# Field experiment estimate of electoral fraud in Russian parliamentary elections

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**Electoral fraud is a widespread phenomenon, especially outside the developed world. Despite abundant qualitative and anecdotal evidence on its existence from around the world, there is very limited quantitative evidence on the extent of electoral fraud. We exploit random assignment of independent observers to 156 of 3,164 polling stations in the city of Moscow to estimate the effect of electoral fraud on the outcome of the Russian parliamentary elections held on December 4, 2011. We estimate the actual share of votes for the incumbent United Russia party to be at least 11 percentage points lower than the official count (36% instead of 47%). Our results suggest that the extent of the fraud was sufficient to have had a substantial impact on the outcome of the elections; they also confirm that the presence of observers is an important factor in ensuring the integrity of the procedure.**

nondemocratic government | authoritarian politics

Electoral fraud helps autocratic leaders to stay in power and demonstrate their strength to both citizens and potential opposition leaders (1, 2). Electoral fraud reduces accountability and slows leadership turnover, which in turn is associated with lower economic growth (3–6). However, convincing identification of the size of electoral fraud is methodologically challenging. Most existing studies establish the presence of the fraud and its correlates but do not estimate the extent of the fraud. In the absence of experimental evidence, the studies need to either make strong assumptions about underlying distributions of voters' preferences (7, 8), focus on voting registration rather than actual voting results (9, 10), assume the absence of unobserved heterogeneity between precincts (11, 12), or use disputed elections to proxy for the presence of electoral fraud (13).

In this article, we used data from a large-scale field experiment that allowed us to estimate the amount of electoral fraud in the city of Moscow during the Russian parliamentary elections in December 2011. Specifically, we compared voting shares of the incumbent United Russia party at polling stations with and without randomly assigned independent electoral observers. The field experiment has several advantages from a methodological point of view (12, 14). First, we randomized polling stations within each of the city's 125 electoral districts, essentially comparing voting results for people from neighboring buildings. This process substantially reduces the concern of unobserved heterogeneity. Second, the assignment of observers to polling stations was kept secret until the last moment, and was unknown not only to the government officials but also to observers themselves. As a result, people responsible for fraud were not able to refocus their operation, as was the case in Ghana in 2008 (10). Third, our experiment covered the whole city of Moscow. Although there is no solid evidence on whether or not the size of the electoral fraud in Moscow is representative for the country as a whole, Moscow itself constitutes a sizable share of the total, comprising ~7% of total number of voters in Russia. (Note that we are studying only one type of electoral fraud that concerns the proper counting of votes cast, whereas other types of fraud, such as illegal disqualifications of candidates and parties, illegal restrictions on campaigning, or unequal media attention, may have also influenced the outcome.)

Parliamentary elections that we examine took place in Russia on December 4, 2011. Russian parliament is elected under closed-list proportional representation system with a 7% threshold. (See refs. 15–18 for background on Russian parliamentary elections.) The voters could vote for one of the seven parties on the ballot. According to official results, the progovernment United Russia party, which at that time controlled two-thirds of seats in the parliament, received 49.3% of votes, which allowed it to obtain a majority of seats in the parliament. In Moscow United Russia received 46.6% of votes, whereas the four main opposition parties, the Russian Communist Party (KPRF, also referred to as Communists), Just Russia, the Liberal Democratic Party of Russia (LDPR), and Yabloko received 19.4%, 12.1%, 9.4%, and 8.6%, respectively. (The two remaining parties on the ballot, Patriots of Russia and Right Cause, received less than 1% of votes each and are not considered in the analysis.) Only United Russia and three opposition parties (KPRF, Just Russia, and LDPR) have passed the 7% national threshold that allowed them to have their representatives in the Parliament.

