Does the Education of Politicians Matter? Evidence from a Bachelors Degree Requirement for Legislators in Pakistan

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Abstract

In order to contest elections in Pakistan in 2002, all candidates for the lower House of Parliament had to have graduated with a Bachelors degree or higher. This unique policy experiment disqualified 60 of the 207 legislators elected in the 1997 election, allowing us to identify the causal effect of legislator education on policy outcomes for the first time; the outcome we study is their development spending. While it initially appears that a legislator's education does not affect his development spending, examining the composite effect of higher politician education and various political changes resulting from the experiment, mainly different party identities, suggests a somewhat positive effect. Specifically, in areas where a large party educated legislator replaced the small party uneducated incumbent, there is some evidence that there was an initial increase in development spending by this legislator. These legislators also implemented more projects, perhaps in a move to gain greater visibility infront of their constituents. In addition, where the educated legislator was from the religious parties alliance which swept into power promising greater service delivery, it appears that while the number of projects implemented increased, total spending did not, suggesting an effort, perhaps, to fool voters (which does not seem to have worked in the subsequent election). The fact that there appear to be no effects of politician education in those areas where the political party identity of the legislator did not change implies that the previous policies of the uneducated legislator persisted: this may partly be because relatives replaced some of the disqualified incumbents in Parliament (Afzal 2009a), perpetuating their policies, or that both educated and uneducated legislators are equally able to cater to the needs of the median voter in their constituencies, thereby rendering this policy experiment somewhat ineffective.

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"The aim of every political Constitution, is or ought to be, first to obtain for rulers men who possess most wisdom to discern, and most virtue to pursue, the common good of society; and in the next place, to take the most effectual precautions for keeping them virtuous whilst they continue to hold the public trust."

James Madison (1788 [1961]), in the *Federalist Papers* (#57)

1 Introduction

Thomas Jefferson wrote of the need to form a "natural aristocracy" to hold the offices of government (Besley 2006, p. 229), referring to a political class that was a cut above the public in terms of ability and talent. It is the same idea which underlies the first part of the quotation above by James Madison, the primary author of the US constitution. And this was claimed to be the thought behind the constitutional amendment invoked by (the then) General Musharraf, President of Pakistan, before the October 2002 general elections: in his Chief Executive Order No.7/2002, he imposed a minimum education requirement on all candidates running for the office of Member of National Assembly, the lower house of Parliament in Pakistan[1]. Musharraf said that the law would ensure a more efficient and less corrupt legislature.

In order to contest elections in 2002, all candidates for Member of National Assembly (MNA) had to file proof of graduating with a Bachelors degree or higher with their candidacy papers[2],[3]. Equivalence of non-standard degrees had to be granted by the University Grants Commission of Pakistan (now the Higher Education Commission). Islamic degrees were generally granted equivalence to a Bachelors degree by the Commission, which was controversial. Opponents of the policy argued that it was unfairly beneficial to religious parties. The equivalence was contested in the Supreme Court by a few lawyers, but the case has not been resolved. The petitioners' argument stated that equivalence had been granted only to the extent that those possessing religious degrees could teach religious courses, and not for other purposes.

This policy experiment had the effect of disqualifying 60 of the 207 MNAs elected in the 1997 election, 29% of the National Assembly incumbents. Even more drastically, it restricted 97 percent

[1] Pakistan has a parliamentary system of government. The lower house is analagous to Congress in the US, except in, of course, the usual differences between the Presidential and Parliamentary systems of government. Pakistan's political system is described in detail in Appendix 1.

[2] In Pakistan, a Bachelors has generally been a 14 year degree, even though both private and public colleges and universities have increasingly introduced 15 or 16 year degrees in order to make them compatible with foreign degrees.

[3] The questions of fake degree arises in Pakistan, that is, whether candidates were able to obtain them in order to run for election. Other than a couple of isolated allegations of candidates obtaining fake degrees, this does not seem to have been a major problem.

of the country from running for Parliament, leaving only 3 percent of the voting population who were college graduates as eligible to contest national elections. Opposition and human rights officials, on this basis, argued that the law was undemocratic and exclusionary (Haven 2002)[4]. In any case, this unique policy experiment enables us, for the first time, to identify the causal effect of legislator education on policy outcomes. This is something we can do in no other context because legislators' education typically cannot be disentangled from voter preferences, and given that such preferences also impact policy, we cannot usually isolate the effect of legislator education on policy.

Why do we care about the effects of legislator education on policy? Politicians' education is one dimension of their identity, and both theory as well as the empirical literature suggest that this identity affects policy. While the classic Downsian framework predicts that electoral competition leads candidates to move to the political center and adopt the policy position preferred by the median voter (and therefore that candidate identity does not matter), the median voter theorem is not robust to a number of extensions to the model (such as multi-dimensional policy spaces with non-probablistic voting or policy-motivated candidates with candidate uncertainty in the location of the median voter).

Empirical testing of the Downsian model in the US also rejects the prediction of convergence to the median voter's ideal (Ansolabehere et al 2001, Gerber and Lewis 2004, Lee, Moretti, and Butler 2004). These tests employ data on legislators' positions and voter preferences. In addition, recent work on India using reservation of seats for lower castes and women finds that politician identity matters in that context as well. Pande (2003) finds that reservation for scheduled castes and tribes positively affects policy targeting towards these groups, while Chattopadhyay and Duflo (2004) find that women's issues get more attention when women politicians are elected due to reservation. Besley, Pande, and Rao (2005) find that better educated politicians exhibit less political opportunism in India, but education cannot be treated as exogenous in their context.

Education, in particular, is an element of politician identity that receives a great deal of attention in South Asia, but has not heretofore been studied in a context in which it can be treated as exogenous; Musharraf's policy experiment allows for exactly that. In South Asia, the popular belief is that uneducated, feudal landlords lord over politics in a manner that is harmful to both

[4]This law was abolished by a seven-member bench of the Supreme Court on April 21, 2008, in response to a petition filed by two members of the JUI (F) political party, on account of inconsistency with articles 17 (freedom of association) and 25 (equality of citizens) of the Constitution. This abolition followed Musharraf's fall from power. The February 2008 elections were held with this requirement in place, therefore the legislators elected in this cycle all possess Bachelors degrees as well; only for those contesting bye-elections does the law no longer hold. This presents another unique experiment to study: the effect of going from an educated Parliament elected in 2008 to one elected without this requirement in 2012 or 2013, whenever the next round of general elections is held.

their poor constituents as well as national policy (most recently written about by New York Times columnist Nicolas Kristof (August 1, 2009)). It is often argued that these politician-landowners do not have an incentive to better the lot of their poor tenants, because more educated constituents would no longer want to work the land. This is similar to Musharraf's argument that the new educated legislators would be more efficient and less corrupt. Politicians' education has been a focus in the US and elsewhere as well.

How can the education of politicians affect policy? They can be better of worse *types* and/or take better or worse *actions* compared to non-educated politicians. Since this may seem relatively abstract, let's look at some concrete hypotheses. First, they may be different in terms of *knowledge* of the needs of their constituents, an issue central to proper service delivery; this may be because education is correlated with residence in and thus knowledge of the constituency and/or related to learning or willingness to learn about the constituency. Second, educated legislators may be able to expend more or less *effort* in politics compared to their uneducated counterparts, both at the national stage as well as on the part of their constituents; this may be because of higher efficiency and/or other demands on their time in terms of other occupations. Third, more educated legislators may have different levels of *experience* relative to less educated legislators; more experience may lead to better service delivery or perhaps higher corruption! More educated legislators in the Pakistani context seem to have weakly lower experience.

