The Effects of Political Competition on Rural Land: Evidence from Pakistan

Katrina Kosec*
Research Fellow
International Food Policy Research Institute
2033 K St. NW
Washington, DC 20006 USA
k.kosec@cgiar.org

Hamza Haider
Michigan State University
108 Cook Hall
East Lansing, MI 48823 USA
shhaider@msu.edu

David J. Spielman
Senior Research Fellow
International Food Policy Research Institute
2033 K St. NW
Washington, DC 20006 USA
d.spielman@cgiar.org

Fatima Zaidi
Research Analyst
International Food Policy Research Institute
2033 K St. NW
Washington, DC 20006 USA
f.zaidi@cgiar.org

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Abstract

Can more vigorous political competition significantly raise rural land values, or contribute to more robust land rental markets? Political competition has been shown in other contexts to improve governance and spur investment in publicly provided goods that encourage economic growth, which in turn affect land values and land utilization. Exploiting exogenous variation in the national popularity of Pakistan's political parties in 2008, we show that provincial assembly constituencies in rural Pakistan with greater between-party political competition have significantly higher land values and more active land rental markets. A standard deviation decrease in a Herfindahl Index (HHI) of political concentration is associated with a 36 percent increase in land values, an 8 percentage point increase in the share of landowners renting out land, and an additional 4 percentage points of each landowner's land being rented out. Land values appear to increase most among poor households as a result of political competition, suggesting that the benefits of political competition with respect to land values accrue to those with the fewest resources to influence policy. In contrast, greater political competition increases land rental the most for the least poor land owners. In exploring potential causal mechanisms, we show that political competition leads to more stable and business-friendly governance and institutions, better amenities, and greater provision of publicly-provided goods, thus leading to higher land values. The effect of political competition on security is more ambiguous in our findings, suggesting that security may decrease land values along some dimensions while increasing it along others.

JEL Classification: H11, Q11, H40, Q18
Keywords: Political Competition, Land Prices, Land Markets, Rural Governance, Government Performance, Public Goods, Pakistan

1. Introduction

Can more vigorous political competition significantly raise rural land values, or contribute to more robust land rental markets? This is an important development question given the centrality of land in the asset portfolio of poor, rural smallholders. We consider this question in the context of Pakistan, where agriculture[1] contributes 21.5 percent to the GDP and over 60 percent of the country's foreign exchange earnings, while providing employment to 45 percent of the country's labor force and livelihoods to 68 percent of its rural population (GoP 2013; Salam 2012). Throughout Pakistan, land—particularly productive agricultural land—is perceived as the single most important component of the rural household's asset portfolio and is closely tied with its owner's social and economic status (Jatileksono 1989; Renkow 1991).

There is a large body of literature showing that political competition leads to more efficient policy outcomes. This occurs through at least three main channels. First, competition may lead to better laws, institutions, and governance. For example, political competition has been shown to increase the transparency of policies (de Janvry 2011), improve politician incentives to respond to citizens' preferences (Stasavage 2005; Callander 2008; McCourt 2012), prevent leaders from blocking technological and institutional innovations and development (Acemoglu and Robinson 2006), and lead to the development of more independent judicial institutions (Hanssen 2004). Political competition may also lead to pro-growth policies such as more efficient taxation policies, greater capital spending, and adoption of labor and other market reforms (Besley et al. 2010; Murillo and Martínez-Gallardo 2007; Rodrick 1999).

Second, political competition can lead to more efficient and higher investments in publicly-provided goods. For example, political competition may allow local governments to capture a greater share of resource transfers from the central government (Arulampalam *et al.* 2008) and thus increase spending on local development priorities. Or it may allow or even encourage local governments to improve the quantity and quality of investments in productivity-enhancing publicly-provided goods and services (Arvate 2013; Díaz-Cayeros *et al.* 2013; Crost and Kambhampati 2010). On the other hand, political competition has the potential to reduce public sector spending by reducing opportunities for rent-seeking and corruption (Knack and Keefer 2007).

[1] In this context, the term "agriculture" is comprised of the crops, livestock, poultry, fisheries, and forestry subsectors. See Salam (2012).

Third, political competition may impact the security environment. It may do so by affecting interactions between individuals and groups who have contested claims over scarce resources such as land, water, public funds, or social and political influence. For example, political competition can make ethnically-divided societies more inclusive by reducing the ability of politicians to discriminate or favor particular groups over others, instead focusing their actions on a broader set of citizens (Sharif 2011). Political competition can also stimulate more interactions among citizens, and between citizens and their governments, to reduce conflict and yield peaceful, institutionalized mechanisms for resolving grievances (Robertson and Teitelbaum 2011). That said, political competition can also have the opposite effect—for example, by undermining the power of autocratic leaders or local strongmen who may be integral to security and stability in more institutionally-fragile settings. For example, Baliga *et al.* (2011) show that autocratic regimes support peace more than do limited democracies (though not full democracies). Gutiérrez-Romero (2012) shows that political parties may strategically instigate violence in areas where they are less likely to win—which may be more abundant when there is greater political competition. And Hafner-Burton *et al.* (2014) show that an incumbent's fear of losing power may cause him or her to use election violence.

In this paper, we exploit exogenous variation in the national popularity of Pakistan's political parties in the 2008 National and Provincial Assembly elections to examine whether political competition affects land values and the propensity for households to rent out their land, and the extent to which these effects differ across rural households at different wealth and consumption levels. We then explore potential causal mechanisms to better understand whether political competition leads to better governance, greater investment in public goods, or improvements in security, which are posited to further lead to higher land values and more vibrant land rental markets. Efficient land markets play a crucial role in increasing agricultural productivity by allowing more effective use of potentially underutilized or idle land (Jin and Deininger 2009; Atwood 1990; Deininger *et al*. 2008).

The next section discusses political competition in Pakistan, land tenure systems, and the close relationship between politics and land. Section 3 presents an empirical strategy to examine the extent to which political competition affects land values and land renting, and describes the data used to do so in the context of the 2008 elections in Pakistan. Section 4 presents findings from our estimations of the relationship between political competition and land, while Section 5

explores potential causal channels. Finally, section 6 provides policy implications and concluding remarks.

2. Background and context

In order to understand the potential pathways through which political competition in Pakistan affects rural land values, land rental markets, and other outcomes, it is important to understand the complex socio-political context and recent evolution of the country's rural sector. This section provides an overview of political competition in Pakistan, land tenure and land markets, and the interactions between land and politics.

2.1 Political competition in Pakistan

Since independence in 1947, Pakistan has spent several decades under military rule. The latest transition from military to civilian rule occurred in 2008 and brought to power a coalition led by the Pakistan People's Party (PPP)—one of the largest civilian political parties in Pakistan. In 2013, after completing its full 5-year term in government, the PPP-led coalition government was succeeded by a government led by the Pakistan Muslim League-Nawaz (PML-N) in what was the country's first democratic transition from one elected government to another. Between spells of military rule, both parties have held power on several occasions since the 1970s.

To understand democracy in Pakistan, it is instructive to return to the 1973 Constitution that established the current system of government. Pakistan is governed under a parliamentary system where the president is the head of state and a popularly-elected prime minister is head of government. The bicameral federal legislature consists of the Senate (Upper House)[2] and the National Assembly (Lower House). Members of the National Assembly are elected through a first-past-the-post system (i.e., the candidate with the most votes wins) under universal adult suffrage. One National Assembly (NA) seat is allocated per NA constituency, and the number of constituencies allocated to each province, the Federally Administered Tribal Areas (FATA), and the Federal Capital is proportional to population. Additionally, there are reserved seats for women and religious minorities. In the 2008 elections, there were 272 NA constituencies,

[2] The Senate has equal representation from the four main provinces, and has elected seats as well as seats reserved for women, religious minorities, and technocrats. Either the majority party or a coalition of parties forms the government.

resulting in 272 directly elected members, 60 additional seats reserved for women, and 10 additional seats reserved for religious minorities.[3]

Each of Pakistan's four main provinces (Punjab, Sindh, Khyber-Pakhtunkhwa (KPK), and Balochistan) hosts a unicameral legislature comprised of representatives elected from the province. One provincial assembly (PA) seat is allocated per PA constituency using a similar first-past-the-post system, with additional seats reserved for women and non-Muslim minorities. PA constituencies are proper subsets of NA constituencies. Constituency boundaries are demarcated with the goal of equalizing populations across constituencies (ECPa 2013).

Each political party can field up to one candidate per constituency in an election, and candidates finance their campaigns from their own or their party's resources. There are no fees required to compete in elections although a security deposit is required before filing nomination papers in the amount of PKR 4,000 for national assembly seats and PKR 2,000 for provincial assembly seats, and eligibility criteria include Pakistani citizenship, an age of 25 or older, and a record free from criminal convictions (ECPb 2013). In the 2008 elections, candidates were also required to have graduate-level education (i.e., a bachelor's degree).[4]

NA and PA members have a range of representative, legislative and oversight roles. Importantly, they can influence the design, location, and budgetary allocation of government projects, policies, and programs (Mirza 2012). Both NA and PA members are allocated development funds for authorized public works and development projects in their individual constituencies. Not unexpectedly, the allocation of these various resources is an extremely controversial, competitive, and contested process.

In recent election cycles, Pakistan has seen an increase in the number of parties and candidates competing within each political constituency, alongside an increase in voter turnout and a decline in winning vote margins. Although there is significant variation in these trends by constituency and province, overall voter turnout in the 2002 election totaled 42 percent of eligible voters, while in increased to 45 percent in 2008 and to 55 percent in 2013 (IDEA 2013).

The importance of PAs has increased in recent years through several far-reaching governance reforms. A first step toward devolution occurred in 2009 when the National Finance

[3] A total of 272 general seats were contested in the 2008 election, however, elections were not held in NA constituency 42 (FATA – Bajaur) due to a military operation such that the ECP (2012) only recorded results for 271 seats.

[4] The graduate-level education requirement was abolished in 2010 with the 18th Amendment to the Constitution.

Commission (NFC) of Pakistan explicitly directed a greater share of federal resources to the provinces (particularly to Balochistan and Khyber Pakhtunkhwa) by including measures of poverty and inverse population density in the revenue-sharing formula, and to Sindh by including taxation indicators in the formula (Shah 2010). However, the more significant step occurred with the 18th Amendment to the Constitution in 2010, which devolved 17 major federal ministries and many essential development responsibilities to the provinces. Specifically, the 18th Amendment transferred a significant portion of economic and social services functions to the PA, including education, health, transfer of property, tourism, unemployment insurance, industry, agriculture and rural development, planning, welfare, and local development (Shah 2012; PILDAT 2010). While the federal government can still legislate in many of these services and sectors, its responsibilities are restricted to matters that pertain to overall national and international policy.[5]

There is much speculation suggesting that the recent elections, the 18th Amendment, and the orderly transition between civilian governments all signal a more secure tenure for democratic, civilian rule in Pakistan. Relatedly, there is also speculation that the now stronger democratic processes will demand higher levels of performance and accountability from elected officials. This is particularly true for PA members who now have greater responsibility for the prioritization, financing, and delivery of publicly-provided goods and services promised in their election campaigns. These new responsibilities may motivate PA members to support high-visibility investment projects—roads, irrigation canals, and energy projects—and may compel them to strengthen the delivery of public services such as health, education, drinking water, sanitation, or agricultural extension (Man and Mukand 2002; Arif *et al.* 2010). However, there is also the possibility that these new responsibilities will simply remain unfulfilled if the governance and managerial capacity of PAs is not commensurate to the electorate's expectations or the provincial development challenges.

