Institutional Corruption and Election Fraud: Evidence from a Field Experiment in Afghanistan*

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Abstract

Elections in developing countries commonly fail to deliver accountability because of manipulation, often involving collusion between corrupt election officials and political candidates. We report the results of an experimental evaluation of Quick Count Photo Capture—a monitoring technology designed to detect the illegal sale of votes by corrupt election officials to candidates—carried out in 471 polling centers across Afghanistan during the 2010 parliamentary elections. The intervention reduced vote counts by 25% for the candidate most likely to be buying votes and reduced the stealing of election materials by about 60%. Additionally, we investigate the role of corrupt institutions in facilitating election fraud by combining: (i) separate fraud measurements at three important stages of the election; (ii) rich data on the political connections of key parliamentary candidates; (iii) precise geographic coordinates of polling centers; and (iv) experimental variation from our evaluation. Interestingly, strong political candidates react to the intervention by substituting fraud spatially and weak candidates react by substituting temporally. We explain these results in the context of a theory of corrupt vote transactions in which the capacity of candidates to protect corrupt officials from prosecution determines equilibrium levels of spatial and temporal substitution.

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1 Introduction

Free and fair elections are central to democracy and provide a vital means of empowering citizens to hold politicians accountable.[1] Election fraud commonly undermines this critical function in many young democracies largely due to weak electoral institutions. In particular, the rents from political office provide strong incentives for candidates to bribe government election commission officials to illegally alter vote totals. Corruption—the illegal selling of votes by a government official with the power to alter candidate vote totals—may in this way pose a direct threat to democracy.

The positive analysis of corruption focuses on the determinants of equilibrium patterns of corruption (Shleifer and Vishny 1993; Cadot 1987; Rose-Ackerman 1975). More recent empirical work documents the role of bribe payer endowments in corrupt transactions. Svensson (2003) documents the relevance of firm profitability and outside options for corrupt transactions. More directly related to this study, Fisman (2001) and Khwaja and Mian (2005) substantiate that political connections improve preferential access to capital from government lenders. The idea that political connections influence the quantity and price of bribes holds strong intuitive appeal, especially where institutions are weak. While the relevance of political connections for corruption is well documented, the rationale for this relationship remains poorly understood.

This paper provides experimental evidence consistent with a theory in which the political connections of candidates determine equilibrium vote sales. They do so by influencing the expected punishment faced by their corrupt counterparties in the election commission. During the September 2010 parliamentary election in Afghanistan, we designed, implemented, and experimentally evaluated a novel election monitoring technology aimed at fraud involving collusion between candidates and election officials.[2] The experimental sample included 471 polling centers (7.8 percent of polling centers operating on election day) in 19 of the 34

[1]There is substantial empirical documentation of the benefits of programs aimed at increasing political accountability or empowering citizens through increased enfranchisement and political representation (Besley and Burgess 2002; Besley et al. 2005; Chattopadhyay and Duflo 2004; Fujiwara 2010; Pande 2003). Recent work indicates that in countries experiencing or emerging from violent contests for state control, such as Afghanistan, fair elections may also undermine popular support for insurgents by promoting an accountable and legitimate government and by providing a forum for reconciliation (Berman et al. Forthcoming; Besley and Persson 2009; McChrystal 2009; United States Army 2006; World Bank 2011).

[2]The intervention occurred during an election of particular geopolitical relevance. The international community viewed this election as vital for the Afghan government's attempt to exercise control and achieve stability through the consolidation of democratic institutions. The 2010 election was only the second parliamentary election after the United States and Coalition forces overthrew the Taliban, and was a central benchmark in the US efforts to support democratic gains with the horizon of an eventual drawdown of international troops. This election also presented an important test of the Afghan government's ability to exert control over territory and the implementation of democratic practices.

provincial capitals in Afghanistan. The technology works by recording differences between immediate post-election polling center level counts and the corresponding numbers in the certified national aggregate. To obtain immediate post-election counts, pictures are taken at the polling center of Declaration of Results Forms (DR forms).[3] We call this technology "Photo Quick Count". We find Photo Quick Count is effective and at only a fraction of the cost of more traditional monitoring techniques.[4] Monitoring reduces the incidence of theft or damaging of election materials at polling centers from 18.9 to 11.8 percent (a 7.1 percent decrease) and has a considerable negative effect on the number of votes cast for powerful candidates.

The experimental estimates of the effect of Photo Quick Count on fraud should be consistent and internally valid, provided that the treatment creates no changes in fraud in our control sample. However, given that the intervention took place in a complex environment with highly adaptive political agents, we also directly consider this possibility. Empirically, we address this by using two separate measure of fraud. One measure, whether affiliates of the candidates damaged or stole materials at the polling center, should not be subject to displacement. We provide empirical support for this. Another measure, the number of votes for the most powerful candidate, should exhibit displacement possibly due to strategic re-adjustments during the aggregation process. To help explain the general equilibrium effects of the treatment, we develop a theory in which: (i) a corrupt official can illegally provide votes to a candidate using several alternative means and; (ii) a candidate has an exogenously given "protection capacity" to shield the official from being fined, which applies to only a subset of illegal transactions. According to this simple model, the candidate reacts to monitoring by shifting from monitored to unmonitored illegal vote transactions as part of a "recovery strategy". The recovery strategy, in turn, depends on the protection capacity of the candidate.

According to this theory candidates have a set of options for recovering votes through alternative illegal means with the support of government officials. They can alter DR forms at polling centers where they do not predict monitoring (spatial recovery). They can also attempt to manipulate the process after becoming aware of monitoring but before the posting of DR forms (temporal recovery). If the expected fine faced by the official is decreasing in protection capacity, then candidates with strong protection capacity have a broader set

[3]A standard practice in many countries is for an election official to record vote totals at a particular polling center on a DR form. After votes are counted at the polling center, an official will post the form on the outside of the polling center, indicating vote totals at the polling centers to local residents.

[4]The relative savings come primarily from avoiding the travel and security costs of supporting international observers. Moreover, Photo Quick Count is well-suited to adoption through pre-existing social networks—viral adoption—especially in light of the global increase in cellular connectivity in developing countries.

of Recovery Strategies than candidates with weak protection capacity.[5] To test this implication, we operationalize a measure of protection capacity using remarkably rich data on candidates' political networks dating back to the 1979 Soviet Invasion of Afghanistan. We then combine this measure with data on three substitutable types of illegal vote sales and the experimental application of Photo Quick Count. We find that, consistent with the theory, strong protection capacity candidates prefer spatial recovery while weak protection capacity candidates prefer temporal recovery. Correspondingly, Photo Quick Count appears to have a negative externality for rigging on behalf of weak protection capacity candidates. We also differentiate the short-term and long-term effects of Photo Quick Count. To do so, we use primary data on the stealing and damaging of election materials immediately after the election at the polling center (DR Form Manipulation) and polling center vote totals for the candidate most likely to benefit after the national aggregation process.

While our results are consistent with the model presented in the next section, they have alternative interpretations. For example, candidates with robust political connections may receive stronger support from election officials because they are directly involved in a repeated game. In this case, officials may be willing to select strategies that provide candidates with more votes, even when they are more likely to be detected. An alternative and related model might be that connected candidates can engage officials in a broader set of unobserved parallel transactions or provide more attractive in-kind transfers than unconnected candidates. Because of the clandestine nature of corrupt vote transactions, we do not have data which allow us to adjudicate between these models. Our model, however, provides a simple framework for interpreting our results, which we develop using a rich set of primary and administrative data and the experimental application of a powerful monitoring technology.

Our results suggest several considerations for policies aimed at reducing corruption and improving the functioning of democracy. First, our experiment adds to the growing experimental and quasi-experimental body of assessments of democracy and governance strengthening efforts (Aker et al. 2010; Di Tella and Schargrodsky 2003; Ferraz and Finan 2008; Fujiwara 2010; Hyde 2007; Olken 2007). Photo Quick Count is highly compatible with Information Communications Technology (ICT). The cost of gathering and centralizing information on diffuse illegal behavior is now nominal. This technology can also be adapted

[5] McMillan and Zoido (2004) provide the best empirical evidence on corrupt agents' willingness to pay for protection against prosecution for corruption. The authors show that the size of the bribes paid by media houses to Vladimiro Montesinos Torres, the secret-police chief for Peruvian President Alberto Fujimori, were conditional on their political connections to the regime or the opposition. The behavior documented in this paper is highly consistent with our results: the more influence a corrupt counterparty has on the expected downside for engaging in corruption the more leverage they have in defining the terms of the transaction.

to citizen-based implementation. This should greatly increase the probability of detection for malfeasance is detected and so may improve elections in institutionally weak contexts.[6] Our results indicate promise for future experiments in this direction. Second, in weak institutions with *partial* constraints, corrupt officials may respond to monitoring by providing preferential access only to powerful individuals. This suggests that monitoring may have the perverse effect of further empowering connected individuals by eliminating rivals. Policy-makers, government agencies, and researchers, should remain conscious of recovery strategies and adaptation, particularly where institutions are weak. Last, improving the independence of electoral institutions and constraining the ability of agents to sell votes is critical to the disciplining role of elections in democracy.

We structure the rest of the paper as follows. Section 2 develops a theoretical model that relates corrupt vote transactions to protection capacity. Section 3 describes our experimental setting and relevant features of electoral institutions in Afghanistan. Section 4 introduces our experiment, data, and research design. Section 5 provides results, and Section 6 concludes.

2 Theoretical Framework

This section presents a basic model of corrupt transactions to help interpret our empirical results. The model characterizes transactions between a candidate seeking election and an official who sells illegal votes but has some probability of being caught and fined.[7] Our model departs from existing treatments in two fundamental ways. First, the official can engage in several different types of corrupt sales of illegal votes, each subject to a different probability of detection. Second, the candidate has an exogenously given protection capacity to shield the official from being fined, which applies to certain illegal sales but not to others. In an environment with perfect information, the candidate pays the risk-neutral expected utility maximizing official an amount equal to the expected fine. Because the protection capacity of the candidate influences this expected cost, it is a key determinant of the price of illegal votes. According to this simple model, the candidate reacts to monitoring by shifting from monitored to unmonitored illegal vote transactions as part of a recovery strategy. The recovery strategy also depends on the protection capacity of the candidate as it applies to some sales but not others.

[6] See Becker (1968), Fisman and Miguel (2007), and Levitt (2004) for studies examining the impact of increasing the probability of detection for corruption on the amount of corruption.

[7] Corrupt transactions are therefore a gamble in the spirit of Becker and Stigler (1974) and Cadot (1987).

2.1 A Model of Corrupt Vote Transactions

Consider a one-period model with two agents: a candidate, interested in winning an election by obtaining both legal and illegal votes, and an official, who can provide the candidate with illegal votes. We assume perfect information, that votes are perfect substitutes in providing utility to the candidate, and that the official is a risk-neutral expected utility maximizer. The official controls two polling centers and has three means of providing illegal votes: manipulating the count *before* the DR form is posted (v_b); changing vote counts on the DR form *after* it is posted at polling center 1 (v_a^1); and also at polling center 2 (v_a^2). The unit price for each type of illegal vote w_b, w_a^1, and w_a^2 respectively.

Only polling center 2 can be monitored, which we denote as $m_2 = 1$ in the monitored state and $m_2 = 0$ otherwise. The official subjectively assesses that she will be caught transacting illegal votes with probability ϕ_b, $\phi_a^1(m_2)$, $\phi_a^2(m_2)$ respectively, where we make ϕ_a^1 a function of monitoring at station 2. We assume that there exists at least some small probability of detection for every type of vote, so that the official is unwilling to provide an infinite number of illegal votes. This assumption reflects the possibility that monitoring at one polling center might carry information for polling center managers at neighboring polling centers. Prior to monitoring, there is no difference in subjective assessments between polling centers ($\phi_a^1(0) = \phi_a^2(0)$). Additionally, we assume that manipulating the count before the posting of the DR form has the lowest chance of detection ($\phi_b < \phi_a^1(0)$). Last, monitoring raises the subjective assessment in both polling centers, but disproportionately in polling center 2 as it is directly monitored ($\phi_a^1(1) < \phi_a^2(1)$).

