic candidates were elected in numerous municipalities, including Ankara and Istanbul. The RP thus united the religious vote that had previously been spread out among the other right-wing parties (Esmer [13]). As a result, mosque construction (Simsek [38]), increased participation in religious schools, and veiled women in public spaces became potent symbols of the religious movement.

A defining characteristic of the RP was its organizational capacity: the party harnessed a network made up of pious entrepreneurs and Sufi brotherhoods (*tarikatar*), the latter primarily through religious foundations (*vakıflar*). These organizations provided a valuable source for investment in RP-controlled municipalities and, in the case of the vakıflar, substantial experience in organizing relief for the poor and subsidizing education. For example, one contemporary study suggests that two large Sufi brotherhoods, the Süleymancı and the Fethullahçı, “each accommodate over one hundred thousand students” (Ayata [3]).

The RP often appears as a representative candidate for an Islamic political party in more general studies on political Islam (Kepel [22] and Roy [36]). As a figurehead of political Islam,

secular elites increasingly came to view the actions of the RP as a strategy to turn Turkey into an Islamic state, and the party was banned in 1998. However, the ban served mostly to exclude the top party leadership, while the local component of the movement remained intact.⁴ This ban was later upheld by the European Court of Human Rights (ECHR), cementing the labeling of the RP as an “Islamist” party⁵. In the final ruling, the court grouped the RP infringements into three categories; *“those which tended to show that Refah intended to set up a plurality of legal systems, introducing discrimination on the grounds of belief; those which tended to show that Refah wanted to apply sharia to the Muslim community; and those based on references made by Refah members to jihad (holy war) as a political method.”*⁶

As such, the RP stands out as a viable candidate for an Islamic political party, with its relatively pro-Islamic agenda but also through operating in an “electoralist and multiparty framework” (Roy [36]).

2.2. Education in Turkey

Both elementary school and middle school (as of 1998), enrolling students aged 6-14, are mandatory in Turkey.⁷ General secondary education, enrolling students aged 14-18, as well as higher forms of education, are voluntary.

For secondary school, there is both a secular and a religious option. On one hand, 1.2 million students were enrolled in secular secondary school in 1995. In the same year, about a quarter of a million students were enrolled in so-called *imam-hatip*, or religious, schools. These originally served to train future imams, but more recently have become a more common alternative to secular high school.

One of the main reforms imposed by Atatürk after the foundation of the modern state of Turkey was expanding education to include women (Mango [29]). Yet more than eighty years after, there is still a large education gender gap. In their recent Gender Gap Report, the World Economic Forum ranked Turkey 121th, out of 128 countries included, in terms of overall gender equality.⁸ A

⁴ A partial reincarnation of the RP, the FP, was once more banned in 2001, and split the political Islamic movement into the Felicity Party (SP), continuing to subscribe to the policies of the previous Islamic parties, and the Justice and Development Party (AKP), which came to adopt a less pronounced Islamic profile. Several key members of the earlier Islamic parties are today prominent members of the AKP. This includes the current Prime Minister and President of Turkey.

⁵ “Turkey Islamists shocked by party ban,” BBC News, July 31st 2001, <http://news.bbc.co.uk/2/hi/europe/1467665.stm>

⁶ See a transcript of the ruling on “Case of the Refah Partisi (The Welfare Party) and Others v. Turkey”, ECHR Third Section judgment and ECHR Grand Chamber judgment (<http://echr.coe.int/echr/en/hudoc>)

⁷ “Turkey in 2007”, Office of the Prime Minister, Directorate of General Press and Information, <http://www.byegm.gov.tr/yayinlarimiz/kitaplar/turkiye2007/english/index.htm>

⁸ The Gender Gap, World Economic Forum, <http://www.weforum.org/en/initiatives/gcp/Gender%20Gap/index.htm>

significant part of this abysmal score was driven by Turkey’s low rates of secondary female education (World Bank [43]). Therefore, the main focus in this paper will be on Turkey’s general secondary education, i.e. secular high school.

Women are not allowed to wear the headscarf in any type of schools, neither as students nor as teachers, except in religious high schools.⁹ This is part of a general ban on religious symbols in public spaces, which also includes public employment. The stated purpose of these restrictions is to guarantee the equality of religious affiliation and gender, as well as to prevent pressure on students. However, these restrictions may also limit access for children whose parents object to sending their daughters uncovered to school.

Surprisingly many parents, particularly among low-income households, disapprove of their daughters removing the headscarf to attend education. Figure 1c shows that a quarter of the respondents in the previously mentioned survey would disapprove if their daughter removed the headscarf in order to attend education, with a much larger disapproval rate in the low income bracket.

In short, existing rules of participation make access to voluntary education for women difficult among the poor and pious. Policies to improve access needs to overcome not only economic constraints, but also religious customs and norms.

2.3. Local Governments and Elections

The main form of local government in Turkey is the municipality (*belediye*), of which there are about 3,000 in total. Municipalities are grouped into 923 districts (*ilçe*) which, in turn, are grouped into 81 provinces (*il*). About two thirds of all municipalities are township (*belde*) municipalities, composed of settlements with more than 2,000 inhabitants in the latest population census. Other types of municipalities act as the center of either a district or a province. Moreover, the 16 largest cities in Turkey have metropolitan (*büyükşehir*) municipalities governing the larger urban region, and sub-metropolitan municipalities nested within the metropolitan municipality.

The official budget size of municipal governments are about 4-6 percent of GDP, on par with many West European countries. The largest share of revenues is made up of transfers from the central government, while property taxes are one of few locally determined sources of revenue. Transfers are largely determined by population and whether a municipality is a district- or province center (World Bank [42]). The provision of education and health services are in the hands of the

⁹ Men also face restrictions, such as the ban on facial hair in high school.

central government, leaving local public services and urban development (building permits) as a main formal responsibility of municipal mayors.

However, nothing prevents municipalities from engaging in education or health policy, either directly or indirectly and, in reality, municipal mayors have a considerable influence over their constituencies, even in areas such as education, partly due to urban planning policies (World Bank [42]).

Local elections are held every fifth year, with each municipality electing a mayor (*belediye başkanlığı*) as well as a council (*belediye meclisi*). The mayor chairs the municipal council and all other committees, sets the agenda for council meetings, and approves permits. For this reason, I will exclusively focus on the municipal mayor. Independent candidates are allowed to run for office although the candidates nominated by the large national parties regularly enjoy larger electoral success.

Local mayoral elections are determined by single-round plurality elections, which allows the use of an RD design. Obviously, analyzing local governments allows more variation and easier comparisons of parties than national elections. In contrast, national elections are proportional and also include restrictions on minority representation¹⁰.

3. Identification Strategy

A key contribution of this paper is the identification of the causal impact of local Islamic rule. The main problem with comparing municipal outcomes by whether an Islamic or secular mayor was elected is that the assignment process of mayor type is not random. As previously noted, the municipalities most likely to vote for an Islamic party may also be those where female participation in education is more constrained or where female returns to schooling are lower. These and other unobserved factors could potentially lead to less education *as well as* an elected Islamic politician, and thus, traditional regression analysis may not be informative about the causal impact of having an Islamic mayor.

The sharp RD design (Hahn and Van der Klauw [17]; Imbens and Lemieux [21]) exploits a discontinuity in the treatment assignment to identify a causal effect. It can be used when treatment assignment, m_i , is determined solely on the basis of a *cutoff score*, c , on an observed *running variable*, x_i . The running variable in this design is the win margin for the Islamic party relative to

¹⁰ For a party to receive any representation in parliament, it needs to have received at least ten percent of the national vote.

the largest non-Islamic party and the cutoff is therefore $c = 0$. Those municipalities that fall below the cutoff are placed in the control group ($m_i = 0$), and receive a secular mayor, whereas those above are placed in the treatment group ($m_i = 1$) and receive an Islamic mayor. The assignment follows a known deterministic rule: $m_i = 1 \{x_i \geq c\}$, where $1 \{\cdot\}$ is the indicator function.

If municipalities close to the threshold, with very similar values of x_i , are comparable, treatment can be considered “as good as randomly assigned” close to c . The causal impact of treatment can then be evaluated by comparing average outcomes with scores of x_i just above c with those just below. Consequently, the RD design identifies the local average treatment effect (LATE) for municipalities close to the cutoff point.¹¹ This not only assumes that municipalities are comparable close to the threshold, but also that agents (i.e. politicians and voters) are unable to precisely manipulate the running variable. These assumptions and the validity of the RD design will be investigated in more detail in Section 5 below.

Previous research has used different approaches to RD estimation. One common strategy has been to adopt a parametric *control function approach* (Heckman and Robb [18]),

$$y_i = \alpha + \beta m_i + f(x_i) + \varepsilon_i, \quad (3.1)$$

where y_i is the outcome in question (for example high school attainment for women). Under valid assumptions, $f(x_i)$ will be a continuous function of x_i at the cutoff point and measures the average treatment effect at c . Consequently, as long as $f(x_i)$ is known and included in the regression, equation (3.1) can be consistently estimated.

An alternative approach is to only include data in a ‘discontinuity sample’ (Angrist and Lavy [1]), a neighborhood around the cutoff value. This is tantamount to estimating

$$\begin{aligned} y_i &= \alpha + \beta m_i + \varepsilon_i \\ \forall x_i &\in (c - \delta, c + \delta) \end{aligned} \quad (3.2)$$

for an arbitrarily small neighborhood of δ around c . In other words, comparisons of average outcomes to the left and right of c provide an estimate of the treatment effect that does not depend on a correct specification of the control function. Using this kind of “discontinuity sample”, however,

¹¹ As an illustration to the RD design, suppose that we compare two hypothetical municipalities where the Islamic party, in a race of two parties, received 70 and 30 percent of the vote shares, respectively. In the first municipality, the win margin was 40 percent and in the second it was -40 percent. The large margins will most likely represent certain underlying voter preferences and assignment is therefore unlikely to be random. Comparing outcomes based on party identity will thus not tell us the causal effect of having an Islamic mayor. However, suppose that the Islamic party had instead received 51 and 49 percent of the vote shares in two other municipalities. In the first, the win margin was 2 percent and in the second -2 percent. It is less clear why these two should be systematically different except for which party won the mayor seat. With a sample of such closely determined elections, comparing outcomes by treatment status may yield a better estimate of the causal effect.

means disregarding a substantial amount of the data. In this paper, I use both a polynomial specification (hereby called the *RD Control*) method and a discontinuity sample (hereby called the *RD Sample*) method as complements.

4. Main Data Description

Data for local mayoral elections come from the Turkish Statistical Institute (henceforth TurkStat) and are reported by municipality. In 1994, elections were held in 2,710 municipalities. These include township, district center, province center, metropolitan, and sub-metropolitan mayors. Fourteen parties received votes and numerous independent candidates also ran for election¹². Islamic parties, mainly the RP and one fringe party, received about 21 percent of the total vote share and won 340 mayoral seats. Since all mayoral elections are determined by plurality, the main explanatory variable, Islamic mayor in 1994, is an indicator variable, which is one if an Islamic party had the largest amount of votes and zero otherwise.

The running variable used in the RD design is defined as the *difference in vote share between the largest Islamic party and the largest secular party* with a cutoff point of zero.¹³ Consequently, the Islamic mayor indicator is one when this measure, hereby labeled the *Islamic win margin*, is positive and zero when it is negative. Each municipality will have a score of the Islamic win margin anywhere between -1 and 1 . The running variable is therefore not tied to any particular absolute vote share (such as fifty percent in a two-party race) but will encompass a heterogenous group of elections (this is covered in more detail in section 5.4).¹⁴

To check that there is no obvious sorting on each side of the cutoff, Figure 3 shows the histogram of the running variable, for the entire range in bins of five percent in the upper graph, and for a shorter range around the threshold in bins of one percent. Inspecting the density of the running variable close to the threshold in the lower graph, it is comforting to note that it appears to be smooth around the cutoff point (a more formal test is conducted in Section 5.3).

The main outcome variable and the control variables come from TurkStat’s Population Census of 2000. Data on educational attainment (primary, high school, and vocational) and demographics

¹² TurkStat reports vote totals for all independent candidates combined. For this reason, the elections where the total vote share of the independents is either the highest, or the second highest, are removed. None of the results are affected by this procedure.

¹³ More formally $x_i \equiv \max \{v_i^{I_1}, \dots, v_i^{I_K}\} - \max \{v_i^{S_1}, \dots, v_i^{S_M}\} \in [-1, 1]$ for the set of K Islamic parties and M secular parties with $v_i^{I_k} \geq 0, v_i^{I_m} \geq 0, k \in K, m \in M$.

¹⁴ For example, suppose that two secular parties A and B receive 55 and 25 percent of the votes, respectively, while the Islamic party only receives 10 percent of the votes. The value of the Islamic win margin will thus be -45 percent.

like population, age, gender, and economic activity (including individuals classified as students) are reported by neighborhood (*mahalle*) for cities (*şehir*), and by individual villages (*köy*) outside of cities. One candidate measure of municipality size is population as reported in the 2000 Census. Another is population as reported in the 1994 election data. The results in this paper hold for both measures, but I use the latter because of it being recorded at the beginning of the term. An important missing control variable is income, and in later sections I use a number of different proxies for income. For most of the analysis, the census data are aggregated to the municipal level. For the 1990 Population Census the lowest level of aggregation is the municipality.

Matching municipalities across time periods is somewhat intricate. As cities have grown, new provinces and districts have been created, with the result that municipalities change names and associated districts and provinces. Metropolitan municipalities have grown to incorporate an increasing amount of smaller (i.e. district center- and township) municipalities. For this reason, when data from the 2000 Population Census are aggregated to metropolitan levels, I use 1994 metropolitan borders. The matched municipal dataset of 1994 elections and 2000 census data has 2,661 observations (see Appendix A for more details).

The main focus of the paper is on high school attainment for the 15-20 cohort, namely the share of the population between 15 and 20, female or male, that in 2000 reported their education level attained as at least a high school degree. As can be seen from column 1 in Table 1, the average high school attainment for this cohort is 16.3 and 19.3 percent for women and men, respectively. The table also reports demographic and administrative variables. Columns 2 and 3 show group means for municipalities with secular and Islamic mayors while column 4 shows the differences between columns 2 and 3. On average, Islamic municipalities have 2.6 percentage points lower female attainment rates than secular municipalities and no corresponding difference for men. A naive conclusion would be that the cause of the lower education is Islamic rule. Yet, Table 1 also shows that Islamic areas differ from secular ones in several other ways. On average, municipalities that elected Islamic mayors in 1994 are larger, younger, have larger households, and more likely to be large cities. The following section therefore employs the RD design to estimate the causal impact of local Islamic rule.