2.2 Land tenure and policy in Pakistan

As Pakistan's voting base is predominantly rural, rural politics are central to Pakistani politics (Alavi 1971). Traditionally, politics in Pakistan has been influenced by strong patron-

[5] Among other services, it is responsible for defense, immigration and citizenship, telecommunications, national highways and strategic roads, nuclear energy, and international and interprovincial trade. There are certain joint subjects such as national planning and coordination, interprovincial coordination, supervision and management of public debt, railways, and minerals that are handled by the Council of Common Interest (Shah 2012).

client ties (Akramov *et al.* 2008; Cheema 2007; PSA 2011)—particularly in rural areas where wealth, 'zaat' or caste, and 'biradiri' or clan are closely tied to land tenure. Access to land is possibly the most important measure of economic and social status in Pakistan (Qureshi and Qureshi 2004). Land is central to the asset portfolio of most rural households (Jatileksono 1989).

The current pattern of land distribution in Pakistan dates back to the irrigation and settlement policies introduced during British colonial rule at the end of the 19th century (Gilmartin 2012; Ali 1988). During this period, the British distributed land grants within canal colonies in Punjab and Sindh to rural elites in exchange for their support. The elites' claims over land were backed by property rights granted under the Punjab Alienation Act in 1900, which reinforced the segmentation between cultivator and non-cultivator castes, and restricted the transfer of land between castes (PSA 2011). Over time, these settlement patterns and ownership rights transformed into entrenched socio-political power structures that effectively partitioned the elite from the dispossessed in modern Pakistan (Cheema and Mohmand 2006). This inequality has persisted in many parts of the country, both in terms of the prevalence of landlessness and the concentration of landholdings (PSA 2011; Anwar et al. 2005). An estimated 2 percent of the households in Pakistan control more than 45 percent of the country's land area (World Bank 2009a) (Table 1).

Table 1: Share of cultivated area in Pakistan by farm size and province, 2010

	Share of cultivated area (%) under farms of…				
Province	**<5 acres**	**5 to < 12.5 acres**	**12.5 to < 25 acres**	**25 to < 50 acres**	**>50 acres**
KPK	37	30	16	9	8
Balochistan	7	20	20	19	33
Punjab	23	37	20	10	10
Sindh	18	26	18	20	19
Pakistan	22	33	19	13	13

Source: PBS (2010)
Notes: KPK denotes Khyber Pakhtunkhwa. Some totals do not add up to 100 percent due to rounding.

Despite a series of state-led land redistribution programs between 1959 and 1977,[6] very little progress has been made in reversing the unequal distribution of land in Pakistan. On the

[6] The first round of reforms under Ayub Khan's administration in 1959 placed a ceiling on 500 acres of irrigated and 1,000 acres of unirrigated land. It is estimated that of the 2.5 million acres taken by the government, 2.3 million acres of land were distributed among 180,000 families. The second and more intensive round of reforms, under

whole, the land ownership Gini coefficient has increased from 0.66 in 1972 to 0.75 in 2000 for Pakistan, with the bulk of the increase attributable to Punjab and KPK (formerly the Northwest Frontier Province) (Qureshi and Qureshi 2004; World Bank 2007). Official figures also indicate that since independence, the prevalence of owner-cultivation has increased in Pakistan while the prevalence of crop-sharing has decreased (Cheema and Naseer 2010; see also Nasim et al. 2013).

Rural land values in Pakistan are closely tied to productivity-related indicators such as land suitability for agriculture. This is, in turn, tied to the availability and reliability of surface and ground water and the efficiency of administrative and socioeconomic institutions that govern water use (Aberman *et al.* 2013). Efficient, market-based exchanges of land in Pakistan are constrained by the high transaction costs imposed by: (1) the absence of clearly defined titles and property rights for many land parcels in the country; (2) the prevalence of customary land ownership rights that are outside the purview of common law; (3) the high frequency and cost of litigation over titles and rights; and (4) limited access to credit for tenants, landless agricultural laborers and small farmers (Qureshi and Qureshi 2004). Land is generally passed down between generations or sold informally according to local conventions, while formal exchanges of land ownership rights are rare, apart from cases of financial distress (Renkow 1991) or large-scale exchanges between large landowners (Qureshi and Qureshi 2004) (Table 2).

Table 2: Percent of land in Pakistan sold formally in 2010, by farm size and province

	Percent of land sold				
Province	**<5 acres**	**5 to < 12.5 acres**	**12.5 to < 25 acres**	**25 to < 50 acres**	**>50 acres**
KPK	0.3	0.3	0.4	0.4	0.4
Balochistan	0.3	1.1	0.3	0.4	0.5
Punjab	0.7	0.6	0.6	0.9	1.4
Sindh	0.1	0.3	0.2	0.1	0.1
Pakistan	0.6	0.5	0.5	0.5	0.7

Source: PBS (2010)
Notes: KPK denotes Khyber Pakhtunkhwa.

Despite these land market frictions, there is an active land rental market in Pakistan, characterized by several types of rental arrangements. Land is generally rented under one of two types of contracts: fixed rents and crop-sharing (Jacoby and Mansuri 2006). Fixed-rent

Prime Minister Z.A. Bhutto in 1972, lowered the ceiling to 150 acres of irrigated and 300 acres of unirrigated land. It is estimated that approximately 1.3 million acres of land were acquired by the state (Naqvi *et al.* 1987, in PSA 2011). The third and most recent Land Reform Act of 1977 was revoked following the military coup by General Zia-ul-Haq in 1978.

arrangements are generally fixed-term contracts in which cash payment is made by the renter to the landowner. Crop-sharing arrangements are not necessarily fixed-term contracts and are paid out by the tenant with a predetermined share of seasonal crop production. Crop-sharing arrangements may absolve the tenant of tax obligations to the government and reduce the tenant's liability for crop losses or failure. However, the arrangement is closely associated with institutions that severely limit tenure security and other social or economic rights of the tenants (Qureshi and Qureshi 2004). Crop-sharing arrangements are more prevalent in Sindh where landownership is particularly skewed toward large landowners, whereas in Punjab, land that is leased is evenly split between crop-sharing and fixed-rent arrangements (Jacoby and Mansuri 2009).[7] An estimated 79 percent of Pakistan's farm area is operated by owners while the remaining 21 percent is tenured under owner-cum-tenant or tenant arrangements and either cultivated directly (i.e., owned and self-operated) or rented out through crop-sharing or lease arrangements (Table 3).

Table 3: Share of farm area by cultivated area in Pakistan by farm size, tenure arrangement, and province, 2010

	Share of cultivated area (%) under farms of…				
Tenure arrangement	**<5 acres**	**5 to < 12.5 acres**	**12.5 to < 25 acres**	**25 to < 50 acres**	**>50 acres**
Owner	81.7	75.1	71.4	71.6	71.7
Owner-cum-tenant	5.7	12.1	16.8	18.4	20.5
-Owned self-operated	51.8	45.5	46.5	41.6	30.3
-Sharecropped	31.3	35.6	31.8	35.3	50.6
-Leased	13.1	16.4	18.6	19.3	14.4
-Other	3.8	2.6	3.1	3.8	4.8
Tenant	12.6	12.8	11.8	10.0	7.8
-Sharecropped	70.3	70.6	76.0	78.2	79.9
-Leased	28.9	28.2	21.9	20.1	19.3
-Other	0.8	1.1	2.1	1.7	0.8

Source: PBS (2010)
Note: KPK denotes Khyber Pakhtunkhwa. Totals may add up to more than 100 percent due to rounding.

Property transactions are subject to various laws designed to govern registration, transfers, and payment of taxes on these transactions.[8] Land ownership titling, demarcations, and

[8] These laws include the Transfer of Property Act of 1882 that outlines laws related to transfer of properties; the Registration Act of 1908 outlining the registration processes for land in Punjab and Sindh; the Stamp Act of 1899

exchanges are administered at the local level by powerful *patwaris*, or junior revenue officers, who serve under the land registrars of the provincial revenue boards (Ali and Nasir 2010; World Bank 2007). In the Punjab, land can be transferred through oral expression in the presence of the *patwari* (USAID 2008). The process of registering a property transaction through this local administrative system requires an average of 50 days, and costs on average 5.3 percent of the total value of the property—although these figures vary by province and district, with lower average costs reported for Punjab and KPK when compared to Sindh (USAID 2008; World Bank 2009b).

Land price data have not been published in Pakistan since 1947. However, several micro-level studies (Renkow 1991; Hirashima 1996; Hirashima 1978) find evidence of a decline—particularly during the Green Revolution period of 1976-1989—in the rent-price ratio, which would naturally reduce land purchases.[9]

In summary, the laws governing the ownership and exchange of land in Pakistan is a morass of colonial and customary laws that provides a weak legal and judicial framework. Thus, it is not surprising that land ownership is rarely registered, land ownership transfers often occur informally, that disputes taken to the courts can take years to resolve (USAID 2010; Ali and Nasir 2010), or that the amount of registered land nationwide remains unreported (SDPI 2008). Nor is it surprising that land is at the heart of politics in Pakistan.

3. Empirical Strategy

Our empirical analysis aims to uncover the impacts of political competition on land in rural Pakistan. We hypothesize that more intense competition increases land values and land rental. We do so by estimating the following fixed effects model:

$$Y_i = \beta_0 + \beta_1 P_j + \beta_2 \boldsymbol{X_i} + \alpha_k + \varepsilon_i \qquad (1)$$

that sets forth the use of revenue-generating stamps used in property transactions in Punjab and KPK; and the Land Revenue Act of 1967 that outlines the structure and functions of land and revenue department in Pakistan (USAID 2010).

[9] The Green Revolution saw the widespread adoption of improved wheat and rice varieties and the introduction of tractors and other mechanized farming implements.

where an observation is a plot of land indexed by *i*, *j* indexes the provincial assembly constituency (a political boundary) in which the plot lies, and *k* indexes the district in which the plot lies. α_k are district fixed effects. Y_i is one of several outcome variables. The three principal outcomes we consider are the logged land value of plot *i* (estimated by the head of the household cultivating the plot), a dummy for a landowning household renting out some of their land, and the share of owned land that is rented out. In companion analyses, Y_i is one of several village-level variables capturing the institutional and governance environment and the set of available amenities and public investments.