As the preceding discussion makes clear, what we are identifying is not just the causal impact of education, per se, but also other characteristics, such as experience, competence, and ability, which are associated with education. This does not confound the analysis but makes it even richer: the policy change serves as a shock not only to education, but these other associated characteristics as well, and separates all these characteristics from voter preferences.

Legislators in Pakistan have responsibilities towards their constituencies, in terms of development spending and service delivery, as well as in Parliament. Votes on legislation in the National Assembly, however, are not recorded by legislator, and the only observable measure of legislator behavior is development spending in their constituencies. I use this as the policy outcome of interest: as I will argue, variation in development spending can be interpreted as variation in legislator effort, and this can be affected by all three channels outlined above: knowledge, effort, and experience. I will attempt to disentangle which of these is at play in the Pakistani context.

The immediate impact, if any, of such a change in the rules for political selection would be on

electoral (political) competition[5]. The policy impact occurs only after the election, once the winning candidates are in power and can influence policy. However, any changes in political competition can also affect policy directly by changing legislator incentives and behavior; the direction of this effect is theoretically ambiguous[6]. In Afzal (2009a), I examine the political/electoral effects of this policy change. I do not find evidence of a significant effect of incumbent disqualification on political competition (defined as increasing in the number of candidates contesting election and the Herfindahl-based political competition index, and decreasing in the vote share and vote margin of the winning candidate). However, the signs on all the political competition variables are consistent with reduced political competition in the constituencies where the incumbent was disqualified as a result of this education requirement. In addition, closer examination reveals evidence of heterogeneity in the effect of disqualification on political competition: there was a sharp decline in political competition in those areas where the incumbent was disqualified and it was harder to find a substitute candidate. Musharraf's party also gained in these constituencies. Other large parties seem not to have benefited overall in these constituencies; disentangling these into the two main opposition parties reveals that while the PPP did not benefit, the PML-N actually did. The policy then seems not to have only been a crude instrument to benefit Musharraf's party, but benefited an opposition party as well. Finally, the MMA or religious parties' alliance did not benefit overall in disqualified constituencies, or in disqualified constituencies with small party incumbents, but it did benefit in constituencies in the North West Frontier Province (its region of dominance) with disqualified incumbents; since the MMA joined Musharraf's party to provide a majority in Parliament, this benefited Musharraf's party as well.

Where there are no political effects of the policy, I argue that any effect on policy comes directly through the difference in legislator education (or characteristics associated with education). Where there are political repercussions, any effect on policy is the combination of those political effects and the impact of higher legislator education. I therefore examine the effects of legislator education on policy cutting across the size of the pool of substitute candidates, as well as checking for varying

[5]This amendment constitutes a barrier to entry to the political process, and as in standard IO theory, these barriers typically reduce political competition.

[6]Recent empirical work by Besley and Burgess [2002] and theoretical work by Bardhan and Yang [2004] relates political competition to economic and policy outcomes. Besley and Burgess show that greater electoral turnout and higher political competition is associated with better government responsiveness in the form of greater public food distribution and calamity relief in India. Bardhan and Yang show that greater political competition leads to tradeoffs of economic costs and benefits. They show that it can pose a threat to long term investments which feature uncertainty that extends across election cycles. In general, they argue that information asymmetries, distributional conflicts, and the characteristics of public investment opportunities can play a role in mapping electoral competition into good or bad economic outcomes. Hence higher political competition does not necessarily translate into higher welfare.

regional effects (North West Frontier Province) given my results in Afzal (2009a). I also examine effects by year to look at learning over time, especially for new, educated legislators.

The empirical strategy employed in this paper is essentially a difference-in-difference approach. I use data on all legislators elected in the 1997 and 2002 elections (before and after the policy change) in Pakistan, and on all their development spending in the term following the elections. I measure the effect of legislator education on a number of development fund outcomes, controlling for year and constituency fixed effects. There appears to be no overall effect of legislator education on total development spending. However, examining the composite effect of higher politician education and various political changes resulting from the experiment, mainly different party identities, suggests a somewhat positive effect. Specifically, in areas where a large party educated legislator replaced the small party uneducated incumbent and faced lower political competition, there is some evidence that there was an initial increase in development spending by this legislator. These legislators also implemented more projects, perhaps in a move to gain greater visibility infront of their constituents. In addition, where the educated legislator was from the religious parties alliance which swept into power promising greater service delivery, it appears that while the number of projects implemented increased, total spending did not, suggesting an effort, perhaps, to fool voters (which does not seem to have worked in the subsequent election). Again, there is some evidence that there was an initial increase in spending by the educated, religious party legislator, but this effect tapered off over the second half of the term. Controlling for experience does not change these results.

The remainder of this paper is organized as follows. In Section 2, I describe the data and discuss my empirical strategy in detail. In Section 3, I discuss how this policy change affects legislator experience. Section 4 presents the main results of the paper: the basic specification, and then accounting for heterogeneity, yearly variation, and legislator experience. Section 5 concludes.

2 Empirical Strategy and Data

2.1 Main Empirical Strategy

The empirical strategy employed in this paper is essentially a difference-in-difference approach. I use panel data over two election cycles, before and after the constitutional amendment, on all electoral constituencies for the lower House of Parliament in Pakistan. The coefficient of interest measures the effect of legislator education on policy, controlling for year and constituency fixed effects. In particular, the effect of education measured here is really a comparison of the legislator

in a constituency going from one who did not have a Bachelor's to one who does as a result of the mandated education requirement in 2002. The policy outcome of interest is the legislator's development spending, discussed more below. The empirical specification is (the coefficient of interest is γ):

$$P_{ct} = \alpha_c + \beta_t + \gamma E_{ct} + \varepsilon_{ct}$$

where:

P_{ct} : Policy outcome in constituency c at time t. The policy outcome used in this paper is development fund spending by the legislator in constituency c at time t (for a detailed discussion of development funds in Pakistan, see Section 2.2.2); in particular, the main outcomes of interest are total development projects implemented and total development funds spent, and education projects implemented and funds spent, versus non-education projects and funds.

E_{ct} : Legislator's education in constituency c at time t. It is a dummy equal to 1 for all MNAs elected in 2002 because all legislators had Bachelors degrees post the constitutional amendment; it equals 0 if the MNA elected from that constituency in 1997 did not have a Bachelors degree or higher, and 1 if he/she did.

t = time; $t = 0$ (pre-constitutional amendment) or $t = 1$ (post-constitutional amendment)

Specifically:

$P_{ct=0}$: Development projects implemented or funds spent in constituency c from $1997 - 1999$ (aggregated or averaged).

$P_{ct=1}$: Development projects implemented or funds spent in constituency c from $2002 - 2008$ (aggregated or averaged).

$E_{ct=0}$: Education (dummy) of MNA elected from constituency c in 1997.

$E_{ct=1}$: Education (dummy) of MNA elected from constituency c in 2002.

α_c : Constituency fixed effects. Any level differences between constituencies where the incumbent was uneducated in 1997 (where the law binds) and those where the incumbent was educated (where the law does not bind) are taken care of by constituency fixed effects.

β_t : Time effects (pre- and post-constitutional amendment). These account for anything that affects all constituencies in each of the time periods. For example, different allocations of development funds for all legislators in each time period are taken care of by time fixed effects. Any different spending rules across years are also taken care of by time fixed effects.