5. Main Results

5.1. Graphical Analysis

Figure 4 shows graphical illustrations of the RD design, where local averages of high school attainment for women (panel A) and men (panel B) in the 15-20 cohort are plotted against the Islamic win margin in bins of one percent. A vertical line showing the cutoff at zero and a parametric fourth-order polynomial is fitted to the data on each side of the cutoff. Panel A reveals a clear negative association between female education and the running variable, in line with earlier sections' claim that women are more constrained from participating in education in the more Islamic municipalities. The most striking feature of this graph, however, is the clear positive jump in high school attainment at the cutoff. The size of the jump is quite large, around 3 percentage points.

Panel B shows a different picture for men. Not only is there little negative relation between the outcome and the running variable per se, but there is also less evidence of a jump at the threshold – the jump is smaller in magnitude and less precise. This is consistent with men being less constrained than women in participating in education, and the Islamic mayor consequently having a less clear impact on their education.

Figure 5 also compares graphically the impact on high school education with that of other education types. As show in panel B there is essentially no effect on primary school attainment for the 15-20 cohort, nor is there one for vocational high school (panel D), which includes religious education. The existence of a jump in enrollment of 15-30-year-olds (panel C), on the other hand, verifies the impact on participation in post-primary education.

The rest of this section will mostly serve to estimate more precisely, and robustly, the impact on female participation in education uncovered in Figure 4.

5.2. Basic Regression Results

To refine the analysis, Table 2 reports education results in 2000 for women in panel A, men in panel B. In each panel, the first two rows show the mean and standard deviation for the dependent variable of the relevant sample. Columns 1-6 use the share of the 15-20 cohort with high school degrees, where even columns are without covariates and odd columns include controls for log population, the share of the population below 19, the share of the population above 65, five gender-specific age cohort controls, gender ratio, as well as dummies for type of municipality. Columns 1 and 2 report OLS regressions of each outcome on Islamic mayor in 1994. For women, the correlation is signifi-

cantly negative both with and without controls, while for men the correlation is indistinguishable from zero.

Columns 3 and 4 report results from the RD Sample method, i.e. the same as in columns 1 and 2 but now only including those observations where the absolute value of the Islamic win margin was lower than 2 percent. In column 3, the coefficient for women is positive at 2.9 percentage points and marginally statistically significant. This confirms the finding from Figure 3 of a relatively large jump at the cutoff. Adding the covariates in column 4 increases the precision of the point estimate to significant at 1 percent, but does little to change its magnitude.

The following regression is estimated for the RD Control method:

$$y_i = \alpha + \beta m_i + f(x_i) + \mathbf{w}_i' \boldsymbol{\gamma} + \varepsilon_i, \quad (5.1)$$

where

$$f(x_i) = \sum_{s=1}^4 (\lambda_s^0 + m_i \lambda_s^1) x_i^s$$

is the control function, and λ_s^0 and λ_s^1 are estimated parameters. Using this method in columns 5 and 6 yields almost exactly the same coefficients, statistically significant at five and one percent, respectively.

Column 7 and 8 show RD Control results for two alternative measures of female participation in education. The first is the share of women with high school degrees in the age cohort 21-25. For this cohort, any impact on education attainment should come through inducing them to finish high school, and the similar estimates for both the 15-20 and 21-25 cohorts suggest that the impact of the Islamic mayor comes both through starting as well as finishing high school. The second column uses a measure of enrollment; the share of women in the cohort 15-30 classified as students, and gives very similar results.

In contrast, for men, the OLS, RD Sample, and RD Control method yield estimates that are either close to or statistically not different from zero. Consequently the broad impact on female cohort education attainment and enrollment found is absent for men.

That Islamic mayors have a positive impact on female attainment of higher education is somewhat striking. So is the finding that the impact is more pronounced for women than for men. Moreover, this phenomenon seems to occur predominantly in voluntary and secular forms of education. Before exploring further this finding, however, the next subsection examines the validity of the RD design.

5.3. Validity and Robustness Checks

In the previous section, estimates by the RD Sample and the RD control method yielded almost identical estimates. This is reassuring as each of the two methods has its own strengths and weaknesses. So is the result that adding covariates to the estimation only makes the estimates more precise without affecting the magnitude of the point estimate. Yet, these estimates can be interpreted as causal only as long as the assumption of random assignment of party identity around the threshold is upheld. If elections could be perfectly manipulated around the threshold, the assumption is violated. Still, the mere existence of election fraud is not sufficient to invalidate the RD design (Imbens and Lemieux [21] and Lee and Lemieux [27]). Instead, as long as politicians, municipalities or voters do not have *precise* control over the running variable, random assignment is still valid.

A common validity check is to examine whether baseline covariates are continuous around the threshold. Figure 6 shows that there are no clear and statistically significant jumps at the threshold of the control variables. The lowest right-hand side graph in this figure is a placebo check to show that there is no evidence of any effect on high school attainment for the 15-20 cohort in 1990.

Another testable hypotheses underlying the RD design is local continuity in the density of the running variable at the threshold *ex post*. If the running variable can be manipulated, there could be sorting around the threshold. The histogram in Figure 3 showed no visible evidence of sorting but is not a formal test. McCrary [31] proposes a two-step procedure for explicitly testing for a discontinuity in the density of the running variable. In the first step, the running variable is partitioned into equally spaced bins and frequencies are computed within those bins. The second step treats the frequency counts as a dependent variable in a local linear regression. This is shown graphically in Figure 7. This test rejects any discontinuity in the density at the threshold with a comfortable margin.¹⁵

A more subtle issue is distinguishing an “Islamic-party” effect from a “Right-wing-party” effect. The Islamic parties examined in this paper are all right-wing parties and thus, the estimate could potentially confound the impact of an Islamic mayor with that of a right-wing, mayor. The first three columns in Table 3, which has female high school attainment as the dependent variable, investigates this possibility with the two different RD methods. Column 1 shows results from the regression

$$y_i = \alpha + \beta_1 m_i + \beta_2 L_i + \beta_3 m_i L_i + f(x_i, L_i) + \mathbf{w}'_i \gamma_0 + L_i \mathbf{w}'_i \gamma_1 + \varepsilon_i, \quad (5.2)$$

¹⁵ See McCrary [31] for more details on the test.

where L_i is a dummy for whether the two adjacent parties on each side of the cutoff constitute an Islamic and a left-wing secular party. Consequently, this dummy variable is interacted with the indicator for Islamic mayor, the control function and all covariates.¹⁶ The coefficient β_1 reflects the effect of an Islamic mayor when the close contest is between an Islamic and right-wing candidate. The effect of an Islamic mayor in a close contest with a left-wing secular candidate is captured by $\beta_1 + \beta_3$. The β_1 coefficient can thus be interpreted as the “Islamic party” effect and β_3 as the “Right-wing party” effect. The effect of an Islamic party, in column 1 of Table 3, in a contest with a right-wing secular party is just slightly lower (2.4 percentage points) than the results in Table 2. But the effect of an Islamic party winning against a left-wing party is larger, with an estimate of 7.4 percentage points, although this is not statistically significant. Columns 2 and 3 verify that the positive effect of Islamic parties are more pronounced when competing against a left-wing party, although it should be noted that the number of close elections between Islamic and left-wing secular parties are just a small fraction of the total number of close elections. Consequently, independent of the right-left divide in Turkish politics, there is a clear positive effect on female education of having an Islamic party. (The issue of why the effect is larger vis-a-vis left-wing parties will be further discussed in Section 6).

Column 4 adds a set of controls for various outcomes from the 1990 Census.¹⁷ These include, respectively, the female share of the population with high school attainment, the share that is employed, and the share that is married. The education in 1990 variable is useful as it is likely to be a good proxy for income. These controls may also be helpful proxies for how socially conservative a municipality is. The resulting estimate of having an Islamic mayor in 1994 when controlling for pre-treatment education is positive and significant, yet somewhat smaller. Column 5 is a differenced equation in the outcome variable and the controls, measuring the impact of Islamic mayor 1994 on *changes* in the share of women with high school degrees between 1990 and 2000.¹⁸ The resulting estimate is very close to that of the baseline specification.

The rest of Table 4 adds additional controls: 1990 levels of log population density, total building space (in log square meters) as well as the education share of all building spaces in column 6; province fixed effects in column 7; an indicator of whether the municipality received an Islamic mayor in the mayoral election of 1989 in column 8; and a polynomial fourth-order function in all

¹⁶ The control function is $f(x_i, L_i) = \sum_{s=1}^4 [\lambda_s^0 + m_i \lambda_s^1 + L_i (\Lambda_s^0 + m_i \Lambda_s^1)] x_i^s$

¹⁷ Adding the controls in this paragraph does not affect the negative significant coefficient in the simple OLS regressions.

¹⁸ The equation is $\Delta y_i = \alpha_0 + \beta_1 m + f(x_i) + \Delta \mathbf{w}' \gamma + \varepsilon_i$, where Δ is the difference operator between 1990 and 2000, and $f(x_i)$ is defined as in equation (5.1).

continuous covariates in column 9. Columns 10 and 11 show RD Sample regressions where the sample are those observations with the absolute value of the running variable being less than 4 and 1 percent (rather than 2 percent). As is evident from the results, estimates from the RD Sample method converge towards the OLS estimate as the interval of the running variable around the threshold grows.

A concern might also be the existence of additional discontinuities in the running variable at values other than zero which, although not necessarily invalidating the RD design, are usually considered to be unwanted. Figure 8 pursues this by estimating placebo RD Control estimates at other points along the running variable. The absolute values of the t-statistics are then graphed on the left-hand side of the figure, with the red line indicating the “true” discontinuity. These t-statistics are then collected in a histogram on the right-hand side with the purpose of showing that the discontinuity at zero is an outlier in the empirical distribution (shown as a black circle in the graph).¹⁹

Another concern could be that the results for women in younger cohorts, especially for students, are driven by the older cohorts. Table 4 shows results for female high school attainment for the 31-64 cohort, essentially a parent cohort. As can be seen from column 1 there is a positive impact of having an Islamic mayor even on this cohort. For example, if the Islamic mayor attracts well-educated conservative parents who immigrate partly so their daughters can attend high school in a more Islamic environment instead of attending high school in a more secular environment, the implications might be different.

This phenomenon is most unlikely for several reasons. First, any effect on older educated women is not large enough to explain the effect on students. Second, allowing for the parent cohort to have a direct effect on the student cohort, leaves the impact of Islamic rule on enrollment largely unaffected.

As an illustration, how many women aged 31-64 would need to be attracted to explain the effect on students in the age 15-30? To compute this, one would need to know the average number of daughters in the age 15-30 per woman aged 31-64. In the absence of detailed data about this, consider the following guesstimate. The average household size is around 4.4, and subtracting 2 parents while assuming equal probability of sons and daughters yields an average 1.2 daughters per household, regardless of daughter age. Since the examined student cohort only includes ages

¹⁹ I also run goodness-of-fit tests, as suggested by Lee and Lemieux [27], including bin dummies to show that, as the order of the polynomial control function increases, the joint significance of the bin dummies becomes insignificant (see Table B3).

15-30, assuming further that half of the daughters are above 15, this results in a guesstimate of 0.6 daughters in the age 15-30 per woman aged 31-64. Thus, as long as the impact on students in levels is about half that of the impact on the female cohort 31-64, this would be consistent with no inducement of education above what is due to migration of older cohorts.

This alternative hypothesis is examined in Table 4. Columns 1 through 3 show the impact of Islamic rule on the number of 31-64 year-old women with high school education, the number of 15-30 year-old women who are students, and the number of 15-20 year-old women who have high school degrees.

Comparing columns 1 and 2 shows that the impact on the student cohort relative to the parent cohort, two cohorts of roughly the same size, has a ratio of 2.9. This seems too large an effect to be caused solely by the number of potential well-educated mothers—for every 0.6 potential students resulting from well-educated mothers, an additional 2.3 students are induced. Column 4 shows that adding as a control the number of women with high school degrees aged 31-64 does little to affect the impact of Islamic rule on female enrollment. The coefficient on Islamic rule is circa 70 percent of the original estimate in column 2. Since this coefficient is, if anything, underestimated *at least* 70 percent of the previously estimated impact on students seem to come from actually inducing students of less-educated parents, as opposed to students who would otherwise have gotten the same secular education in less Islamic environments.²⁰ The same thing holds for using the 15-20 cohort with high school degree in column 5.

5.4. Conveniently LATE

One potential concern with RD designs is that they estimate *local* average treatment effects (LATE), specifically at a fixed covariate of the running variable. In the presence of heterogenous effects, the RD LATE will often differ from the average treatment effect. This may be particularly problematic in a political economy setting if politicians' incentives are correlated with the level of political competition. If a candidate wins an election with a very thin margin, she may have incentives to allocate more time towards reelection, perhaps pursuing a moderate policy, as opposed to pursuing her preferred policy. A related issue is whether close elections only occur in very few areas of a certain type, distinct from the population as a whole. The main concern is therefore a combination of unrepresentative and homogenous close elections in an environment with heterogenous treatment

²⁰ The coefficient on the parent cohort is likely to exhibit an upward bias as omitted factors affecting the returns to schooling for the old are likely to be positively correlated with similar factors affecting the same for the young. Thus, under reasonable assumptions the impact of Islamic rule on the student cohort exhibits a downward bias.

effects.

Due to the system of Turkish local politics and, consequently, the definition of the running variable, these limitations are less damaging in this particular design. Instead, I argue that the RD LATE estimated is informative about a substantial and highly relevant group of municipalities.

In elections where only two parties participate (such as most areas in the US), a close election means being close to a majority at a fifty percent share of the total vote. This hypothetical one-to-one relationship is illustrated by the diagonal line in Figure 9. Such close elections are more likely to be ideologically “moderate” and may also lead politicians to pursue more moderate policies than otherwise.

In contrast, in the current design close elections comprise a heterogenous group – by defining the running variable as a win margin between the Islamic party and the largest of several secular parties, this creates a much larger surface of different close election constellations²¹. As can be seen in the figure, the absolute Islamic vote share of the close elections ranges from the high teens to the low fifties. Around a third of the total sample has absolute Islamic vote shares within this range. As a result, several close elections involving Islamic parties occur in municipalities that would vote in a secular mayor with a wide margin if only two parties ran for office. However, due to fragmentation in either block, even a secular-majority municipality may receive an Islamic mayor.