Moscow is subdivided into 125 electoral districts, each of which consists of around 30 polling stations subordinated to a Territorial Electoral Committee. The total number of polling stations in Moscow was 3,374, of which 210 had a special status, as they were located in hospitals, military units, or pretrial detention facilities. These polling stations were excluded from the analysis because sending observers there was not always possible, and it was not clear if these polling stations were sufficiently similar to each other to use randomization. The number of votes cast at these polling stations, however, stood at only 1.8% of total votes in Moscow. The average number of voters in 3,164 ordinary stations was about 2,250, with the total number of voters amounting to 7.1 million people.

## Results

Using a randomized assignment of independent observers coordinated by Citizen Observer, a nongovernmental organization, we estimated the extent of electoral fraud in the city of Moscow during the Russian parliamentary elections held on December 4, 2011. We found that the mere presence of independent observers at the polling stations decreased reported vote shares of United Russia by almost 11 percentage points, even though many of these observers were removed before the vote counting process was finished. (Vote share is a number of votes for a party as a percentage of all votes cast, unless it is explicitly mentioned

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otherwise.) Our estimates demonstrate that electoral fraud was serious enough to change the outcome of the elections. Even a change in 5 percentage points in the United Russia totals would strip it of a majority in the Russian parliament; the 11 percentage point estimate of the size of fraud in Moscow hints that the change in the country total might have been substantial.

Comparison of the share of votes received by different parties and the share of those eligible voters who actually voted (turnout) between polling stations with independent observers from Citizen Observer (treatment group) and without observers (control group) is presented in Fig. 1. The results indicate that the presence of observers led to a decrease in the share of votes for United Russia of 10.8 percentage points and an increase in the share of votes for the four opposition parties of 2.2, 1.7, 2.9, and 3.5 percentage points for Just Russia, LDPR, Communists, and Yabloko, respectively (all differences are statistically significant at the 1% level). The turnout at the polling stations with observers was lower by 6.5 percentage points. [The results are robust to taking into account the compositional structure of the data; that is, that the share of votes for all of the parties sums up to one (Table S1).] The results are even stronger if we test the hypothesis that electoral fraud disproportionately benefited United Russia compared with other parties, which reflects the fact that all other parties except United Russia were hurt by electoral fraud. (Table S2 presents the results of the corresponding differences-in-differences estimations, which compare the differences in the votes for United Russia between polling stations with and without independent observers with the corresponding differences for the other four parties.)

## Discussion

The above results are likely to provide a lower bound on the extent of the electoral fraud, because the presence of observers at the polling stations did not fully prevent fraud. There are two additional assumptions that are required to ensure that these estimates are indeed the lower bound. First, observers themselves should not be involved in pro-opposition electoral fraud. Second, the presence of independent observers at a polling station should not affect the extent of fraud at the polling stations where observers were not present, so that the stable unit treatment-value assumption is satisfied (19). The first assumption seems plausible, as observers have very limited means of affecting the electoral results even if they wanted to affect it.

To test for the existence of spillover effects, we used data on polling stations located in the same building as the polling stations in which the observers were present. The results reported in Table 1 imply that observers were able to prevent fraud even on neighboring polling stations, leading to a smaller—not larger—vote share of United Russia in these stations. (The spillover effect is smaller than the main effect for all of the parties and the difference is statistically significant at the 1% level for all of the parties except for the LDPR.) This finding implies that violation of the stable unit treatment-value assumption leads to underestimation rather than overestimation of the observer effect. Thus, the results provide a lower bound for the extent of the electoral fraud both because of spillover effects and because the presence of observers at the polling stations did not fully prevent fraud.

To provide more information on the extent of the fraud, we divided all treatment stations into three groups: (*i*) those in which observers reported no serious violations; (*ii*) those in which serious violations were reported, but the observers received the final protocol; and (*iii*) those in which all observers were not able to get the official protocol of the vote count. Observers were not able to get a protocol if they were either dismissed from the polling station or the heads of electoral commissions illegally refused to give a signed copy of the protocol. [Most observers were removed under the pretext of violating ballot secrecy (Russian law permits photo and video recording at a polling station, but not of a voter with a filled ballot), or for "obstructing the polling process." Observers remaining were at 118 (of 153) polling stations after the vote count was complete. At 23 of the stations, from which no data was received, electoral commissions simply refused to give a signed copy of the protocol to the observers, and at 15 of these stations all observers were removed before the final protocol was signed.]