2.2 Data

2.2.1 Education

I have data on the exact education levels for the 207 MNAs elected from general seats in 1997, as well as the 272 MNAs elected in 2002. For the MNAs elected in 2002, the information was part of the application for candidacy filed with the Election Commission. For each of the MNAs elected in 1997, I asked each of the District Coordination Officers in Pakistan to report the education levels of all MNAs elected from the constituencies which fell within their district in 1997[7]. I do not use all this education level information for this analysis so as to isolate the differences in legislator education caused by the mandated requirement; therefore, I use the Bachelors degree or not distinction.

I have defined "educated" as a dummy which is equal to 1 if the MNA has a Bachelors degree, and 0 if not. It is therefore 1 for every MNA elected in 2002 since candidates could only contest elections if they had a Bachelors degree; it is equal to 0 if the MNA elected from that constituency in 1997 did not have a Bachelors degree (or higher), and 1 otherwise. As Table 1.1 shows, 60 out of 207 MNAs elected in 1997 were uneducated. Alternatively, this means that 60 out of 207 MNAs in 1997 were disqualified from contesting elections in 2002!

Table 1.1: Education of Legislators Elected in 1997

Educated	Frequency	Percent	% Urban	% Literate
0	60	28.99	26.38	41.46
1	147	71.01	33.56	43.90
Total	207	100.00	-7.18***	-2.44

The table also shows that constituencies where the incumbent was disqualified are significantly less urban than those where the incumbent was not disqualified (26.4% vs. 33.6%) but not significantly less literate. As long as the proportion of urban population stays relatively constant within constituencies over time, constituency fixed effects take care of this difference between constituencies hit by the requirement vs those which weren't. The only problem which might arise is if the two types of constituencies are changing their urban/rural composition differently, but it is hard to imagine why this would be the case.

[7] An officer from the DCO's office obtained this information either through phone, or by personally going to the ex-MNA's house. I am extremely grateful to the Home Department, Government of Punjab, for their invaluable help in getting this information.

2.2.2 Development Funds

Pakistani legislators have responsibilities towards their constituencies, in terms of development spending and service delivery, as well as in Parliament. Votes on legislation in the National Assembly, however, are not recorded by legislator, and the only observable measure of legislator behavior available is development spending in their constituencies. I use development spending as the policy outcome of interest: this is salient given that development schemes form a large part of what constituents expect from their legislators in Pakistan. As I will argue, variation in development spending can be interpreted as variation in legislator effort.

Development funds have been allocated to each legislator in Pakistan in every year since 1985 to spend on various development projects in his/her constituency. The name of the program has varied with successive governments, but the overall mandate remains the same: provision of development schemes to communities by their elected representatives. Development funds were allocated to MNAs under the Peoples Programme in 1988-90 and 1993-97, under the Tameer-e-Watan Programme in 1991-93 and 1998-2000, and under the Khushal Pakistan Programme from 2002-8. MNAs can spend these funds on projects in the broad areas of health, education, roads, water supply, drainage and sanitation, electrification, gas, construction, establishment of public call offices, and certain miscellaneous fields[8],[9]. For example, the funds could be used to help with the establishment of a basic health unit (BHU, a primary level public health care facility) or an elementary school for boys, or both.

How does MNA development fund spending work in the Pakistani context? Each MNA is allocated the same amount of money in each budget year. However, the key thing to note is that this money is not handed over to them at the start of the year to spend as they wish. MNAs must propose the exact projects that they wish to be implemented. In this proposal, they must also submit a detailed cost estimate, as well as suggest agencies which can implement the project. This proposal is then put through a process of bureaucratic approval. The projects are approved at the top by the heads of a federal ministry and an implementation agency is assigned[10]. Funds are then

[8] The Pakistan Ministry of Local Government and Rural Development generously provided detailed development fund spending data for this paper, including data on the number of projects implemented and the amount of funds spent by each MNA under each head, in each year.

[9] In 1997-99, funds could be spent on the following heads: roads/street; health; education; water supply/sanitation/irrigation; electrification/gas/telephone/others. In 2002-8, funds could be spent on: roads; health; education; electrification; gas; telephone; water supply; sanitation; bld hours (construction). I combined water supply and sanitation in 2002-8 to compare to water supply/sanitation in 1997-99; and electrification, gas, telephone, and bld hours in 2002-8 to compare to electrification/gas/telephone/others in 1997-99.

[10] Specifically, the Ministry of Local Government and Rural Development is responsible for final approval of the proposal. If the cost estimate exceeds the allocation, the projects are prioritized according to cost. These cost

disbursed directly to the selected implementation agency, and the project is underway.

Table 1.2: Development Funds: Summary Statistics

	2002-08		1997-99	
Projects (#); Funds (in million Rupees)	Mean	SD	Mean	SD
Roads Projects	21.66	26.78	5.69	8.15
Roads Funds	14.29	12.88	2.98	3.28
Electrification, Gas, Telephone Projects	38.56	37.41	3.52	9.26
Electrification, Gas, Telephone Funds	18.26	15.32	1.2	2.49
Education Projects	1.57	8.13	0.84	2.04
Education Funds	0.96	3.54	0.39	1.11
Health Projects	0.27	2.04	0.03	0.17
Health Funds	0.23	1.70	0.02	0.15
Water Supply & Sanitation Projects	8.74	30.65	0.71	5.67
Water Supply & Sanitation Funds	2.98	6.10	0.25	1.15
Total Projects	71.18	49.62	10.8	14.29
Total Funds	36.88	12.15	4.84	3.81
Allocation	43.43	7.65	9	0
Obs	272	272	207	207

Table 1.2 contains summary statistics for total development fund spending over the time period under study in this paper. As the table shows, MNAs put more emphasis on spending on roads and electrification/gas/telephone projects rather than on health and education. In addition, the entire amount allocated for development fund spending in every year is not spent by many MNAs, similar to the situation with Indian MPLADS (Member of Parliament Local Area Development Scheme), the analogous development program for Lok Sabha legislators in India[11]. Many MNAs spend less than the allocated amount; some spend more; and some do not propose projects at all[12].

estimates are also verified by the AGPR (Accountant General, Pakistan Revenue) office in consultation with the designated executing agency. The majority of projects are implemented by the Pakistan Public Works Department, followed by the Local Government and Rural Development Department and the Water and Power Development Agency.

[11] See Keefer and Khemani (2007) for an analysis of MPLADS in India.

[12] The latter group of MNAs is missing in the data provided by the Ministry, and a Ministry officer confirmed that this was so because they had not spent their development fund money in that year. Many MNAs could not spend in 1999-00 because the government was dissolved in October 1999 with Musharraf's military coup.

This variation in total development spending provides a very useful measure for legislator behavior. Since there is a considerable amount of effort required to decide on projects and propose them with a detailed cost analysis, total spending by MNAs can plausibly be interpreted as effort expended by them in pursuing their political duties towards their constituents. This interpretation of total funds spent as effort was confirmed in discussions with a senior Ministry officer[13].

It would be difficult to dispute that voters prefer more development spending in their constituencies; therefore, higher development spending can be considered beneficial in this context. Higher development spending in a constituency should not be interpreted as higher corruption because the money is directly spent by the implementing agency and not by the politician; even if there is an opportunity for some collusion between the implementing department and the politician (most government officials say that the proportion skimmed by the MNA could not be more than 10% in the case of these development funds), the amount of corruption is likely to be small and the proportion skimmed is constant relative to amount of funds spent.