Municipalities with recent close elections are, over time, only marginally more competitive than the average. Factors determining the fragmentation of different political blocks are often quite idiosyncratic, and therefore, so is the incidence of having a close election.²² For example, analyzing all election periods between 1989-2004, I find that 12 percent of all non-close elections were close in the next election and the corresponding number for close elections was a meagre 19 percent — a politician who just barely won is therefore not meaningfully more likely to subject to a close election the next time around. Consequently, the close elections studied here are not just an eclectic sample of “moderates”, but are characterized by heterogenous political compositions and incentives facing the winning candidate.

An important point is also to what extent close elections are observably representative of Turkish municipalities in general. Table 5 reports summary statistics of several municipality groups and

²¹ The median number of parties with non-zero votes in the sample is 5.

²² An interesting example is the metropolitan municipality of Ankara, where the divide between the city’s secular upper-class and the poorer, and more pious, community evenly divides the electorate to the right and left. In the 1989 mayoral election, the left-wing SHP candidate Murat Karayalçın won with a comfortable margin since an uncoordinated right-wing bloc (including the RP) received substantial vote support for each party. In the 1994 election, the right-wing bloc was much more concentrated, resulting in a razor-thin win margin for the RP’s Melih Gökçek.

the comparisons among them. In addition to the full and close-election sample, the table includes two groups of municipalities won by either an Islamic or a secular politician with an absolute win margin exceeding 2 percent. These two latter groups are referred to as Far Islamic and Far secular municipalities, indicating that they are *far* on either side of the political spectrum. Column 5 reveals no systematic differences between the sample of close elections and Far Islamic municipalities (with the exception of having slightly older inhabitants and marginally more men). Most noteworthy is the absence of any real differences in education, household size, and children-to-women ratio—useful proxies for social conservatism and income. Given this, it is less surprising that column 6 shows systematic differences between close elections and Far secular municipalities since, as was shown in Table 1, there are differences between Islamic and secular municipalities.

In summary, not only does this RD design capture a kaleidoscope of close elections in terms of underlying voter support and politician incentives, but the close election sample is also observably similar to Turkey’s poorer and more socially conservative municipalities. It is thus particularly informative from a development perspective, as it may be helpful in understanding the impact of Islamic rule for the poor and pious. This is the aim of the next section.

6. The Emancipation of the Poor and Pious

How can a religiously conservative mayor from an Islamic party lead to more female participation in secular education? I argue that the mechanism comes through Islamic parties being more effective in mobilizing those groups where the barriers to entry in education are higher, namely the poor and pious. From the household perspective, these barriers may include parents lacking sufficient financial resources to send all or any eligible household members to high school (or university). Equally important, other barriers may be a lacking willingness by pious parents to send their daughters to school without headcover. When social norms and religious practice at the local level conflict with centrally decided rules of secularism, these groups may be the most vulnerable.

The result in column 1 of Table 3 showed that the effect of the Islamic party is larger when the contestant to the Islamic party is a left-wing, rather than a right-wing, party. This is surprising since many left-wing parties have women’s rights among their top platform issues.²³ Yet the left-wing parties are also more likely to adhere to Kemalist principles of bundling social and economic reform, thereby raising the barrier to educational participation. In contrast, the Islamic parties’

²³ See the latest party program of the largest secular left-wing party, the CHP available at http://www.chp.org.tr/index.php?module=museum&page=show&entry_id=1659

advantage in harnessing local culture and social norms is well documented in Turkey (Yavuz [45] and White [40]) and in other countries (Hefner [20]). If this is the case, then the groups that are most restrained under the current education system, the poor and pious, should be those benefitting the most from having an Islamic mayor. This is investigated in the next two sub-sections

A related question is how Islamic parties are capable of affecting education with limited formal resources. Part of the answer may come from the RP's close connection with other religious organizations, especially religious foundations which provide an important source of investment in Islamic-ruled regions. This is investigated in the third sub-subsection.

6.1. Who gets mobilized?

The Poor So far, the analysis has mostly centered on the (local) *average* treatment effect of Islamic rule, but one may also wonder whether the impact varies along the distribution of education; i.e. is the impact different in relatively uneducated and relatively well-educated areas? Educational attainment is also a credible proxy for income, and for this purpose, I use quantile regressions (Koenker and Bassett [24]) to estimate the quantile RD (QRD) effects of having an Islamic mayor. This means estimating the same equation as in equation (5.1), but instead of using least squares to minimize the sum of squared residuals, I minimize a sum of asymmetrically weighted absolute residuals giving differing weights to positive and negative residuals. This allows me to estimate impacts of local Islamic rule at different percentiles of the distribution of education, rather than just at the mean.

Figure 10 illustrates the results for the share of women in the 15-20 cohort with high school degrees. The estimates are essentially flat, and seem to track the RD-OLS estimate well, with the exception that estimates become increasingly imprecise at the highest quantiles. The similar magnitude of the quantile coefficients hide the fact that the quantile means vary along the distribution. For example, the QRD estimates for 15-20 year-olds in the 25th and median quantiles are almost identical at 2.7 percentage points (both statistically significant), yet the quantile means are 8.2 and 15.6 percentage points, respectively. Consequently, the proportionate increase is almost twice as large in the lower quantile.

The above analysis shows that the impact of the Islamic parties on educational choices have been largest in the lower education quantiles, i.e. the relatively poorer municipalities.

The Pious If Islamic parties help mobilize women in religiously conservative regions, this suggests that the effect of having an Islamic mayor should be relatively larger in those areas *within* the municipality that are more religiously conservative. The detail of the 2000 Census is helpful in this respect, as it has data on educational attainment and demographics by neighborhood for the 923 city municipalities. The neighborhood, of which there are about 10,000 in total, is the administrative unit below the municipality. While data for the local election of 1994 only exists at the municipal level, for the 1995 parliamentary elections data exists by neighborhoods, and the major Islamic party was the same in both elections. Therefore, in order to examine whether the Islamic party effect varies by the neighborhood-level support of the party, I specify the following regression model

$$y_{ij} = \alpha + \beta_0 m_i + \beta_1 m_i s_{ij} + \delta s_{ij} + f(x_i, s_{ij}) + \mathbf{w}'_{ij} \gamma_0 + s_{ij} \mathbf{w}'_{ij} \gamma_1 + \varepsilon_{ij} , \quad (6.1)$$

which is similar to equation (5.2) with the exception that the measure of religiosity is defined as $s_{ij} = v_{ij}^{RP} / v_i^{RP}$, the ratio of the vote share for the Islamic party in neighborhood j in municipality i to that of the entire municipality i . Scaling the religiosity variable by the aggregate municipal vote share makes it easier to distinguish variation within municipalities from variation across municipalities.²⁴ Moreover, introducing an additional margin at the neighborhood level also allows me to test whether Islamic mayors have adverse effects in more secular neighborhoods.

Even though the RP represented the main political party of religious conservatives, the neighborhood level RP vote share is an imperfect measure of religiosity - other parties such as the ANAP and various regional Kurdish parties may also have received support from such groups. However, I would argue that this measure is still very informative. First, surveys show that voting for the Islamic party is highly correlated with religious intensity (Esmer [12]). Second, the hypothesis is that the effect should be relatively larger for women than for men. If the variable s_{ij} is solely a measure of relative electoral support, then there should be no difference between men and women in this direction. Thus, evidence of a relatively larger effect in neighborhoods with higher values of s_{ij} for women but not for men would be hard to explain by patronage.²⁵

²⁴ Allowing the effect of the Islamic party to vary by religiosity at the municipal level would be less informative about this issue since any resulting heterogeneity could just as easily be interpreted as varying the type of competitive elections between a close election in a concentrated (e.g. only two parties and close to 50 percent vote share for the Islamic party) race versus a close election in a less concentrated race (e.g. four parties with around a quarter of the vote share each).

²⁵ If parties rewarded different neighborhoods more or less depending on whether they voted more or less for the party, one would expect the effect in more supportive neighborhoods would be expected to be equal for men and women. This is because votes are secret and the party should have no good way of determining whether men or women voted in one way or the other, only the neighborhood total.

While in equation (5.2) each municipality received equal weight in the regression, estimating equation (6.1) unweighted instead gives each neighborhood equal weight and thus puts more emphasis on larger municipalities (which have more neighborhoods). For this purpose, the regression is weighted by the inverse of the number of neighborhoods within each municipality. Moreover, standard errors are clustered by municipality to allow for correlation within municipalities.

In contrast to the interaction model in equation (5.2), the religiosity measure is not a binary but a continuous variable, and so it is more informative to graph the partial derivative $\beta_0 + \beta_1 s_{ij}$ for relevant values of s_{ij} rather than just reporting the individual coefficients (these are reported in Table B1). This is done in panel A of Figure 11 through three graphs representing the heterogeneous effect of having an Islamic mayor on high school attainment for women in the uppermost panel, men in the upper-middle panel and the ratio of the female-to-male outcomes in the lower-middle. The bottom graph in panel A shows the histogram of the religiosity variable. The value on the y-axis at $s_{ij} = 1$ denotes the average effect of the Islamic party ($\beta_0 + \beta_1$), which is positive for both men and women. For high school attainment, what is striking is how the effect of the Islamic party is clearly larger for women but not for men in neighborhoods with higher religiosity. For men, the line is almost completely flat. Moreover, while the effect for women in more religious neighborhoods is clearly positive, the corresponding effect for the more secular neighborhoods is not significantly negative. This relatively larger impact in more Islamic neighborhoods is also present when the outcome is the ratio of female-to-male high school attainment.

As an alternative measure, I examine a measure of religious infrastructure in panel B, the share of a municipality's building space made up by religious buildings in 1990. This amounts to estimating 6.1 at the municipal level, with the religious building share as the interacting variable. Results on high school reveal very similar findings with the estimate being clearly larger in municipalities with relatively more religious buildings.

Altogether, areas that can be considered more religiously conservative saw the largest effects on female education from having an elected Islamic mayor.

6.2. Education, Islamic Networks and the *Vakıf*

So far, the analysis has solely focused on educational attainment and enrollment, with less time spent on what actual policy might have triggered these changes. The results are not only striking because of their sign and magnitude but also because local governments in Turkey have little official responsibility for education policy. Education spending is almost entirely within the realm

of the central government. Yet, even though municipalities' official responsibilities do not include education, they are not prohibited to engage in this policy area. In fact, municipalities do build schools and cater to their constituencies' demands for better schools in several ways. Municipalities indirectly affect education through urban planning policies, including building permits.²⁶ Any construction or large repair of buildings, including education-related buildings, needs the approval of the municipal mayor.

Focusing on urban planning, i.e. buildings constructed and permits given, also allows me to examine the role of the Islamic party's link with other religious organizations, in particular the *vakıf*. The *vakıf*, a common form of organization in the Muslim world with roots in Islamic Law (Kuran [26]), is a religious foundation that is legally distinct from other civil society organizations, and has larger economic freedoms (White [40]). The *vakıf* also achieves its preferred legal status versus general associations (*dernekler*) once it is endowed with property as collateral. A *vakıf* may engage in a wide number of charitable activities including education (Yavuz [46]). Granting scholarships, selling subsidized school supplies at school starts, as well as building student dormitories and schools are a few examples.

When a *vakıf* builds a school, either a religious or a secular one, it will be subject to monitoring by the state through the Ministry of Education, and must consequently also adhere to a centrally determined curriculum. But a substantial amount of activity also goes into building student dormitories. Such dormitories may house students attending religious as well as secular schools, and do not fall under the umbrella of state monitoring. Being able to wear the headscarf, use prayer rooms, and take part in religious courses outside the main education curriculum, may enable religious segments of the population to participate in education. At times, rapid construction of dormitories has also led to suspicions of unmonitored spread in religious education (Balli [4], and Kinzer [23]).²⁷ Nonetheless, the legal and economic strength of such private civil organizations, in a country where associational freedoms are relatively restricted, is an important source of social aid and local public service delivery.²⁸ Even though the link between the Islamic party and the *vakıf* is largely implicit, anecdotal evidence provides numerous examples of the connection between the two. Indeed, "a strong selling point for the Welfare Party — at least among many parents — has

²⁶ Building permits are an important and common form of local policy area (see for example Bertrand and Kramarz [6]).

²⁷ In addition, the existence of dormitories, in conjunction with boarding schools, may be particularly beneficial for poorer households by reducing the direct costs of education. This comes as children in such facilities often receive free school uniforms, textbooks, and free meals, as well as certain stipends which can be shared with their families (World Bank [44]).

²⁸ For an extensive source of indices of associational freedoms, see the World Freedom Atlas (<http://freedom.indiemaps.com/>)

been its readiness to provide dormitories for women who as students are coming to the big cities for the first time.” (Cowell [10]). Moreover, White [40] notes that officially independent *vakıflar* often received offices in RP-controlled municipal buildings.

Against this background, the aim of this section is to determine whether Islamic mayors shift the allocation of the urban space towards education, and to assess the role of *vakıf* physical investment in education. For these purposes, two datasets were collected. The first comprises completed buildings between 1990-2000 by type, financier and owner from the 2000 Building Census. The second comprises building permits for the years 1991-2004 by type and financier. Both datasets come from TurkStat.

Panel A of Table 8 reports the effect of an Islamic mayor on buildings completed 1990-2000 as estimated by the RD Control method set up in equation (5.1). Row 1 reports averages of the share of all building space (in square meters) that comprise education buildings (schools, dormitories etc.). On average, about 4 percent of the construction between 1990 and 2000 consisted of such buildings. A fifth of all the education buildings constructed during the period were privately financed, regardless of who eventually became the owner of the building. Most education buildings, i.e. 58 percent, are owned by state-controlled organizations (mostly the Ministry of Education). Also shown are the average ownership shares of municipalities (2.3 percent) and private *vakıf* ownership share (1.6 percent). Column 2 and 3 report OLS and RD Control estimates the effect on these shares according to equation (5.1). The results in this panel show that Islamic rule, while not leading to more education facilities per se, did result in a larger share of them being financed privately and subsequently owned by religious charities.

Panel B of the table shows results for building permits given between 1991-2004 in panel regressions specified as

$$y_{it} = \alpha + \beta m_{it} + f(x_{it}) + \mathbf{w}'_{it} \boldsymbol{\gamma} + \mu_t + \varepsilon_{it} \quad (6.2)$$

$$f(x_{it}) = \sum_{s=1}^4 (\lambda_s^0 + m_{it} \lambda_s^1) x_{it}^s,$$

where the variables are defined as previously except for the dependent variables and an additional time-specific effect μ_t .²⁹ The data is averaged over election periods, so the effect of the 1989 election will have one effect on the years 1990 through 1994, and so on. The first column in panel B shows an average floorspace share of permits given to schools at 3 percent, while the share of these 3 percent allocated to privately-financed schools is around 50 percent. Neither the OLS specification

²⁹ Adding fixed effects to the equation does not change the results.

in column 2 nor the RD specifications in columns 3 show any clear effect on the school share of building permits. In contrast, the effect of an Islamic mayor on the private share of school permits is both large and significant, with the RD specification in column 3 showing estimates of around 10 percent.