If the official is caught transacting illegal votes, she pays a fine F for each vote transacted.[8] The candidate can leverage political connections to reduce the fine by a share equivalent to their protection capacity θ, but only for votes after the DR form is posted. We assume $\theta \in [0, 1]$, where 0 corresponds to connections sufficient to provide complete immunity and 1 corresponds to having no connections. To analyze the pattern of substitution, we find the equilibrium both in the absence of monitoring $m_2 = 0$, and when monitoring is implemented $m_2 = 1$.

The candidate has an amount E to spend on illegal votes and obtains v_0 votes legitimately. The candidate therefore faces the budget constraint $E \geq +w_b v_b + w_a^1 v_a^1 + w_a^2 v_a^2$. Since votes are perfect substitutes each yielding an equivalent amount of utility, the candidate's utility function is $U = v_0 + v_b + v_a^1 + v_a^2$.

[8] The predictions of our model are robust to a penalty which is independent of the number of votes transacted, so long as the probability of detection increases in the number of illegal votes transacted.

No Monitoring Equilibrium

The candidate offers the official a unit wage which makes him perfectly indifferent between transacting and not transacting: $w_b = \phi_b F$, $w_a^1(m_2) = \phi_a^1(m_2)\theta F$, and $w_a^2(m_2) = \phi_a^2(m_2)\theta F$. Prior to monitoring, $\phi_a^1(0) = \phi_a^2(0)$ and so $w_a^1(0) = w_a^2(0)$, allowing the equilibrium to be completely defined in terms of optimal sales of v_b and v_a^1. The equilibrium transaction in the absence of monitoring will therefore be:

$$v_b^* = \begin{cases} \frac{E}{w_b} & \text{if } w_b \leq w_a^1(0) \\ 0 & \text{if } w_b > w_a^1(0) \end{cases}; \qquad v_a^{1*} = \begin{cases} \frac{E}{w_a^1} & \text{if } w_a^1(0) \leq w_b \\ 0 & \text{if } w_a^1(0) > w_b \end{cases}.$$

The corner solution that obtains depends on the candidate's protection capacity θ. To see this, note that indifference between transactions, $w_b = w_a^1$, is equivalent to $\theta = \frac{\phi_b}{\phi_a^1(0)}$. We denote this separating value as θ'. If $\theta' > \frac{\phi_b}{\phi_a^1(0)}$ the candidate transacts in votes before the DR form is posted, and if $\theta' < \frac{\phi_b}{\phi_a^1(0)}$, the candidate transacts in votes after the posting of the DR form.

Monitoring Equilibrium

We now solve for the equilibrium if $m_2 = 1$. The key change at this stage is that monitoring increases both ϕ_a^1 and ϕ_a^2, causing a change in corner solutions that depends on protection capacity. Because the subjective assessment of monitoring increases more in the directly monitored station, $w_a^2(1) > w_a^1(1)$ for all θ, so that $v_a^{2*}(1) = 0$. The solutions for the remaining vote transactions are therefore:

$$v_b^* = \begin{cases} \frac{E}{w_b} & \text{if } w_b \leq w_a^1(1) \\ 0 & \text{if } w_b > w_a^1(1) \end{cases}; \qquad v_a^{1*} = \begin{cases} \frac{E}{w_a^1} & \text{if } w_a^1(1) \leq w_b \\ 0 & \text{if } w_a^1(1) > w_b \end{cases}.$$

Importantly, the change in parameter values leads to a new separating value for θ, $\theta'' = \frac{\phi_b}{\phi_a^1(1)}$, which separates candidate types that prefer to transact in v_b from those that prefer to transact in v_a^1.

We now summarize the set of predictions that we take to the data. First, introducing monitoring will weakly reduce transactions for votes in monitored polling centers (i.e. $v_a^{2*}(0) \geq 0$ and $v_a^{2*}(1) = 0$). Second, candidates with strong protection capacity (θ low) will react to monitoring by substituting across polling centers. In other words, if $\theta < \theta''$, the candidate will substitute from v_a^2 to v_a^1. Third, candidates with weak protection capacity (θ

high) will substitute from transacting *after* votes (v_a^1 or v_a^2) to *before* votes (v_b). Specifically, if $\theta \in [\theta'', \theta']$, the candidate will completely substitute to v_b out of v_a^2 and v_a^1. Importantly, taken together, the second and third testable implications of our model imply that monitoring should create *positive* spillovers for candidates with strong protection capacity and *negative* spillovers for candidates with weak protection capacity.

Three features of our data allow us to test these predictions. First, we are able to develop a measure of protection capacity, based on detailed data on political networks. Second, a combination of administrative and primary data allows us to observe fraud both *before* and *after* the DR form is posted. Last, we have precise geographic coordinates for all of the polling centers in our experimental sample, so we can test for displacement across polling centers in response to the administration of the monitoring technology.

Before proceeding to our research design, we mention two policy-relevant implications of our model. First, in this simple set-up, monitoring raises the price of illegal votes and so reduces the total number of votes that can be purchased with a given endowment E. Accordingly, a corrupt official sells fewer votes in the monitored equilibrium. Second, in this model, the spatial externalities for polling center 1, when polling center 2 is monitored, are *positive* if protection capacity is strong and *negative* if protection capacity is weak. The negative externality results because monitoring at polling center 2 increases the the subjective assessment of the likelihood of detection at polling center 1 ($\phi_a^1(0) < \phi_a^1(1)$). In the analysis in Section 5, we investigate this "chilling" effect empirically in addition to the spatial recovery strategies of candidates with strong protection capacity. Strong candidates are better able to recover and weak candidates suffer additional vote losses from the "chilling" effect. It is possible, therefore, in this model that monitoring has the perverse effect of further empowering the most egregious violators. Figure 2 depicts the predictions of our model graphically and relates them to the corresponding electoral institutions.

3 Institutional Background

In this section, we describe the experimental setting and relate it to our model. To demonstrate how officials provide illegal votes after they post DR forms, we work through a simple example. Specifically, we compare a photograph of a DR form at a polling center with the copy that was entered into the national count at the end of aggregation. We also describe the fraud monitoring technology that we designed and implemented: Photo Quick Count. Last, we explain how the electoral rules in Afghanistan give rise to a setting where: (i) a large number of candidates compete in parallel elections with close victory margins, creating a viable market for illegal votes; (ii) institutions are weak and election officials face limited accountability for assisting candidates; and (iii) candidates leverage patronage networks which pre-date democratization for corrupt purposes.

3.1 Experimental Setting

On Election Day (September 18), voting began at 7am and ended at 4pm. The count started immediately after polling concluded at individual polling centers and and was completed the same evening. In the first period, our intervention announced monitoring to Polling Centers Managers (PCMs) during polling. This intervention leaves two general types of manipulation unmonitored: (i) altering the count by attributing fake votes to the corrupt candidate (count manipulation); (ii) and altering DR forms so that more votes are recorded for a given candidate than were actually cast as depicted in Figure 1 (DR form manipulation).[9] Count manipulation happens before the posting of DR forms and so corresponds to v_b in our model. DR form manipulation takes place after posting, corresponding to v_a^1 and v_a^2 in our model.[10] The international community paid considerable attention to this election, given its relevance for global geopolitical stability, and so provided a remarkable amount of administrative data on the electoral process. Section 4.1 describes how we use this data to observe both types of manipulation.

3.2 A Simple Example

To see how rigging occurs on DR forms, Figure 1 depicts photos from our dataset. Our research team took the picture on the left immediately after the count (i.e., at the end of the Election Day stage). The IEC produced the picture on the right, as a scanned copy from the IEC aggregation center in Kabul of the same DR form. The DR form on the left should be identical to the picture on the right since it is a carbon copy.[11]

There are three major differences that demonstrate direct evidence of rigging. Someone has converted the Dari script for the polling center and polling station numbers to arabic numerals.[12] Second, the name of the presiding PCM has been changed. Third and most

[9]DR Manipulation can be perpetrated many different ways. These include stealing ballot boxes and sealed Tamper Evident Bags (TEBs) in order to alter their contents.

[10]In some cases, candidates can also influence the post-election fraud investigation and adjudication process. To avoid contamination of our results from this highly politicized and unpredictable process, we scraped the record of the votes from the initial publication of polling station results by the IEC on its website. The IEC posted these after the aggregation of tallies but before the ECC adjudication process and subsequent prosecution of candidates by the Attorney General.

[11]Because it is a carbon copy, it is not possible to have differences that are attributable to recording error.

[12]Polling centers typically have 3-10 stations within them. PCMs are the most senior IEC official at a polling center. They maintain responsibility for opening their center's stations on election day, conducting the vote, closing the polling center, overseeing the count, and posting the final DR form from each station

tellingly, while the sheet on the left records votes for most candidates that appear to result from normal polling, the figure on the right records no votes whatsoever. There are many comparable examples in our data.[13] From this it is clear that election officials assist candidates by manipulating DR forms. We see here that the official who altered totals did not attempt comparability to the original, consistent with limited accountability.

3.3 Photo Quick Count

The fraud we document through this example suggests a powerful monitoring technology. Taking independent photographic records of DR forms and separating them from the electoral chain of custody allows near certain detection of DR form manipulation. This design builds on Parallel Vote Tabulations (PVTs), which have been in use since the 1980s.[14] Two important technological developments allow us to build on the PVT concept. First, it is now common for Election Commissions to release disaggregated results and to post them on the internet. Second, the cheap availability of digital photography allows rapid and perfectly accurate recording of DR forms.[15]

Photo Quick Count allows us to investigate illegal vote transactions in three ways. First, it narrowly targets fraud through DR form manipulation and should only detect differences after PCMs post DR forms. Second, while we announce our monitoring intervention *during* voting, it is not able to pick up cheating until *after* officials post the DR form, leaving the probability of detection for count manipulation, ϕ_b unchanged. Third, in the absence of our intervention, corrupt agents' subjective assessment that DR form manipulation is detected should be uniform across polling centers, consistent with our assumption that $\phi_a^1(0) = \phi_a^2(0)$. This makes the rigging of any one tally perfectly substitutable, from the perspective of the official, with rigging another. Our intervention changes this as we announce monitoring only at specific polling centers.

Illegal votes transacted in equilibrium depend on the probability of detection for both count manipulation and DR form manipulation. However, our technology only changes

in a visible location within the polling center.

[13]While these data provide exceptional and precise documentation of fraud, we show below that our treatment strongly reduced the frequency with which candidates and their agents stole tally sheets. For this reason, attrition in the measure of comparing tallies relates strongly to treatment. We therefore cannot use this as a measure of fraud.

[14]Through representative sampling and recording of ballots by field staff, PVTs predict national totals within a small margin of error (Cowan et al. 2002). PVTs are an important means of checking votes against results that electoral commission ultimately certify, but cannot identify whether differences occur from count manipulation or DR form manipulation. Exit polls can also be compared with certified results, under certain assumptions, to provide a check against electoral manipulation (Gibson and Long 2009; Bjornlund 2004).

[15]Our team has since implemented Photo Quick Count using a custom application for smartphones during the February, 2011 parliamentary and presidential elections in Uganda with the support of Qualcomm, Inc.

the probability of DR form manipulation detection. The first margin for recovering votes after our treatment is through count manipulation (increasing v_b), which we call temporal recovery. Commonly, this involves taking votes cast for one candidate and attributing them to another.

An alternative means of recovering votes is through DR form manipulation at unmonitored centers (spatial recovery). This involves switching votes from v_a^2 to v_a^1. Given monitoring of DR forms in polling center 2, candidates will try and recover those lost ballots by engaging fraud in polling center 1. Our theory predicts strong protection capacity candidates should prefer spatial recovery because the expected fine an official faces for DR form manipulation is lower in this case.