P_j is a Herfindahl–Hirschman Index (HHI) of political concentration in provincial assembly constituency *j* during the 2008 Provincial Assembly elections. For each provincial assembly constituency, the index is constructed by summing the squared vote shares (s_c) of all candidates $(c_1, \dots, c_n)$ in the constituency that competed in the Provincial Assembly elections:

$$P_j = \sum_{c=1}^{n} s_c^2$$

Since $s_c \in [0,1] \forall c$, $P_j \in [0,1]$. A higher value of P_j indicates greater political concentration, and thus less political competition. $P_j = 1$ only when a single candidate wins all votes cast, and adding an additional candidate who won votes would lower the value of P_j. Additionally, in two provincial assembly constituencies with the same number of candidates winning votes, the constituency with the closest to an "even" split of the votes (50 percent each in the case of 2 candidates, 33.3 percent each in the case of 3 candidates, 25 percent each in the case of 4 candidates, etc.) would have the lowest value of P_j.

$\boldsymbol{X_i}$ is a vector of characteristics from a 2012 household survey describing plot *i*, the household which farms the plot, and the village in which it is located. Six sets of controls are entered sequentially: geographic, plot-level, weather, household socioeconomic, household wealth and consumption variables; and distances to major cities (distance in kilometers to a city of 20,000 or more and to a city of 100,000 or more). These variables are detailed in the next section. District fixed effects control for the unique institutional, geographic, and social features of each district. These include provincial and district policies, institutions, and the level of public goods and services provision; district-level variation in soil quality, fertility, and weather patterns; and socio-economic and cultural differences between districts.

3.1 Data and data sources

Our primary data sources are Rounds 1 and 1.5 of the Pakistan Rural Household Panel Survey (RHPS), carried out in 2012 by the International Food Policy Research Institute (IFPRI) in collaboration with Innovative Development Strategies (IDS). The Round 1 survey, conducted in March-April 2012, covered 2,090 rural households across 76 rural villages in Punjab, Sindh, and KPK provinces using a multi-stage stratified random sampling approach.[10] The sampling frame excludes the province of Balochistan, FATA, and 13 of KPK's 24 districts because they were all considered unsafe for enumeration.

Of the 2,090 households covered in Round 1, a total of 980 households (47 percent) reported that they were directly engaged in the cultivation of at least one plot of land that was owned, rented, or crop-shared. These households—situated in 75 of the 76 villages that were initially surveyed—were interviewed again in Round 1.5 in October-November 2012. Note however, that in the time that elapsed between Round 1 and Round 1.5, 38 households (4 percent) of the households that were cultivating owned, rented, or crop-shared land in Round 1were not doing so when the Round 1.5 interviews were conducted, thus reducing the sub-sample to 942 households. Round 1.5 includes data on household demographics, assets, education, consumption, income, employment, credit, and plot characteristics.[11] Plot-level information included plot sizes, soil conditions, locations on the watercourse (canal), access to a tubewell or pump, perceived plot values, and tenancy status (owned, rented in, owned but rented out, crop-sharing in, or owned but crop-sharing out).

Data from both rounds were combined with information on village characteristics captured through a community questionnaire conducted during Round 1. The community questionnaire is based on responses from three-member focus groups of village leaders and other

[10] In the RHPS multi-stage, stratified sampling approach, the proportion of rural households in each province was used to determine the number of districts to be chosen from that province. A total of 19 districts were selected from the three provinces: 12 from Punjab, 5 from Sindh, and 2 from KPK. Districts in each province were then selected using a probability proportionate to size (PPS) technique. This gave districts with more rural households a greater probability of selection. In each district, four *mauzas* (revenue villages) were then randomly selected. In each *mauza*, 28 households were randomly selected without replacement. In each household, interviews were conducted with household heads, spouses of household heads, and select other household members. Only data from interviews with the household heads and from community focus groups are used in our analysis.

[11] Our analysis relies on data reported by the household head. Less than 2% of households were female-headed.

knowledgeable individuals, and provides information on the infrastructural, governance, institutional, and business environment of each village.

For our analysis, we construct two datasets. The first is a plot-level dataset which includes all plots owned, rented, or crop-shared by the 942 land-cultivating households surveyed in Round 1.5. This dataset includes 1,659 plots, and is used to analyze the impact of political competition on land values. The second is a household-level dataset, comprised of the 746 land-cultivating households in Round 1.5 that own at least one plot. This sample is used to analyze the impact of political competition on landowners' use of land rental and crop-sharing arrangements.

Control variables include geography variables (longitude, latitude, longitude × latitude, household elevation, farming systems/agro-ecological zones, and distances to major cities) that capture the suitability of the land with respect to agricultural production or other geographic determinants of land value; plot characteristics (area, soil type, soil fertility, erosion level, slope type, waterlogging, and salinity, to capture more site-specific determinants of land value), and; weather variables (average rainfall and average temperature in the village in which the plot is located, and their coefficients of variation—by season[12]—during the period 1981-2012) to capture climatic conditions that affect land values. Plot characteristics are summarized in Table 4, weather variables are summarized in Appendix Table A.1, and all other controls are summarized in Table 5. The average plot is 3.3 acres, is located 1.4 km from the home, and is within the village. It has clay loam soil of moderate fertility, is flat, and is not experiencing problems of erosion, waterlogging, or salinity. The plot is not irrigated, and there is no tubewell or pump located on the plot.

The rainfall and temperature data come from NASA-POWER satellite data, obtained from the NASA Langley Research Center POWER Project. We first computed the centroid of all households in a village using household GPS coordinates. We then found the rainfall and temperature for this village centroid for each month during 1981-2012 (the full period for which data are available) and constructed the weather variables described above. Data on National Assembly and Provincial Assembly election results was provided by the Election Commission of Pakistan,[13] and used to calculate measures of political competition in all constituencies.

Table 4: Summary statistics of plot characteristics for sampled plots

[12] We consider three seasons: Rabi (October – March), Kharif (April – June), and Monsoon (July – September).
[13] The election data was tabulated on http://elections.com.pk by PakTribune, a Pakistani news service.

Variable	Unit	Mean	S.D.
Plot area	acres	3.28	4.57
Distance of plot from household residence	km	1.39	14.19
Soil type (n=1,397)			
Soil type = sandy	1/0	0.10	0.30
Soil type = sandy loam	1/0	0.30	0.46
Soil type = loam	1/0	0.27	0.44
Soil type = clay loam	1/0	0.32	0.47
Soil type = clay	1/0	0.01	0.12
Soil conditions of plot (n=1,397)			
Soil fertility level = very fertile	1/0	0.15	0.36
Soil fertility level = moderate	1/0	0.77	0.42
Soil fertility level = poor	1/0	0.05	0.23
Soil fertility level = very poor/ not productive	1/0	0.02	0.13
Soil erosion = no erosion	1/0	0.83	0.38
Soil erosion = mild erosion	1/0	0.15	0.36
Soil erosion = severe erosion	1/0	0.02	0.15
Plot experiences waterlogging	1/0	0.16	0.37
Plot experiences salinity	1/0	0.13	0.34
Slope of plot (n=1,397)			
Slope = flat	1/0	0.70	0.46
Slope = slight slope	1/0	0.19	0.39
Slope = moderate slope	1/0	0.08	0.28
Slope = steep slope	1/0	0.03	0.17
Plot location (n=1,659)			
Plot located in village	1/0	0.77	0.42
Plot not canal irrigated	1/0	0.52	0.50
Plot location on watercourse = head	1/0	0.08	0.27
Plot location on watercourse = middle	1/0	0.23	0.42
Plot location on watercourse = tail	1/0	0.17	0.38
Tubewell/pump located on plot	1/0	0.21	0.41
Tenure status of plot (n=1,659)			
Tenure status = landowner	1/0	0.66	0.47
Tenure status = crop-sharing in/out	1/0	0.21	0.41
Tenure status = rent in/out	1/0	0.13	0.34
Agricultural rotations on plot (n=1,659)			
Crops = wheat/rice	1/0	0.14	0.35
Crops = wheat/ maize	1/0	0.09	0.29
Crops = wheat/sorghum	1/0	0.05	0.22
Crops = wheat/ cotton	1/0	0.29	0.45
Crops = wheat/ sugarcane	1/0	0.05	0.21
Crops = other	1/0	0.38	0.49

Source: Authors using Round 1.5, plot-level data (2012).

Table 5: Summary statistics at the plot level

Variable	Unit	Mean	S.D.	N
Household's perceived value of plot if sold today	Rs./acre	764,157	727,340	1659
Log household's perceived value of plot if sold today	ln(Rs./acre)	13.15	0.95	1659
Latitude	degrees	30.10	2.81	1657
Longitude	degrees	71.14	1.90	1657
Latitude x longitude	degrees	2145.34	243.32	1656
Household elevation (meters)	meters	144.42	97.30	1659
Standard deviation of elevation	std. dev.	13.76	16.64	1658
Household head uneducated	1/0	0.46	0.50	1659
Household head has up to primary education	1/0	0.19	0.40	1659
Household head has education above primary	1/0	0.34	0.47	1659
Log total wealth	ln(Rs. 10,000)	4.75	1.66	1659
Log per capita consumption	ln(Rs. 10,000)	-1.26	0.44	1659
Log distance to a city of 20,000+ population	ln(km)	9.16	0.58	1656
Log distance to a city of 100,000+ population	ln(km)	9.96	0.66	1656
Household rents out owned land (household level)	1/0	0.06	0.23	746
Share of owned land rented out (household level)	%	0.03	0.12	746

Source: Authors using Round 1.5, plot-level data and Round 1.5 household-level data (last two rows) (2012).

Note that the plot-level control variables described earlier cannot, by construction, be used in the household-level estimations. Instead, we use three land controls in these household-level estimations: total acres owned, total acres owned squared, and a dummy for the household having at least one plot located on the watercourse (canal). The household-level control variables include both household socio-economic variables (education level of the household head,[14] ethnicity of the household head, household size, and tenure status), and household wealth and consumption variables. On average, the households in our sample are headed by an uneducated male who is most likely to grow cotton and wheat on the plot. Among land-owning households, an average of six percent rent out some portion of their land, and the average share of owned land that is rented out (across all landowners) is three percent. Of those households in our sample that rent out, 79 percent do so through fixed-rent arrangements while 21 percent do so through crop-sharing arrangements.

[14] Head education dummies include: uneducated (base group), grade 1 to primary, and higher than primary.

3.2 Identification and instruments for political competition

The main threat to identification of a causal relationship between political competition and our outcome variables is the existence of unobserved covariates that are correlated with both political competition and household outcomes, including land values and the propensity to rent out plots of land. This could arise for several reasons. First, areas with high land values or more active land rental markets may be pleasant places to live that are proximate to urban centers and have many amenities. However, these features may encourage many candidates to compete in political races. Second, areas with low land values may be populated with many poor people whose political support is accordingly relatively cheap to earn. However, this may introduce more political competition since winning an election in such an area may be a relatively cheaper way to earn a provincial assembly seat. Third, areas with high land values and active land rental markets may be places with ample rent-seeking opportunities for politicians. However, this is likely to attract a great deal of political competition since the rewards of being in office will be accordingly higher. Fourth, places with lots of contested claims over land might have lower land values since such insecure property rights can have adverse effects on production and investment incentives (Besley 1996). However, such contested claims could open up opportunities for political competition for resources. The possibility of reverse causality is also a concern. An area with high land values and good governance is likely to attract lots of candidates to fight for its PA seat. Any of these possibilities would cause endogeneity problems that would bias ordinary least squares (OLS) estimates of $\beta_1$in Equation (1).