These results suggest that Islamic mayors did not necessarily increase the share of school and other education buildings. But they did affect who financed and owned them. More specifically, having an Islamic mayor meant that newly constructed educational buildings were more likely to be financed by private organizations and more likely to be owned by religious foundations. As such the increase in participation, especially with regards to enrollment in post-primary education, may have been facilitated by building particular facilities more tailored to religious conservatives.

7. Labor Market Outcomes

Given the results on increased female participation in education, a logical follow-up question is whether female participation in labor markets were also affected, and this section therefore examines direct effects of having an Islamic mayor on labor market outcomes. Unfortunately, detailed and consistent labor market data exist for cities only. For the 923 city municipalities, the Population Census reports neighborhood-level data on several measures of labor market activity, forms of income and sector employment. Since the number of municipal observations is on the low side, and more disaggregated data by neighborhood is available, I focus on RD regressions at the neighborhood level. Regressions are weighted (as in Section 6) by the inverse number of neighborhoods within a municipality and standard errors are clustered by municipality.

Table 9 shows results on economic activity, forms of income and sector employment. The columns also show sample means and standard deviations, as well as specifications for OLS, RD Sample, and RD Control, while the final column reports an unweighted RD Control specification.

For labor supply, i.e. the share of the population classified as participating in the labor force, average female labor market participation is a paltry 8.5 percent compared to 46 percent for men. A substantial share, on average 70 percent, of women are classified as housewives (*ev kadını*). The OLS results in column 2 show negative correlations for both female employment and the share classified as housewives, consistent with Islamic municipalities being poorer and more socially conservative. The RD estimates, on the other hand, show no significant effects on female employment (with some specifications having positive coefficients) and a reduction in the share classified as housewives. This is consistent with the result obtained earlier of increased participation in education, although not

necessarily increased participation in the labor market per se. On the other hand, if Islamic parties increase educational attainment for the purpose of later labor force participation, this may not show up as early as in 2000. A successful high school graduate could just as well continue university education as taking a job. Therefore, it may be more informative to look at measures of the quality of employment among the employed.

As for the form of income in Panel B, a substantial amount of women in the labor market are family-employed and non-salaried (almost 20 percent) as opposed to being wage-earners, a much larger number than for men (8 percent). This can be explained by the prevalence of domestic piecework among women in poorer neighborhoods. This form of exchange is often met through the organization of the family through a male entrepreneur, often without monetary payments (White [41]). While not all members of such organization of labor are necessarily Islamist, “the Islamist segment of the business class comes primarily from this sector” (Gülalp [16])

The RD estimates, however, show the opposite effect namely that the share of wage-earners is actually higher at the expense of the proportion of family-employed. This resonates well with the findings in preceding sections of a more well-educated female population in older cohorts. Moreover, the RP and its affiliated organizations’ use of educated female labor is well documented.³⁰

Finally, as can be seen in Panel C for sector employment, a substantial share of the labor force is employed in agriculture. The largest employer for women is the service sector. The results show a shift of employed women from the agricultural sector (and partly the manufacturing sector, although the estimates are statistically insignificant) to the service sector. For men, there is also a shift to the service sector, in particular from the construction sector.³¹

Altogether, these results confirm the view that Islamic rule has improved the situation for a large group of people, not only with regard to getting an education but also in terms of labor market prospects. While no aggregate labor force participation effects were found, having an Islamic mayor is conducive to a lower share of women being classified as housewives, which is consistent with the finding of increased participation in education. Whether such participation will ultimately lead to subsequent inclusion in the labor force is too early to tell (although if this is the case, the next 2010 Population Census should reveal more evidence on this).

³⁰ Female Islamic activists have been an important tool in campaigning for the Islamic parties, not only as a symbol at political rallies. In socially conservative neighborhoods, veiled female activists provided a practical advantage over male activists. Whereas it would be culturally inappropriate for a male to enter a house with only women present, female activists had no restrictions against doing so (White [40]).

³¹ The construction sector in Turkey is the sector where occupational accidents end in the highest mortality rates among all sectors (see for example Colak et al [9])

8. Concluding Remarks

The institutional setting of local politics in Turkey provides a powerful test of the consequences of Islamic rule on education and labor market outcomes. Since women are often proclaimed to be most vulnerable in an occurrence of Islamic rule, I focus on this group.

My findings show that despite its pro-Islamic and often socially conservative characteristics, Islamic rule has had a large and positive impact on education. An “as good as” randomly-assigned Islamic mayor increased educational attainment, and relatively more so for women than for men. This finding is robust to enrollment and other voluntary forms of secular education. An examination of direct impacts on labor market outcomes provide further evidence of a remarkable phenomenon: a religiously conservative Islamic party can be more effective in educating and providing better jobs for women than secular parties, despite the latter parties often having women’s rights as a key policy issue.

This points to a delicate tradeoff between restrictions on religious expression and constraints to participation for religious conservatives. In Turkey a large majority of women wear some form of headcover. Consequently, the ban on wearing the headscarf in public institutions makes the barriers to participation highest among those who need it the most. Policymakers thus face a double challenge of alleviating economic constraints, as well as social constraints, to participation.

One observed mechanism behind the increase in education seems to be investment by private religious charities, the Islamic *vakıf*. These facilities are examples of a different type of public goods with less focus on the exclusion of religious expression in public spaces. For opponents of political Islam, this has been one out of several threatening symbols of creeping Islamification. Yet the Islamic party’s capacity to mobilize women may instead have resulted from the unbundling of social and economic reforms. Secular — especially left-wing — parties often pursue a two-fold agenda of economic as well as social modernization. In contrast, the Islamic party seems to have focused more on the economic reforms while harnessing, rather than attempting to change, existing social norms and customs.

My results stand in contrast to some cross-country evidence documenting a negative correlation between Islamic influence and development, as well as gender-related outcomes. To be fair, the approach here differs from previous research in several aspects, and generalizations to other contexts should be done with utmost care. As the RD design only provides for a local average treatment effect in close elections, it may be less informative about the impact of Islamic rule far away from

the threshold, i.e. for uncompetitive elections. Yet, a consequence of this particular design is that the treatment effect estimated can be considered particularly informative for areas where Islamic rule was plausible. The RD local average treatment effect is therefore economically meaningful for a substantial and highly relevant subgroup.

However, other concerns about external validity also deserve to be mentioned. The impact and nature of the Islamic party, or rather parties, may or may not have changed character over time. The focus on local democratic politics excludes evaluating the impact of Islamic rule on national policies and outcomes, or the actions of Islamic political organizations in autocracies.

Finally, much of the discussion about cross-country-level findings and discussions about allowing Islamic parties or not is inherently tied to institutions. The approach here has been to evaluate the treatment of local Islamic rule, holding the institutions fixed. Therefore, it is important to point out that the results in the paper do not imply a judgment on secular institutions or regulations per se. It might just be the strong secular nature of Turkey's institutions that led Islamic parties to participate in democratic politics, as opposed to engaging in violent struggle.

Even though it may be tempting to dismiss the results found here as a particular trait of Turkey's Islam or institutions, I argue that the uniqueness of this study comes not from the institutional setting, but from the possibility of identifying a meaningful causal treatment effect of Islamic rule. The initial negative association between Islamic influence and development is the same as in many other settings around the world. It is the identification of the causal impact, not the initial setting, that makes the difference. Regarding the nature of Islam, even though Turkey never experienced the kind of Salafist and Deobandi influence that became prevalent in other Muslim countries (Rabasa et al [35]), the influence of the Sufi brotherhoods like the Nakşibendi, Nurcu, and Süleymanlı movements which make up the backbone of the *vakıf* in Turkey are shared across most of Central Asia (Yavuz [46]).

The irony in the positive impact of Islamic parties on female participation in education and labor markets may not have been completely lost on secular and especially left-wing parties in Turkey.³² Nonetheless, the headscarf as well as a more general debate on religious expression in public spaces remain contentious. In this regard, Turkey is not the only country with such restrictions, nor is it the only country where the manifestation of political Islam in democratic politics is highly divisive.

³² There is some evidence that secular parties may be trying to soften their secular stance in an attempt to broaden their appeal to a wider public. For example, the party leader of the CHP recently made headlines appearing on stage at a campaign rally together with women wearing the chador. "Chador not political symbol, opposition leader Baykal says," *Today's Zaman*, November 28, 2008, <http://www.todayszaman.com/tz-web/detaylar.do?load=detay&link=159821>

The school ban on the headscarf exists in Singapore, Tunisia, Malaysia, France and some states in Germany (Saul [37]). Recent immigration into urban areas is also changing the demographics of European cities, resulting in a debate on and the compatibility between secular institutions and the preferences of a growing constituency of religious conservatives. In this regard, Turkey in the 1990s provides an example of where locally elected religious governments and organizations served to improve access to education for those citizens who may have needed it the most.

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A. Appendix: Data and Sources

Source: *Türkiye İstatistik Kurumu* (Turkish Statistical Institute), www.tuik.gov.tr

A.1. Election Data (*Mahalli İdareler Seçimi, Milletvekili Genel Seçimi*)

- *Islamic mayor in 1994* is a dummy variable taking on the value of 1 if the municipality received a mayor in 1994 from either the Welfare Party (Refah Partisi, RP), which received 19.4 % of the votes and was awarded 329 municipalities; or the Great Union Party (Büyük Birlik Partisi, BBP) which received 0.94 % of the votes and was awarded 11 municipalities. For the *Islamic mayor in 1989* variable, RP is the only Islamic party.
- *Islamic win margin* is defined as the difference in vote share between the largest Islamic party and the largest secular party.
- *Neighborhood-level RP vote share relative to municipal-level RP vote share in 1995* is the vote share of a neighborhood’s vote share in the national election in 1995 relative to the municipality’s RP vote share in the same election.
- *Municipality dummies*: Dummy variables indicating whether a municipality is a district center, province center, metropolitan, or sub-metropolitan municipality

A.2. Population Census 1990/2000 (*Genel Nüfus Sayımları*)

- *Share of Population with High School Education* is the number of individuals (male/female) recorded in the relevant census municipality or neighborhood as having obtained secondary education degree (Lise) divided by the total population (male/female) in the municipality or neighborhood.
- *Share of Population with University Education* is the number of individuals recorded in the relevant census municipality or neighborhood as having obtained university education degree (Yüksek Öğretim) divided by the total population (male/female) in the municipality or neighborhood.
- *Share of Population with Primary Education* is the number of individuals recorded in the relevant census municipality or neighborhood as having obtained primary education degree (İlkokul or İlköğretim) divided by the total population (male/female) in the municipality or neighborhood.
- *Share of Population with Vocational Education* is the number of individuals recorded in the relevant census municipality or neighborhood as having obtained vocational education degree

(Lise dengi meslek) divided by the total population (male/female) in the municipality or neighborhood.

- *Age distribution shares*: the share of the population below 20 years of age, and above 60 years of age.
- *Gender ratio*: ratio of female-to-male population
- *Household size*: Average of household population per household.
- *Children/women*: Number of children divided by number of women.

A.3. Building Census 2000 (*Bina Sayımı*)

- *Log Population Density 1990*: The logarithm of total population in 1994 divided by total building floor space in 1990.
- *Share of education floor space in 1990*: Share of total municipal floor space stock, consisting of education facilities in 1990.
- *Education Share of All Buildings*: Share of total municipal floor space, constructed between 1990-2000, consisting of education facilities.
- *Privately-financed share of Education Buildings*: Share of all education facilities in floor space, constructed between 1990-2000, consisting of privately-financed education facilities.
- *Vakıf-owned share of Education Buildings*: Share of all education facilities in floor space, constructed between 1990-2000, consisting of vakıf-owned education facilities.
- *Municipal-owned share of Education Buildings*: Share of all education facilities in floor space, constructed between 1990-2000, consisting of municipality-owned education facilities.
- *Government-owned share of Education Buildings*: Share of all education facilities in floor space, constructed between 1990-2000, consisting of central-government-owned education facilities.

A.4. Building Permits 1991-2008 (*Bina Ruhsatı*)

- *Education Share of All Building Permits*: Share of building permits in floor space allocated to education facilities, by election periods (1991-1994, 1995-1999, 2000-2004, 2005-2008).
- *Private Share of All Education Building Permits*: Share of building permits in floor space allocated to education facilities that were privately-financed, by election periods (1991-1994, 1995-1999, 2000-2004, 2005-2008).