3.4 Electoral Institutions in Afghanistan

In this section, we describe characteristics of Afghanistan's electoral institutions relevant to corrupt electoral practices. We outline the history and characteristics of the rules and institutions that govern elections in Afghanistan. We also discuss how informal networks that link political actors can undermine formal institutions.

After the US invasion and fall of the Taliban in 2001, Coalition forces helped to empanel a Constitutional Loya Jirga that established democratic institutions in Afghanistan after decades of internecine conflict, civil war, and Taliban rule. Hamid Karzai won the first presidential elections in 2004 with 55 percent of the vote. In 2005, Afghans voted in elections for the lower house of parliament, the Wolesi Jirga. Amid claims of rigging and substantial election day violence, Karzai won re-election in 2009. In 2010, the second Wolesi Jirga elections occurred amid a growing insurgency and a US commitment to begin withdrawing troops in July 2011. The international community viewed these elections as a critical benchmark in the consolidation of democratic institutions given doubts about the Karzai government's ability to excercise control in much of the country. Despite lingering memories of violence from the 2009 election, between 4 million and 5.4 million voters cast ballots in the Wolesi Jirga elections.[16]

Afghanistan's 34 provinces serve as multi-member districts that elect members to the Wolesi Jirga. Each province is a single electoral district and the number of seats is proportional to its estimated population. Candidates run "at large" within the province without

[16]The Independent Electoral Commission projected this number out of what it believes is 11 million legitimate registered voters. This corresponds to an estimated turnout of between 37 and 49 percent. This remarkable turnout resonates with summary statistics from our baseline survey of 2,900 Afghans, which we describe in Section 4.1. 89 percent of respondents view the Wolesi Jirga as important to their lives, 60 percent believe that voting in the Wolesi Jirga elections will increase the quality of services in their area, and 65 percent stated that voting will lead to improvements in the future.

respect to any smaller constituency boundaries. Voters cast a single non-transferable vote (SNTV) for individual candidates, nearly all of whom run as indepedents.[17] Candidates compete for votes province-wide. The rules declare winning candidates as those who receive the most votes relative to each province's seat share. For example, Kabul province elects the most members to Parliament (33) and Panjsher province the fewest (2). The candidates who rank 1 to 33 in Kabul and 1 to 2 in Panjsher win seats to the Wolesi Jirga.

These rules hold implications for the dynamics of electoral malpractice. First, SNTV with large district magnitudes and a lack of political parties creates a wide dispersion of votes across a large number of candidates. The vote margins separating the lowest winning candidate from the highest losing candidate are often small. This lowers the minimum number of votes required for winning a seat in the parliament and suggests a high expected return for even small manipulation for a large number of candidates. In contrast, electoral systems with dominant parties guarantee victory with large vote margins, and so the likelihood that a non-viable candidate will rig falls. Second, because they compete for votes province-wide, candidates can attempt substitution of legitimate and fake ballots elsewhere. If monitoring leads to a loss of votes in one polling station, candidates will seek to recover lost ballots in other polling stations. This directly supports our formulation of the candidate's perfect substitutes utility function in Section 2. Third, despite a province-wide race, candidate support usually correlates with geographic proximity. Candidates garner most of their votes in their home districts or towns where they remain popular. Given the areas that powerful candidates exert control over, influential candidates can rig in their home areas but are not likely to do so province-wide. Since provinces are multi-member, even powerful candidates have to compete with and share seats with other powerful candidates.

The weak institutions tasked with managing elections in Afghanistan also permit fraud. The Independent Election Commission (IEC) serves as the main electoral body responsible for polling, counting votes, aggregation, and certifying winning candidates. Historically, the IEC has proven susceptible to influence by corrupt agents. A lack of published data on the 2005 Wolesi Jirga elections do not allow for investigations into potentially fraudulent vote returns. But wide-scale rigging occured in the 2009 presidential elections. The IEC initially gave Karzai 53 percent of the vote, above the 50 percent threshold necessary to avoid a run-off. However, the Electoral Complaints Commission (ECC) reduced that margin to

[17] SNTV systems provide voters with one ballot that they cast for one candidate or party when multiple candidates run for multiple seats. If a voter's ballot goes towards a losing candidate, the rules do not re-apportion that vote. Former U.S. Ambassador to Afghanistan Zalmay Khalilzad and President Hamid Karzai promoted SNTV during the first parliamentary elections in 2005 to marginalize warlords and reduce the likelihood they obtained parliamentary seats. As a corrolary, Karzai also decreed that political parties should not be allowed to form.

47 percent after investigating numerous allegations of electoral corruption and malfeasance. Evidence from a random sample of ballots along with digit analyses of vote returns provide convincing evidence of widespread manipulation, mostly in favor of Karzai (Callen and Weidmann 2011). Before the IEC could hold a run-off, the runner-up Dr. Abdullah Abdullah dropped out of the race leaving the presidency to Karzai.[18]

In addition to the challenges of formal institutions, non-formal institutions also play an important role in determining political outcomes in Afghanistan.[19] Despite attempts to grow incipient democratic institutions, pre-existing power structures exert influence over political processes and frequently undermine them. Similar to developing countries elsewhere, extra-state networks of patronage that pre-date democratization help to determine lines of political accountability and control between powerful actors. Many new leaders and members of institutions, such as the Wolesi Jirga, candidates running for office, local government councils, and electoral officials make use of existing relationships. For example, Karzai enjoys strong links with government officials in Southern Afghanistan given his family roots in that part of the country. Former warlords fighting in the Northern Alliance against the Taliban exert strong control in Northern Afghanistan. Networks of these powerful actors support corruption within and outside of the state as patrimonial ties link corrupt officials with government entities that can protect them for prosecution. These connections inform our concept of protection capacity and influence how we operationalize the measure.

Despite opportunities to illegally provide votes to candidates, officials in Afghanistan must weigh these incentives against the expected cost of prosecution. The United Nations backed Electoral Complaints Commission (ECC) exists as a separate and independent body from the IEC. The ECC investigates complaints against polling officials, candidates, or citizens. Any Afghan can lodge such a complaint. Based on the seriousness of a complaint and its likelihood of affecting the election's outcome, the ECC may decide to cancel all of the votes at a given polling station, all of the votes for a particular candidate at a polling station, or the total votes for a candidate across their entire province. The ECC overturned some 25 percent of the ballots in this process in the 2010 election. Under its purview of fighting corruption, the Attorney General may prosecute specific individuals, including election officials and candidates, it believes to have participated in election fraud and levy

[18]Given serious problems with the 2009 presidential election and under pressure from the international community, the IEC attempted some reforms ahead of the 2010 Wolesi Jirga elections. Many observers viewed these as hollow. In our baseline survey, we find that 51 percent of respondents expected problems with counting ballots at polling centers, 50 percent projected problems with the count at the IEC in Kabul, and 53 percent forecasted problems with transporting ballots from polling centers to the IEC aggregation center in Kabul.

[19]Callen and Weidmann (2011) for non-experimental evidence consistent with patronage networks facilitating illegal vote transactions in Afghanistan.

fines or prison sentences against them if found guilty. Theoretically the punitive capacity of the Attorney General and the ECC is important as the probability for being punished is non-zero (i.e. $F > 0$). In Section 5, we empirically investigate whether these linkages affect Recovery Strategies.

4 Research Design

Our experiment estimates the effect of Photo Quick Count on election fraud. The technology narrowly targets DR Manipulation, one of several means of obtaining illegal votes. The theory we present in Section 2 predicts that: (i) Photo Quick Count will reduce DF Form Manipulation at monitored stations; (ii) the recovery strategy of strong protection capacity candidates will be spatial recovery; (iii) the recovery strategy of weak protection capacity candidates will be temporal recovery; (iv) weak protection capacity candidates will reduce DR form manipulation at unmonitored polling centers because of a "chilling" effect. Our empirical analysis proceeds in two steps. First, we test for a fraud-reducing effect of Photo Quick Count. Second, we test the further implications of our model, using administrative data to operationalize measures of count manipulation and protection capacity.

4.1 Data

Elections in Afghanistan receive considerable international attention because of their importance for the NATO-led occupation. This results in a remarkable range of administrative data documenting details of the electoral process. We use the following administrative data in our empirical analysis: (i) systematic political background investigations of the main candidates from Democracy International (DI); (ii) geographic coordinates and security assessments of polling stations provided by the International Security Assistance Force (ISAF); (iii) complaints about illegal election activities filed at the ECC; (iv) disaggregated vote counts from the IEC; and (v) data on adherence to electoral laws and protocols from the Free and Fair Elections Foundation of Afghanistan (FEFA).[20] Additionally, we fielded a baseline survey in August 2010 of households living in the immediate vicinity of polling centers in our experimental sample. Our experimental sample comprises 471 polling centers (7.8 percent of polling centers operating on election day) in 19 of the 34 provincial capitals in Afghanistan. We designated 450 of the 471 polling centers in our experimental sample as Primary Sam-

[20] Democracy International was the leading international mission observing the parliamentary elections and our institutional partner. We obtained the disaggregated data from the IEC website on October 24, 2010.

pling Units (PSUs).[21] We obtained an additional measure of DR form manipulation by sending field staff to investigate whether election materials were stolen or damaged the day following the election (September 19), which we describe in subsection 4.2.

Measuring Protection Capacity

In Section 2, candidates' protection capacity determines the equilibrium price of DR form manipulation by affecting the expected fine corrupt officials face. Protection capacity does not, however, affect the expected cost of count manipulation. Accordingly, candidates' recovery strategy depends on their protection capacity in the following way: (i) candidates with strong protection capacity should prefer spatial recovery, and (ii) candidates with weak protection capacity should prefer temporal recovery, switching votes from DR form manipulation to count manipulation.

Investigating these predictions requires a measurement of protection capacity. We operationalize this measure by exploiting extensive and systematic background research into candidates performed by DI. The investigations report history of government service, known political affiliates and supporters, as well as demographic, education, and occupation histories for 76 of the leading candidates.

We develop a measure of protection capacity in three stages. First, we use the DI political connections data to create a simple index of the political connections for candidate i as:

$$Political\ Connection\ Index_i = Karzai_i + Government_i + DEO_i + PEO_i$$

where $Karzai_i$ equals 1 for an indirect connection to Karzai (e.g. through a relative) and 2 for a direct connection (e.g. having worked directly with the president), $Government_i$ equals 1 for having held a minor government post since 2001 (e.g. teacher) and 2 for having held a major government post (e.g. parliamentarian), DEO_i equals 1 if a candidate has a connection to the District Elections Officer, and PEO_i equals 1 if a candidate has a connection to the Provincial Elections Officer. Second, we take the top 10 vote recipients in our control sample in each province, removing those for which DI did not complete a political connections investigation. From this list, we identify the person with the highest Political Connection

[21] We selected our experimental sample of 471 polling centers by identifying polling centers scheduled to open on election day and deemed secure by ISAF and Afghan National Police (ANP) for the safety of our field staff. The 21 polling centers in the experimental sample not surveyed at baseline are in Kabul. These were subsequently added because of additional funding made available after the baseline. The survey contained 2,900 respondents. To attempt to obtain a representative sample of respondents living near polling centers, enumerators employed a random walk pattern starting at the polling center, with random selection of every fourth house or structure. Respondents within households are randomly selected using Kish grid. The survey had 50 percent male and female respondents and enumerators conducted it in either Dari or Pashto.

Index. We call this candidate the "most connected candidate."[22] In the final stage, we identify whether the most connected candidate has a *specific connection* to the Provincial Elections Officer (PEO).[23] This divides our sample into 12 provinces with 244 polling centers where the most connected candidate has connections to the PEO ($Protection\ Capacity = 1$) and 7 provinces with 227 polling centers where the most connected candidate does not have a connection to the PEO ($Protection\ Capacity = 0$). Table 1 provides summary statistics for the DI political connections data we use to develop a measure of protection capacity.