To address such threats to identification, we construct a simulated instrumental variable that captures plausibly exogenous variation in the level of political concentration, P_j in Provincial Assembly (PA) constituency *j* in 2008. The idea behind the instrument is as follows. All candidates in a PA constituency either run under a political party (with a maximum of one candidate per party) or as independents, and only one of them is chosen to represent the PA constituency. Each of their chances of election will be helped or harmed by how popular their party is on a national scale (or by how popular independent candidates are, on average, in the case of an independent). We thus exploit information on this national popularity as an exogenous "shock" to the share of votes received by a given candidate in a PA constituency political race.

Table 6 shows the number of votes cast for each party competing in the 2008 National Assembly elections, as well as the number of votes cast for independent candidates (Column 1).

Column (2) shows the share of votes that this represents. Columns (3) – (6) show the share of votes received by each of these parties in each of Pakistan's four main provinces.

Table 6: Voting results from the 2008 Pakistan National Assembly election, by party and province

Party	Total NA votes	Share (%)	Share (%) of NA votes in…			
			Balochistan	KPK	Punjab	Sindh
Pakistan People's Party	10,600,000	31.2	23.4	19.4	29.0	43.7
Pakistan Muslim League (Q)	7,270,579	21.4	23.3	16.0	26.3	12.2
Pakistan Muslim League (N)	7,078,343	20.8	3.6	12.1	31.2	1.7
Independents	3,829,048	11.3	24.5	16.3	11.7	2.4
Mohajar Qaumi Movement	2,565,023	7.5	0.3	0.1	0.1	30.4
Muttahida Majlis-e-Amal	757,294	2.2	14.1	14.5	0.2	0.8
Pakistan Muslim League (F)	680,300	2.0	0.0	0.0	0.8	6.1
Awami National Party	644,696	1.9	4.1	16.9	0.0	0.5
National Peoples Party	160,122	0.5	0.9	0.0	0.0	1.8
Pakistan People's Party (Sherpao)	124,734	0.4	0.0	3.8	0.0	0.0
Pakistan Democratic Party	84,025	0.3	0.0	0.0	0.4	0.0
Istiqlal Party	82,783	0.2	0.0	0.0	0.2	0.4
Balochistan National Party	72,956	0.2	5.9	0.0	0.0	0.0
Jamiat Ulam-e-Islam Pakistan	25,319	0.1	0.0	0.8	0.0	0.0
PPP (Shaheed Bhutto)	14,292	0.0	0.0	0.0	0.0	0.2
Pakistan Awami Party	5,975	0.0	0.0	0.2	0.0	0.0
Other*	8,573	0.0	0.0	0.0	0.0	0.0

Source: Authors, based on data from…

*Note: This category other includes those parties that obtained less than 5,000 votes, and includes the following parties: Ittehad Milli Hazara (3,009), Jamhoori Wattan Party (2,054), Pakistan Bachao Party (1,650), Sunni Tehrik (1,460), Pakistan Gharib Party (215), Mohajar Qaumi Movement Pakistan (104), Pakistan Qaumi League (72) and Pakistan Freedom Party (9). Totals may add up to more than 100% due to rounding.

From this table, it is fairly obvious that parties popular in one province are often not as popular in another province, and even the most popular parties do not compete in all constituencies. This type of heterogeneity is even more striking if one examines voting results at the NA constituency level (not shown). Pakistan's three most popular parties on the national scale fared very differently across different NA constituencies. In particular, the vote shares of the Pakistan People's Party and the Pakistan Muslim League (N) ranged from 0 to 100.0 percent, and those of the Pakistan Muslim League (Q) ranged from 0 to 82.4 percent.

The instrumental variable we construct, N_j, is a Herfindahl–Hirschman Index (HHI) of simulated (i.e. predicted) political concentration in provincial assembly constituency *j* in 2008. Just as for P_j, the index is a sum of squared vote shares. However, these vote shares are

computed somewhat differently. Instead of looking at the number of votes actually won by each competing candidate in the PA constituency, we look at the number of votes won by the candidate's *party* across *all* NA constituencies in the country other than the NA constituency in which PA constituency *j* is located. This captures the national popularity of that party (specifically, that part of its national popularity not influenced by its local popularity). In this way, we use NA, national aggregate data to assign a vote total to each party competing in PA constituency *j*.[15] Given these vote totals, we compute the share of votes earned that this implies for each party competing in the PA constituency. The instrument is then the sum of the squared vote shares, s_r of all parties $(r_1, \ldots, r_n)$ in the constituency that competed in the PA elections:

$$N_j = \sum_{r=1}^{n} s_r^2$$

Table 7 summarizes the political concentration indices for the sampled PA constituencies. The average political concentration index (P_j) is 0.41, with a standard deviation of 0.11, whereas the average simulated political concentration index (N_j) is 0.33, with a standard deviation of 0.08. Table 8 summarizes the range of possible values of the political concentration index. In Panels A and B, respectively, we show the minimum and maximum possible index value, given a set number of candidates competing and a set share of the vote earned by one of the candidates. With N candidates competing and one of them earning X percent of the vote, one would minimize political concentration by assigning (1-X)/(N-1)% of the vote to each of the N-1 remaining candidates. One would maximize political concentration by assigning (1-X) percent of the vote to the second candidate and 0 percent to each additional candidate. Comparing Panels A and B in Table 8, we can see, for example, that when 10 candidates compete and one of them wins 10 percent of the vote, the index could be anywhere between 0.10 (if the other 9 candidate each earn 10 percent of the vote) and 0.82 (if another candidate earns 90 percent of the vote and the other 8 earn 0 percent).

[15] If one or more candidates in the PA constituency run as independents, we treat this as if a party called the "Independent Party" were running. The sum of votes earned by all candidates running as independents in NA elections is used in the same way that the sum of votes earned by all NA candidates running under a specific party (e.g., the PML-N) is used.

Table 7: Summary statistics of political concentration and simulated political concentration

Variable	Mean	S.D.	N
Political concentration index (0-1)	0.41	0.11	1,659
Simulated political concentration index (0-1)	0.33	0.08	1,659

Source: Authors

The results from Table 9 are intuitive; with more candidates competing, there is a greater range of possible political concentration index values. The additional candidates can earn almost none of the vote, and therefore introduce almost no political competition into the electoral race (leading to a very high HHI), or they can generate a very close political race (leading to a very low HHI). Furthermore, for a given number of competing candidates, the HHI is minimized when there is the most even possible split of the votes. For two candidates, this is a 50–50 race; as we see from the corresponding row of Panel A, the political concentration index is minimized at 0.5 when each candidate has half of the votes. For three candidates, this is a 33.3–33.3–33.3 race; as we see from the corresponding row of Panel A, the political concentration index is minimized at 0.34 when there is this even split.

Table 8: Minimum and maximum possible values on Political Concentration Index given electoral outcome for one of the candidates

Panel A: Minimum possible Political Concentration Index values

Assume one candidate wins the following percentage of the vote:

Number of competing candidates:	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
3	0.42	0.36	0.34	0.34	0.38	0.44	0.54	0.66	0.82	1.00
4	0.28	0.25	0.25	0.28	0.33	0.41	0.52	0.65	0.81	1.00
5	0.21	0.20	0.21	0.25	0.31	0.40	0.51	0.65	0.81	1.00
6	0.17	0.17	0.19	0.23	0.30	0.39	0.51	0.65	0.81	1.00
7	0.15	0.15	0.17	0.22	0.29	0.39	0.51	0.65	0.81	1.00
8	0.13	0.13	0.16	0.21	0.29	0.38	0.50	0.65	0.81	1.00
9	0.11	0.12	0.15	0.21	0.28	0.38	0.50	0.65	0.81	1.00
10	0.10	0.11	0.14	0.20	0.28	0.38	0.50	0.64	0.81	1.00

Panel B: Maximum possible Political Concentration Index values

Assume one candidate wins the following percentage of the vote:

Number of competing candidates:	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
3	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
4	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
5	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
6	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
7	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
8	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
9	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00
10	0.82	0.68	0.58	0.52	0.50	0.52	0.58	0.68	0.82	1.00

Source: Authors.

Notes: For each cell, a number of competing candidates is assumed (it is not assumed that each gets a strictly positive share of the vote), one candidate's vote share is assumed, and the vote shares of other candidates are chosen to minimize (Panel A) or maximize (Panel B) the political concentration index.

In the next section, we show that simulated political concentration, N_j satisfies the inclusion restriction: it is a strong predictor of actual political concentration, P_j. For the instrument to be valid, the exclusion restriction requires that simulated political concentration only affects rural outcomes (our main outcomes being land values and the propensity to rent out

land) by affecting the actual degree of political concentration. It cannot be the case that simulated political concentration has a direct effect on rural outcomes, or that it has an effect running through omitted variables that themselves affect rural outcomes. As the simulated instrument uses data on the national popularity of each party (which is exogenous to the party's popularity in the local PA constituency), we argue that the exclusion restriction is satisfied.

4. Effect of political competition on land values and on land rental

4.1 OLS results

Table 9 presents OLS estimates of the effect of political concentration on land values in rural Pakistan. All regressions are carried out at the plot-level and include district fixed effects. Other controls are introduced sequentially in Columns (2) – (7). The coefficient on political concentration varies little with the inclusion of controls for geography, plot characteristics, weather, socio-economic characteristics, household wealth and consumption, and distance to cities. A standard deviation decrease in political concentration (a 0.11 unit decrease) is consistently associated with a 10 to 16 percent increase in rural land values. These findings are significant at the 1 percent level. In the baseline specification of Column (7), which includes the full set of controls, a standard deviation decrease in political concentration raises land values by 16 percent.[16] The results suggest a robust and positive relationship between political competition and rural land values (β_1<0).