A related outcome that gets at effort and also accounts for differential allocations for certain parties in the 2002-08 term (possibly cronyism) is the percentage of funds spent relative to allocation. In addition, because education is the element of legislator identity whose effect we are examining, we are particularly interested in understanding whether or not a politician's degree actually changes his or her emphasis on education spending: that is, does legislator education have an impact on spending on education versus non-education projects?

Let's discuss the other possible outcomes one can examine from this development fund data. We can look at whether a legislator spent on roads as opposed to health, but attaching any welfare metric on this involves a normative judgement, which a researcher is not in a position to make: one could easily visualize a situation in which the road had more positive impact on constituents' lives in terms of not only getting them to a health clinic in the neighboring town but also enabling them to get their crop to the market. Another potential outcome of interest is the number of projects implemented by the legislator. However, we're in the undesirable position of making a value judgement again, and one big project could be more beneficial than 10 small ones or vice versa (think of a road the politician's house vs the farmers market).

Table 1.3 looks at the development spending outcomes of interest in 1997 across educated and uneducated legislators (those not disqualified by the education requirement versus those who are) and finds that these two types of legislators do not appear to be spending differently in 1997.

[13] Keefer and Khemani (2007) also interpret MPLADS similarly.

Therefore uneducated legislators are as good (or as bad!) at service delivery as their educated counterparts prior to the experiment.

Table 1.3:

Development spending across Educated and Non-educated Legislators in 1997

	Educated		
Development spending outcomes, 1997-99	Yes	No	Difference
Education projects	0.95	0.80	0.15
Education funds	0.38	0.40	-0.02
Non-education projects	10.83	9.66	1.18
Non-education funds	4.60	4.38	0.22
Total projects	11.78	10.46	1.33
Total funds	4.98	4.78	0.21

2.3 Identification

This unique policy experiment enables us, for the first time, to identify the causal effect of legislator education on policy outcomes. This is something we can do in no other context because legislators' education typically cannot be disentangled from voter preferences, and given that such preferences also impact policy, we cannot usually isolate the effect of legislator education on policy. In terms of the empirical strategy outlined above, in contexts without the mandated education requirement, voter preferences would be part of the error term ε_{ct}, and would jointly affect E_{ct} and P_{ct}, leading to a biased estimate of γ. The policy experiment disqualifies uneducated legislators by law, forces voters who had previously chosen uneducated representatives to choose one from a pool composed entirely of educated legislators, and ends any effect of voter preferences on education, enabling us to accurately identify the causal impact of legislator education. This is precisely the reason why we don't use the exact education levels in the regression, but rather use an indicator for the legislator possessing a Bachelors degree because that is exactly what the policy forced a change in.

Difference-in-differences assumes that in the absence of the policy intervention, development funds in the constituencies where the incumbent was disqualified/uneducated would have grown at the same rate as in constituencies where the incumbent was not disqualified/educated. I indirectly

tested this before the policy intervention, by comparing development fund growth rates[14] between 1993-96 and 1997-99 in constituencies hit by the education requirement in 2002 with constituencies not hit by the requirement in 2002. I cannot reject equality of means; therefore, there seem to be no strong pre-existing differential trends in development fund spending between these two types of constituencies, lending validity to the empirical approach employed in this paper[15].

2.4 Delimitation of Constituencies

Pakistan had 207 electoral districts, referred to as constituencies, for the four elections which took place between 1988-1997. In 2002, after the 1998 population census, the Election Commission of Pakistan (ECP) delimited the constituencies and increased their number to 272 in accordance with the Delimitation of Constituencies Act, 1974. In order to use panel data, I matched the 1997 constituencies to the 2002 ones, and constructed a population-weighted average of the 2002 data corresponding to each 1997 constituency[16], [17].

2.5 Heterogeneity

2.5.1 Small Parties

Afzal (2009a) documented a reduction in political competition in constituencies where the pool of substitute candidates was small and the incumbent was disqualified. In addition, Musharraf's

[14] I look at development fund spending growth rates for the total funds spent and total projects implemented, education funds spent and projects implemented, and non-education funds spent and projects implemented.

[15] The difference in means t-test for total projects growth has a value of: |P|>t=0.84; for total funds growth the value is: |P|>t=0.56; for education projects growth the value is: |P|>t=0.15; for education funds growth the value is: |P|>t=0.42; for non-education projects growth the value is: |P|>t=0.85; and for non-education funds growth the value is: |P|>t=0.79.

[16] The Election Commission does not have the maps in GIS formats required for such matching. Therefore, I obtained the maps in graphic formats from the Election Commission for 2002. For 1997, I got the maps from a private consulting company, ECIL, which had been hired as a consultant firm by the ECP. I then manually converted all the maps into GIS format by digitizing them. Details of the construction steps in GIS are available upon request.

[17] The matching formula I constructed was:

$Data\_D\_in\_2002 = \frac{Pop\_d1}{Pop\_D\_in\_2002} * Data\_A + \frac{Pop\_d2}{Pop\_D\_in\_2002} * Data\_B + \frac{Pop\_d3}{Pop\_D\_in\_2002} * Data\_C$[18]

where:

$Pop\_d1 = \frac{Area\_d1}{Area\_A} * Pop\_A$

$Pop\_d2 = \frac{Area\_d2}{Area\_B} * Pop\_B$

$Pop\_d3 = \frac{Area\_d3}{Area\_C} * Pop\_C$

$Pop\_D\_in\_2002 = \frac{Area\_d1}{Area\_A} * Pop\_A + \frac{Area\_d2}{Area\_B} * Pop\_B + \frac{Area\_d3}{Area\_C} * Pop\_C$

That is, I weighted each intersected area by its population in 2002 (assumed to equal the fraction of the intersected area relative to the 2002 constituency, multiplied by the population of the 2002 constituency) and then multiplied by the 2002 data for the 2002 constituency to which the intersected area belonged. I then added this weighted data for 2002 to correspond to the 1997 constituency, and then divided by population of the 1997 constituency in 2002 (calculated with the same assumption by intersected area as above; the 2002 population of the 1997 constituency is used to account for population growth).

party was more likely to win in these constituencies, as was an opposition party; the incumbent small party and all other small, regional parties were weakened here. Given this, the effect of the education requirement on policy outcomes in these constituencies will be a composite effect of these political changes *and* higher politician education. Legislators belonging to Musharraf's party and the opposition party may have very different preferences toward development spending compared to small, regional parties. In addition, a reduction in political competition may change the legislator's incentives to expend effort on behalf of his constituents because he perceives a lower threat of political turnover.

I therefore separate out the effect of the education requirement on policy outcomes by the size of the pool of substitute candidates; as discussed in my previous work, this pool is proxied for by the party size of the winner in 1997. The assumption underlying this proxy is that if there is an equal proportion of educated candidates in small and large parties, small parties will be less likely to find an educated candidate to replace a disqualified one; this will reduce political competition. I define small party based on the number of candidates put up for election by that party in all the national constituencies in Pakistan in the 1997 general election. Table A3.1 in Appendix 3 clearly illustrates this definition. In Table A3.2, I have reproduced the substitutability results.

Given these results, I run the following empirical specification to measure the policy effect of the education requirement in constituencies where the pool of substitute candidates is small: $P_{ct} = \alpha_c + \beta_t + \gamma_1 E_{ct} + \lambda E_{ct} * S_c + \varepsilon_{ct}$, where S_c signifies whether the winner from the constituency in 1997 belonged to a small party[19]. The coefficient λ measures the composite effect of the education requirement on policy outcomes: it includes the effect of the political changes on development funds (if any) as well as the effect of politician education on development spending.