4.2 Experiment

On election day (September 18, 2010), we randomly announced the use of Photo Quick Count by delivering letters to 238 of the 471 polling centers in our experimental sample. We instructed Afghan researchers, that we trained and hired through a local research firm, to deliver letters to Polling Center Managers (PCMs) between 10AM and 4PM, during polling. Researchers visited all 471 polling centers the following day in order to take a picture of the DR form. Of the 471 polling centers, 6 did not operate on election day. Figure 3 maps the polling centers in our sample and indicates treatment status across the country. Figure 4 depicts the same in Kabul specifically.

The delivery of this letter constitutes the treatment in our experiment. The letter announced to PCMs that researchers would photograph DR forms the following day (September 19). It also explained that Photo Quick Count documents discrepancies between DR forms photographed at the polling center and results certified by the IEC. Appendix Figure A1 provides a copy of the letter in English and Appendix Figure A2 provides a copy in Dari. We asked Polling Center Managers (PCMs) to acknowledge receipt by signing the letter. PCMs at 17 polling centers (7 percent of centers receiving letters) refused to sign. We designate a polling center as treated if the PCM received a letter (Letter Delivered = 1). Our results remain robust to redefining treatment as both receiving and signing a letter.

To ensure balance, we stratify treatment on province, and, for the 450 PCs for which we had baseline data, on the share of respondents from the baseline survey reporting at least occasional access to electricity and on respondents reporting that the district governor carries the most responsibility for keeping elections fair. All core specifications reflect our assignment strategy, by including strata dummies as suggested by Bruhn and McKenzie (2009).[24] Table 2 reports summary statistics and verifies balance.

[22]We assume that candidates who (i) receive lots of votes in neighborhoods where our intervention takes place and (ii) have robust political connections are the most likely to engage in election fraud.

[23]As the highest ranking provincial election official, the Provincial Elections Officer holds considerable leverage over the punishments meted out to corrupt PCMs.

[24]Bruhn and McKenzie (2009) suggest stratified treatment assignment on baseline measurements of the

To obtain a measure of DR form manipulation, our researchers investigated whether any of the materials had been stolen or damaged during the night of September 18, after polling.[25] We trained enumerators to investigate by only interviewing local community members and not to engage IEC staff. We focus on reports of theft by candidate agents, who are candidate representatives legally permitted to observe polling and typically present at polling centers in their candidate's constituency. We received reports of candidate agents stealing materials at 60 (12.9 percent) of the 465 operating polling centers. We therefore define our measure DR Form Manipulation as an indicator equal to 1 if materials were reported stolen by a candidate agent at a given polling center.

To obtain estimates of the effect of Photo Quick Count, we regress DR Form Manipulation at polling center c on the treatment status of the polling center, covariates from our baseline survey, and a set of stratum fixed effects:

$$DR\ Form\ Manipulation_c = \gamma_1 + \gamma_2 Letter\ Delivered_c + \boldsymbol{\gamma}_3' \mathbf{X}_c + \varepsilon_c \tag{1}$$

where $\mathbf{X}_c$ is a vector of polling center attributes including stratum fixed effects. Equation 1 permits a test of the first prediction of the theory presented in Section 2, and provides a consistent estimate of the effect of Photo Quick Count on DR Form Manipulation.

In Section 5, we estimate a variant of Equation 1, replacing $DR\ Form\ Manipulation_c$ with the number of votes cast for the candidate with the highest political connections index at polling station s ($Most\ Connected\ Candidate\ Votes_{cs}$) to provide a cardinal measure of the number of fraudulent votes eliminated through Photo Quick Capture.

Our research design mirrors that of many randomized control trials. It relies entirely on primary data and experimental assignment to obtain internally valid estimates of the effect of an intervention. Our theory, however, predicts that candidates should implement a recovery strategy in response to the intervention. In order to understand the ultimate effect, we therefore investigate the broader general equilibrium response of candidates. To investigate Recovery Strategies, we now turn to an analysis of administrative records of count manipulation.

outcome of interest, or variables that are highly correlated with this outcome. Because measures of fraud are unavailable prior to the election, we select our stratifying variables by identifying measures most highly correlated with fraud during the 2009 presidential election. Our strategy finds support in Callen and Weidmann (2011), who demonstrate evidence supporting the involvement of election officials in perpetrating fraud during the 2009 election. However, we do not stratify on 2009 fraud because, at least according to the very coarse measures used in Callen and Weidmann (2011), this did not occur frequently in our sample. We re-randomize to guarantee balance.

[25] We speculate that in many cases the purpose of stealing the materials was to manipulate them and then reintroduce altered DR forms into the aggregation process.

4.3 Recovery Strategies and Protection Capacity

Analysis of Temporal Recovery

Our field staff delivered letters announcing monitoring from 10PM to 4PM on September 18, when voting concluded. PCMs then counted ballots at the polling station and filled out a DR form, completing the process around 8PM. Importantly, because of this timeline, Photo Quick Count cannot detect count manipulation, while it is virtually guaranteed to detect any DR form manipulation. PCMs, aware that our researchers would take photographs of DR forms on the morning of September 19, could in response recover votes for candidates by engaging in count manipulation in place of DR form manipulation.

We obtain data on count manipulation from the ECC. These include complaints about the electoral process made by candidates, observers, and candidate agents. Count manipulation occurred widely in our sample. For example, a complaint made by a candidate about the Charahi Taymani neighborhood in Kabul reports "in Ismailya Polling station, 10 of my family members voted for me, but the Declaration of Results Form displayed only 7." Similarly, at the Sayedullah Khan Bazaar High School in Terin Kot in Urozgan province, a candidate reports "382 votes were cast, but then the voting papers were inexplicably lost. Later that evening, I observed the brother of Sema Joyenda replacing the vote papers into the boxes." The ECC received 5,869 total complaints regarding the September 2010 parliamentary elections, of which 4,138 were made by candidates and 944 were made about IEC polling officials violating protocols. 650 of the 944 complaints about polling staff were made by candidates. In our sample of 2,004 polling stations in 471 polling centers, 1,858 complaints were filed with the ECC. 1,227 of these complaints were filed by candidates and 900 were filed regarding polling center staff. We measure Count Manipulation using these two variables: the number of complaints filed by candidates about a given polling station and the number of complaints filed against IEC staff about a given polling station.

The second prediction of the model we present in Section 2 is that Photo Quick Count should increase Count Manipulation. We investigate this using the specification:

$$Count\ Manipulation_{cs} = \beta_1 + \beta_2 Letter\ Delivered_c + \boldsymbol{\beta}_3' \mathbf{X}_{cs} + \nu_{cs} \tag{2}$$

where, $\mathbf{X}_{cs}$ is a vector of polling station attributes which includes stratum fixed effects. Our estimates for β_1 will be consistent as they we estimate them using random assignment to treatment. The prediction of temporal recovery corresponds to $\beta_2 > 0$.

Additionally, to test if candidates with weak protection capacity prefer to substitute temporally, we repeat Specification 2, interacting *Letter Delivered* with *Protection Capacity*:

$$
\begin{aligned}
Count\ Manipulation_{cs} =& \phi_1 + \phi_2 Letter\ Delivered_c + \phi_3 Protection\ Capacity_c + \\
& \phi_4 Letter\ Delivered_c \cdot Protection\ Capacity_c + \boldsymbol{\phi}_5' \mathbf{X}_{cs} + \eta_{cs}.
\end{aligned} \tag{3}
$$

Analysis of Spatial Recovery

Our model additionally predicts that strong protection capacity candidates will prefer spatial recovery. Precise geographic coordinates of the polling centers provided by the U.S. Military allow us to test for spatial externalities consistent with spatial recovery:

$$
Most\ Connected\ Cand.\ Votes_{cs} = \varphi_1 + \varphi_2 Letter\ Received_{cs} + \sum_{i=1}^{3} \psi_i \bar{T}_c^i + \boldsymbol{\varphi}_6' \mathbf{X}_{cs} + \zeta_{cs} \tag{4}
$$

where $\bar{T}_c^1$ indicates the sum of treatment statuses for the 5 nearest polling centers, $\bar{T}_c^2$ indicates the sum of treatment statuses of the next 5 nearest polling centers and $\bar{T}_c^3$ is the sum of treatment statuses of the next nearest 5 polling centers after that. Thus, each of the sums form a mutually exclusive group.

This specification, run only on the weak protection capacity sample, allows us to test for the "chilling" effect. The "chilling" effect in our model predicts that $\psi_i < 0, \forall i \in \{1, 2, 3\}$ in the weak protection capacity sample, and spatial recovery predicts that $\psi_i > 0, \forall i \in \{1, 2, 3\}$ in the strong protection capacity sample. We investigate both predictions in subsection 5.2 below.

5 Results

This section provides evidence that Photo Quick Count reduced DR Form Manipulation, which we measure as the illegal stealing of election materials. Second, we find a corresponding reduction in votes for the most connected candidates by about 25 percent and by as much as 40 percent in the strong protection capacity sample. This result accords with our prediction that strong protection capacity candidates prefer DR form manipulation. We also document that candidates made efforts to recover votes through count manipulation (temporal recovery) and by relocating DR form manipulations to polling centers where we did not announce monitoring (spatial recovery). Last, we find evidence that candidates with weak protection capacity prefer temporal recovery while candidates with strong protection capacity prefer spatial recovery. All these results are consistent with the predictions of our model of corrupt transactions between a candidate and an election official capable of selling several substitutable types of illegal votes.

5.1 Evidence of Fraud Reduction

Table 3 presents estimates of several variants of Equation 1 for both the full sample and the strong protection capacity sample, sequentially adding stratum fixed effects and covariates to demonstrate robustness. According to our theory, strong protection capacity candidates prefer DR form manipulation, which the intervention targets. We therefore separately estimate effects for this subsample in columns 4 - 6. Panel A reports our estimates of the effect of announcing Photo Quick Count Monitoring on DR form manipulation and Panel B reports estimates of the effect on votes for the most connected candidate.

We report estimates of effects on both measures for two reasons. First, the timing of our intervention made it difficult to quickly redeploy candidate agents to new polling centers to steal materials. This measure therefore provides an estimate of the effect subject to fewer externalities. We include the second measure to obtain a cardinal estimate of treatment effects, which may provide a basis for cost comparisons with other monitoring technologies.[26]

We find that the intervention substantially reduces both measures of fraud. The simple mean difference reported in column 1, Panel A indicates a reduction in DR Form Manipulation from 18.9 percent to 7.1 percent. Columns 2 and 3 provide estimates which remain virtually unchanged with the inclusion of stratum fixed effects and covariates. Column 1 in Panel B suggests about a 25 percent reduction in votes for the most connected candidate.[27] Consistent with the model, we find in columns 4 - 6 in both Panels A and B that the largest reductions for both measures occur in the strong protection capacity sample. This is especially true for votes for the most connected candidate, suggesting that connected candidates have additional means of altering the count during aggregation in addition to DR form manipulation.

[26]There are at least two concerns about using votes for the most connected candidate as a dependent variable. First, the prediction of spatial recovery indicates the presence of spatial externalities, which we discuss in Section 5.2 below. Second, the arrival rate for this measure can vary dramatically across polling center for a given candidate and so Ordinary Least Squares may not produce the appropriate specification. We estimate Equation 1 using MLE to address this problem in Section 5.4 below. We thank Gordon Dahl for very helpful discussions on this issue.

[27]Results for all three columns are significant in corresponding negative binomial regressions.

5.2 Evidence on Political Connections and the Strategic Response to Monitoring

Temporal Recovery

The first window for recovering votes after our treatment occurs through count manipulation. Commonly, this involves taking votes cast for one candidate and attributing them to another. This strategy suffers limited effectiveness because of an adding up constraint (stations have a fixed number of possible votes) and occurs in the presence of observers and candidate agents during the polling center count, who may observe and report on manipulation. Indeed, our data on manipulation in this margin come from such complaints made to the ECC. We focus on two types of complaints in our data. The first includes complaints made to the ECC about the behavior of polling center officials. The second includes complaints made by parliamentary candidates to the ECC about a specific polling stations. The latter complaint usually comes from reports from lesser candidates that votes they know they and their supporters cast on their behalf never appear on DR forms. For this to happen, manipulation must occur during the count. This strategy has limited effectiveness, but only requires the complicity of a PCM, and not a more senior elections officer.