To examine the effect of observers on the distribution of vote shares for United Russia, we combined univariate kernel density estimations of the vote share for United Russia for polling stations from these three groups with corresponding histograms (Fig. 2). For the polling stations in the control group, the distribution is bimodal with two peaks: one around 25% of votes and another one around 55% of votes. The distribution for polling stations in the treatment group also has two peaks, with the first one around 25% of votes. However, the second mode is located around 50% of votes and the share of polling stations around this peak is noticeably smaller compared with the control group. For the polling stations in the treatment group in which no violations were reported by observers, the distribution becomes unimodal, with the peak around 25% of votes for United Russia. Thus, the results are consistent with the hypothesis that the distribution of vote shares for United Russia in the control group is a mixture of two distributions that correspond to polling stations without electoral fraud (for which the distribution was centered around 25% of votes) and polling stations with electoral fraud (for which the distribution was centered around 55% of votes). A similar pattern is observed in the distribution of the turnout, but not in the distribution of vote shares for the other parties. (Fig. S1 shows similar graphs for the distributions of vote shares of other parties and turnout for the same three groups of polling stations. Vote shares of other parties without observers demonstrate fatter left tails, in contrast to symmetric densities in the no-violation case, consistent with hypotheses that votes were stolen from these parties and added to votes of United Russia.)

Table 2 presents the results of the corresponding regression analysis. We introduced electoral district fixed effects, because our independent variables (e.g., the presence of serious violations) were not randomly assigned, and the incidence of fraudulent behavior might vary from district to district. The results indicate that, controlling for electoral district fixed effects, the share of votes for United Russia at the polling stations in which no violations were reported was 16% lower and the turnout 9% lower compared with the polling stations without observers. At the polling stations where observers reported serious violations, the share of votes for United Russia and turnout were lower by 7.3% and 6.2% respectively, whereas at the polling stations in

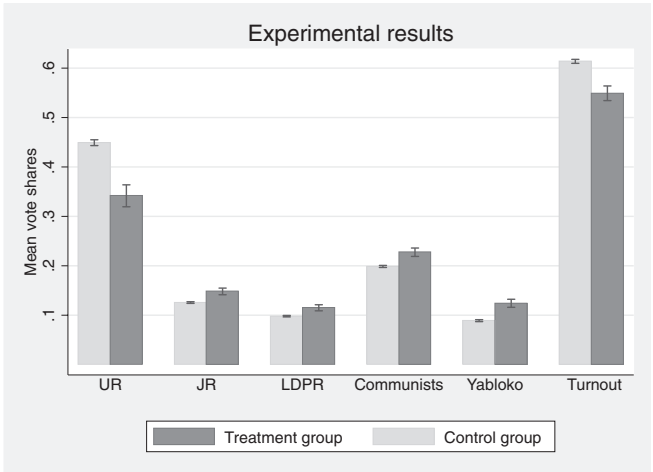


**Fig. 1.** Vote shares in 2011.

**Table 1. Spillovers**

| Sample | Vote share of | | | | | Turnout |
|---|---|---|---|---|---|---|
| | United Russia | Just Russia | LDPR | Communists | Yabloko | |
| Observers present | −0.130*** (0.013) | 0.029*** (0.004) | 0.027*** (0.003) | 0.035*** (0.005) | 0.034*** (0.004) | −0.086*** (0.009) |
| Observers present in a neighboring polling station | −0.052*** (0.014) | 0.014*** (0.004) | 0.022*** (0.004) | 0.015*** (0.005) | −0.002 (0.005) | −0.047*** (0.009) |
| Constant | 0.452*** (0.010) | 0.125*** (0.003) | 0.097*** (0.002) | 0.198*** (0.003) | 0.089*** (0.004) | 0.616*** (0.006) |
| Observations | 3,164 | 3,164 | 3,164 | 3,164 | 3,164 | 3,164 |
| $r^2$ | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.03 |