2.5.2 Religious Parties Alliance

Afzal (2009a) also shows that the MMA or religious parties' alliance was more likely to be elected in constituencies in the North West Frontier Province (its region of dominance) with disqualified incumbents. Given this, we also look at the following specification: $P_{ct} = \alpha_c + \beta_t + \gamma_1 E_{ct} + \lambda E_{ct} * NWFP_c + NWFP_c + \varepsilon_{ct}$; as before, our estimate will measure the composite effect having an MMA legislator who is educated. Legislators from religious parties may have different preferences toward development spending, and in particular toward education spending. The MMA rolled into power

[19] I have not included small party independently in the regression because the coefficient is just a linear combination of the fixed effects.

on the mandate of provision of services to the poor, but the MMA also has a stance against girls schooling, which is why this is a particularly important effect to examine.

2.5.3 Year

The above regressions aggregate development spending for the 1997-99 term and the 2002-08 term. I also separate out the regressions by year: that is, keep the aggregated spending for the 97-99 term but run the regression separately for each of the years in the 02-08 term, yielding 6 regressions, to separate out learning on the part of these new legislators.

2.5.4 Experience

Finally, I run additional regressions controlling for legislator experience, to separate out the effect of legislator education versus experience (because this policy also served as a shock to experience).

3 Legislator Experience

Tables 2.1-2.2 examine how legislator experience is affected by this unique policy experiment which disqualified 30% of the incumbents in the National Assembly. Using election results to match legislators over time is a non-trivial task in the Pakistani context, where there is a large degree of variation in how the same name is spelt in English, and the number of names that are listed for the same person, as well as the ordering of these names (given titles, castes, and the fact that last names are not generally the family name but often the father's first name). We dealt with these issues by using a combination of manual matching and a name-matching algorithm we specifically designed for the Pakistani context.

Table 2.1 looks at legislator experience in 1997 versus 2002. I separate out a current legislator's experience within the same constituency where he was elected in this term versus his experience in any of the electoral constituencies for the National Assembly. The average experience of a legislator elected in 1997 was 0.87 years within that constituency, and 1 year in the National Assembly overall, while the mean experience of a legislator elected in 2002 was just 0.31 years within that constituency, and 0.48 years in the National Assembly overall; legislators elected to office in 2002 had significantly less experience of both types compared to legislators elected in 1997. Finally, I also look at whether this the legislator was elected for the first time to the National Assembly. 74% of legislators in 2002 were elected for the first time in 2002, compared to 40% in 1997; again, this difference is

statistically significant. Note that experience decreased in 2002 partly because of delimitation of constituencies, especially given the addition of 65 electoral constituencies in 2002.

Table 2.1: Legislators' experience, by year

	Year		
Legislator experience	1997	2002	Difference
Experience w/in constituency	0.87	0.31	0.56***
Any experience	1.00	0.48	0.52***
First term	0.40	0.74	-0.33***

Table 2.2 looks at the elected legislators' experience within the constituency (arguably the kind of experience most relevant for proper service delivery), cut by year and disqualification. It shows that uneducated legislators elected in 1997 had an average of 0.95 years of experience within the constituency, compared to educated legislators' mean experience of 0.84 years, but this difference is not significant; so it appears that educated and uneducated legislators had similar degrees on experience in 1997. However, in 2002, in constituencies where the (uneducated) legislator had been disqualified, the elected legislators' experience was just 0.14 years, compared to a significantly higher 0.29 years where the (educated) legislator had not been disqualified. If we look at the table vertically and we compare constituencies hit by disqualification in 1997 versus 2002, the elected legislators' mean experience within the constituency decreased significantly from 0.95 years to 0.14 years, so disqualification does seem to have had a big impact. But if one compares constituencies not hit by disqualification in 1997 versus 2002, the elected legislators' mean experience within the constituency also decreased significantly from 0.84 years to 0.29 years, and this is more than likely in large part due to the delimitation of constituencies mentioned earlier.

In any case, the difference-in-difference estimate of -0.26 (in bold) shows that in 2002, legislators in constituencies with disqualified incumbents had 0.26 years less experience in the constituency compared to legislators in constituencies where the incumbent had not been disqualified, relative to the differences between these two types of constituencies in 1997; this estimate though is not significant (although only marginally so). The results for experience in any constituency and the first term election variables are in Appendix 4, and largely mirror the results of Table 2.2[20].

[20] Note that the numbers in Table 2.1 are based on the 207 constituencies in 1997 and 272 constituencies in 2002. In Table 2.2 and Tables A4.1 and A4.2, in order to determine which of the constituencies are hit by disqualification, we use the (population-weighted) matching method to determine experience in 2002, and the numbers are averaged back to 207 constituencies in 2002 (and thus yield an overestimate of experience when compared to Table 2.1).

Table 2.2: Legislators' experience within the constituency, by year & disqualified (Difference-in-difference estimates)

		Disqualified		
Year	Legislator experience	No	Yes	Difference
1997	Experience w/in constituency	0.84	0.95	-0.11
2002	Experience w/in constituency	0.29	0.14	0.15*
	Difference	0.55***	0.81***	**-0.26**

4 Results

4.1 Basic Specification

Table 3:

Main Regression: The Effect of Legislators' Education on Development Funds

	3.1: Aggregate Development Fund Outcomes					
	Education		Non-Education		Total	
	Projects	Funds	Projects	Funds	Projects	Funds
Educated	-0.88	-0.44	2.35	-2.22	1.47	-2.66
	(1.33)	(0.58)	(9.84)	(2.22)	(9.86)	(2.24)
Obs	410	410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes used are the aggregate for the 97-99 term and the 02-08 term.

Educated is an indicator for whether the legislator has a Bachelors degree.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	3.2: Average Development Fund Outcomes					
	Education		Non-Education		Total	
	Projects	Funds	Projects	Funds	Projects	Funds
Educated	-0.1960	-0.0681	-0.0012	-0.4448	-0.1973	-0.5129
	(0.3037)	(0.1365)	(2.1228)	(0.4670)	(2.1405)	(0.4861)
Obs	410	410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes are averaged per year over the 97-99 term and the 02-08 term.

Educated is an indicator for whether the legislator has a Bachelors degree.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	3.3: Development Fund Spending as %age of allocation		
	Education	Non-Education	Total
Educated	-0.8603	-4.3641	-5.2244
	(2.5615)	(8.4496)	(8.7812)
Obs	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes over each term are divided by the allocation to the legislator for that term.

Educated is an indicator for whether the legislator has a Bachelors degree.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

Tables 3.1-3.3 present the results of the baseline specification of the paper. They look at the effect of legislators' education on six development fund spending outcomes: namely, number of projects undertaken and funds spent on education, number of projects undertaken and funds spent on heads other than education, and the total number of development projects undertaken and funds spent; these are defined in three ways: aggregated over each election cycle (Table 3.1), averaged per year over each election cycle (3.2), and (the funds spent) are presented as a percentage of the allocation over each election cycle (3.3). Recall that we are interested in examining whether more educated politicians actually exhibit different behavior from less educated ones, and in particular whether they are better "types" in expending greater effort in the political arena. An additional

outcome that is of interest is whether more educated politicians spend more money on education-related projects versus non-education related projects, to test whether they infact put a greater emphasis on education spending.

As Tables 3.1-3.3 show, I find that more educated politicians do not appear to be spending differently overall compared to less educated politicians, and in particular, they do not appear to be targeting more funds towards education-related projects. The effect of legislators' education on all development fund outcomes is remarkably insignificant; if anything, the signs point towards the direction that educated politicians actually spend less development funds.