Table 1. Descriptive statistics: Census 2000 outcomes and 1994 Local elections

	(1)	(2)	(3)	(4)
<i>Municipality Sample</i>	<i>All</i>	<i>Secular</i>	<i>Islamic</i>	<i>Diff</i>
	(N=2633)	(N=2318)	(N=315)	(3)-(2)
<u>Dependent Variables</u>				
(1) Female High School Share 15-20 years of age	0.163 (0.096)	0.166 (0.097)	0.140 (0.090)	-0.026*** [0.006]
(2) Male High School Share 15-20 years of age	0.193 (0.077)	0.192 (0.078)	0.196 (0.076)	0.004 [0.005]
<u>Main explanatory variable</u>				
(4) Islamic mayor 1994	0.120 (0.325)	0.000 (0.000)	1.000 (0.000)	1.000 [0.000]
<u>Covariates</u>				
(5) Log Population	7.840 (1.191)	7.776 (1.074)	8.315 (1.767)	0.540*** [0.071]
(6) Share below 19	0.405 (0.083)	0.400 (0.082)	0.445 (0.075)	0.046*** [0.005]
(7) Share between 20-59	0.503 (0.062)	0.506 (0.061)	0.482 (0.060)	-0.024*** [0.004]
(8) Share above 60	0.092 (0.040)	0.095 (0.040)	0.073 (0.031)	-0.022*** [0.002]
(9) Gender ratio	1.073 (0.253)	1.073 (0.266)	1.076 (0.117)	0.003 [0.015]
(10) Household size	5.834 (2.359)	5.751 (2.375)	6.445 (2.147)	0.694*** [0.141]
(11) District center	0.345 (0.475)	0.338 (0.473)	0.394 (0.489)	0.055* [0.029]
(12) Province center	0.023 (0.149)	0.017 (0.129)	0.067 (0.250)	0.050*** [0.009]
(13) Metropolitan	0.006 (0.075)	0.004 (0.062)	0.019 (0.137)	0.015*** [0.005]
(14) Sub-metropolitan	0.022 (0.147)	0.015 (0.120)	0.076 (0.266)	0.062*** [0.009]

Standard deviations in paranthesis, standard errors in square brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 2. Education in 2000 and 1994 Local Elections

<i>Dependent Variable</i>	<i>Share of Cohort with High School Degree</i>						<i>Student Share</i>	
			15-20		21-25		15-30	
Cohort								
Specification	OLS		RD Sample		RD Control		RD Control	RD Control
Covariates	N	Y	N	Y	N	Y	Y	Y
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Women								
Outcome mean	0.163		0.145		0.163		0.165	0.130
Islamic Mayor 1994	-0.026*** (0.006)	-0.012** (0.005)	0.029* (0.014)	0.034*** (0.012)	0.031** (0.014)	0.029*** (0.011)	0.030*** (0.011)	0.023*** (0.008)
Panel B. Men								
Outcome mean	0.193		0.199		0.193		0.262	0.186
Islamic Mayor 1994	0.004 (0.005)	0.008 (0.005)	0.023 (0.014)	0.02 (0.013)	0.015 (0.012)	0.011 (0.011)	0.008 (0.015)	0.007 (0.010)
Observations	2633	2633	102	102	2633	2633	2633	2633

Panel A reports high school attainment results for the female 15-20 age cohort and panel B shows the same for the male 15-20 cohort. The first row in each panel shows the mean for the relevant sample. Columns 1-2 are basic OLS specifications; columns 3-4 are reduced-sample specifications including observations where the absolute Islamic win margin was less than 2 percent; and columns 5-6 are full-sample polynomial specifications where a fourth-order polynomial in the Islamic win margin is estimated on each side of the threshold at zero. In column 7 the outcome is the share of women (panel A) or men (panel B) with high school degree in the age cohort 21-25, and in column 8 the outcome is the share of all women (panel A) or men (panel B) classified as students in the age cohort 15-30. The Islamic win margin is defined as the difference in vote share between the largest Islamic party and the largest secular party in 1994. Covariates include the share of the total population under 19 years, the share of the total population above 60, five gender-specific age cohorts, the gender ratio, log total population and dummies for municipality types. Robust standard errors clustered by province in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Robustness Checks for Female 15-20-year-olds with High School Degrees in 2000

Robustness Check	<i>Islamic-Left vs. Islamic-Right</i>			<i>1990 Census Controls</i>	<i>Long-Difference 1990-2000</i>	<i>Building Census controls</i>	<i>Province Fixed Effects</i>	<i>Incumbent Islamic Mayor</i>	<i>Covariate Polynomial</i>	<i> Margin < 0.04</i>	<i> Margin < 0.01</i>
	<i>All</i>	<i>Isl./Left</i>	<i>Isl./Right</i>								
Specification	RDC	RDS	RDS	RDC	RDC	RDC	RDC	RDC	RDC	RDS	RDS
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Islamic mayor in 1994	0.024** (0.012)	0.058 (0.056)	0.022 (0.017)	0.024** (0.011)	0.021* (0.011)	0.024** (0.011)	0.025*** (0.009)	0.026* (0.016)	0.024** (0.010)	0.020** (0.008)	0.042** (0.017)
Islamic-Left Contest	0.074 (0.045)										
Islamic mayor and I-L interaction	1.474* (0.793)										
Observations	2661	23	79	1866	1613	2615	2661	1915	2661	209	56

All regressions are estimated using OLS, with RDS meaning a regression including only observations within 2 percent of the threshold, and RDC meaning a full-sample regression with a fourth-order polynomial in the running variable on each side of the threshold. Column 1 includes an interaction of the Islamic mayor dummy with a dummy denoting whether the contest was between an Islamic party and a left-wing secular party. Columns 2 and 3 show reduced sample regressions with the samples of Islamic versus left-wing and right-wing, respectively. Column 4 adds census 1990 controls including the female share of the population with high school attainment, employed, and married. Column 5 is a (long) difference equation of changes between 1990 and 2000. Column 6 includes log population density, log total floor space of all buildings and the share of education building space, all measured in 1990. Column 7 includes (80) province dummies. Column 8 adds a dummy for whether an Islamic mayor was elected in 1989. Column 9 includes fourth-order polynomials in all continuous covariates. Columns 10 and 11 are RD Sample regressions including observations not further than 4 and 1 percent, respectively, from the threshold. Robust standard errors clustered by province in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4. Direct effects and indirect effects

	(1)	(2)	(3)	(4)	(5)
<i>Outcome variable</i>	<i>Share of Women with High School Degrees</i>	<i>Share of Women who are Students</i>	<i>Share of Women with High School Degrees</i>	<i>Share of Women who are Students</i>	<i>Share of Women with High School Degrees</i>
<i>Cohort</i>	<i>31-64</i>	<i>15-30</i>	<i>15-20</i>	<i>15-30</i>	<i>15-20</i>
Islamic mayor 1994	0.008** (0.003)	0.023*** (0.008)	0.028*** (0.011)	0.016** (0.007)	0.018** (0.009)
Share with High School (ages 31-64)				0.808*** (0.119)	1.306*** (0.151)
Observations	2633	2633	2633	2633	2633
Relative size				0.70	0.64

Covariates include fourth-order polynomial in Islamic win margin, log population, cohort population shares, gender ratio, and dummies for municipality type. Standard errors clustered by province in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5. RD Sample comparisons

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>All</i>	<i>Secular</i> <i>x<-.02</i>	<i>Close</i> <i> x <.02</i>	<i>Islamic</i> <i>x>.02</i>	<i>Diff</i> <i>(3)-(2)</i>	<i>Diff</i> <i>(3)-(4)</i>
Women 15-20 with High School	0.163 (0.096)	0.167 (0.097)	0.145 (0.091)	0.137 (0.089)	-0.023** [0.010]	0.007 [0.010]
Men 15-20 with High School	0.193 (0.077)	0.192 (0.078)	0.199 (0.078)	0.194 (0.076)	0.007 [0.008]	0.005 [0.009]
Log Population	7.840 (1.191)	7.771 (1.063)	8.096 (1.547)	8.343 (1.802)	0.326*** [0.110]	-0.247 [0.202]
Share below 19	0.405 (0.083)	0.399 (0.082)	0.446 (0.078)	0.444 (0.075)	0.047*** [0.008]	0.002 [0.009]
Share between 20-59	0.503 (0.062)	0.506 (0.061)	0.474 (0.061)	0.484 (0.059)	-0.033*** [0.006]	-0.010 [0.007]
Share above 60	0.092 (0.040)	0.095 (0.040)	0.080 (0.033)	0.072 (0.031)	-0.015*** [0.004]	0.008** [0.004]
Gender ratio	1.073 (0.253)	1.074 (0.268)	1.047 (0.096)	1.079 (0.120)	-0.026 [0.027]	-0.032** [0.013]
Household size	5.834 (2.359)	5.742 (2.354)	6.332 (2.734)	6.439 (2.128)	0.590** [0.240]	-0.108 [0.270]
Children/Women	3.444 (0.749)	3.409 (0.742)	3.700 (0.724)	3.649 (0.766)	0.291*** [0.075]	0.051 [0.088]
Observations	2633	2269	102	262	2371	364

The table shows summary statistics for 1) the full sample, 2) secular municipalities where the *Islamic win margin* was smaller than -2 percent, 3) municipalities where the *absolute Islamic win margin* was below 2 percent, and 4) Islamic-run municipalities where the *Islamic win margin* was larger than 2 percent. Standard deviations are in parenthesis and standard errors are in square brackets. *p<0.1 ** p<0.05 *** p<0.01

Table 6. Islamic Rule and Urban Planning

<i>Dependent Variable</i>	(1) <i>Mean</i>	(2) <i>OLS</i>	(3) <i>RDC</i>	(4) <i>Obs (Clust.)</i>
Panel A. Building Space Constructed between 1990-2000				
(1) Education Share of All Bldgs	0.04	-0.002 (0.003)	0.000 (0.007)	2644 (80)
(2) Privately-financed share of Education Bldgs	0.20	0.045** (0.018)	0.085* (0.048)	2012 (80)
(3) <i>Vakif</i> -owned share of Education Bldgs	0.02	0.016** (0.008)	0.073** (0.028)	2012 (80)
(4) Municipal-owned share of Education Bldgs	0.02	-0.003 (0.007)	-0.017 (0.014)	2012 (80)
(5) Government-owned share of Education Bldgs	0.58	-0.017 (0.030)	-0.010 (0.055)	2012 (80)
Panel B. Municipal Building Permits for Educational Buildings 1991-2004				
(6) Education Share of All Bldg. Permits	0.03	0.003 (0.005)	0.009 (0.017)	5867 (2573)
(7) Private Share of All Education Bldg. Permits	0.49	0.039 (0.024)	0.173** (0.088)	2192 (1338)

All regressions are estimated with OLS and include controls for log population, age below 19, age below 60, gender ratio, and municipality types. Panel A shows results from the Building Census of 2001; row 1 shows the education share of all building space (in square meters) constructed between 1990 and 2000. Rows 2 through 5 show, for the same period, shares of education building spaces financed privately (row 2), owned by religious foundations (*vakiflar*, row 3), owned by municipalities (row 4), and owned by the central government (row 5). Panel B shows panel regressions of the election period average of Education Share of Building Permits (in row 6) and Private Share of School Permits (row 7) on Islamic mayor at the start of the election period (either of 1989, 1994, or 1999). Regressions in panel A have standard errors clustered by province while regressions in panel A include election period-specific effects and have standard errors clustered by municipality. *** p<0.01, ** p<0.05, * p<0.1

Table 7. Labor Market Outcomes in Cities

		<i>Neighborhoods</i>					<i>Municipalities</i>
		Mean (sd)	OLS	RDS	RDC	RDC	RDC
		(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Economic Activity (shares of male or female population)							
(1) Employment	Men	0.460 (0.143)	0.002 (0.008)	-0.006 (0.024)	-0.013 (0.025)	-0.018 (0.030)	-0.029 (0.024)
	Women	0.085 (0.071)	-0.014*** (0.004)	0.008 (0.011)	-0.008 (0.011)	0.001 (0.010)	-0.003 (0.010)
(2) Housewives	Women	0.704 (0.104)	0.034*** (0.005)	-0.046*** (0.017)	-0.025 (0.017)	-0.033** (0.015)	-0.021 (0.018)
Panel B. Form of Income (shares of men or women employed)							
(3) Wage-taker	Men	0.660 (0.152)	0.039*** (0.009)	0.034 (0.027)	0.012 (0.026)	-0.029 (0.026)	-0.013 (0.023)
	Women	0.767 (0.248)	0.038*** (0.014)	0.105* (0.054)	0.086* (0.046)	0.04 (0.040)	0.042 (0.057)
(4) Family-employed	Men	0.080 (0.072)	-0.008* (0.004)	-0.018 (0.012)	-0.009 (0.010)	-0.004 (0.011)	0.003 (0.010)
	Women	0.182 (0.233)	-0.033** (0.013)	-0.088* (0.050)	-0.081* (0.043)	-0.04 (0.038)	-0.043 (0.055)
Panel C. Sector Employment (shares of men or women employed)							
(5) Agriculture	Men	0.154 (0.169)	-0.047*** (0.010)	-0.055* (0.029)	-0.046* (0.026)	-0.033 (0.027)	-0.007 (0.019)
	Women	0.211 (0.273)	-0.054*** (0.016)	-0.112** (0.055)	-0.081 (0.049)	-0.047 (0.043)	-0.034 (0.063)
(6) Industry	Men	0.163 (0.126)	0.032*** (0.009)	-0.002 (0.028)	-0.023 (0.027)	-0.048 (0.044)	-0.035 (0.027)
	Women	0.148 (0.182)	0.033** (0.014)	0.014 (0.042)	-0.038 (0.043)	-0.060 (0.058)	-0.053 (0.042)
(7) Construction	Men	0.100 (0.081)	0.002 (0.004)	-0.035** (0.014)	-0.046*** (0.013)	-0.028** (0.011)	-0.034** (0.014)
	Women	0.006 (0.026)	0.000 (0.001)	-0.001 (0.001)	-0.004*** (0.002)	-0.002 (0.002)	-0.002 (0.001)
(8) Services	Men	0.580 (0.167)	0.014 (0.012)	0.091*** (0.031)	0.113*** (0.034)	0.108*** (0.036)	0.076** (0.029)
	Women	0.632 (0.276)	0.02 (0.018)	0.100 (0.065)	0.122** (0.060)	0.109* (0.060)	0.087 (0.058)
Observations		9,998	9,998	653	9,998	9,998	907
Covariates		-	Y	Y	Y	Y	Y
Weighted		Y	Y	Y	Y	N	N

All regressions are estimated with OLS and include covariates for population, age, gender ratio and type of municipality. Columns 1 through 4 are weighted by the inverse number of neighborhoods within a municipality. Column 5 is unweighted. Column 6 includes observations at the municipal level.

Table A1. Neighborhood-level heterogeneous effects

	(1)	(2)	(3)	(4)	(5)	(6)
	High School			Students		
Interaction	No	Yes	Yes-FE	No	Yes	Yes-FE
<i>Panel A. Women</i>						
Islamic mayor	0.026** (0.011)	-0.01 (0.025)		0.015 (0.009)	0.011 (0.019)	
Islamic mayor * Rel.vshr.		0.032 (0.022)	0.034* (0.020)		0.001 (0.013)	-0.008 (0.013)
Relative Islamic vote share		0.002 (0.035)	0.013 (0.035)		0.074*** (0.027)	0.065** (0.025)
Adjusted R-squared	0.382	0.414	0.681	0.095	0.115	0.477
<i>Panel B. Men</i>						
Islamic mayor	0.039*** (0.013)	0.042* (0.025)		0.013 (0.011)	0.026 (0.022)	
Islamic mayor * Rel.vshr.		-0.009 (0.020)	-0.007 (0.019)		-0.024 (0.019)	-0.027 (0.017)
Relative Islamic vote share		0.026 (0.038)	0.002 (0.039)		0.025 (0.039)	0.042 (0.039)
Adjusted R-squared	0.248	0.276	0.651	0.427	0.443	0.661
<i>Panel C. Ratio</i>						
Islamic mayor	0.032 (0.035)	-0.078 (0.088)		0.009 (0.033)	-0.179 (0.133)	
Islamic mayor * Rel.vshr.		0.101 (0.085)	0.105 (0.077)		0.218* (0.128)	0.165 (0.129)
Relative Islamic vote share		-0.24 (0.156)	-0.028 (0.201)		1.512 (0.950)	1.471 (0.982)
Adjusted R-squared	0.29	0.29	0.52	0.33	0.40	0.45
Observations	10194	8056	8056	10194	8056	8056

The graph shows neighborhood-level results on high school (columns 1-3) and students (columns 4-6) as a share of the female population (Panel A), the male population (Panel B), and the female-to-male ratio (Panel C). Columns 1 and 4 show results without interactions. Columns 2 and 5 show interaction results with the interacting variable defined as the neighborhood-level vote share for the Islamic party divided by the municipal-level vote share for the party. Columns 3 and 6 shows similar models including municipal-fixed effects. All regressions include a fourth order polynomial on each side of the threshold at zero, covariates as described in the text, and the interacting variable is interacted with the polynomial control function and other covariates. Standard errors are clustered by municipality and observations are weighted by the inverse number of neighborhoods existing within a municipality.