Table 4 reports estimates of Equation 2, our test of temporal recovery. In Panel A, we measure Count Manipulation as the number of complaints against IEC staff at a given polling station and in Panel B we measure Count Manipulation as the number of complaints filed by candidates. The point estimates in columns 1 and 2 in Panel A indicate that treatment doubles the number of complaints against IEC officials at the polling center from 1 to 2. Corresponding estimates in Panel B indicate that complaints made by candidates increases even more substantially. Both results are consistent with temporal recovery.

Columns 5 and 6 present an additional set of tests using data from FEFA, based on the availability of indelible ink to prevent multiple voting at the polling station. Domestic civil society election monitors working for FEFA gathered the data we use on adherence to anti-fraud election protocols.[28] We focus on the availability of indelible ink, which is applied to voters' fingers after admittance to the polling center to prevent multiple voting, and whether this ink could be washed off as measures of pre-treatment vulnerability to rigging. A lack of truly indelible ink to prevent multiple voting provides information about the pre-monitoring allocation of fraud. This allows us to understand equilibrium allocations of corrupt votes in

[28]FEFA visited 201 (89 percent) of the 227 control polling centers from our sample and 202 (85 percent) of the 238 treatment polling centers. We fail to reject the null hypothesis of equality for visits by FEFA monitors with a p-value of 0.25. We observe whether ink is available in 177 (78 percent) of our 227 controls and in 175 (77 percent of our 238 treatments). We also fail to reject the null of differences in this mean with a p-value of 0.25.

the absence of any intervention.

The increase in ECC complaints, in this subsample, shown in columns 5 and 6 of both panels, is 2 - 3 times larger. The availability of indelible ink should be correlated with the planned extent of count manipulation before the letter announcing Photo Quick Count arrived. This provides additional support for the theory and increases our confidence in our interpretation of the increase in Count Manipulation as evidence of temporal recovery.

Spatial Recovery

Table 5 reports estimates corresponding to Specification 4, with votes for the most connected candidate as the dependent variable in Panel A and DR Form Manipulation in Panel B. Panel A columns 1 - 3 report estimates on the weak protection capacity subsample. The negative and significant coefficients on the spatial lags are consistent with the chilling effect discussed in Section 2, resulting from the increase in officials' subjective assessments of the probability of monitoring. It appears that news of our letters traveled, causing a reduction in votes for the most connected candidate, even in unmonitored polling centers. The negative coefficients for spatial lags in Panel B, additionally support the presence of a chilling effect.

We now test for spatial recovery. Columns 4 - 6 of Panel A provide two key insights. First, we see that contamination of our controls, as a result of spatial recovery, requires us to reinterpret the estimates on votes for the most connected candidate in Table 3. Column 4 replicates Column 5 in Panel B of Table 3. The effect size is lessened with the inclusion of spatial lags, suggesting that spatial recovery increases DR Form Manipulation in unmonitored stations. The second insight is that the negative and signficant estimate for ψ_2, on the strong protection capacity sample accords with spatial recovery. This is an especially surprising result, given the countervailing Caution Effect we document in columns 1 - 3 of Panel A. Taken together, this suggests candidates may have offset some of the total effects of the intervention through spatial recovery.

In Panel B, we see that the negative and significant effects on DR Form Manipulation in Table 3 are sustained and are not much affected by the inclusion of spatial lags. The estimates increase slightly, however, when accounting for the Caution Effect. The small point estimates on the spatial lags are consistent with our interpretation of the effect on DR Form Manipulation as reflecting a partial equilibrium response. The effects on votes for the most connected candidate in Panel A, by contrast, reflect a series of changes that occur later in the aggregation process outside of the polling center. Officials have both more time and face lower costs to spatially coordinating a response, as at this stage DR forms are in a centralized aggregation center.

The estimates in Table 5 support two predictions of our model. First, subjective assessments of monitoring should increase in unmonitored polling centers, creating a Caution Effect. Second, strong protection capacity candidates should prefer spatial recovery, because officials still face a low expected cost when engaging in DR form manipulation on behalf of candidates.

As with the results already discussed, these are consistent with several models. For example, it could be that in our weak protection capacity sample, there is a candidate, who is not the most connected candidate, but who is *rigging against* the most connected candidate and causing them to lose votes. This is inconsistent with our interpretation of the negative coefficients on the spatial lags as evidence of a Caution Effect, but still supports the core prediction of spatial recovery.

5.3 Extention - Further Evidence of Election Official Involvement in Rigging

Table 6 reports regressions where we interact treatment status with the availability of ink and with whether the ink could be washed for the sample which reports having ink:

$$DRFormManipulation_{cs} = \beta_1 + \beta_2 T_{cs} + \beta_3 T_{cs} \cdot Ink\ Problem_c + \boldsymbol{\beta}_4' \mathbf{X}_{cs} + \boldsymbol{\beta}_5' \mathbf{D}_c + \nu_{cs} \quad (5)$$

Estimates in columns 1 and 2 provide evidence that our researchers successfully observed the stealing of election materials during their investigative work the day after the election. At the point estimate, we find that candidate agents are 25 percent more likely to steal election materials in polling centers with no ink in our control sample. We also find that the effect of the letter on the immediate reaction of candidates is much stronger in polling centers where ink was not available on election day. The results suggest a reduction of materials theft by 33.1 percent in these polling centers. Therefore, the announcement of monitoring has a greater impact in places where fraud is endemic.

If a candidate exerts control over a polling station, they should ensure that PCMs do not enforce safeguards to prevent multiple voting, and additionally alter DR forms directly or hand them off to someone to adjust later. Our results support this intuition. We also note that having the ink wash predicts votes for the most connected candidate.

5.4 Robustness

The results from Table 5 constitute the core test of our hypothesis. In this section, we test the sensitivity of these results to various specifications. As mentioned above, one issue concerns the distribution of votes, which may vary dramatically across provinces as we use vote totals for different candidates in different provinces. A related concern addresses the influence of outliers. We use three additional specifications to deal with these concerns. First, we estimate the spatial externalities using a negative binomial model. Second, we transform the dependent variable to the within-sample ascending rank position for the most connected candidate Vote total, which dampens outliers. Last, we run negative binomial regressions using the rank transformation. To provide a further check against outliers, we show that our results are robust to trimming at the 99th percentile of the dependent variable in Panel B. Table 7 reports our robustness results. We see that in all cases, our results remain robust to these checks.

6 Conclusion

Free and fair elections are critical for democracy to fulfill its key function of empowering citizens to hold politicians accountable. Elections fail in new democracies for a range of reasons, but commonly because of weak institutions with limited constraints on the ability election officials to manipulate on behalf of a candidate. Corruption, traditionally defined as the illegal sale of preferential treatment by government agents, therefore also poses a threat to democracy.

This paper provides results from an experimental evaluation of a novel Photo Quick Count technology intended to reduce the corrupt sale of votes by election officials to candidates. The technology is effective, scalable, well-suited to citizen-based implementation and "viral" adoption, and cost-effective relative to traditional international election monitoring.[29] We exploit the randomized evaluation of this technology, along with unusually rich administrative data on the election process, to test a set of predictions from a model of trade in corrupt votes between a candidate and an election official.

Theoretical treatments of corruption typically consider an official illegally transacting a government good or service, with comparative statics focusing on the determinants of equilibrium prices and quantities(Shleifer and Vishny 1993; Cadot 1987; Rose-Ackerman 1975). More recent empirical work, especially Fisman (2001) and Khwaja and Mian (2005), documents the central role of political connections in determining who gets illegal preferential access to favors from the government. Our results add to this by providing and experimentally testing a logic for the relevance of political connections in determining the pattern of corruption. Politically connected bribe payers can influence the expected cost for officials

[29]Viral adoption refers to the adoption of new technology based on information that spreads through pre-existing social networks in a self-replication process. Typically viral adoption relies on ICT to spread information about new technologies.

engaging in corruption, which is reflected in a lower price.

Our results are consistent with a range of models. However, no matter how they are interpreted, they are actionable for policy. First and most importantly, our results indicate that ICT-based corruption monitoring technologies represent a promising and potentially highly cost-effective means of reducing corruption. These results are supported by a standard randomized impact evaluation, and so should be consistent and internally valid. Second, corrupt networks have both incentives and strong means to adapt to changes that result from monitoring. At a minimum, anti-corruption efforts, especially in weakly institutionalized contexts, should attempt to account for these and also remain sensitive to the possibility of perverse allocative consequences. Specifically, resilient corrupt agents might benefit from monitoring as it pushes less powerful individuals out of the market for illegal government goods. Finally, monitoring is likely to be most cost-effective when it is not possible to predict. Foreknowledge may be met by adaptation, undermining effectiveness.

Our findings produce a natural set of questions for future research. First, data on the response of prices for government favors to an unannounced shock to the detection probability would constitute a direct test of the core prediction of our model. This research design would allow our model to be separated from a broader class of theories. Second, exhaustive data on the reallocation of corruption into unmonitored transactions would permit a full accounting of the ultimate equilibrium pattern corruption. Such data would allow definitive statements about the general equilibrium effect of monitoring on total corruption. Third, understanding the long run effects of reducing corruption in an election, or in any other context, is incomplete without an analysis of the welfare consequences. In this context, the effects on citizens' support for the government may be especially critical. Finally, and perhaps more practically, our results suggest that identifying and operationalizing innovative uses of ICT to quickly gather information on corruption and other types of waste and abuse, in the presence of non-zero punishments, may be able to effectively reduce corruption.

References

Aker, Jenny, Paul Collier, and Pedro C. Vicente, "Is Information Power: Using Cellphones During an Election in Mozambique," Working Paper, Oxford University November 2010.

Becker, Gary S., "Crime and Punishment: An Economic Approach," *Journal of Political Economy*, 1968, *76*, 169–217.

_ **and George J. Stigler**, "Law Enforcement, Malfeasance, and Compensation of Enforcers," *Journal of Legal Studies*, January 1974, *3* (1), 1–18.

Berman, Eli, Jacob N. Shapiro, and Joseph H. Felter, "Can Hearts and Minds Be Bought? The Economics of Counterinsurgency in Iraq," *Journal of Political Economy*, Forthcoming.

Besley, Timothy and Robin Burgess, "The Political Economy of Government Responsiveness: Theory and Evidence from India," *Quarterly Journal of Economics*, 2002, *117* (4), 1415–1452.

_ **and Torsten Persson**, "The Logic of Political Violence," 2009.

_ **, Rohini Pande, and Vijayendra Rao**, "Participatory Democracy in Action: Survey Evidence from South India," *Journal of the European Economic Association*, 2005, *3* (2-3), 648–657.

Bjornlund, Eric, *Beyond free and fair: Monitoring elections and building democracy*, Woodrow Wilson Center Press, 2004.

Bruhn, Miriam and David McKenzie, "In Pursuit of Balance: Randomization in Practice in Development Field Experiments," *American Economic Journal: Applied Economics*, 2009, *1* (4), 200–232.

Cadot, Olivier, "Corruption as a gamble," *Journal of Public Economics*, July 1987, *33* (2), 223–244.

Callen, Michael and Nils Weidmann, "Violence, Control, and Election Fraud: Evidence from Afghanistan," 2011.

Chattopadhyay, Raghabendra and Esther Duflo, "Women as Policy Makers: Evidence from a Nationwide Randomized Experiment in India," *Econometrica*, September 2004, *72* (5), 1409–1443.

Cowan, Glenn, Melissa Estok, and Neil Nevitte, *The Quick Count and Election Observation*, National Democratic Institute for International Affairs, 2002.

Ferraz, Claudio and Frederico Finan, "Exposing Corrupt Politicians: The Effects of Brazil's Publicly Released Audits on Electoral Outcomes," *The Quarterly Journal of Economics*, 2008, *123* (2), 703–745.