4.2 Small Party

As argued earlier, the effect of the education requirement on policy outcomes in constituencies where the pool of substitute candidates was small and the incumbent was disqualified will be a composite of the effects of political changes induced by the requirement (a reduction in political competition, higher probabilities of Musharraf's party winning and an opposition party winning, and lower probabilities of the incumbent small party or any small party winning) *and* higher politician education. In Tables 4.1-4.3, I therefore separate out the effect of the education requirement on policy outcomes by the size of the pool of substitute candidates; this pool is proxied for by the party size of the winner in 1997, and party size is defined by the number of candidates fielded by that party in the 1997 general election. The coefficient on the Educated*Small Party interaction term measures the composite effect of the education requirement on policy outcomes: it includes the effect of higher political turnover and larger parties as well as the effect of higher politician education on development spending. As before, the three tables define the development fund outcomes in slightly different ways: aggregated over each election cycle (Table 4.1), averaged per year over each election cycle (4.2), and (the funds spent) are presented as a percentage of the allocation over each election cycle (4.3).

Tables 4.1-4.3 show that this composite effect is also mostly insignificant, with one notable exception: the composite effect is marginally positive for total projects (but not funds), and this appears to be driven mainly by non-education projects. As noted earlier, it is difficult to interpret an increase in projects and place a welfare metric on what it signifies, but we can perhaps argue that more projects being implemented signifies a desire on the legislator's part to make his development projects highly visible (the more the projects, the greater the visibility). In addition, Table 4.3 suggests that the composite effect on total funds spent as a percentage of allocated funds is positive,

although marginally insignificant; again, this appears to be driven by non-education spending. Therefore we see at least some positive effects of education where there is political turnover to larger parties, although mostly driven by more projects being implemented and non-education spending. Separating out the effects by year (Table 4.4) shows that there is a positive composite effect on total spending, which comes through the first half of the new, educated legislator's term. This may signal an initial eagerness on the part of the educated legislator (from the larger party) to undertake his official duties which eventually tapers off. Table 4.5 adds the legislator's within constituency experience as a control to the previous regression, to deal with the fact that any newly elected legislators may learn on the job over their first term. Accounting for legislator experience does not seem to affect the results: experience does not affect development spending, and the initially positive composite results of education and the political changes on development spending persist.

Table 4:

Small Party Interaction Regression: The Composite Effect of Legislators' Education and Political Competition on Development Funds

	4.1: Aggregate Development Fund Outcomes					
	Education		Non-Education		Total	
	Projects	Funds	Projects	Funds	Projects	Funds
Educated	-1.34	-0.69	-7.86	-1.90	-9.20	-2.60
	(1.14)	(0.46)	(8.57)	(2.47)	(8.51)	(2.46)
Educated*Small Party	1.99	1.09	43.75	-1.35	45.74*	-0.26
	(3.14)	(1.62)	(24.23)	(4.25)	(24.08)	(4.55)
Obs	410	.410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes used are the aggregate for the 97-99 term and the 02-08 term.

Educated is an indicator for whether the legislator has a Bachelors degree.

Small Party is an indicator for whether the winner from the constituency in 1997 was from a small party.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	4.2: Average Development Fund Outcomes					
	Education		Non-Education		Total	
	Projects	Funds	Projects	Funds	Projects	Funds
Educated	-0.2610	-0.1100	-1.5843	0.5254	-1.8454	-0.6354
	(0.2888)	(0.1279)	(1.7491)	(0.5237)	(1.7539)	(0.5291)
Educated*Small Party	0.2786	0.1794	6.7846	0.3456	7.0631	0.5250
	(0.7022)	(0.3632)	(6.1447)	(0.8862)	(6.1569)	(0.9917)
Obs	410	.410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes are averaged per year over the 97-99 term and the 02-08 term.

Educated is an indicator for whether the legislator has a Bachelors degree.

Small Party is an indicator for whether the winner from the constituency in 1997 was from a small party.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	4.3: Development Fund Spending as %age of allocation		
	Education	Non-Education	Total
Educated	-1.3612	-8.7645	-10.1256
	(2.5919)	(9.2628)	(9.3505)
Educated*Small Party	2.1466	18.8586	21.0052
	(5.5711)	(15.7633)	(17.3178)
Obs	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes over each term are divided by the allocation to the legislator for that term.

Educated is an indicator for whether the legislator has a Bachelors degree.

Small Party is an indicator for whether the winner from the constituency in 1997 was from a small party.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	4.4: Development Funds Spent by Year					
	02-03	03-04	04-05	05-06	06-07	07-08
Educated	-1.09	-0.10	-0.22	-1.38	-1.50	-1.49
	(1.04)	(1.13)	(1.09)	(1.25)	(1.49)	(1.29)
Educated*Small Party	3.32**	-1.56	2.47*	2.58	0.29	1.17
	(1.74)	(2.84)	(1.52)	(2.42)	(2.76)	(1.93)
Obs	410	406	410	410	410	410

OLS regressions with constituency and year fixed effects.

Educated is an indicator for whether the legislator has a Bachelors degree.

Small Party is an indicator for whether the winner from the constituency in 1997 was from a small party.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	4.5: by Year, Accounting for Experience					
	02-03	03-04	04-05	05-06	06-07	07-08
Educated	-0.8584	-0.2335	-0.1939	-1.3940	-1.5809	-1.3973
	1.0396	1.1132	1.0924	1.2725	1.4937	1.3244
Educated*Small Party	3.3245*	-1.5549	2.4675	2.5801	0.2952	1.1592
	1.7507	2.8564	1.5114	2.4286	2.7681	1.9239
Experience	-0.0620	-0.1118	0.1087	-0.0514	-0.3077	0.3337
	0.4596	0.4760	0.4360	0.5498	0.5379	0.5593
Obs	410	410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Educated is an indicator for whether the legislator has a Bachelors degree.

Small Party is an indicator for whether the winner from the constituency in 1997 was from a small party.

Experience denotes the legislator's experience within the constituency (number of election cycles elected).

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

4.3 Effect of Religious Party and Educated Legislators: NWFP

In Afzal (2009a), I showed that the MMA (the alliance of religious parties) was 73% more likely to win in NWFP (the North West Frontier Province, its region of dominance) constituencies with disqualified incumbents relative to the previous election. Given this result, I examine the effect of the increase in legislator education caused by disqualification in NWFP constituencies on development spending. Of course, the effect of higher education here really signifies the composite effect of an educated legislator and higher likelihood of an MMA legislator, or an educated MMA legislator. An educated MMA legislator signifies that he likely had a religious degree, which was granted a controversial equivalence by the University Grants Commission (a case against this equivalence is still pending in the Supreme Court).

Table 5:

NWFP Interaction Regression: The Composite Effect of Legislators' Education and Religious Party Election on Development Funds

	5.1: Aggregate Development Fund Outcomes					
	Education		Non-Education		Total	
	Projects	Funds	Projects	Funds	Projects	Funds
Educated	-0.82	-0.39	-12.65*	-0.83	-13.48*	-1.22
	(1.46)	(0.66)	(7.63)	(2.49)	(7.65)	(2.51)
NWFP * Educated	-0.23	-0.21	64.30***	-5.95	64.07***	-6.16
	(1.47)	(0.78)	(22.11)	(3.68)	(22.17)	(3.74)
Obs	410	410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes used are the aggregate for the 97-99 term and the 02-08 term.

Educated is an indicator for whether the legislator has a Bachelors degree.