SEs clustered by electoral district are in parentheses. *$P < 0.1$, **$P < 0.05$, ***$P < 0.01$.

which observers were removed before the official protocol of the vote count was signed the share of votes for United Russia was lower by 4.4% and the turnout was not significantly different from the polling stations without observers. Note, however, that these results should be interpreted with caution, as the allocation of the polling station with observers to one of the three groups was endogenous, which could lead to biased results (e.g., the coefficient for "no violations" will overestimate the magnitude of fraud if violations were more likely to be observed at the polling stations with higher genuine support for United Russia). Nevertheless, the results provide some important information. In particular, they show that the presence of observers reduced the share of votes for United Russia even at the polling stations in which all of the observers were removed before the final vote count.

To measure the overall impact of the electoral fraud in Moscow on the result of parliamentary elections, we estimated the total number of votes that United Russia received because of electoral fraud. As both turnout and share of votes were affected by electoral fraud, we compared the number of votes for each party as a share of registered voters in places with and without observers. (Note that voter registration is automatic for people residing in a precinct, and all of the people living in a precinct have to maintain valid registration with police all of the time, including nonelection years. Thus, there is very limited ability to manipulate the number of registered voters.) The results (reported in Fig. S2) indicate that the presence of observers reduced this share for United Russia by 9.3 percentage points and increased it for Just Russia, LDPR, Communists, and Yabloko by 0.6, 0.3, 0.5, and 1.5 percentage points, respectively (most differences significant at the 1% level). The total number of registered voters at polling stations without observers was 6.75 million. Using these numbers, we get a conservative estimate of the number of votes that United Russia received at the ordinary polling stations in Moscow because of electoral fraud that amounts to 635,000. As we have already mentioned, this is a lower bound for the size of electoral fraud because it assumes that the presence of observers fully prevented any fraud. If we use results from the polling stations in which observers reported no serious violations as an alternative estimate of the size of fraud, the corresponding number increases to 870,000 and the estimate goes up to 1,090,000 if we do not control for electoral district fixed effects.

Anecdotal evidence suggests that different methods of electoral fraud were used, starting from plain ballot stuffing to announcing of votes for competitors of United Russia as votes for United Russia at the stage of ballot counting, and to changing the final protocol in a computer system. (Theoretically, observers could go to the court if they have these violations documented, but in practice Russian courts have almost never sustained claims in vote fraud cases.) Our results allowed us to examine separately fraud that increased the share of votes received by United Russia