Fisman, Raymond, "Estimating the Value of Political Connections," *American Economic Review*, 2001, *91* (4), 1095–1102.

_ **and Edward Miguel**, "Cultures of Corruption: Evidence From Diplomatic Parking Tickets," *Journal of Political Economy*, 2007, *115* (6).

Fujiwara, Thomas, "Voting Technology, Political Responsiveness, and Infant Health: Evidence from Brazil," 2010. Mimeo, University of British Columbia.

Gibson, Clark and James D. Long, "The Presidential and Parliamentary Elections in Kenya," *Electoral Studies*, 2009, *28.*

Hyde, Susan D., "The Observer Effect in International Politics: Evidence from a Natural Experiment," *World Politics*, 2007, *60* (1), 37–63.

Khwaja, Asim Ijaz and Atif Mian, "Do Lenders Favor Politically Connected Firms? Rent Provision in an Emerging Financial Market," *Quarterly Journal of Economics*, November 2005, *120* (4), 1371–1411.

Levitt, Steven D., "Understanding Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six that Do Not," *JEP*, 2004, *18* (1), 163–190.

McChrystal, Stanley, "COMISAF's Initial Assessment to the Secretary of Defense," Technical Report August 2009.

McMillan, John and Pablo Zoido, "How to Subvert Democracy: Montesinos in Peru," *Journal of Economic Perspectives*, Fall 2004, *18* (4), 69–92.

Olken, Benjamin A, "Monitoring Corruption: Evidence from a Field Experiment in Indonesia," *Journal of Political Economy*, 2007, *115* (2), 200–249.

Pande, Rohini, "Can Mandated Political Representation Increase Policy Influence for Disadvantaged Minorities? Theory and Evidence from India," *American Economic Review*, 2003, *September.*

Rose-Ackerman, Susan, "The economics of corruption," *Journal of Public Economics*, 1975, *4* (2), 187 – 203.

Shleifer, Andrei and Robert W. Vishny, "Corruption," *Quarterly Journal of Economics*, August 1993, *108* (3).

Svensson, Jakob, "Who Must Pay Bribes and How Much? Evidence from A Cross Section of Firms*," *Quarterly Journal of Economics*, 2003, *118* (1), 207–230.

Tella, Rafael Di and Ernesto Schargrodsky, "The Role of Wages and Auditing during a Crackdown on Corruption in the City of Buenos Aires," *Journal of Law and Economics*, 2003, *46* (1), 269–292.

United States Army, "Field Manual 3-24: Counterinsurgency," December 2006.

World Bank, *World Development Report 2011: Conflict, Security, and Development* WDR April 2011.

Table 1: Summary Statistics for Political Connections Data

	Full Sample	Strong Protection Capacity	Diff. (2) - (1)	p-value
	(1)	(2)	(3)	(4)
Connected to Provincial Elect. Officer (=1)	0.491	0.632	0.140	0.295
	[0.504]	[0.496]	(0.133)	
Connected to District Elect. Officer (=1)	0.228	0.316	0.088	0.451
	[0.423]	[0.478]	(0.116)	
Served in Senior Post Since 2001 (=1)	0.614	0.684	0.070	0.589
	[0.491]	[0.478]	(0.129)	
Served in Junior Post Since 2001 (=1)	0.158	0.263	0.105	0.312
	[0.368]	[0.452]	(0.103)	
Connected Directly to Karzai (=1)	0.298	0.526	0.228*	0.074
	[0.462]	[0.513]	(0.126)	
Indirectly Connected to Karzai (=1)	0.281	0.211	-0.070	0.554
	[0.453]	[0.419]	(0.118)	
Connected to Provincial Governor (=1)	0.632	0.579	-0.053	0.687
	[0.487]	[0.507]	(0.130)	
Connected to Provincial Council (=1)	0.842	0.737	-0.105	0.312
	[0.368]	[0.452]	(0.103)	
Female (=1)	0.123	0.000	-0.123	0.112
	[0.331]	[0.000]	(0.076)	
Pashtun (=1)	0.368	0.316	-0.053	0.683
	[0.487]	[0.478]	(0.128)	
Tajik (=1)	0.246	0.158	-0.088	0.434
	[0.434]	[0.375]	(0.111)	
Hazara (=1)	0.158	0.158	0.000	1.000
	[0.368]	[0.375]	(0.098)	
Uzbek (=1)	0.123	0.158	0.035	0.700
	[0.331]	[0.375]	(0.091)	
Other Ethnicity	0.088	0.211	0.123	0.155
	[0.285]	[0.419]	(0.086)	
Connected to Insurgents (=1)	0.158	0.211	0.053	0.604
	[0.368]	[0.419]	(0.101)	
Connected to Business (=1)	0.316	0.368	0.053	0.677
	[0.469]	[0.496]	(0.126)	
Election Winner (=1)	0.544	0.526	-0.018	0.896
	[0.503]	[0.513]	(0.134)	
# Observations	57	19		

Table 2: Randomization Verification

	Control	Treatment	T-C	p-value
	(1)	(2)	(3)	(4)
Plans to turnout during election (=1)	0.788	0.797	0.009	0.682
	[0.237]	[0.232]	(0.022)	
Believes vote is secret (=1)	0.664	0.650	-0.014	0.561
	[0.267]	[0.255]	(0.025)	
Candidate will know how I voted (=1)	0.088	0.090	0.002	0.868
	[0.147]	[0.153]	(0.014)	
Can identify sitting MP (=1)	0.372	0.386	0.013	0.664
	[0.327]	[0.318]	(0.031)	
People in precinct will vote for same cand. (=1)	0.238	0.249	0.010	0.673
	[0.253]	[0.258]	(0.024)	
Problems with ballot transport are likely (=1)	0.533	0.534	0.001	0.974
	[0.304]	[0.302]	(0.029)	
Police in PC help security (=1)	0.738	0.737	-0.000	0.987
	[0.237]	[0.241]	(0.023)	
People like you are threatened to vote one way (=1)	0.217	0.202	-0.015	0.482
	[0.232]	[0.223]	(0.022)	
Local violence likely on elect. day (=1)	0.501	0.483	-0.018	0.570
	[0.317]	[0.347]	(0.032)	
MP Candidate from same Qawm (=1)	0.233	0.232	-0.001	0.973
	[0.221]	[0.227]	(0.021)	
Trad. auth. helps settle disputes (=1)	0.287	0.293	0.006	0.800
	[0.267]	[0.240]	(0.024)	
Pashtun (=1)	0.326	0.318	-0.008	0.830
	[0.388]	[0.407]	(0.038)	
Tajik (=1)	0.426	0.433	0.007	0.858
	[0.383]	[0.390]	(0.037)	
Income generating activity (=1)	0.602	0.607	0.005	0.793
	[0.198]	[0.192]	(0.019)	
Monthly income (1,000 AFs)	10.613	10.553	-0.061	0.910
	[4.817]	[6.356]	(0.540)	
Electrified (=1)	0.726	0.706	-0.020	0.491
	[0.300]	[0.323]	(0.030)	
District Governor keeps elect. fair (=1)	0.111	0.114	0.004	0.814
	[0.170]	[0.169]	(0.016)	
Visited by international election monitors (=1)	0.144	0.174	0.030	0.380
	[0.350]	[0.378]	(0.034)	
# Observations	227	238		

Notes: Standard deviations reported in brackets and standard errors reported in parentheses. Data on election monitoring visits are provided by Democracy International. Polling data are based on 2,904 responses to interviews performed during August 2010 in 450 of the 471 polling center precincts in our experiment sample. Randomization was blocked on province and stratified on shares reporting some electricity and that the District Governor keeps elections fair.

Table 3: Evidence of Fraud Reduction

Dependent Variable:	DR Form Manipulation (=1)					
	Full Sample			Strong Protection Capacity		
Panel A	(1)	(2)	(3)	(4)	(5)	(6)
Delivered Letter (=1)	-0.118***	-0.118***	-0.115***	-0.153***	-0.150***	-0.149***
	(0.031)	(0.030)	(0.030)	(0.044)	(0.042)	(0.043)
Constant	0.189***	0.189***	0.162**	0.216***	0.214***	0.353**
	(0.026)	(0.025)	(0.082)	(0.038)	(0.036)	(0.173)
Province+Stratum FEs	No	Yes	Yes	No	Yes	Yes
Full Covariates	No	No	Yes	No	No	Yes
R-Squared	0.031	0.234	0.251	0.049	0.268	0.288
# Observations	465	444	444	243	243	243
Dependent Variable:	Votes for Most Connected Candidate					
	Full Sample			Strong Protection Capacity		
Panel B	(1)	(2)	(3)	(4)	(5)	(6)
Delivered Letter (=1)	-5.923*	-4.729	-4.855*	-11.180**	-9.866**	-7.830*
	(3.303)	(3.053)	(2.867)	(5.139)	(4.218)	(3.982)
Constant	23.262***	23.619***	36.804***	27.703***	27.012***	18.462
	(2.558)	(2.095)	(6.829)	(4.563)	(3.474)	(11.477)
Province+Stratum FEs	No	Yes	Yes	No	Yes	Yes
Full Covariates	No	No	Yes	No	No	Yes
R-Squared	0.006	0.230	0.243	0.018	0.256	0.343
# Observations	1,879	1,786	1,786	873	873	873
# Clusters	437	420	420	232	232	232

Notes: *Level of significance*: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors are reported in parentheses (standard errors in *Panel B* are clustered at the the polling center level). DR Form Manipulation is an indicator for whether candidate agents stole materials or damaged Declaration of Results forms. The Most Connected Candidate is identified using the procedure described in Section 4.1. The full set of covariates are the share of respondents who are Pashtun, Tajik, who anticipate violence on election day, and who can identify the sitting member of parliament and whether the polling center was visited by international election monitors (*Panel B* regressions include the total number of votes cast at the station). Strong Protection Capacity corresponds to provinces in which the Most Connected Candidate has a connection to the Provincial Elections Officer.

Table 4: Temporal Recovery

Dependent Variable	Count Manipulation 1: Number ECC Complaints Against Polling Official					
	Full Sample				Ink Problems	
Panel A	(1)	(2)	(3)	(4)	(5)	(6)
Letter Delivered (=1)	1.063*	1.016*	1.967	2.106*	3.680*	3.512**
	(0.594)	(0.539)	(1.297)	(1.272)	(1.893)	(1.635)
Letter x Strong Protection Capacity			-1.702	-2.028	-3.493*	-3.497**
			(1.308)	(1.393)	(1.898)	(1.747)
Constant	0.678	0.408	0.769	0.374	0.830	0.448
	(0.736)	(1.270)	(0.720)	(1.243)	(0.840)	(1.624)
R-squared	0.206	0.253	0.213	0.260	0.261	0.324
# Observations	442	442	434	434	339	339

Dependent Variable	Count Manipulation 2: Number of ECC Complaints by Candidates					
	Full Sample				Ink Problems	
Panel B	(1)	(2)	(3)	(4)	(5)	(6)
Letter Delivered (=1)	1.406*	1.313*	2.655	2.765*	4.614*	4.351**
	(0.750)	(0.680)	(1.612)	(1.588)	(2.413)	(2.046)
Letter x Strong Protection Capacity			-2.309	-2.654	-4.320*	-4.282*
			(1.661)	(1.780)	(2.456)	(2.229)
Constant	1.727***	0.523	1.791***	0.387	1.598***	0.788
	(0.289)	(1.398)	(0.287)	(1.362)	(0.336)	(2.230)
R-squared	0.152	0.194	0.159	0.202	0.197	0.260
# Observations	444	444	436	436	341	341

Notes: *Level of significance*: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. All regression include stratum fixed effects. Robust standard errors are reported in parentheses. The full set of covariates are the share of respondents who are Pashtun, Tajik, who anticipate violence on election day, and can identify the sitting member of parliament and whether the polling center was visited by international election monitors. The Ink Problems sample corresponds to polling centers that report at least one station having no indelible ink to prevent multiple voting or that report at least one station where ink is washable.