Table A2. Heterogenous Effects by Share of Religious Buildings

	(1)	(2)	(3)	(4)	(5)	(6)
	High School Education			Primary Education		
	Women	Men	Ratio	Women	Men	Ratio
Islamic mayor	-0.006 (0.012)	0.003 (0.017)	-0.019 (0.035)	-0.014 (0.020)	-0.007 (0.011)	-0.01 (0.028)
Islamic mayor * Shr.Rel.	1.624** (0.784)	1.359 (1.224)	3.659 (2.660)	0.214 (1.501)	0.355 (0.725)	-0.568 (2.196)
Share Religious Buildings	-6.131 (4.189)	-4.925 (4.620)	-9.975 (8.797)	3.871 (5.587)	0.166 (3.517)	3.849 (8.652)
Adjusted R-squared	0.54	0.44	0.51	0.63	0.72	0.40
Observations	2643	2643	2643	2643	2643	2643

The graph shows municipal-level results on high school (columns 1-3) and primary education (columns 4-6) as a share of the female population (columns 1 and 4), the male population (columns 2 and 5), and the female-to-male ratio (columns 3 and 6). All regressions include a fourth-order polynomial in the Islamic win margin on each side of the threshold at zero, and covariates as described in the text. The interacting variable is the share of a municipality's building floor space composed of religious buildings. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Fig 1a. Survey: Religiosity and Islamism

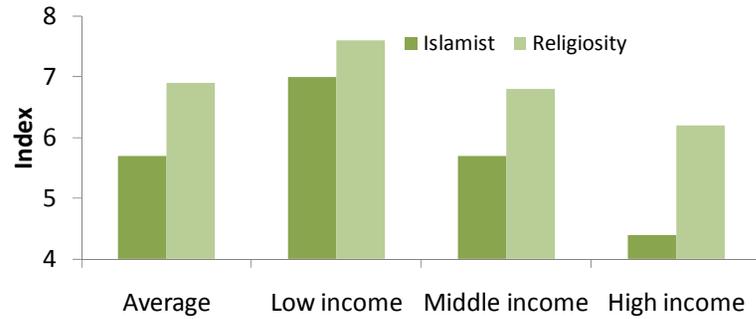


Fig 1b. Survey: Share of Covered Women

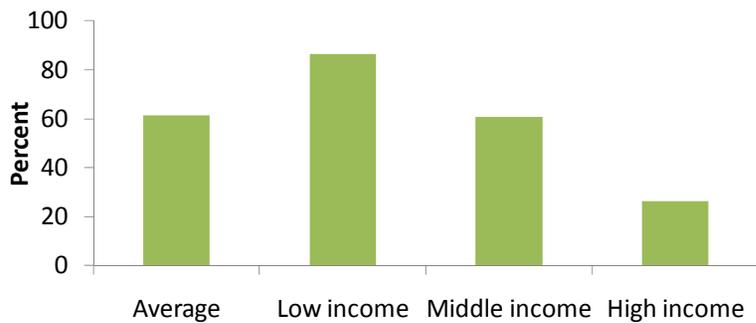
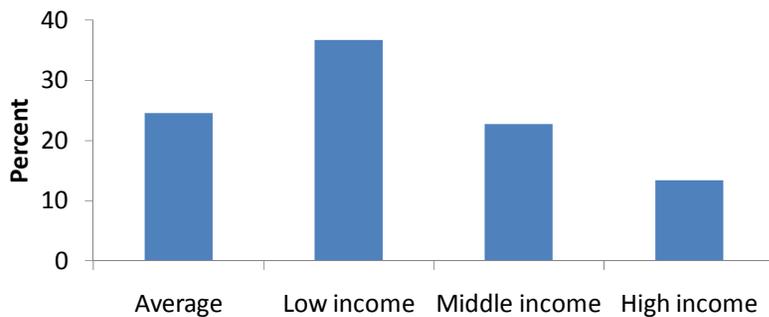
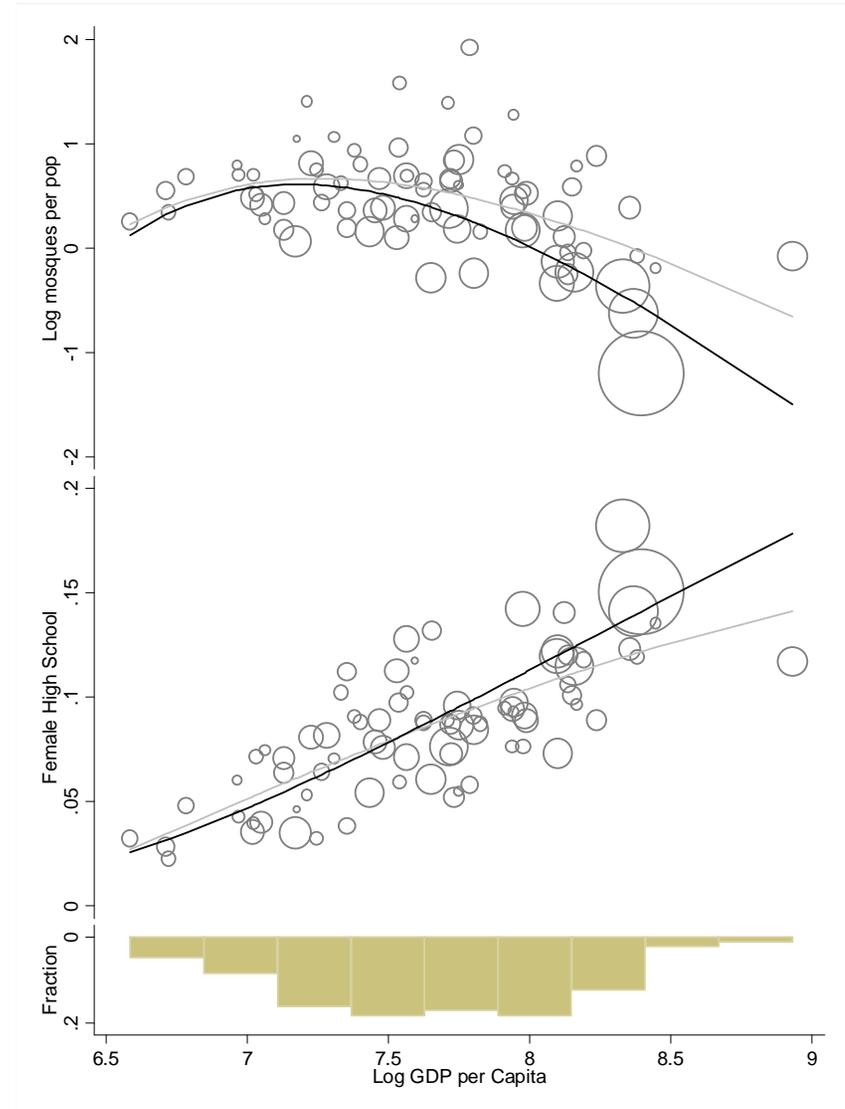


Fig 1c. Survey: Share of Respondents who would disapprove if daughter removed headscarf to attend education



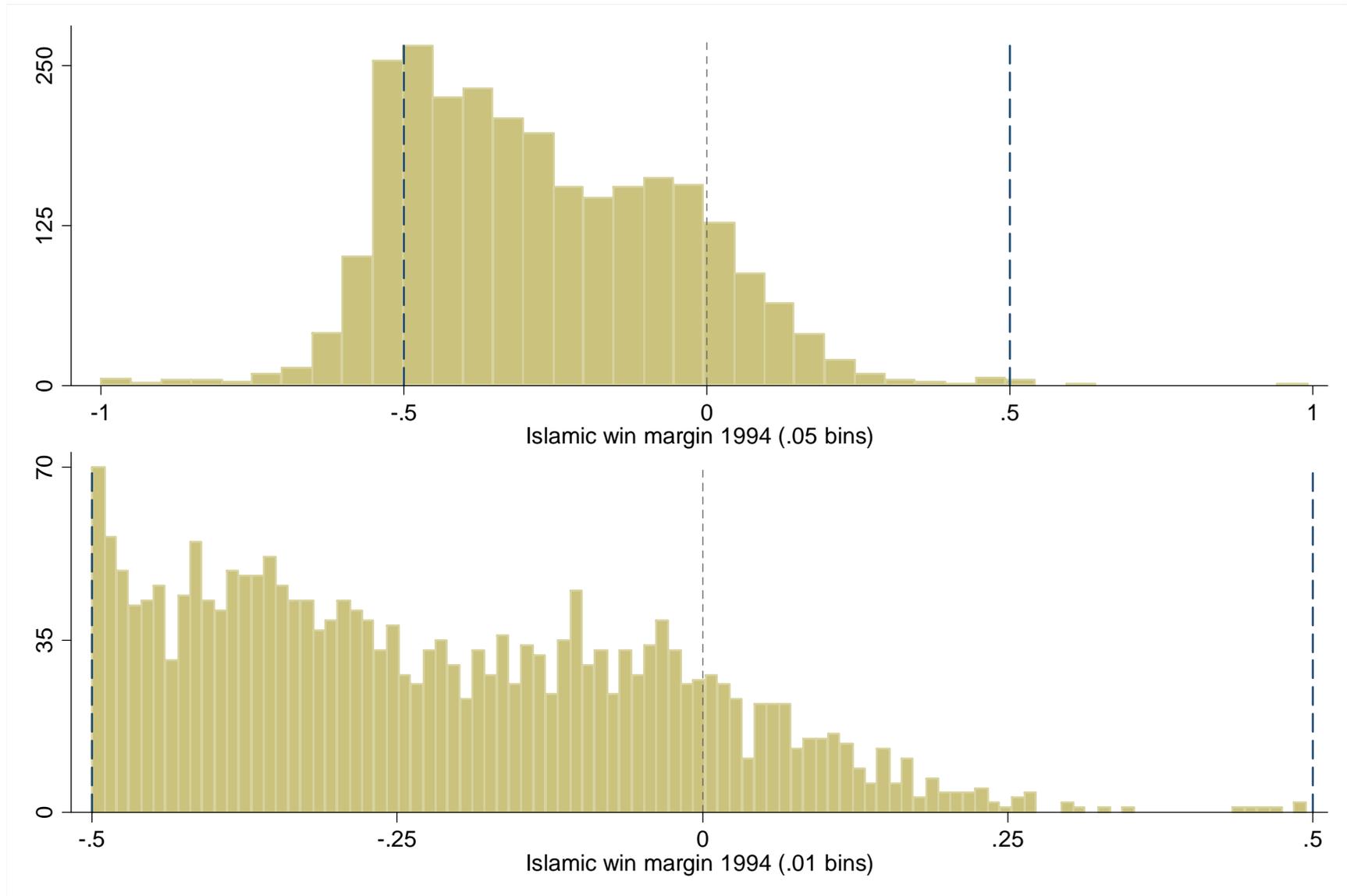
The graphs show results from a survey of 1500 individuals by TESEV in 2006. Fig 1a: Religiosity measures the degree to which respondents defined themselves as being religious Muslims. The Islamist index allows respondents to place themselves on a range from 1 to 10, with 1 being “Secularist” and 10 being “Islamist”. Fig 1b: Share of female respondents who wear some form of headcover. Source: Çarkoğlu, Ali and Binnaz Toprak, “Religion, Society and Politics in Changing Turkey,” TESEV (2006), <http://www.tesev.org.tr/>

Figure 2. Education, Religion, and Income



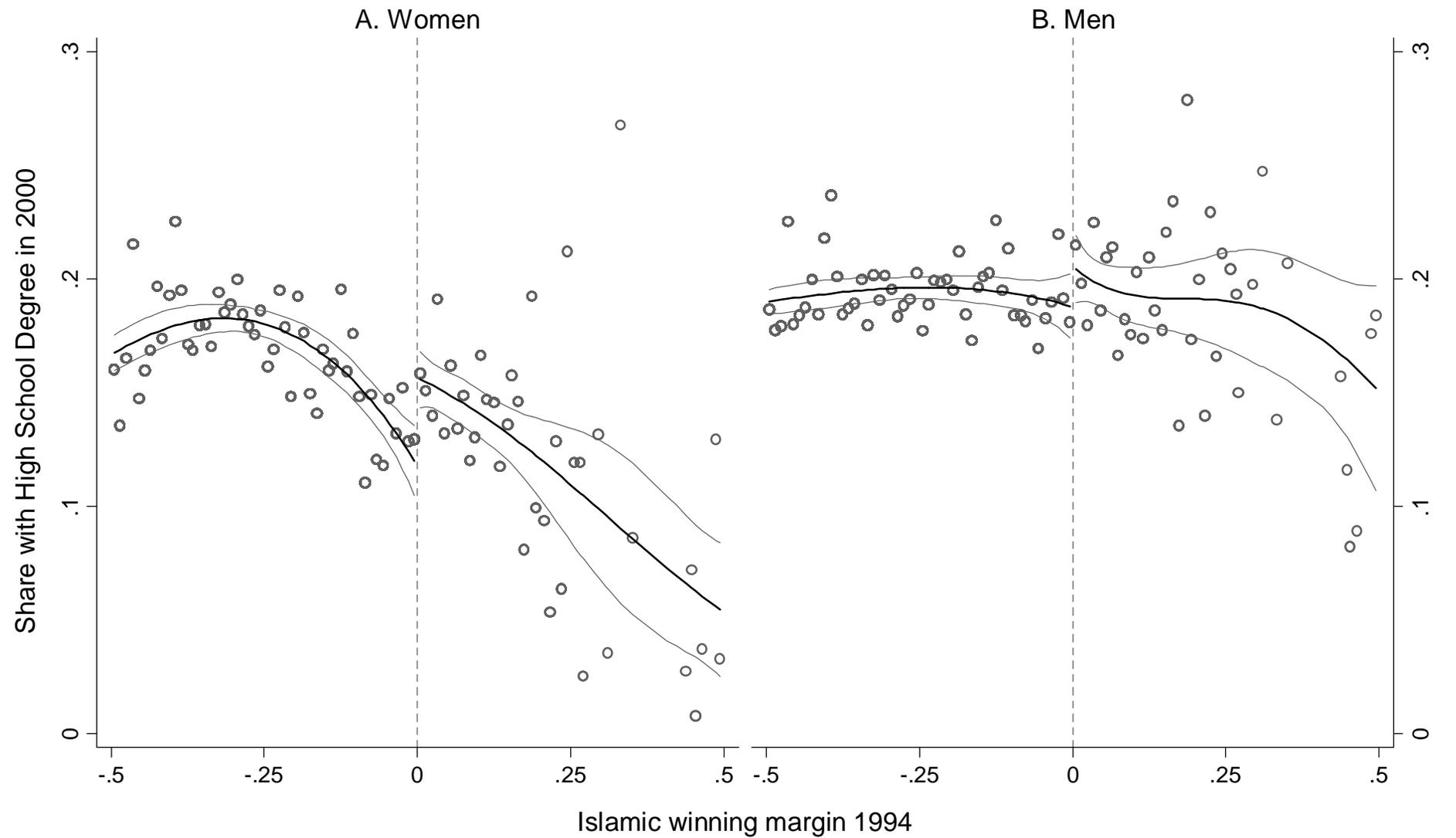
The graph shows province-level Log GDP per Capita (x-axis), its distribution (lowest y-axis), female high school education attainment (middle y-axis), and log mosques per population (upper y-axis). Observations are weighted by population and fitted by fractional polynomials, weighted (black) and unweighted (gray).