NWFP is an indicator for whether the legislator is from the North West Frontier Province.

Robust standard errors clustered by constituency in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	5.2: Average Development Fund Outcomes					
	Education		Non-Education		Total	
	Projects	Funds	Projects	Funds	Projects	Funds
Educated	-0.1894	-0.5255	-2.1081	-0.2905	-2.2974	-0.3549
	(0.3389)	(0.5237)	(1.6443)	(0.5314)	(1.6686)	(0.5476)
NWFP * Educated	-0.0286	0.3456	9.0292	-0.6615	9.0006	-0.6775
	(0.4399)	(0.8862)	(6.1060)	(0.8190)	(6.0175)	(0.8761)
Obs	410	410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes are averaged per year over the 97-99 term and the 02-08 term.

Educated is an indicator for whether the legislator has a Bachelors degree.

NWFP is an indicator for whether the legislator is from the North West Frontier Province.

Robust standard errors clustered by constituency in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	5.3: Development Fund Spending as %age of allocation		
	Education	Non-Education	Total
Educated	-0.8892	-6.0739	-6.9631
	(2.9362)	(9.4041)	(9.6386)
NWFP * Educated	0.1239	7.3275	7.4514
	(3.5923)	(16.0091)	(17.0087)
Obs	410	410	410

OLS regressions with constituency and year fixed effects.

Outcomes over each term are divided by the allocation to the legislator for that term.

Educated is an indicator for whether the legislator has a Bachelors degree.

NWFP is an indicator for whether the legislator is from the North West Frontier Province.

Robust standard errors clustered by constituency in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	5.4: NWFP Interaction by Year					
	02-03	03-04	04-05	05-06	06-07	07-08
Educated	-0.4915	-0.5981	-0.2281	-0.8666	-0.7399	-1.2642
	1.0643	0.6382	1.0961	1.2856	1.5480	1.2871
Educated*NWFP	1.8209	-0.0844	2.4930*	0.3768	-2.9672	0.2178
	1.8045	0.7464	1.4435	2.4078	2.2166	1.9823
Obs	410	410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Educated is an indicator for whether the legislator has a Bachelors degree.

NWFP is an indicator for whether the legislator is from the North West Frontier Province.

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

	5.5: by Year, Accounting for Experience					
	02-03	03-04	04-05	05-06	06-07	07-08
Educated	-0.5239	0.0792	-0.2047	-0.8861	-0.8296	-1.1462
	1.0834	1.0495	1.1085	1.3199	1.5737	1.3456
Educated*NWFP	1.8579	-2.8385	2.4663*	0.3991	-2.8648	0.0830
	1.8208	2.9351	1.4430	2.4482	2.2527	2.0437
Experience	-0.0918	-0.0611	0.0663	-0.0551	-0.2537	0.3338
	0.4639	0.4787	0.4337	0.5594	0.5488	0.5654
Obs	410	410	410	410	410	410

OLS regressions with constituency and year fixed effects.

Educated is an indicator for whether the legislator has a Bachelors degree.

NWFP is an indicator for whether the legislator is from the North West Frontier Province.

Experience denotes the legislator's experience within the constituency (number of election cycles elected).

Robust standard errors clustered by longitude-latitude grid point in parentheses.

* denotes significance at 10%, ** at 5%, and *** at 1%.

Tables 5.1-5.3 present the results of our six development fund outcomes regressed on legislator education interacted with the NWFP, defined in the following ways: aggregated over each election cycle (Table 5.1), averaged per year over each election cycle (5.2), and (the funds spent) are pre-

sented as a percentage of the allocation over each election cycle (5.3). The results indicate that better educated legislators in the NWFP (who happened to be more likely to belong to the MMA) actually put significantly more development projects in place, but spent (marginally significantly) less in total development funds. The increase in projects is on the magnitude of 64 more development projects in the 2002-08 term relative to the 1997-99 term (a huge increase relative to an average of 71 projects in 2002-08 and 11 in 1997-99); note that the overall differences between the two terms are taken care of by year fixed effects], and the decrease in total funds spent is Rs 6 million (relative to an average of Rs. 37 million spent in 2002-08 and Rs. 5 million spent in 1997-99). This effect appears to be entirely driven by non-education projects and funds.

As noted earlier, it is tough to pin a welfare metric on what a increase in projects implemented signifies (think about one big useful project vs 10 nominally useful ones, or vice versa), especially when it is accompanied by somewhat of a decrease in funds spent. Again, here it appears these educated MMA legislators desired greater visibility of their work, which makes sense given that the party came into power on the mandate of more service delivery. The evidence here suggests that they tried to do this through greater project implementation while actually spending less, perhaps trying to 'fool' the voters; this seems to not have worked, given that the MMA was overwhelmingly voted out in the 2008 election.

Separating out the effects by year (Table 5.4) shows that there is an initial positive composite effect of having an educated MMA legislator on total spending,. This may signal an eagerness on the part of the educated MMA legislator to undertake his official duties at the beginning of the term, which eventually tapers off. Table 5.5 adds the legislator's within constituency experience as a control to the by-year regressions, to deal with the fact that any newly elected legislators may learn the ropes of their new job over their first term. Accounting for legislator experience does not seem to affect the results: experience does not affect development spending, and the initially positive composite results of education and having an MMA legislator on development spending persist.

5 Discussion/Conclusion

This paper examines the causal impact of legislators' education on their development spending using a unique policy experiment in Pakistan. While it initially appears that a legislator's education does not affect his development spending, examining the composite effect of higher politician edu-

cation and various political changes resulting from the experiment, mainly different party identities, suggests a somewhat positive effect. Specifically, in areas where a large party educated legislator replaced the small party uneducated incumbent, there is some evidence that there was an initial increase in development spending by this legislator. These legislators also implemented more projects, perhaps in a move to gain greater visibility infront of their constituents. In addition, where the educated legislator was from the religious parties alliance which swept into power promising greater service delivery, it appears that while the number of projects implemented increased, total spending did not, suggesting an effort, perhaps, to fool voters (which does not seem to have worked in the subsequent election).

The fact that there appear to be no effects of politician education in those areas where the political party identity of the legislator did not change implies that the previous policies of the uneducated legislator persisted: this may partly be because relatives replaced some of the disqualified incumbents in Parliament (Afzal 2009a), perpetuating their policies, thereby rendering this policy experiment somewhat ineffective. On the other hand, examining development spending trends across educated and uneducated legislators in 1997 also showed that there were no significant differences in initial spending patterns between these two types of legislators (Table 1.3); our main results show that this also holds when we look at the same constituencies over time (if there are no other accompanying political changes) with a credible identification strategy. The implication then is that service delivery is something you don't have to be an educated legislator to do well: uneducated legislators may serve the needs of their constituencies equally well, and this is all that matters to constituents (indeed, in India, even criminal politicians are routinely elected and re-elected to their constituencies because they are known to get things done). Perhaps both types of legislators can just as ably cater to the demands of the median voter in their constituency.

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A Appendix 1: Pakistan's Political System

Pakistan has a parliamentary system of government. The legislative branch of government is the Parliament, which consists of the Senate (Upper house), whose 87 members are indirectly elected by the 4 provincial assemblies, and the National Assembly (Lower house), 272 of whose 342 members are directly elected from single seat constituencies using plurality rule. Of the other 70 seats, 60 are reserved for women and 10 for minorities, but women and minorities can stand from the 272 general seats as well[21]. Candidates can stand for election from more than one constituency. Each party typically fields one candidate per constituency, and various independent candidates (not aligned with any party) contest elections as well.