Table 5: Protection Capacity and Spatial Recovery

	Votes for Most Connected Candidate					
	Weak Protection Capacity			Strong Protection Capacity		
Panel A	(1)	(2)	(3)	(4)	(5)	(6)
Letter Delivered (=1)	0.060	-2.317	-3.303	-9.866**	-6.735	-5.466
	(4.351)	(4.093)	(3.709)	(4.218)	(4.278)	(4.364)
Nearest 5 Neighbors Treat (1-5)		-4.967*	-3.794*		1.931	2.915
		(2.611)	(2.090)		(2.249)	(2.566)
Second Nearest 5 Neighbors Treat (1-5)		-5.511**	-5.412**		5.897*	6.988**
		(2.355)	(2.144)		(3.372)	(3.507)
Third Nearest 5 Neighbors Treat (1-5)		-3.555	-3.653		3.022	4.335
		(2.570)	(2.620)		(3.335)	(3.792)
Constant	20.481***	55.303***	60.820***	27.012***	-3.374	1.309
	(2.402)	(13.615)	(15.563)	(3.474)	(19.011)	(25.590)
Full Controls	No	No	Yes	No	No	Yes
R-Squared	0.206	0.226	0.262	0.256	0.264	0.284
# Observations	913	913	913	873	873	873
# Clusters	188	188	188	232	232	232
	DR Form Manipulation (=1)					
	Weak Protection Capacity			Strong Protection Capacity		
Panel B	(1)	(2)	(3)	(4)	(5)	(6)
Letter Delivered (=1)	-0.080*	-0.099**	-0.092*	-0.150***	-0.173***	-0.172***
	(0.044)	(0.048)	(0.048)	(0.042)	(0.049)	(0.051)
Nearest 5 Neighbors Treat (1-5)		-0.039	-0.045		-0.043	-0.039
		(0.032)	(0.033)		(0.030)	(0.031)
Second Nearest 5 Neighbors Treat (1-5)		-0.015	-0.017		-0.045	-0.047
		(0.028)	(0.028)		(0.034)	(0.035)
Third Nearest 5 Neighbors Treat (1-5)		-0.048*	-0.051*		0.021	0.018
		(0.027)	(0.028)		(0.035)	(0.036)
Constant	0.159***	0.414**	0.352*	0.214***	0.404*	0.519*
	(0.034)	(0.175)	(0.195)	(0.036)	(0.221)	(0.275)
# Observations	201	201	201	243	243	243
R-Squared	0.195	0.213	0.253	0.268	0.289	0.307

Notes: *Level of significance*: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors are reported in parentheses (standard errors in *Panel B* are clustered at the the polling center level). DR Form Manipulation is an indicator for whether candidate agents stole materials or damaged Declaration of Results forms. The Most Connected Candidate is identified using the procedure described in Section 4.1. The full set of covariates are the share of respondents who are Pashtun, Tajik, who anticipate violence on election day, and who can identify the sitting member of parliament and whether the polling center was visited by international election monitors (*Panel B* regressions include the total number of votes cast at the station). Strong Protection Capacity corresponds to provinces in which the Most Connected Candidate has a connection to the Provincial Elections Officer.

Table 6: Polling Centers with Pre-Count Fraud Exhibit the Largest Treatment Effects

	DR Form Manipulation				Votes for Politically Connected MP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Received Letter (=1)	-0.063*	-0.056*	-0.043	-0.037	-5.706	-5.728	9.656	11.694
	(0.033)	(0.033)	(0.092)	(0.090)	(3.973)	(3.641)	(9.125)	(8.751)
No Ink at PC (=1)	0.247**	0.265**			-7.745	-10.121		
	(0.124)	(0.122)			(7.278)	(7.205)		
Treat x No Ink at PC	-0.268***	-0.276***			9.022	9.540		
	(0.095)	(0.092)			(6.655)	(6.886)		
Ink Washable (=1)			-0.014	-0.024			17.523**	18.000***
			(0.084)	(0.082)			(6.769)	(6.683)
Treat x Ink Washable			-0.037	-0.043		-18.655*	-20.716**	
			(0.098)	(0.096)			(10.018)	(9.606)
Constant	0.117	0.063	0.174*	0.080	28.325***	44.063***	12.040	26.750**
	(0.076)	(0.108)	(0.102)	(0.124)	(7.899)	(11.337)	(7.829)	(10.882)
Sample	Full	Full	Ink	Ink	Full	Full	Ink	Ink
Full Controls	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.191	0.216	0.165	0.195	0.196	0.218	0.208	0.233
# Observations	387	387	336	336	1,608	1,608	1,387	1,387
# Clusters	-	-	-	-	369	369	319	319

Notes: *Level of significance*: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. Robust standard errors are reported in parentheses. Standard errors for estimates in *Panel B* are clustered at the the polling station level. All regressions include province and stratum fixed effects. The full set of covariates are the share of respondents who are Pashtun, Tajik, who anticipate violence on election day, and can identify the sitting member of parliament and whether the polling center was visited by international election monitors. *Panel B* estimates also control for total votes cast at the station. The *Ink* sample corresponds to the set of polling centers in our experimental sample that report having indelible ink to prevent multiple voting on election day. Results in specifications 1 - 4 are robust to negative binomial regression and results in specifications 5 -8 are robust to probit regression.

Table 7: Robustness - Protection Capacity and Spatial Recovery

	Votes for Most Connected Candidate					
	Weak Protection Capacity			Strong Protection Capacity		
Panel A	(1)	(2)	(3)	(4)	(5)	(6)
Received Letter (=1)	-0.037	-64.338	-0.049	-0.456**	-76.310	-0.116
	(0.174)	(58.626)	(0.076)	(0.181)	(51.160)	(0.076)
Nearest 5 Neighbors Treat (1-5)	-0.190**	-69.835*	-0.085**	0.094	8.664	0.060
	(0.087)	(35.556)	(0.041)	(0.155)	(32.326)	(0.061)
Second Nearest 5 Neighbors Treat (1-5)	-0.321***	-84.993**	-0.106**	0.242*	58.619*	0.101**
	(0.111)	(38.541)	(0.050)	(0.145)	(35.307)	(0.046)
Third Nearest 5 Neighbors Treat (1-5)	-0.173	-80.500**	-0.134***	0.270	13.995	0.045
	(0.108)	(34.350)	(0.047)	(0.170)	(41.851)	(0.069)
Constant	6.461***	1408.485***	8.261***	1.543	1146.590***	6.548***
	(0.835)	(286.598)	(0.376)	(1.434)	(271.927)	(0.493)
$ln(\alpha)$	0.203**		0.218*	0.657***		0.574***
	(0.100)		(0.116)	(0.098)		(0.089)
Estimation	NB	Rank	NB Rank	NB	Rank	NB Rank
# Observations	913	913	913	866	866	866
# Clusters	188	188	188	230	230	230
Log-Likelihood (R-Squared)	-3375.316	(0.378)	-7124.650	-3194.843	(0.398)	-6571.506

	Votes for Most Connected Candidate					
Panel B	Weak Protection Capacity			Strong Protection Capacity		
Trimmed at 99th Pctile	(1)	(2)	(3)	(4)	(5)	(6)
Received Letter (=1)	-0.123	-70.250	-0.053	-0.225	-65.422	-0.088
	(0.162)	(58.554)	(0.076)	(0.161)	(50.361)	(0.078)
Nearest 5 Neighbors Treat (1-5)	-0.224***	-72.550**	-0.087**	0.000	-2.416	0.044
	(0.083)	(35.201)	(0.040)	(0.099)	(29.949)	(0.058)
Second Nearest 5 Neighbors Treat (1-5)	-0.336***	-86.505**	-0.107**	0.215**	45.307	0.082**
	(0.104)	(38.465)	(0.050)	(0.100)	(32.865)	(0.041)
Third Nearest 5 Neighbors Treat (1-5)	-0.116	-72.964**	-0.130***	0.007	-6.873	-0.005
	(0.104)	(34.332)	(0.048)	(0.127)	(37.948)	(0.061)
Constant	3.714***	1360.474***	7.581***	2.773***	1143.890***	6.882***
	(0.741)	(286.182)	(0.374)	(0.783)	(266.474)	(0.338)
$ln(\alpha)$	0.135		0.226*	0.454***		0.575***
	(0.106)		(0.116)	(0.081)		(0.089)
Estimation	NB	Rank	NB Rank	NB	Rank	NB Rank
# Observations	905	905	905	855	855	855
# Clusters	188	188	188	230	230	230
Log-Likelihood (R-Squared)	-3289.262	(0.375)	-7054.750	-3029.159	(0.413)	-6467.521

Notes: *Level of significance*: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. All regressions include province and stratum fixed effects and full covariates. Robust standard errors clustered at the Polling Center level are reported in parentheses. The full set of covariates are the share of respondents who are Pashtun, Tajik, who anticipate violence on election day, and whether the polling center was visited by international election monitors. Estimation is by: NB = Negative Binomial; Rank = OLS with the dependent variable transformed to be the within-sample rank; NB Rank = Negative Binomial with the dependent variable transformed to be the within-sample rank. Panel B is trimmed at the 99th percentile of the dependent variable.

Figure 1: Declaration of Results (DR) Form for the Same Polling Center Before and After Aggregation