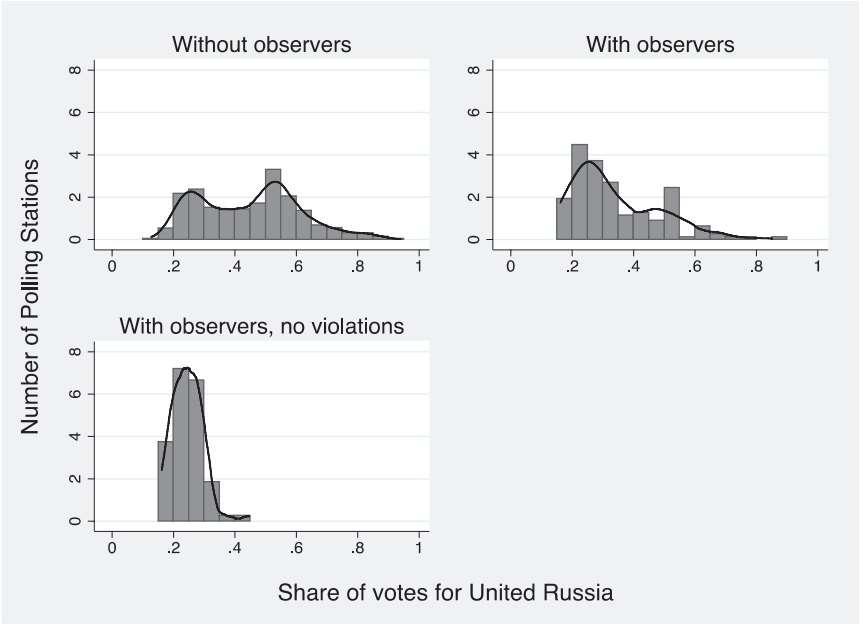


**Fig. 2.** Distribution of votes for United Russia.

**Table 2. Effect of the presence of observers on results of elections**

| Sample | Vote share of | | | | | Turnout |
|---|---|---|---|---|---|---|
| | United Russia | Just Russia | LDPR | Communists | Yabloko | |
| Observers present, no serious violations | −0.159*** (0.013) | 0.037*** (0.004) | 0.026*** (0.004) | 0.044*** (0.005) | 0.046*** (0.006) | −0.090*** (0.011) |
| Observers present serious violations reported | −0.073*** (0.016) | 0.015*** (0.005) | 0.015*** (0.005) | 0.016* (0.009) | 0.024*** (0.005) | −0.062*** (0.015) |
| Observers present, no protocol received | −0.044* (0.023) | 0.001 (0.007) | 0.009 (0.006) | 0.012 (0.010) | 0.020** (0.008) | −0.022 (0.015) |
| Constant | 0.449*** (0.000) | 0.126*** (0.000) | 0.098*** (0.000) | 0.199*** (0.000) | 0.089*** (0.000) | 0.614*** (0.000) |
| Electoral districts fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 3,164 | 3,164 | 3,164 | 3,164 | 3,164 | 3,164 |
| $r^2$ | 0.42 | 0.34 | 0.37 | 0.31 | 0.47 | 0.34 |

SEs clustered by electoral district are in parentheses. *$P < 0.1$, **$P < 0.05$, ***$P < 0.01$.

by increasing the official number of ballots cast (either through ballot stuffing or by changing the final protocol) and fraud that involved counting ballots cast for other parties as ballots cast for United Russia (at the stage of ballot counting or by changing the final protocol).

The results for the number of votes for parties as a share of registered voters (Fig. S2) also allows us to assess the extent of the fraud that involved counting ballots cast for other parties as ballots cast for United Russia. The results indicate that the share of votes as a percentage of registered voters was higher at the polling stations with observers for all of the parties except United Russia. As ballot stuffing or increasing the number of votes for United Russia in the final protocol does not affect the number of votes cast for the opposition parties, this difference can occur only because of the fraud that involves counting ballots cast for other parties as ballots cast for United Russia. The results indicate that the presence of observers increased the share of votes that went to opposition parties by 3%. Thus, the results suggest that this alternative method of fraud accounts for about one-third of votes received by United Russia because of electoral fraud.

The fraud that involves increasing the share of votes received by United Russia by increasing the official number of ballots cast, such as ballot stuffing, should lead to a disproportionately high correlation between the turnout and the share of votes for United Russia compared with other parties. However, such differences in correlation itself is not evidence of fraud, as a high correlation of the turnout and the vote share of one of the parties might be a result of the voters' heterogeneity. To estimate to what extent the correlation between the share of votes for United Russia and turnout is driven by electoral fraud, we tested whether or not the differences in correlation depends on whether the observers were present at the polling station.