[16] This is computed by taking $e^{1.366 \times 0.11} = 0.16$

Table 9: Effect of political competition on logged land values (OLS results)

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Political concentration index (0-1)	-1.136***	-1.306***	-0.880***	-1.163***	-1.162***	-1.202***	-1.366***
	(0.283)	(0.295)	(0.280)	(0.351)	(0.378)	(0.383)	(0.394)
Household latitude		8.408***	5.119**	8.318**	9.538**	9.608**	9.894**
		(2.238)	(2.344)	(3.704)	(3.881)	(3.888)	(4.060)
Household longitude		3.514***	2.294**	4.025***	4.459***	4.491***	4.751***
		(0.896)	(0.929)	(1.504)	(1.563)	(1.567)	(1.671)
Latitude x longitude		-0.118***	-0.073**	-0.117**	-0.133**	-0.135**	-0.139**
		(0.031)	(0.033)	(0.051)	(0.054)	(0.054)	(0.057)
Household elevation		0.004***	0.004***	0.004***	0.004***	0.004***	0.004***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Std. dev. of elevation		-0.012***	-0.007***	-0.002	-0.002	-0.001	-0.002
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Distance of plot from home			0.001***	0.001***	0.001***	0.002***	0.002***
			(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Soil erosion = mild			-0.183***	-0.057	-0.072	-0.068	-0.080
			(0.057)	(0.055)	(0.054)	(0.054)	(0.054)
Soil erosion = severe			-0.571***	-0.488***	-0.482***	-0.477***	-0.493***
			(0.127)	(0.121)	(0.118)	(0.119)	(0.120)
Plot experiences waterlogging			0.021	-0.045	-0.031	-0.029	-0.053
			(0.068)	(0.071)	(0.070)	(0.071)	(0.073)
Plot experiences salinity			-0.229***	-0.220***	-0.220***	-0.237***	-0.226***
			(0.076)	(0.075)	(0.073)	(0.073)	(0.073)
Plot located in village			-0.063	-0.024	-0.022	-0.025	-0.022
			(0.049)	(0.048)	(0.048)	(0.048)	(0.048)
Tubewell / pump on plot			0.066	0.000	0.007	0.009	0.006
			(0.044)	(0.044)	(0.045)	(0.046)	(0.046)
Watercourse location = head			0.467***	0.425***	0.415***	0.416***	0.420***
			(0.079)	(0.078)	(0.080)	(0.080)	(0.081)
Watercourse location = middle			0.408***	0.381***	0.380***	0.385***	0.394***
			(0.066)	(0.068)	(0.070)	(0.071)	(0.071)
Watercourse location = tail			0.265***	0.260***	0.262***	0.271***	0.270***
			(0.066)	(0.067)	(0.068)	(0.069)	(0.071)
Log dist. to city of 20,000 + pop							0.109**
							(0.043)
Log dist. to city of 100,000 + pop							-0.072
							(0.060)
Observations	1,659	1,655	1,393	1,393	1,390	1,390	1,390
R-squared	0.403	0.431	0.485	0.536	0.555	0.556	0.558
Controls for:							
Plot area, slope, soil type & fertility	No	No	Yes	Yes	Yes	Yes	Yes
Weather	No	No	No	Yes	Yes	Yes	Yes
Ethnicity, HH size & head education	No	No	No	No	Yes	Yes	Yes

Tenure status and crop rotation	No	No	No	No	Yes	Yes	Yes
HH wealth and consumption	No	No	No	No	No	Yes	Yes

Source: Authors

Notes: Robust standard errors are in parentheses. All estimates are at the plot level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

That the coefficient on political concentration varies little when we add controls suggests that omitted variables alone do not drive the results. Following Bellows and Miguel (2009), we use the change in the coefficient on political concentration following the addition of controls to estimate the relative importance of the omitted variables required to explain the entire effect of political concentration. Comparing specifications (1) and (7) in Table 10, we find that selection on unobservables would have to be 5.9 times greater than selection on our observable controls to itself account for the entire effect of political concentration.[17] The addition of other controls is thus unlikely to eliminate the relationship between political concentration and rural land values.

The signs on the control variables are generally intuitive. Both severe soil erosion and salinity significantly lower land values. Non-irrigated land is worth less than irrigated land, and among irrigated plots, it is better to have a plot at the head of the watercourse than in the middle, and better in the middle than at the tail. Plots near a city of 20,000 or more population are worth more than those that are not. Finally, experiencing water-logging, being located on more rugged terrain (as evidenced by the standard deviation of elevation in the village), having a tubewell or pump on the plot, and being closer to a city of 100,000 population or higher do not significantly affect rural land values in the presence of the other controls.

Table 10 presents OLS estimates of the effect of political competition on two measures of landowners' use of land rental arrangements: i) a dummy for the household renting out land (Panel A) and ii) the share of owned land that is rented out (Panel B). All of these regressions are carried out at the household-level, and include only those land-cultivating households that own land (and could thus take the decisions to rent out that land). For both measures, we find that greater political competition (a lower value on the political concentration index) significantly

[17] Following Bellows and Miguel (2009), the ratio is computed as follows (where C denotes "controls," and NC denotes "no controls"): $\frac{\beta_1 \, OLS,C}{\beta_1 \, OLS,NC - \beta_1 \, OLS,C} = \frac{-1.366}{-1.136+1.366} = -5.9$

increases land rental (β_1<0). Once again, all specifications include district fixed effects, and other controls are introduced sequentially in columns (2) – (7).

Panel A shows that a standard deviation decrease in political concentration (0.11 units) is associated with a 4–5 percentage point increase in the probability of renting out land. This is a sizeable, 61-94 percent increase over the mean rate (about 6 percent of landowners rent out land, on average). Panel B shows that political competition is not only associated with more rental arrangements, but also with a greater share of total owned land being rented or crop-shared. A standard deviation decrease in political concentration is associated with an additional 2–3 percentage points of the average landowner's land being rented out. These findings suggest a robust and positive relationship between political competition and renting land. In the baseline specifications of Column (7), with the full set of controls, a standard deviation decrease in political concentration is associated with a 5 percentage point increase in the probability of renting or crop-sharing and a 3 percentage point increase in the share of land rented out.

Comparing Specifications (1) and (7) in Table 10, Panel A, we find that selection on unobservables would have to be 2.9 times greater than selection on observables to itself account for the entire effect of political concentration of the prevalence of land rental arrangements.[18] In Panel B, we find a similar ratio. The addition of other controls is thus unlikely to eliminate the relationship between political concentration and land rental arrangements.

[18] Following Bellows and Miguel (2009), the ratio is computed as follows (where C denotes "controls," and NC denotes "no controls"): $\frac{\beta_{1\,OLS,C}}{\beta_{1\,OLS,NC} - \beta_{1\,OLS,C}} = \frac{-0.498}{-0.328+0.498} = -2.9$

Table 10: The effect of political competition on landowners' use of rental arrangements (OLS results)

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Dependent variable - Household renting out land (0/1)							
Political concentration index (0-1)	-0.328**	-0.485***	-0.402	-0.372*	-0.372*	-0.372*	-0.498**
	(0.161)	(0.180)	(0.246)	(0.204)	(0.204)	(0.204)	(0.208)
Observations	746	743	743	743	743	743	743
R-squared	0.037	0.053	0.066	0.164	0.164	0.164	0.172
Panel B: Dependent variable - Share of owned land rented out (%)							
Political concentration index (0-1)	-0.156**	-0.238***	-0.245**	-0.231**	-0.231**	-0.231**	-0.283***
	(0.078)	(0.087)	(0.120)	(0.105)	(0.105)	(0.105)	(0.105)
Observations	746	743	743	743	743	743	743
R-squared	0.034	0.047	0.061	0.140	0.140	0.140	0.145
Controls for:							
Geographic controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Weather controls	No	No	Yes	Yes	Yes	Yes	Yes
Acres owned, acres owned squared, and watercourse access	No	No	No	Yes	Yes	Yes	Yes
Ethnicity, HH size, head education, and crop rotation	No	No	No	No	Yes	Yes	Yes
HH wealth and consumption	No	No	No	No	No	Yes	Yes
Distance to major cities	No	No	No	No	No	No	Yes

Source: Authors.

Notes: Robust standard errors are in parentheses. All estimates are at the household level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

4.2 IV first stage results

Table 11 presents estimates from the first-stage regression using the plot-level dataset. All specifications include district fixed effects. Simulated political concentration is robustly positively correlated with observed political competition in all specifications. The baseline specification in Column (6), which includes the full set of controls, indicates that a 1.0 unit increase in simulated political concentration raises observed political concentration by 0.62. The F-statistic on the excluded instrument is 352, indicating that this is a robustly strong predictor of political concentration and there is no problem of weak instruments. The national popularity of the parties competing in a given PA constituency strongly predicts the success of those parties at the PA constituency level, and thus helps predict the resulting level of political concentration.

Table 11: IV first stage results at the plot level, showing the effect of simulated political competition on observed political competition

Explanatory variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Simulated political concentration index (0-1)	0.535***	0.486***	0.601***	0.587***	0.599***	0.617***
	(0.040)	(0.043)	(0.030)	(0.034)	(0.033)	(0.033)
Household latitude	1.049***	1.057***	-0.528**	-0.489*	-0.472*	-0.815***
	(0.139)	(0.159)	(0.257)	(0.261)	(0.258)	(0.293)
Household longitude	0.373***	0.386***	-0.247**	-0.246**	-0.241**	-0.391***
	(0.060)	(0.066)	(0.105)	(0.107)	(0.105)	(0.126)
Latitude x longitude	-0.015***	-0.015***	0.008**	0.008**	0.008**	0.013***
	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)	(0.004)
Household elevation	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Standard deviation of elevation	0.000***	0.000**	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Distance of plot from home		0.000***	0.000***	0.000	0.000	0.000*
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Soil erosion = mild		0.015***	0.005	0.004	0.004	0.002
		(0.005)	(0.004)	(0.004)	(0.004)	(0.003)
Soil erosion = severe		0.041***	0.015*	0.015*	0.011	0.004
		(0.014)	(0.008)	(0.009)	(0.009)	(0.008)
Plot experiences waterlogging		0.007	0.012**	0.012**	0.012***	0.005
		(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Plot experiences salinity		-0.019***	-0.026***	-0.023***	-0.023***	-0.019***
		(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Dummy - plot located in village		-0.003	0.003	0.001	-0.000	0.000
		(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Tubewell/pump on plot		0.006	0.010***	0.009***	0.010***	0.009***
		(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Watercourse location = head		-0.006	-0.005	-0.005	-0.008*	-0.005
		(0.006)	(0.005)	(0.004)	(0.004)	(0.004)
Watercourse location = middle		-0.004	-0.003	-0.002	-0.003	0.002
		(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Watercourse location = tail		0.009*	0.004	0.006	0.005	0.007*
		(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Log distance to city of 20,000 + pop						0.026***
						(0.003)
Log distance to city of 100,000 + pop						0.007
						(0.005)
Observations	1,655	1,393	1,393	1,390	1,390	1,390
R-squared	0.771	0.774	0.873	0.887	0.890	0.897
Controls for:						
Plot area, slope, soil type & fertility	No	Yes	Yes	Yes	Yes	Yes
Weather	No	No	Yes	Yes	Yes	Yes
Ethnicity, HH size & head education	No	No	No	Yes	Yes	Yes
Tenure status and crop rotation	No	No	No	Yes	Yes	Yes
HH wealth and consumption	No	No	No	No	Yes	Yes
F Statistic on excluded instrument	180.0	126.4	391.0	304.1	323.4	352.4

Source: Authors.
Notes: Robust standard errors are in parentheses. All estimates are at the plot level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

Table 12 presents estimates from the first-stage regression using the household-level dataset. Once again, simulated political concentration is robustly positively correlated with observed political concentration in all specifications. The baseline specification in Column (6), which includes the full set of controls, indicates that a 1.0 unit increase in simulated political concentration raises observed political concentration by 0.63. The F-statistic on the excluded instrument is 226—still very high and indicating no problem of weak instruments. Together, these results indicate that simulated political competition satisfied the inclusion restriction whether we use a plot-level or a household-level dataset.