Figure 3. Histogram of running variable



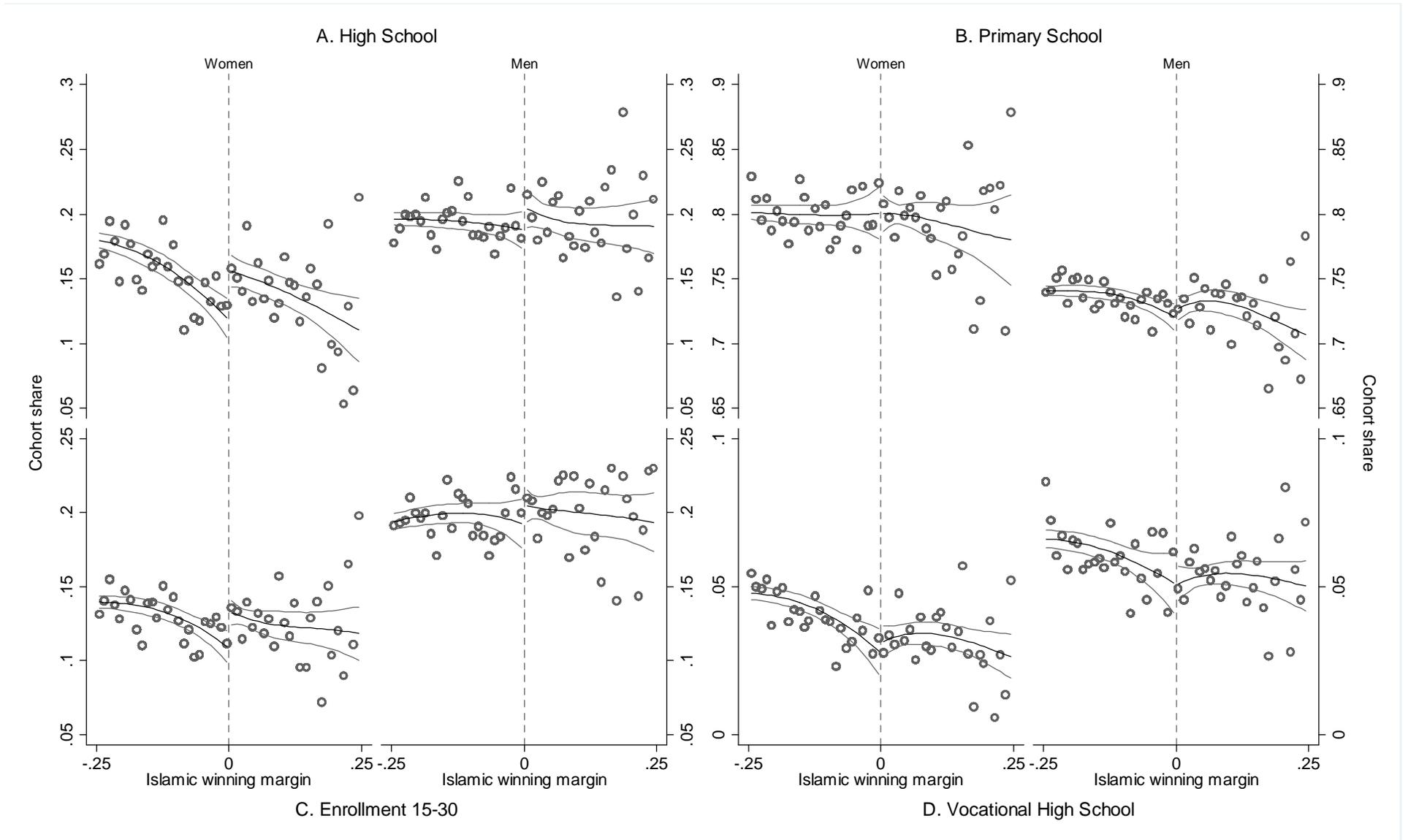
Graph shows histogram of the Islamic winning margin in 1994 for the full range in 5 percent bins (upper graph) and for a smaller range for bins of 1 percent.

Figure 4. Islamic win margin in 1994 and High School Education in 2000



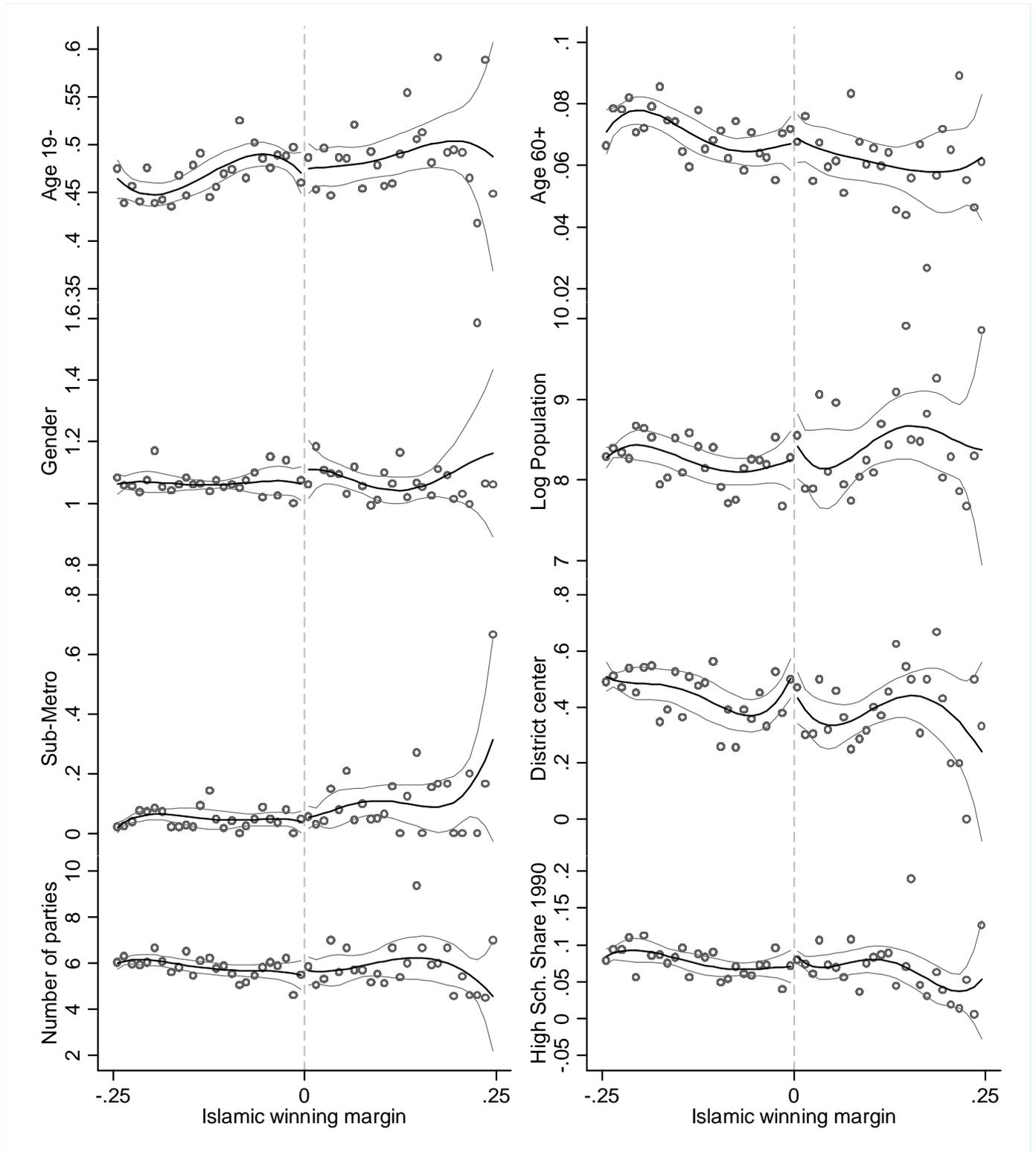
The graphs show unconditional means in one-percent bins for the share of women (left) and men (right) respectively between 15-20 years of age with a high school degree. The solid represent the predicted values of a fourth-order polynomial fit estimated on each side of the threshold at zero. The outer gray lines denote 95 percent confidence intervals.

Figure 5. Islamic Mayor and Education by Type.



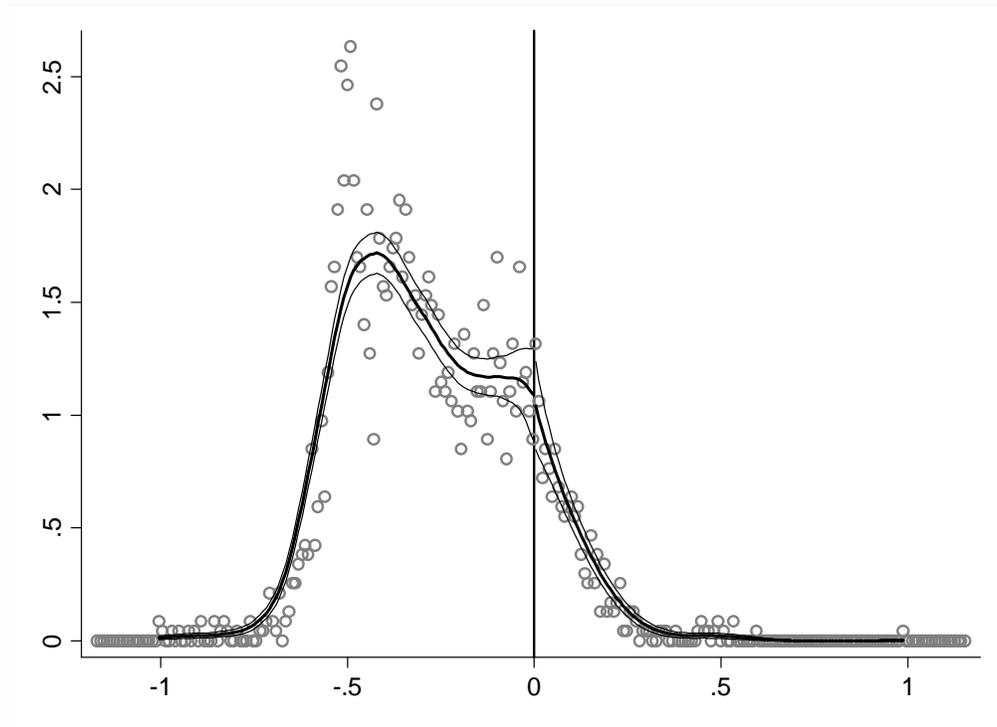
The graphs show unconditional means in one-percent bins for the share of women (left within panel) and men (right within panel) with high school degree in the cohort 15-20 (panel A), primary school in the cohort 15-20 (panel B), enrollment in the cohort 15-30 (panel C), and vocational high school in the cohort 15-20 (panel D). The solid represent the predicted values of a fourth-order polynomial fit estimated on each side of the threshold at zero. The outer gray lines denote 95 percent confidence intervals.

Figure 6. Balanced Covariate Checks



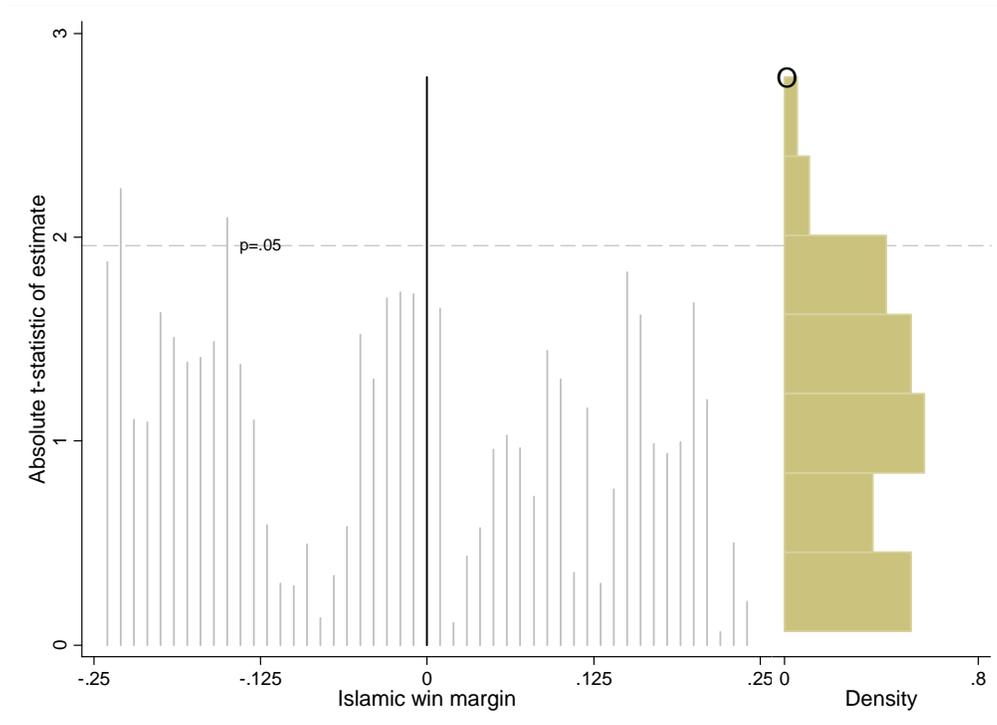
The panels refer to the following municipality characteristics: Share of the population aged below 19, share the of population aged above 60, gender ratio, log population, sub-metro municipality indicator, district municipality indicator, number of parties, and the share of female 15-20-year-olds with a high school degree in 1990. Each circle corresponds to the unconditional mean in bins of one percent by the Islamic win margin in mayoral elections 1994. The solid line represents the predicted values of a fourth-order polynomial fit, one on each side of the threshold at zero. Dashed lines indicate 95 percent confidence intervals.