The results in Table 3 indicate that the correlation between turnout and the share of votes as a percentage of registered voters is significantly higher for United Russia when compared with any of the other four parties. However, the difference in correlations is significantly smaller at polling stations with observers. The coefficient for the effect of turnout on the share of votes for United Russia is around 1 at polling stations without observers, but only around 0.7 at polling stations with observers. (In the specification presented in Table 3, the effect of turnout on the share of votes of United Russia at polling stations without observers is the sum of coefficients for *Turnout* and *Turnout* × *United Russia dummy*. At polling stations with observers the effect is the sum of coefficients for *Turnout*, *Turnout* × *United Russia dummy*, and *Observers present* × *Turnout* × *United Russia dummy*. For other parties the effects are calculated as the coefficient for *Turnout* and the sum of coefficients for *Turnout* and *Observers present* × *Turnout*, respectively.) At the same time, for other parties the coefficient is very small and often negative at polling stations without observers (this negative correlation can be attributed either to substantial voter heterogeneity or to the fact that ballot stuffing is positively correlated with occurrences of other types of fraud that reduce the official number of ballots

**Table 3. Effect of the presence of observers on the correlation between turnout and results of elections**

| Sample | Vote share as a number of registered voters | | | |
|---|---|---|---|---|
| | United Russia and Just Russia | United Russia and LDPR | United Russia and Communists | United Russia and Yabloko |
| Observers present × Turnout × United Russia dummy | −0.349** (0.157) | −0.276* (0.141) | −0.350** (0.161) | −0.347** (0.133) |
| Turnout × United Russia dummy | 1.040*** (0.036) | 1.048*** (0.033) | 1.015*** (0.039) | 1.062*** (0.038) |
| Observers present × Turnout | 0.081** (0.041) | 0.010 (0.029) | 0.081* (0.046) | 0.078*** (0.030) |
| Turnout | −0.024 (0.014) | −0.029** (0.013) | −0.001 (0.016) | −0.050*** (0.015) |
| Observers present × United Russia dummy | 0.160* (0.083) | 0.122 (0.075) | 0.160* (0.085) | 0.151** (0.070) |
| Observers present | −0.040* (0.022) | −0.003 (0.016) | −0.040 (0.024) | −0.032* (0.016) |
| United Russia dummy | −0.426*** (0.023) | −0.414*** (0.021) | −0.454*** (0.024) | −0.417*** (0.024) |
| Constant | 0.089*** (0.010) | 0.076*** (0.009) | 0.119*** (0.010) | 0.083*** (0.010) |
| Electoral districts fixed effects | Yes | Yes | Yes | Yes |
| Observations | 6,328 | 6,328 | 6,328 | 6,328 |
| $r^2$ | 0.85 | 0.87 | 0.80 | 0.85 |

The unit of observation is party-precinct. Each regression includes observations for United Russian and a party indicated in the table. SEs clustered by electoral district are in parentheses. *$P < 0.1$, **$P < 0.05$, ***$P < 0.01$.

cast.), but is significantly higher for all parties except the LDPR at polling stations with observers. Overall, the results indicate that an increase in turnout did indeed disproportionately benefit United Russia, but the magnitude of the effect is much smaller than the official numbers suggest. The remarkable result that all of the additional votes go to the progovernmental party is partly driven by ballot stuffing, which accounts for about 30% of the effect.

## Materials and Methods

To estimate the extent of electoral fraud, we exploited randomized assignment of independent observers to polling stations. Before Russian parliamentary elections in December 2011, the independent nongovernmental organization Citizen Observer (Grajdanin-nabludatel) trained more than 500 volunteer observers in the city of Moscow. The observers were sent to 156 randomly selected polling stations. The polling stations were selected using a systematic sampling technique. In particular, polling stations were divided by electoral districts. [As Moscow is a large city, there is some heterogeneity across different neighborhoods and, therefore, electoral districts (e.g., some are richer, some are poorer, some are more educated, some are less). However, different precincts within each district are very similar. The vast majority of Moscow consists of large apartment buildings, and a typical precinct includes 8–10 buildings with the median number of eligible voters per precinct being 2,325. As a result, many precincts within a district are just different buildings on the same street, and sometimes even one building was divided between two different precincts.] Within each district, polling stations were sorted according to their official number assigned by Central Election Committee. Every 25$^{th}$ polling station within an electoral district, starting from the first, was assigned for observation, resulting in a sample of 185 polling stations. (In 71 electoral districts with fewer than 26 polling stations, we selected only the first one; in 6 districts with more than 51 polling stations we selected the 1$^{st}$, 26$^{th}$, and 51$^{st}$ polling stations; and in the remaining 48 districts we selected the 1$^{st}$ and 26$^{th}$ polling stations. This sampling technique was chosen because it is considered as the most trustworthy by the general public in Russia. We started from the first polling stations for logistical reasons, because by the time randomization took place location of the polling stations was not yet known and the first polling station is the only one for which the location never changes from one election to another.) To make sure that this procedure does not lead to a biased sample because of some hidden periodicities, we checked that in the previous parliamentary elections (2007) polling stations selected using a similar procedure were not different from other polling stations (see below). The sampling procedure and the identity of the polling stations to be observed were kept secret until the last moment to prevent strategic response.