Table 12: IV first stage results at the household level, showing the effect of simulated political competition on observed political competition

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)
Political concentration index (0-1)	0.499***	0.561***	0.563***	0.563***	0.563***	0.629***
	(0.061)	(0.043)	(0.044)	(0.044)	(0.044)	(0.042)
Household latitude	0.572***	-1.479***	-1.472***	-1.472***	-1.472***	-2.686***
	(0.170)	(0.329)	(0.329)	(0.329)	(0.329)	(0.451)
Household longitude	0.122*	-0.678***	-0.676***	-0.676***	-0.676***	-1.234***
	(0.074)	(0.142)	(0.141)	(0.141)	(0.141)	(0.202)
Latitude x longitude	-0.008***	0.021***	0.021***	0.021***	0.021***	0.039***
	(0.002)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Household elevation (meters)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Standard deviation of elevation	0.001***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Total acres owned (100s)			-0.032	-0.032	-0.032	-0.000
			(0.045)	(0.045)	(0.045)	(0.038)
Total acres owned (100s), squared			0.033	0.033	0.033	0.029
			(0.061)	(0.061)	(0.061)	(0.051)
Dummy – HH has some land located on watercourse			-0.001	-0.001	-0.001	0.006
			(0.005)	(0.005)	(0.005)	(0.005)
Log distance to city of 20,000 + pop						0.038***
						(0.004)
Log distance to city of 100,000 + pop						0.033***
						(0.008)
Observations	743	743	743	743	743	743
R-squared	0.785	0.884	0.885	0.885	0.885	0.906
Weather controls?	No	Yes	Yes	Yes	Yes	Yes

Source: Authors.

Notes: Robust standard errors are in parentheses. All estimates are at the household level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

4.3 IV second stage results

Table 13 presents IV estimates of the effects of political competition on land values; Columns (1) - (6) correspond with the OLS estimates in Columns (2) – (7) of Table 10. The IV results similarly suggest that political competition significantly raises rural land values. In the baseline specification with the full set of controls (Column 6), a standard deviation decrease in political concentration (0.11 units) leads to a 36 percent increase in rural land values. This finding is statistically significant at the 1 percent level, and suggests a large impact. The OLS point estimate is just outside the 95 percent confidence interval around this estimate, indicating

that the IV estimate is statistically distinguishable from the OLS estimate at the 95 percent level of confidence (though it is not significantly different at the 99 percent confidence level).

Table 13: IV Results at the plot level showing the effect of political competition on logged land values

Explanatory variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Political concentration index (0-1)	-4.460***	-3.623***	-2.931***	-2.904***	-2.810***	-2.796***
	(0.716)	(0.784)	(0.646)	(0.704)	(0.695)	(0.701)
Household latitude	12.358***	8.547***	9.970***	10.934***	10.948***	10.879***
	(2.461)	(2.628)	(3.674)	(3.788)	(3.794)	(3.967)
Household longitude	4.966***	3.575***	4.592***	4.888***	4.905***	5.047***
	(0.986)	(1.038)	(1.485)	(1.515)	(1.519)	(1.627)
Latitude x longitude	-0.173***	-0.121***	-0.137***	-0.150***	-0.150***	-0.150***
	(0.034)	(0.037)	(0.051)	(0.052)	(0.053)	(0.055)
Household elevation (meters)	0.005***	0.005***	0.005***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Standard deviation of elevation	-0.011***	-0.007***	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Distance of plot from home (km)		0.001***	0.001***	0.001***	0.002***	0.002***
		(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Soil erosion = mild		-0.149**	-0.059	-0.075	-0.071	-0.086
		(0.059)	(0.055)	(0.053)	(0.053)	(0.053)
Soil erosion = severe		-0.406***	-0.441***	-0.438***	-0.440***	-0.469***
		(0.128)	(0.117)	(0.114)	(0.115)	(0.116)
Plot experiences waterlogging		0.032	-0.040	-0.022	-0.021	-0.054
		(0.072)	(0.070)	(0.069)	(0.069)	(0.071)
Plot experiences salinity		-0.285***	-0.261***	-0.254***	-0.268***	-0.248***
		(0.082)	(0.076)	(0.073)	(0.073)	(0.073)
Dummy - plot located in village		-0.071	-0.017	-0.022	-0.027	-0.023
		(0.050)	(0.048)	(0.048)	(0.048)	(0.047)
Tubewell / pump on plot		0.063	0.007	0.011	0.015	0.010
		(0.045)	(0.044)	(0.045)	(0.045)	(0.045)
Watercourse location = head		0.450***	0.435***	0.421***	0.418***	0.425***
		(0.081)	(0.078)	(0.079)	(0.079)	(0.079)
Watercourse location = middle		0.383***	0.381***	0.382***	0.385***	0.400***
		(0.067)	(0.068)	(0.069)	(0.069)	(0.069)
Watercourse location = tail		0.283***	0.270***	0.278***	0.285***	0.283***
		(0.067)	(0.067)	(0.067)	(0.068)	(0.069)
Log distance to city of 20,000 + pop						0.142***
						(0.044)
Log distance to city of 100,000 + pop						-0.076
						(0.059)
Observations	1,655	1,393	1,393	1,390	1,390	1,390
Controls for:						
Plot area, slope, soil type & fertility	No	Yes	Yes	Yes	Yes	Yes
Weather	No	No	Yes	Yes	Yes	Yes
Ethnicity, HH size, & head	No	No	No	Yes	Yes	Yes

education						
Tenure status and crop rotation	No	No	No	Yes	Yes	Yes
HH wealth and consumption	No	No	No	No	Yes	Yes
First-stage F Statistic	180.0	126.4	391.0	304.1	323.4	352.4

Source: Authors.

Notes: Robust standard errors are in parentheses. All estimates are at the plot level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

Table 14 presents IV estimates of the effects of political competition on use of rental arrangements that correspond with the OLS estimates of Table 11. From the baseline specification of Column (6) (with the full set of controls), a standard deviation decrease in political concentration leads, on average, to an 8 percentage point increase in the share of landowners renting out land (a more than doubling of the average rate) and an additional 4 percentage points of each landowner's land being rented out. Each of the corresponding OLS point estimates are within the 95 percent confidence interval around these IV estimates, making the IV estimates statistically indistinguishable from the OLS estimates at the 95 percent level of confidence.

Table 14: Effect of political competition on landowners' use of rental arrangements (IV results)

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Dependent variable - Dummy for the household renting out land						
Political concentration index (0-1)	-0.804**	-0.826**	-0.880***	-0.880***	-0.880***	-0.714**
	(0.321)	(0.334)	(0.303)	(0.303)	(0.303)	(0.280)
Panel B: Dependent variable - Share of owned land rented out						
Political concentration index (0-1)	-0.400*	-0.422**	-0.444**	-0.444**	-0.444**	-0.375**
	(0.206)	(0.186)	(0.173)	(0.173)	(0.173)	(0.169)
Observations	743	743	743	743	743	743
First-stage F Statistic	67.91	167.4	164.9	164.9	164.9	226.0
Controls for:						
Geography	Yes	Yes	Yes	Yes	Yes	Yes
Weather	No	Yes	Yes	Yes	Yes	Yes
Acres owned, acres owned squared, and watercourse access	No	No	Yes	Yes	Yes	Yes
Ethnicity, HH size, head education, and crop type	No	No	No	Yes	Yes	Yes
HH wealth and consumption	No	No	No	No	Yes	Yes
Distance to major cities	No	No	No	No	No	Yes

Source: Authors.

Notes: Robust standard errors are in parentheses. All estimates are at the household level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

4.4 Results by household poverty level

In order to better understand the heterogeneous impacts of political competition, we separately examined the effects estimated above on relatively poor households and less poor households. To do so, we segmented plots into poverty categories in two ways. First, we looked at the per capita expenditure of the household that manages the plot, and divided plots into those managed by households in the bottom and the top half of per capita household expenditure. Second, we looked at the total wealth of the household that manages the plot, and divided plots into those in the bottom and top half of wealth. For both the consumption and wealth definitions of poverty, we refer to the bottom half as the poorest half and the top half as the least poor half. One might expect political competition to disproportionately raise the land values of poorer households, since they typically have less access to channels of patronage and therefore reap fewer benefits in political settings controlled by a few dominating elites. We investigate this hypothesis in Table 16.

Table 15 presents OLS and IV estimates of the impact of political concentration on land values by poverty level. Columns (1) and (2) consider plots managed by the poorest half of households, while Columns (3) and (4) consider plots managed by the least poor half of households. We estimate a model that includes all but socioeconomic, expenditure, and wealth controls (Columns 1 and 3) and a model that includes the full set of controls (Columns 2 and 4).

Panels A and B present OLS and IV results, respectively, using the per capita expenditure measure of poverty. From Columns (2) and (4) of Panel A, we see that a standard deviation decrease in political concentration raises land values by 18 percent for the poorest half, but by only 12 percent for the least poor half (both effects are statistically significant at the 5 percent level). Panel B presents the corresponding IV results. Here, the difference between the effect of political competition on the poor and on the less poor in Columns (2) and (4) is even more dramatic; a standard deviation increase in political competition raises land values by 79 percent for the poorest half (significant at the 1 percent level) but does not have a statistically significant impact on the land values of the least poor households.

Panels C and D present OLS and IV results, respectively, using the total household wealth measure of poverty. From Columns (2) and (4) of Panel C, a standard deviation decrease in political concentration raises land values by 19 percent for the poorest half (significant at the 5 percent level), but has no economically or statistically significant impact on the least poor. Panel

D presents the corresponding IV results, showing that a standard deviation increase in political competition raises land values by 52 percent for the poorest half, but by only 28 percent for the least poor half (both effects are significant at the 1 percent level).