Figure 7. Running variable density test



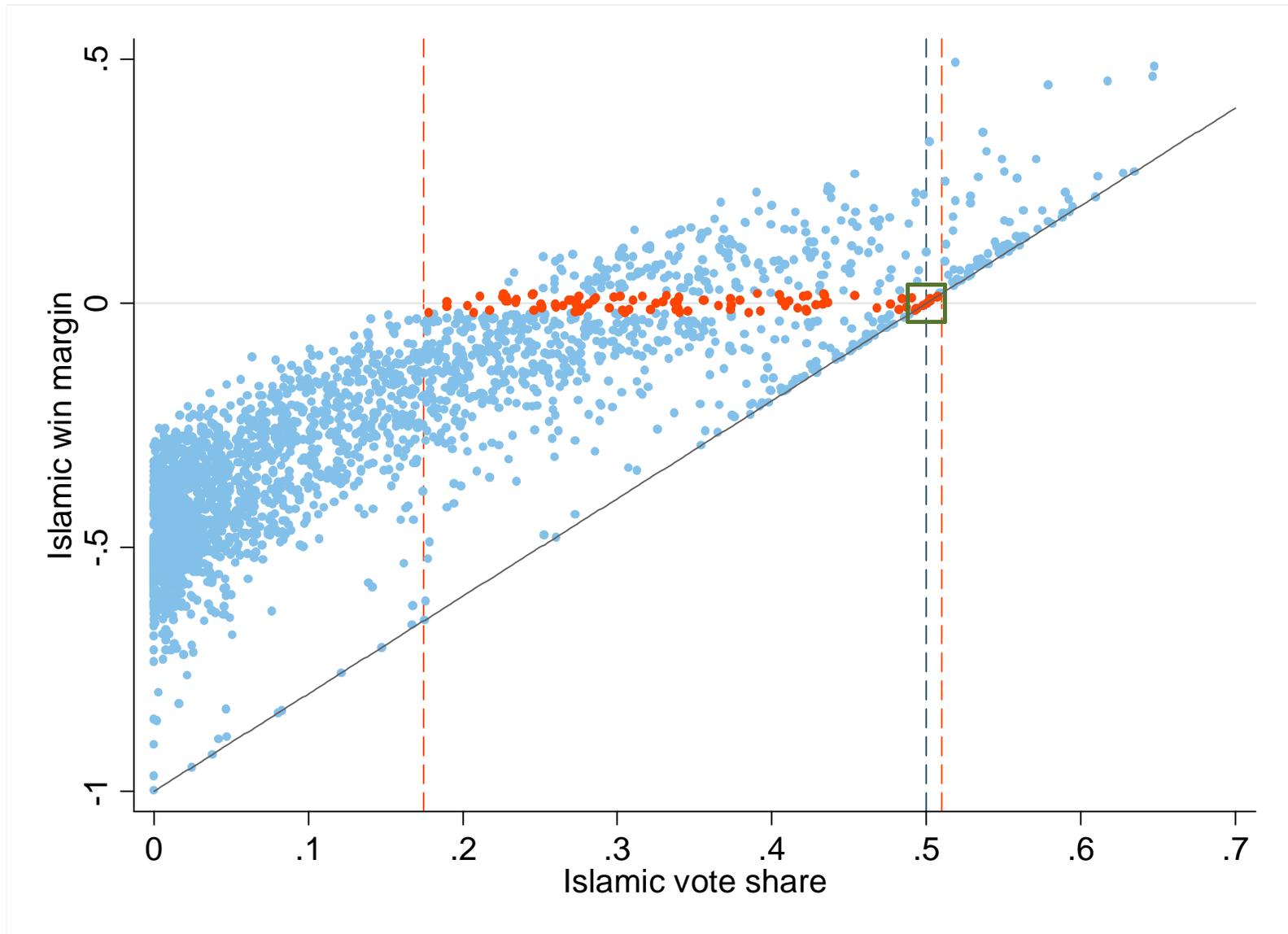
The graph shows the McCrary (2008) test of whether there is a discontinuity in the density of the Islamic win margin. $\Theta = -0.016$, $S.E = 0.141$, bin width = 0.009, bandwidth = 0.165.

Figure 8. Alternative breaks



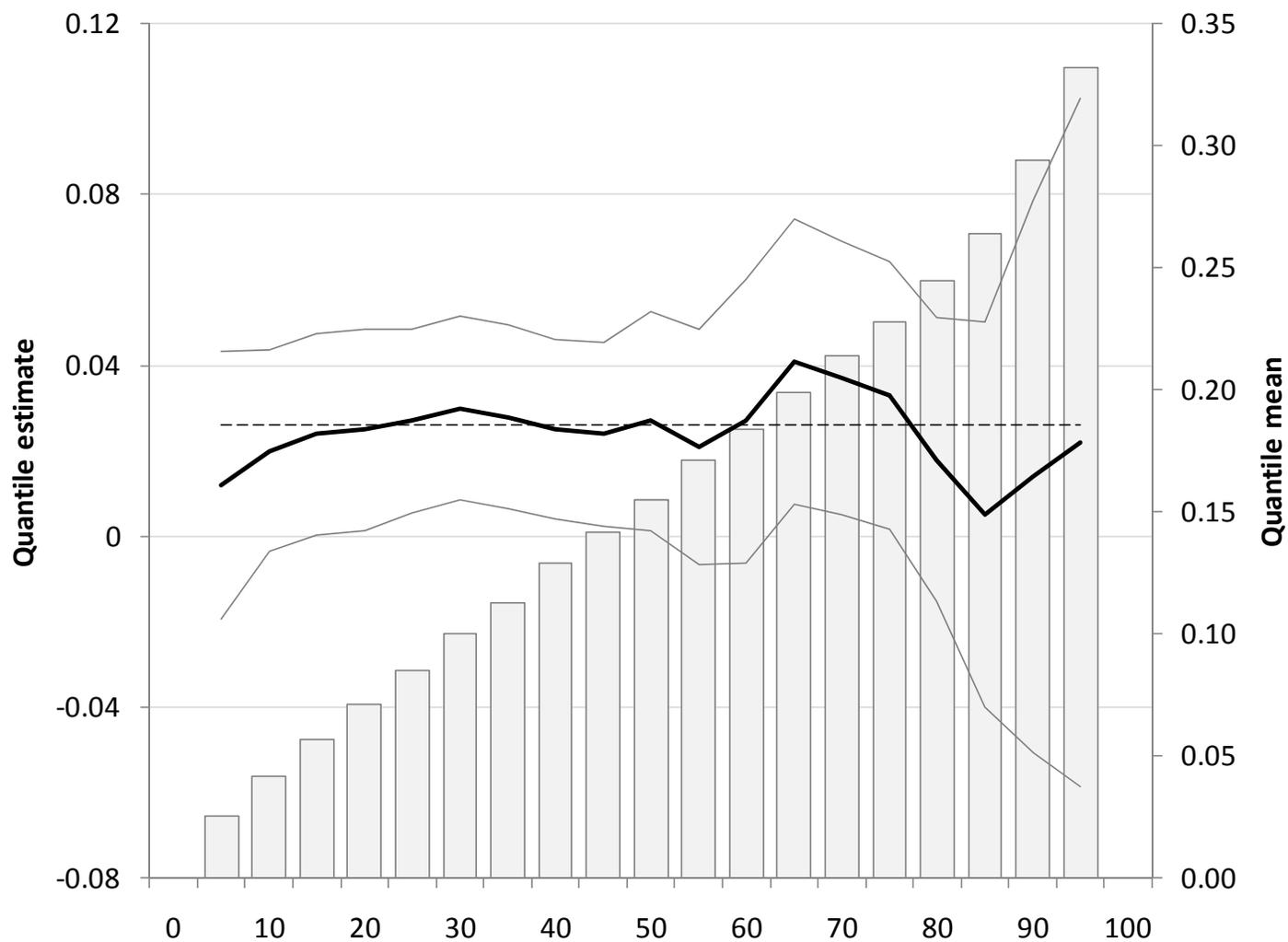
The graph shows, on the left-hand side, absolute t-statistics of placebo RD estimates at various thresholds, where a fourth-order polynomial in the Islamic win margin is estimated on each side of the threshold. The points included have at least 50 observations within a bandwidth of .25. The right-hand side shows the distribution of the t-statistics, with the threshold at zero indicated by a black circle.

Figure 9. Islamic win margin and Islamic vote share



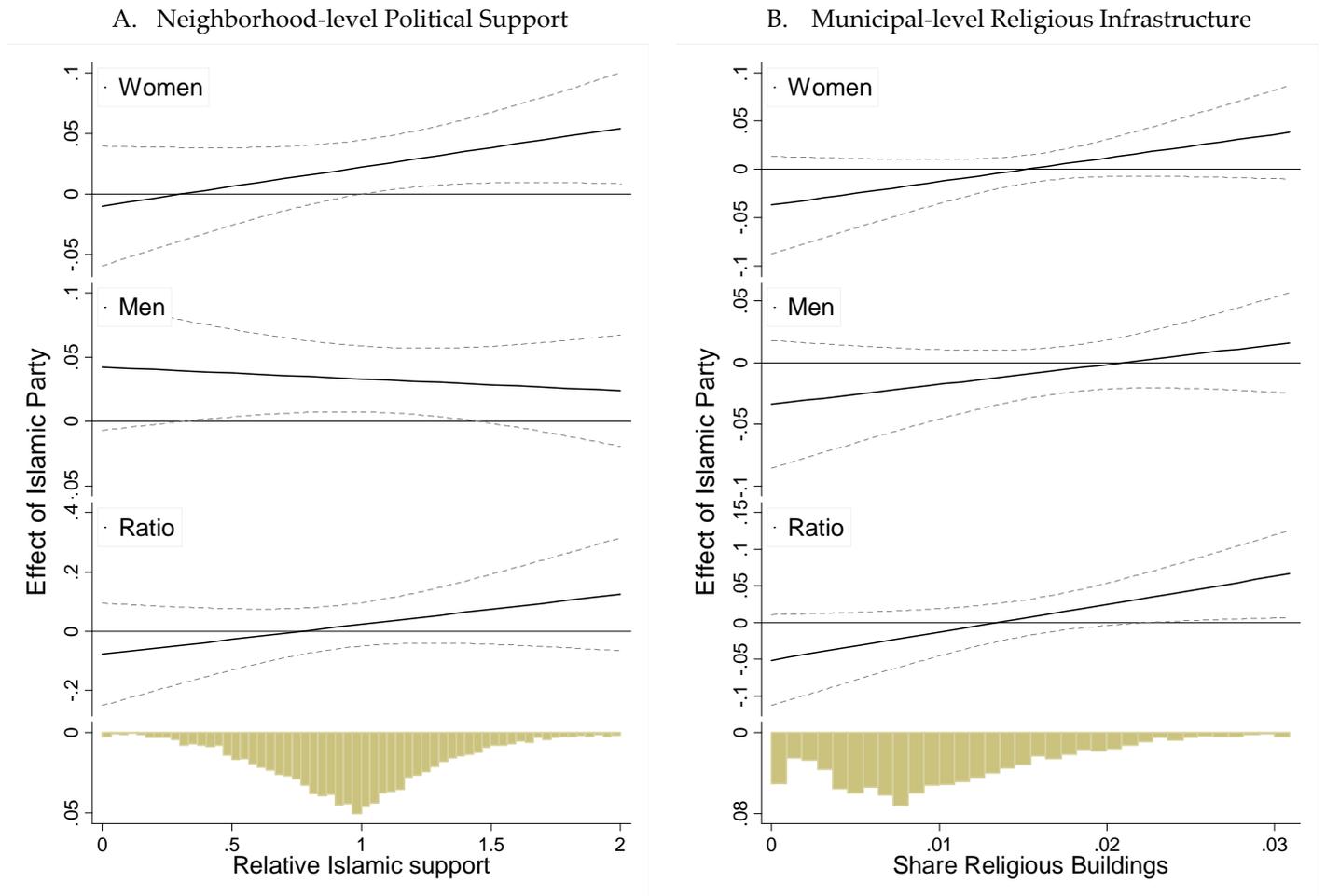
The graph shows the absolute vote share for the Islamic party plotted against the Islamic win margin, both in 1994. Observations less than 2 percentage points away from the threshold at zero are in black. The diagonal line is the hypothetical one-to-one relationship between the two variables in an election with only two parties.

Figure 10. Quantile RD Estimates on 15-20-year-old women's high school education



The panels show quantile RD estimates (black line) high school attainment cohorts for ages 15-20. The gray lines indicate 95 percent confidence intervals, where standard errors are bootstrapped using 1000 replications and clustered by province. The gray bars show quantile means of the dependent variable. All regressions include controls for log population, total population below 19, total population above 60, five female age cohorts, gender ratio, and type of municipality.

Figure 11. Impact of Islamic Mayor on High School Education by Relative Islamic Influence



The above graphs show neighborhood-level heterogeneous effects of Islamic party in 1994 on the share of the population with a high school degree in 2000, by the ratio of neighborhood-to-municipal vote share for the Islamic party (Panel A) and the share of all building space made up by religious buildings in 1990 (panel B). The uppermost panels show results for women, the upper-middle for men, and the lower-middle is the ratio of the female-to-male outcome. The bottommost graph is a histogram of the interacting variable. In each regression, the outcome is regressed on the Islamic mayor indicator, a fourth-order polynomial in the Islamic win margin, log population, age below 19, age above 60, gender ratio, type of municipality, and the interacting variable. The latter is also interacted with each of the variables on the right-hand side of the regression equation including the polynomial control function. The neighborhood-level regression is weighted by the inverse of the number of neighborhoods within a municipality and standard errors are clustered by municipality to allow for correlation among neighborhoods within the same municipality. For municipal-level regressions standard errors are clustered by province. Dashed lines denote 95 % confidence intervals