In the Russian electoral environment, the major sources of fraud that is preventable by election observers located at the polling stations are ballot stuffing and vote-count manipulation (20). It is necessary to have no fewer than three to four motivated observers per station to have a realistic chance of reducing the magnitude of fraud. The Citizen Observer's network recruited enough observers to cover 156 of the 185 polling stations, which corresponds to 4.9% of the 3,164 ordinary polling stations in Moscow. For each polling station the observers reported whether they were able to get the official protocol of the vote count (and the data contained in the protocol), and whether the observers witnessed or suspected violations that were serious enough to have significantly compromised the vote count. The reports by the observers indicate that, among the 156 polling stations, in 38 polling stations observers were not able to get the official protocol of the vote count; in 43 polling stations observers reported serious violations; and in 75 polling stations observers reported no serious violations.

The initial randomized assignment selected 185 polling stations to be observed, but because of insufficient numbers of observers they were present only at 156 of them. To control for potential attrition bias, we estimated an instrumental variable regression in which we used a dummy variable for preliminary assignment of the polling stations as an instrument for the dummy variable of the actual presence of observers (intention-to-treat design). The comparison between instrumental variable and ordinary least-squares estimates indicates that the difference between the two estimates is very small in magnitude (Table S3). A Hausman test indicates that there is no statistically significant difference between the coefficients in instrumental variable and ordinary least-squares, so there are no signs that there was any bias in the choice of the 156 polling stations.

The main identifying assumption in the analysis is that, absent the presence of independent observers, the results at the polling stations assigned to the treatment group would have been the same as in the control group. Although we cannot test this assumption directly for the whole sample, we conducted two empirical exercises. First, we tested whether the selection rule lead to any bias using the results of the 2007 parliamentary elections. In particular, we constructed a dummy variable for the 1$^{st}$, 26$^{th}$, and 51$^{st}$ polling stations within each electoral district and ran a regression of the electoral results on this dummy variable. The results of this placebo regression indicated that the vote outcomes at these polling stations were not different from average voting results (Fig. S3). Second, for ∼one-third of electoral districts (in particular, for 1,028 of 3,164 precincts in 45 of 125 electoral districts), we were able to match treatment precincts in 2011 with corresponding precincts in 2007 (we matched precincts if more than seven-eighths of buildings coincided in 2007 and 2011). A simple difference analysis suggests that treatment and control precincts were very similar in 2007 (Fig. S4). [We also checked that electoral returns in 2007 were not substantially different in treatment and control precincts by using Kolmogorov–Smirnov tests. These tests implied that there is no significant difference between distribution functions in treatment and control precincts, with corresponding $P$ values being not less than 0.5 for all major parties and turnout except KPRF, for whom the $P$ value is 0.154. Note also that, if anything, average vote share of KPRF in 2007 was (insignificantly) smaller in treatment precincts, but average vote share of KPRF in 2011 was significantly larger in treatment precincts, presumably because in control precincts votes of Communists were stolen in favor of United Russia.] A difference-in-difference analysis implies that our results do not change if preexisting differences and common trends are being controlled for (Table S4). Thus, these placebo tests suggest that the procedure that was used to select polling stations for observation did not lead to any systematic bias.

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