Table 15: OLS and IV results, showing the effect of political competition on logged land values by households poverty level

	(1)	(2)	(3)	(4)
	Poorest half		Least poor half	
Panel A: OLS, per capita expenditure measure of poverty				
Political concentration index (0-1)	-2.055***	-1.529**	-0.888*	-1.030**
	(0.599)	(0.685)	(0.455)	(0.462)
Observations	684	684	709	706
R-squared	0.593	0.624	0.519	0.570
Socioeconomic controls?	No	Yes	No	Yes
Panel B: IV, per capita expenditure measure of poverty				
Political concentration index (0-1)	-5.502***	-5.295***	-1.229	-1.019
	(1.077)	(1.384)	(0.774)	(0.797)
Observations	684	684	709	706
Firststage F Statistic	150.1	88.66	213.4	179.6
Socioeconomic controls?	No	Yes	No	Yes
Panel C: OLS, total household wealth measure of poverty				
Political concentration index (0-1)	-1.364**	-1.563**	-0.593	-0.102
	(0.635)	(0.662)	(0.520)	(0.544)
Observations	702	701	691	689
R-squared	0.581	0.623	0.451	0.498
Socioeconomic controls?	No	Yes	No	Yes
Panel D: IV, total household wealth measure of poverty				
Political concentration index (0-1)	-4.567***	-3.787***	-2.281***	-2.206***
	(1.207)	(1.420)	(0.716)	(0.759)
Observations	702	701	690	688
Firststage F Statistic	118.1	87.40	381.6	479.7
Socioeconomic controls?	No	Yes	No	Yes

Source: Authors.
Notes: Robust standard errors are in parentheses. All estimates are at the household level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

Combined, these results suggest that it is the poorest half of households that see the largest increase in land values as a result of greater political competition in their PA constituency. Higher land values are likely to especially benefit those who own land; renters may see higher land rental prices as a result, so may not benefit.

Table 16 presents OLS and IV results showing how political competition affects households' propensity to engage in rental arrangements. As in the plot-level analysis, we define poverty by both a per capita expenditure and a household wealth measure. In contrast to the land values regressions, it is apparent that it is the *least* poor half of households that is most affected by political competition. A standard deviation decrease in political concentration is associated with between an 8 (OLS results, Panel A) and 13 (IV results, Panel B) percentage point increase in the likelihood that a landowner in the top half of per capita consumption rents out land. However, political competition has no statistically significant effect on the propensity to rent out land for landowners in the bottom half of per capita consumption. We find similar results when defining poverty by wealth (Panels C and D). It may be the case that poorer land owners need all of their land to subsist, and their behavior is therefore unaffected by political competition. Richer land owners, on the other hand, may have excess land and make rental decisions based on the political and institutional environment.

Table 16: Effect of political competition on landowners' use of rental arrangements (OLS and IV results)

	(1)	(2)	(3)	(4)
	Poorest half		Least poor half	
Dependent variable:	**Dummy for household renting out land**	**Share of owned land rented out**	**Dummy for household renting out land**	**Share of owned land rented out**
Variable mean, consumption measure:	**0.053**	**0.026**	**0.062**	**0.024**
Variable mean, wealth measure:	**0.011**	**0.008**	**0.086**	**0.035**
Panel A: OLS, per capita expenditure measure of poverty				
Political concentration index (0-1)	-0.107	-0.075	-0.723**	-0.395**
	(0.233)	(0.086)	(0.312)	(0.172)
Observations	358	358	385	385
R-squared	0.206	0.154	0.221	0.227
Panel B: IV, per capita expenditure measure of poverty				
Political concentration index (0-1)	-0.599	-0.310	-1.143***	-0.570***
	(0.407)	(0.248)	(0.385)	(0.211)
Observations	357	357	384	384
Firststage F Statistic	113.8	113.8	102.8	102.8
Panel C: OLS, total household wealth measure of poverty				
Political concentration index (0-1)	0.022	0.013	-0.663**	-0.355**
	(0.067)	(0.057)	(0.291)	(0.153)
Observations	280	280	463	463
R-squared	0.232	0.260	0.197	0.192
Panel D: IV, total household wealth measure of poverty				
Political concentration index (0-1)	-0.272	-0.240	-1.031***	-0.481***
	(0.186)	(0.174)	(0.333)	(0.182)
Observations	279	279	462	462
Firststage F Statistic	39.15	39.15	246.1	246.1

Source: Authors.

Notes: Robust standard errors are in parentheses. All estimates are at the household level and include district-level fixed effects. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively. Note that poorest half and least poor half sample sizes do not match because all households are divided into the poorest and least poor halves, but these regressions include only land-owning households.

A standard deviation decrease in political concentration is also associated with between a 4 (OLS results, Panel A) and 6 (IV results, Panel B) percentage point increase in the share of owned land that is rented out by landowners in the top half of per capita consumption. However, again political competition has no statistically significant impact on the share of land rented out by landowners in the bottom half of per capita consumption. Once again, the results are substantially unchanged when we instead measure poverty using the household wealth measure

(Panels C and D). It seems that poor, landowning households fail to rent out land because they are actively using it—a need that is invariant to the level of political competition. On the contrary, the level of political competition may—through a number of institutional and public expenditure mechanisms explored in the next section—affect the decisions of less poor households, who may not need to farm all of their land.

5. Potential Causal Channels

Earlier, we reviewed three strands of literature suggesting mechanisms through which political competition raises rural land values and increases land rental. First, competition may lead to better laws, institutions, and governance. Second, political competition may lead to more efficient and higher investments in publicly-provided goods, and better communal amenities more generally. Third, political competition may affect the security situation in a village. In this section, we explore these potential causal channels by examining how political competition affects a number of outcome variables capturing both the institutional environment and public investment and village amenities.

To capture laws, institutions, and governance as they apply in a rural setting, we use nine variables, summarized in Table 17. Five variables were derived from the RHPS household survey: the household head's perceived access to justice,[19] a dummy for the head feeling that he/she could sell the land they own at a fair price if they wanted to (73 percent of landowners felt they could), a dummy for the head feeling that he/she could sell their livestock at a fair price if desired to do so (70 percent of livestock owners felt they could), a dummy for most landowners having a legal document for at least some type of property, and a dummy for the presence of organized meetings of village residents to discuss village issues and events. The remaining four variables were derived from the RHPS community survey, and pertain specifically to focus group respondents' perceptions of major constraint on businesses: it is expensive or tedious to

[19] The exact questions used asked respondents if they strongly disagree (1), disagree (2), agree (3), or strongly agree (4) with a given statement. These statements are: 1) The laws and law enforcement in my community generally prevent crime; 2) If someone commits a crime against me, members of my community will be able to help me; 3) If someone commits a crime against me, the police will be able to help me; 4) If someone commits a crime against me, I can get justice through the courts system; 5) In the end, victims of crime usually see justice done; 6) I can get justice through the courts if someone tries to take my land; 7) A land title means that I can get justice through the courts if someone tries to take away my land; and 8) Being harassed by the police is a problem for young men in my community. Questions for which 1 indicates a high sense of access to justice were reverse-coded so that high scores on each of the eight components always indicate greater sense of access to justice. These eight scores where then individually normalized, and the eight were then averaged.

register/license a business; heavy government regulation of land or labor; heavy government regulation of prices or agricultural production; and poor access to markets or market information.

To capture government investments and community amenities which government policies may impact, we use ten variables also derived from the RHPS community survey and summarized in Table 17: dummies for the village having an electricity connection, a natural gas supply, a sewage system, mud roads as the most common village road surface, and public transport available to the nearest city; the distance to the nearest clinic/dispensary (km); a dummy for having received information on crop or livestock production within the past year from a source other than an extension agent; a dummy for any household member having met with an extension agent within the past year; and dummies for the village having had the Watan Card flood relief program in the village by 2010 (a year of major flooding) and having citizens benefitting from the Benazir Income Support Program (BISP) [20] by 2010.

[20] The Benazir Income Support Programme (BISP) is a social protection program of the Government of Pakistan that began implementation in 2008/09' across Pakistan to provide cash assistance to qualifying recipients along with vocational technical training, loans, and insurance services as part of its graduation strategy. See GOP (2011).

Table 17: Summary statistics, institutional environment and public investment variables

Variable	Mean	S.D.	N
Panel A: Institutions and governance outcomes			
Justice score (uses 8 questions on perceived access)	0.15	0.52	1290
Dummy - head feels could sell owned land at a fair price if desired	0.73	0.44	1049
Dummy - head feels could sell livestock at a fair price if desired	0.70	0.46	1189
Most people in village have legal documents for at least some type of land	0.91	0.29	1618
Dummy - There are organized meetings of village residents to discuss village issues and events	0.57	0.50	1659
Dummy - That it is expensive or tedious to register/license business is a constraint on business	0.27	0.44	1659
Dummy - Heavy government regulation of land or labor is a constraint on business	0.19	0.39	1659
Dummy - Heavy government regulation of prices or agricultural production is a constraint on business	0.34	0.47	1659
Dummy - Poor access to markets or market information is a constraint on business	0.51	0.50	1659
Panel B: Amenities and public sector investment outcomes			
Dummy - Village has an electricity connection	0.93	0.26	1659
Dummy - Village has a natural gas supply	0.07	0.26	1659
Dummy - Village has a sewage system	0.14	0.35	1659
Dummy - The most common surface of village roads is mud	0.69	0.46	1659
Dummy - Public transport available to nearest city	0.70	0.46	1659
Distance to nearest Clinic/Dispensary (km)	5.43	5.72	1659
Dummy - Received information on crop or livestock production within the past year from a source other than an extension agent (Round 1.5)	0.29	0.45	1659
Dummy - Any HH member met with an extension agent within the past year (Round 1.5)	0.24	0.42	1659
Dummy - Village had Watan Card program by 2010	0.16	0.37	1659
Dummy - Village had Benazir Income Support Program (BISP) by 2010	0.68	0.47	1659

Source: Authors.
Notes: Unless otherwise indicated, all dependent variables come from Round 1 of the Pakistan RHPS survey.

Table 18 presents IV results showing the effect of political concentration on each of the nine institutions and governance outcomes (Panel A) and 10 amenities and public sector investment outcomes (Panel B). From Panel A, we see that greater political concentration leads to a decreased sense of access to justice, a lower perceived ability to sell land (though a higher prevalence of legal documents for land), and more governance-related constraints on business. Column (1) shows that a standard deviation decrease in political concentration leads to a (-0.11 × -1.14) = 0.12 unit increase in perceived access to justice, which is a 0.24 standard deviation increase. Column (2) shows that the same decrease in political competition makes households 10 percentage points (-0.11 × 0.93 = 0.10) more likely to feel that they could sell owned land at a

fair price if they wanted to. A similar effect is not found for the perceived ability to sell livestock (Column 3). This easier perceived ability to sell land comes despite the fact that households become 3 percentage points less likely to live in a village where most people have legal documents for some type of land (Column 4)—a modest, 3.5 percent decrease from the mean.

There appears to be no impact of political concentration on the prevalence of village meetings to discuss village issues and events (Column 5). However, there is a large impact of political competition on perceptions that the government places constraints on businesses. While there is not a significant effect of political concentration on the perception that the expense and tedium of registering or licensing a business is a constraint on business (Column 6), political concentration seems to have many other effects on the business climate. A standard deviation decrease in political concentration leads to a 9 percentage point decrease in the perception that government regulation of land or labor is a constraint (Column 7), a 6 percentage point decrease in the perception that government regulation of prices or agricultural production is a constraint (Column 8), and a 47 percentage point decrease in the perception that poor access to markets or market information is a constraint (Column 9). Combined, these findings suggest that the institutional and governance environment—and what they imply for the business climate—may be one important mechanism through which political competition raises rural land values.