[21] These numbers are for 2002, post the delimitation of constituencies in response to the population census of 1998. For the 1988-1997 elections, the National Assembly consisted of 207 general seats.

B Appendix 2: Overall Effect of Education Requirement on Political Competition

Table A2.1: Effect of Disqualification on Political Competition

	Vote Fraction	Number of Candidates	Vote Margin	Turnout Proxy	Herfindahl Competition	Musharraf Party Win
Relation w/ Political Competition	-	+	-	+	+	
Disqualified	0.042	-1.087	0.049	-0.009	-0.038	-0.047
	(0.038)	(1.060)	(0.047)	(0.011)	(0.033)	(0.103)
Year	-0.083***	-0.266	-0.111***	-0.005	0.060***	-0.319***
	(0.020)	(0.415)	(0.025)	(0.006)	(0.017)	(0.059)
Fixed effects	const	const	const	const	const	const
R-squared	0.98	0.95	0.84	0.99	0.99	0.87
Obs	396	396	396	396	396	412

OLS regression with robust standard errors clustered by province in parentheses.

Vote Fraction = winning candidate's votes/total votes polled in the constituency.

Number of Candidates is the number of candidates who ran for election in the constituency.

Vote Margin = (winner's votes - runner-up's votes)/total votes polled in the constituency.

Voter Turnout Proxy = total votes polled in the constituency/constituency's population.

Herfindahl-based political competition index = $1 - \sum VS_i^2$, where VS_i = vote share of candidate i.

Main party win is an indicator for Musharraf's party (PML-Q) winning.

Disqualified equals 1 for a constituency in 2002, if the MNA elected from that constituency in 1997 did not have a Bachelors degree or higher; it equals 0 for all constituencies in 1997.

* denotes significance at 10%, ** at 5%, and *** at 1%.

C Appendix 3: Heterogeneity in the Effect of Disqualification on Political Competition: Small Party Interaction

I define small party based on the number of candidates (and not just the winners) put up for election by that party in 1997. Table 6 clearly illustrates this definition. A party is defined as large if it fields 50 or more candidates, and as small if it fields less than 50 candidates for election. Alternatively, this definition means that a party is small if it fields candidates in approximately less than one-fourth of the total national assembly constituencies, which number 207 for 1997. This seems to be a natural cutoff in the data[22].

[22] However, I also used three alternate cutoffs for small party to check for robustness - whether the number of candidates fielded is less than 10, 20, or 100. I also define a continuous small party measure by using the number of candidates fielded by each party instead of an indicator variable based on a cutoff, and the results using that measure mirror the results below.

Table A3.1: Small Party Definition

Party	Candidates	Percent	Small Party
ANP	20	1.14	1
AQP	7	0.40	1
BNM	8	0.45	1
BNP	6	0.34	1
HPG	51	2.89	0
IND	939	53.29	1
JUI(F)	23	1.31	1
JUI(FG)	12	0.68	1
JUI(S)	4	0.23	1
JUI(SG)	4	0.23	1
JUP	2	0.11	1
JWP	7	0.40	1
KJP	4	0.23	1
KT	5	0.28	1
MIP	3	0.17	1
MKP(KBG)	2	0.11	1
MQM(H)	11	0.62	1
NPP	5	0.28	1
NPP(WG)	2	0.11	1
PAP	7	0.40	1
PDP	8	0.45	1
PK-MAP	8	0.45	1
PMI	3	0.17	1
PML(J)	32	1.82	1
PML(N)	178	10.10	0
PML(Q)	4	0.23	1
PPP	161	9.14	0
PPP(SB)	66	3.75	0
PPP(ZAB)	8	0.45	1
PSL	3	0.17	1
PTI	134	7.60	0
SI	3	0.17	1
SNP	3	0.17	1
TI	2	0.11	1
TIP	2	0.11	1
UNA	7	0.40	1
WP	3	0.17	1
One Candidate Parties	15	0.85	1
Total	1762	100	

Table A3.2: Heterogeneity in the Political Effects of Disqualification: Small Party Interaction

	Herfindahl Competition	Musharraf Party Win	Incumbent Party Win	Small Party Win	Other Large Party Win	PPP Win	PML-N Win
Disqualified	-0.007	-0.2052*	0.0827	0.1013	0.0458	0.0307	
	(0.032)	(0.1236)	(0.1209)	(0.0791)	(0.1190)	(0.1179)	
Year	0.060***	-0.3165***	0.4173***	-0.0144	0.3237***	0.2302***	
	(0.017)	(0.0650)	(0.0597)	(0.0523)	(0.0620)	(0.0586)	
Small party	-0.137**	0.5987***	-0.3462*	-0.7793***	0.2458	-0.1839	
X Disqualified	(0.069)	(0.1489)	(0.1773)	(0.1920)	(0.2177)	(0.1469)	
Fixed effects	const	const	const	const	const	const	
R-squared	0.99	0.86	0.72	0.76	0.81	0.73	
Obs	396	396	396	396	396	396	

OLS regression with robust standard errors clustered by province in parentheses.

Herfindahl-based political competition index $= 1 - \sum VS_i^2$, where VS_i = vote share of candidate i.

Disqualified equals 1 for a constituency in 2002, if the MNA elected from that constituency in 1997 did not have a Bachelors degree or higher; it equals 0 for all constituencies in 1997.

Small Party is an indicator for whether the party fields fewer than 50 candidates across all constituencies.

* denotes significance at 10%, ** at 5%, and *** at 1%.

D Appendix 4:

Table A4.1 looks at the elected legislators' experience in any constituency, cut by year and disqualification. It shows that uneducated legislators elected in 1997 had an average of 1.10 years of experience in any constituency, compared to educated legislators' mean experience of 0.95 years, but this difference is not significant. However, in 2002, in constituencies where the (uneducated) legislator had been disqualified, the elected legislators' experience was just 0.32 years, compared to a significantly higher 0.54 years where the (educated) legislator had not been disqualified. Also, if we compare constituencies hit by disqualification in 1997 versus 2002, the elected legislators' mean experience in any constituency decreased significantly from 1.10 years to 0.32 years. Comparing constituencies not hit by disqualification in 1997 versus 2002, the elected legislators' mean experience in any constituency also decreased significantly from 0.95 years to 0.54 years. The difference-in-difference estimate, -0.37, is significant, and implies that legislators elected in disqualified constituencies in 2002 had 0.37 years less experience than legislators from non-disqualified constituencies, relative to 1997.

Table A4.1: Legislators' experience in any constituency, by year & disqualified

		Disqualified		
Year	Legislator experience	No	Yes	Difference
1997	Any experience	0.95	1.10	-0.15
2002	Any experience	0.54	0.32	0.22**
	Difference	0.41***	0.78***	-0.37**

TableA4.2 looks at whether a legislator was elected for the first time, cut by year and disqualification. It shows that 38% of uneducated legislators elected in 1997 were in their first term, compared to 41% of educated legislators, but this difference is not significant. However, in 2002, in constituencies where the (uneducated) legislator had been disqualified, 58% of legislators were in their first term, compared to 48% where the (educated) legislator had not been disqualified. The difference-in-difference estimate implies that 13% more legislators were in their first term in 2002 in constituencies where the incumbent had been disqualified, relative to 1997.

Table A4.2: Legislators' first term, by year & disqualified

		Disqualified		
Year	First term	No	Yes	Difference
1997	First term	0.41	0.38	0.03
2002	First term	0.48	0.58	-0.10
	Difference	-0.07	-0.20**	0.13