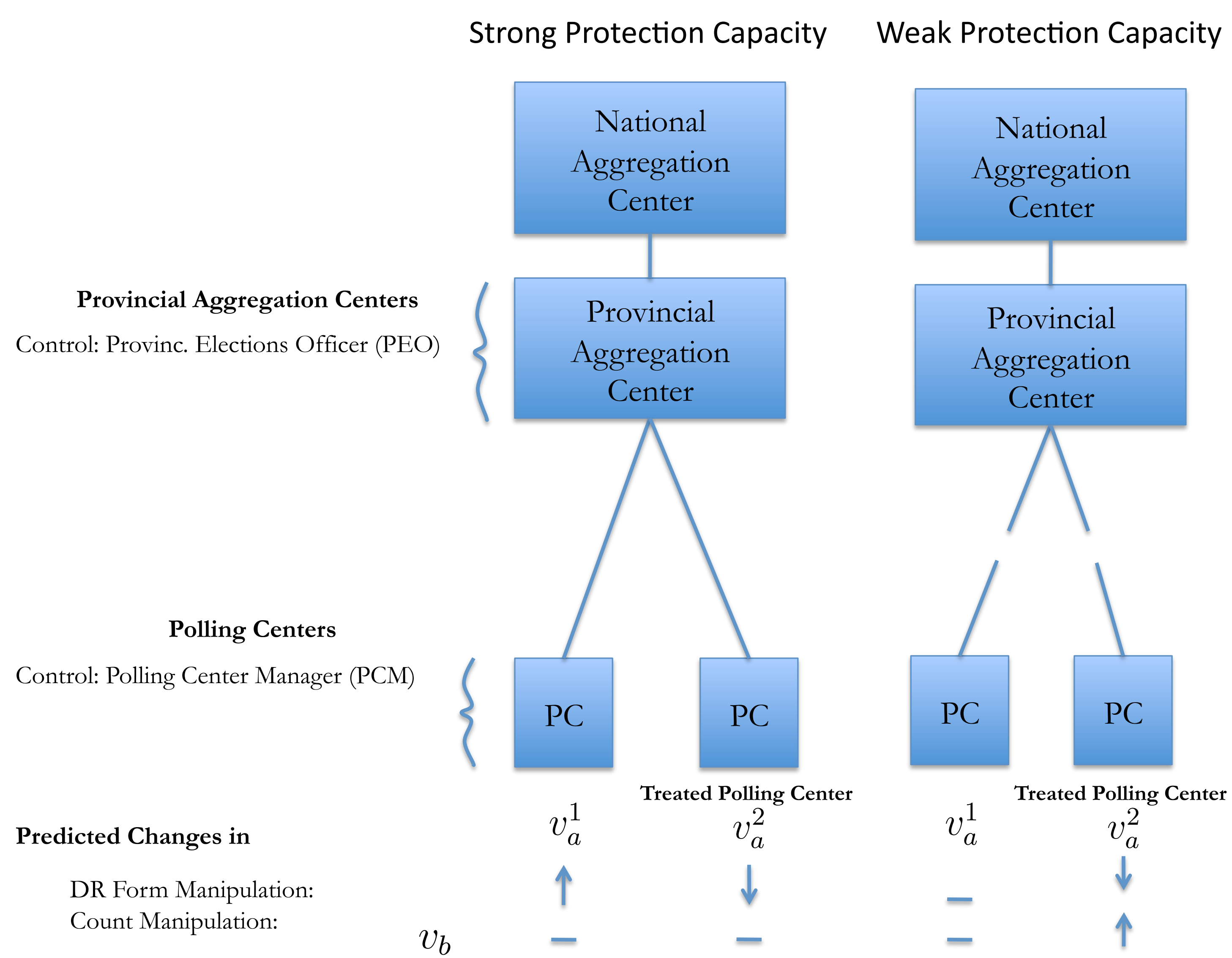

Figure 2: The Aggregation Process and Theoretical Predictions

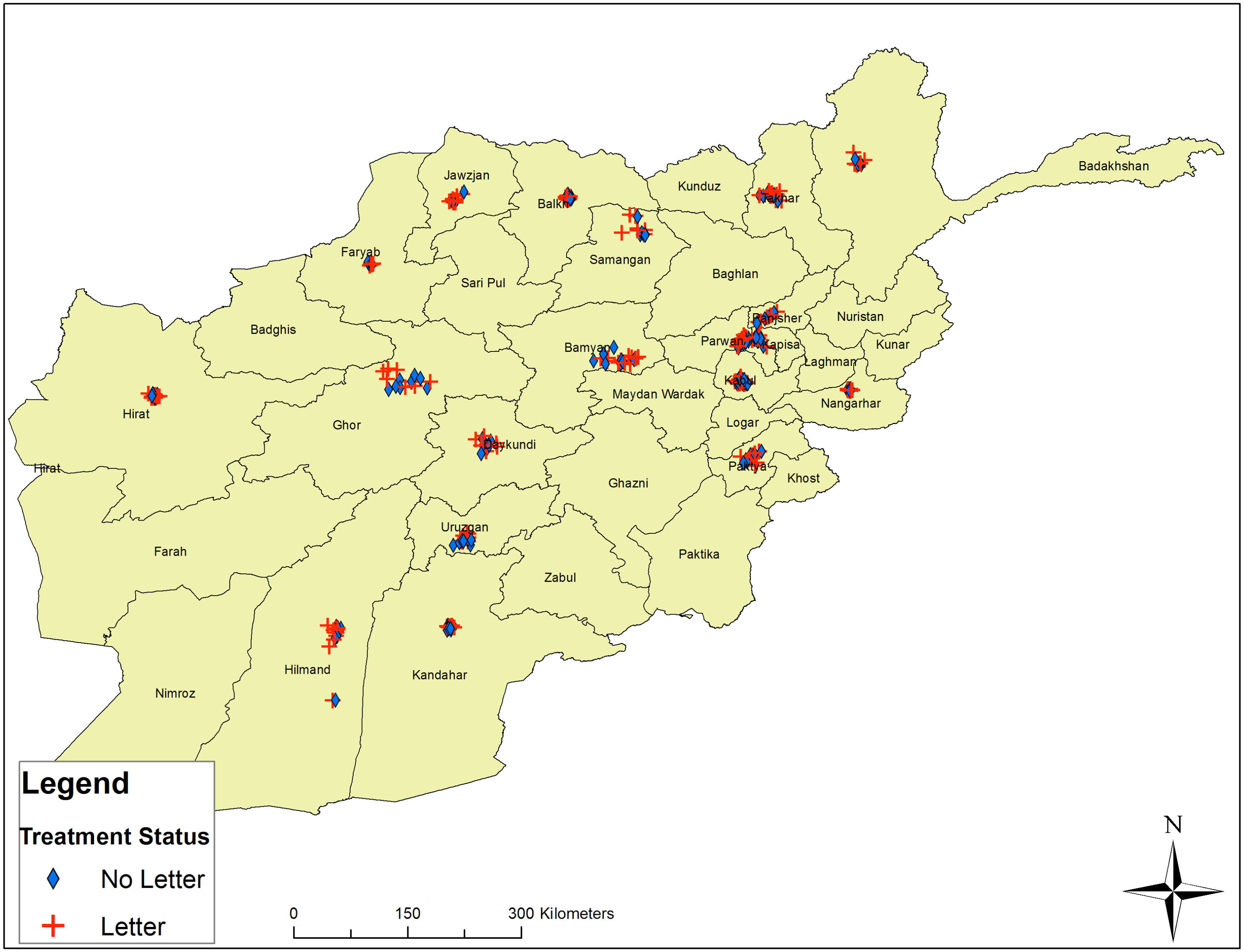

Figure 3: Experimental Sample Map

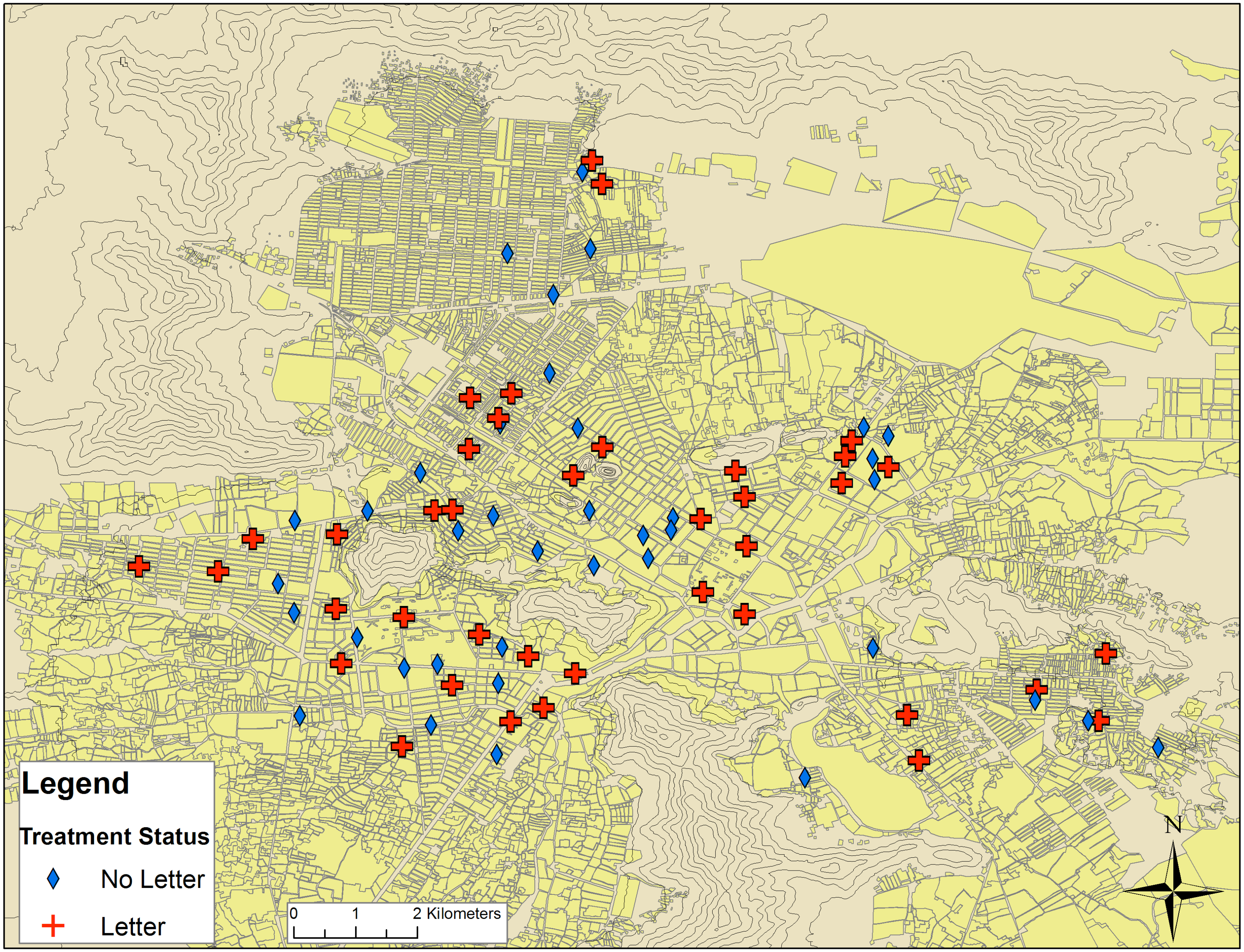

Figure 4: Experimental Sample in Kabul

Polling Center Name: …………………..

Polling Center Code:…………………….

Date: ………………………………………

Dear Sir or Madam-

Greetings! I am an official election observer with the Opinion Research Center of Afghanistan (ORCA). My organization is providing this letter to collect some important information about your polling center and share it with our main office. Your polling center has been randomly selected from among polling centers in this province.

In our attempts to help Afghanistan have free and fair elections, I will return to this polling center tomorrow morning in order to take pictures of the results for every candidate in every station on the tally sheets after they have been posted.

The information will be posted on a website that belongs to local and international election observers so that it will be used by the people of Afghanistan, the international community, and local and international media. We will also compare the photos taken with the tally certified by the IEC in Kabul.

As recognition that you have read and understood this letter, please sign here: ___________

Thank you kindly for your help and cooperation.

Sincerely,

Haj Abdul Nabi Barakzai

Deputy Head of ORCA

Name and Signature of manager of polling station:………………………………………

Figure A1: Letter Delivered to Polling Center Managers

Opinion Research Center of Afghanistan

نام مرکز رائ دهی: ___________________ تاریخ: __________________

___ مرکز رائ دهی: ______________ کود

به حضور محترم آقای / خانم

مسئولیت نظارت 472 مراکز رائ برحسب توافقنامه کمیسیون مستقل انتخابات دفتر اورکا
دهی را بر عهده دارد.

میباشد و برای او (ORCA) دفتربه مربوطیک تن از نظارت کننده گان رسمیدارنده مکتوب
معلومات تا بتواند مرکز رای دهی تسلیم نمودهدراین تا این مکتوب را وظیفه سپرده شده است
. این مرکز دفتر مرکزی شریک بسازدجمع آوری نموده و با مرکز رای دهی این و دقیق را ازموثق
این ولایت تمام مراکز رای دهی میانبه صورت تصادفی از گر به شمول چندین مراکز دیرای دهی
انتخاب شده است.

فردا صبح . ناظر ما یک انتخابات آزاد و مشروع در افغانستان کمک خواهیم کرد تقویتبرایما
. نصب میگردد اخذ نمایدمرکز رای دهیاین که در را نتایج کاندیدان لست آمد تا تصاویر از دخواه

گذاشته مربوط به ناظرین انتخاباتی داخلی و خارجی این نتایج در سایت انترنتی تصاویر
از این نتایج ، موسسات خارجی، و مطبوعات داخلی و خارجیخواهد شد تا تمام مردم افغانستان
نتایج را با نتایج که از طرف اینتصاویر حاصله از ناظرحیث مناستفاده کنند. و همچنان ما
انتخابات در کابل نشر میشود مقایسه خواهیم کرد. مستقلکمیسیون

در پائین ایدبرای تائید اینکه این مکتوب بدسترس شما قرار گرفته و شما انرا مطالعه نموده
مضا نمائید. لطف نموده ا

از همکاری شما قبلاَ اظهار سپاس.

بااحترام

حاجی عبدالنبی بارکزی

معاون دفتر اورکا

آمر محترم مرکزرائ دهی: _________________ یامضاسم و

Figure A2: Dari Translation of Letter Delivered to Polling Center Managers