Table 18, Panel B, shows that greater political concentration leads to less access to amenities, extensions services, and social protection. A standard deviation decrease in political concentration leads to an 8 percentage point increase in village electrification (Column 1), a 12 percentage point increase in village access to natural gas (Column 2), though no impact on access to a sewage system (Column 3). The village becomes 16 percentage points less likely to have mud as its main road surface (Column 4), 12 percentage points more likely to have public transportation available to the nearest city (Column 5), and has a health clinic or dispensary that is 1.5 km closer to the village (Column 6). Citizens in the village are 10 percentage points more likely to have received information on crop or livestock production within the past year from a source other than an extension agent (Column 7), and 9 percentage points more likely to have been visited by an extension agent (Column 8). The village is also 39 percentage points more likely to have the Watan Card program in place in 2010 (Column 9), though no more likely to have citizens benefiting from the BISP by 2010 (Column 10). These findings suggest that greater

provision of productivity-enhancing public investments and amenities may be another important mechanism through which political competition raises rural land values.

Table 18: Effect of political competition on the institutional environment and public investment (IV results)

	Dependent variable	Coeff.	S.E.	N	R^2
Panel A: Institutions and Governance Outcomes					
(1)	Justice score (uses 8 questions on perceived access) (Aspirations survey)	-1.135**	(0.448)	1,081	0.114
(2)	Dummy - head feels could sell owned land at a fair price if desired (Aspirations survey)	-0.926*	(0.474)	888	0.165
(3)	Dummy - head feels could sell livestock at a fair price if desired (Aspirations survey)	-0.415	(0.498)	995	0.148
(4)	Most people in village have legal documents for at least some type of land	0.292*	(0.175)	1,349	0.716
(5)	Dummy - There are organized meetings of village residents to discuss village issues and events	0.301	(0.264)	1,390	0.604
(6)	Dummy - That it is expensive or tedious to register/license business is a constraint on business	0.338	(0.253)	1,390	0.641
(7)	Dummy - Heavy government regulation of land or labor is a constraint on business	0.846***	(0.153)	1,390	0.436
(8)	Dummy - Heavy government regulation of prices or agricultural production is a constraint on business	0.578***	(0.209)	1,390	0.587
(9)	Dummy - Poor access to markets or market information is a constraint on business	4.265***	(0.330)	1,390	0.295
Panel B: Amenities and Public Sector Investment Outcomes					
	Dependent variable	**Coeff.**	**S.E.**	**N**	**R^2**
(1)	Dummy - Village has an electricity connection	-0.704***	(0.104)	1,390	0.484
(2)	Dummy - Village has a natural gas supply	-1.057***	(0.186)	1,390	0.550
(3)	Dummy - Village has a sewage system	0.238	(0.263)	1,390	0.328
(4)	Dummy - The most common surface of village roads is mud	1.480***	(0.330)	1,390	0.528
(5)	Dummy - Public transport available to nearest city	-1.051***	(0.213)	1,390	0.590
(6)	Distance to nearest Clinic/Dispensary (km)	13.616***	(4.589)	1,390	0.420
(7)	Dummy - Received information on crop or livestock production within the past year from a source other than an extension agent (Round 1.5)	-0.939***	(0.300)	1,390	0.177
(8)	Dummy - Any HH member met with an extension agent within the past year (Round 1.5)	-0.799**	(0.366)	1,390	0.169
(9)	Dummy - Village had Watan Card program by 2010	-3.585***	(0.305)	1,390	0.544
(10)	Dummy - Village had BISP program by 2010	-0.000	(0.202)	1,390	0.409

Notes: Each column comes from a separate regression of the specified dependent variable on the political concentration index (ranging from 0 to 1) and our full set of controls and district fixed effects. Unless otherwise indicated, all dependent variables come from Round 1 of the Pakistan RHPS survey; where not otherwise specified, the data are from the community-level survey, completed by a three-person focus group. The excluded instrument is simulated political competition. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

Finally, we examine the effects of political competition on the security environment. On the one hand, political competition can promote more peaceful interactions and reduce conflict. On the other hand, political concentration may undermine the power of local strongmen who may be integral to security in more institutionally-fragile settings, or may create incentives for politicians to strategically instigate violence. Table 19 examines the impact of political competition on measures of how secure land cultivators feel. The results paint a mixed picture, and for many measures of security, political competition has no significant impact.

Table 19: Effect of political competition on security (IV results)

	Dependent variable	Coeff.	S.E.	N	R^2	Mean
(1)	Individual has a security level of 6 or higher on a scale from 1-10 (above mean)	-1.316**	(0.533)	1,167	0.155	0.55
(2)	Head agrees: Locks are necessary to keep one's house and belongings safe from theft while they are away from home	0.544	(0.447)	1,390	0.102	0.73
(3)	Head agrees: Harassment is a problem in my community	0.779*	(0.418)	1,390	0.103	0.17
(4)	Head agrees: Theft is a problem in my community	0.904*	(0.490)	1,390	0.134	0.31
(5)	Head agrees: Assault is a problem in my community	1.073**	(0.420)	1,390	0.071	0.13
(6)	Head agrees: I feel safe going outside my house alone	-0.606	(0.453)	1,390	0.134	0.74
(7)	Head agrees: The laws and law enforcement in my community generally prevent crime	0.293	(0.449)	1,390	0.119	0.60
(8)	Head agrees: If someone commits a crime against me, the police will be able to help me	0.024	(0.517)	1,390	0.074	0.47
(9)	Head agrees: If someone commits a crime against me, I can get justice through the courts system	-0.076	(0.482)	1,390	0.097	0.61
(10)	Head agrees: I can get justice through the courts if someone tries to take my land	-0.271	(0.500)	1,390	0.115	0.63
(11)	Head agrees: In the end, victims of crime usually see justice done	0.944*	(0.516)	1,390	0.087	0.55
(12)	Too much crime, theft, and social disorder are a constraint on business	-1.901***	(0.282)	1,390	0.523	0.51

Notes: Each column comes from a separate regression of the specified dependent variable on the political concentration index (ranging from 0 to 1) and our full set of controls and district fixed effects. Unless otherwise indicated, all dependent variables come from Round 1 of the Pakistan RHPS survey. The excluded instrument is simulated political competition. Coefficient estimates are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

First, political competition seems to enhance perceived personal security in several ways. A standard deviation decrease in political concentration (0.11 units) is associated with a 14 percentage point increase in the probability that an individual rates their security level as 6 or higher on a scale from 1-10—a 26 percent increase over the mean rate. It also leads to a 9 percentage point decline in feeling that harassment is a problem, a 10 percentage point decline in

the feeling that theft is a problem, and a 12 percentage point decline in the feeling that assault is a problem. However, political competition has no impact on whether the individual feels locks are necessary to keep one's house and belongings safe from theft while they are away, and it also does not make the individual more likely to feel safe going outside their house alone.

Second, political competition appears to have little impact on faith in the criminal justice system. With greater political competition, an individual is no more likely to feel that laws and law enforcement prevent crime, and no more likely to feel that the police or the courts will help them if someone commits a crime against them. We also find no evidence that greater political competition helps with land disputes; individuals are no more likely to feel that they can get justice through the courts if someone tries to take their land. However, we do fine some evidence that an increase in political competition *decreases* perceptions that justice will be done in some way; a standard deviation decrease in political concentration is associated with a 10 percentage point decrease in the perception that in the end, victims of crime usually see justice done (significant at the 10 percent level). This may reflect that political concentration instills faith in more informal justice systems (beyond laws, police, and formal courts). We also find some evidence that these perceptions may harm the business climate; a standard deviation decrease in political concentration is associated with a 21 percentage point increase in the perception that too much crime, theft, and social disorder are a constraint on business (significant at the 1 percent level).

6. Conclusions and policy implications

In this paper, we combine data from Pakistan's 2008 elections with data from 2012 Pakistan RHPS household surveys to show that PA constituencies in rural Pakistan with greater political competition have significantly higher land values and more active land rental markets. In demonstrating this, we take care to address the underlying issues of endogeneity that would otherwise threaten the causal relationships we explore in this analysis. We find that provincial assembly constituencies in rural Pakistan with greater political competition have significantly higher land values. A standard deviation decrease in a Herfindahl–Hirschman Index (HHI) of political concentration in one's provincial assembly constituency leads to a 36 percent increase in land values. Such a decrease in the HHI could be due, for example, to moving from a situation of two candidates winning 27% and 73% of the vote to a situation of each winning 50 percent.

Importantly, land values appear to increase most among poor households, suggesting that the benefits of political competition for land values are greatest for those with the least resources to influence policy.

Beyond land values, we also find that a standard deviation decrease in political concentration leads to an 8 percentage point increase in the share of landowners renting or share-cropping out land (a more than doubling of the average rate) and an additional 4 percentage points of each landowner's land being rented or crop-shared out. Increases in renting and crop-sharing are greatest for the least poor landowners, suggesting that they are the ones for whom the level of political competition is marginal to their renting and crop-sharing decisions. Exploring potential causal mechanisms, we show that political competition leads to a more stable and business-friendly governance and institutional environment and better amenities and provision of publicly-provided goods. The effect of political competition on security is more ambiguous, suggesting that security may decrease along some dimensions while increasing along others.

The findings presented above have potentially important implications for the governance of land and land tenure in Pakistan. First, our findings suggest that open, transparent, and competitive political competition can support Pakistan's economic goals of growth and poverty reduction. Second, our findings suggest that political competition is especially beneficial to the land-owning rural poor. Third, our findings suggest that while political competition may have an ambiguous effect on security—a major challenge for Pakistan that cuts across PA constituencies, NA constituencies, districts, and provinces alike—political competition does lead to improvements in publicly-provided goods and services, and the governance environment more broadly. With the devolution of many federal powers to the provinces under the 18th Amendment in 2010, PA members will likely have increasingly greater access to decision-making power over the allocation of public resources to development projects in their constituencies. With greater access to public resources, higher expectations of transparency and accountability among PAs may follow from the very constituents who voted them into power. And where such expectations are unmet, it is possible that political competition may ensue. This cycle of competition may, in the end, be a virtuous one for Pakistan's democracy if PAs are able to muster the requisite governance and managerial capacity to fulfill their electorate's expectations and address provincial development challenges.

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Appendix Tables

Table A.1: Summary statistics for weather-related control variables

Variable	Unit	Mean	S.D.
Annual kharif rainfall, 1981-2012	57.66	38.07	1659
Annual monsoon rainfall, 1981-2012	177.20	46.77	1659
Annual rabi rainfall, 1981-2012	54.17	86.65	1659
Coeff. of variation, kharif rainfall, 1981-2012	0.72	0.19	1659
Coeff. of variation, monsoon rainfall, 1981-2012	0.54	0.12	1659
Coeff. of variation, rabi rainfall, 1981-2012	0.77	0.22	1659
Daily average kharif temperature, 1981-2012	34.20	4.13	1659
Daily average rabi temperature, 1981-2012	20.59	4.02	1659
Coeff. of variation, kharif temperature, 1981-2012	0.03	0.01	1659
Coeff. of variation, rabi temperature, 1981-2012	0.05	0.07	1659