Electoral Fraud in Russia: Vote Counts Analysis using Second-digit Mean Tests*

Walter R. Mebane, Jr.† Kirill Kalinin‡

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Abstract

Growing authoritarian tendencies in Russian politics pose the problem of widespread electoral fraud designed to boost electoral support for Kremlin presidential candidates and parties, and to suppress political competitors. We use tests based on the second-digits of polling station level data from the Russian Duma elections of 2007 and presidential election of 2008 to examine the methods used to distort vote counts and examine whether votes reported at different times during the day are differently distorted. We find evidence of substantial changes in at least the location of fraud in Russian elections. In 2008, fraud moved into cities in ways it had not been present in 2007. We also find signs of "normal politics" at work, meaning that besides extensive evidence of widespread fraud there is also evidence of people having switched their votes in order to avoid wasting them on hopeless candidates.

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†Professor, Department of Political Science and Department of Statistics, University of Michigan, Haven Hall, Ann Arbor, MI 48109-1045 (Phone: 734-763-2220; Fax: 734-764-3522; E-mail: wmebane@umich.edu).

‡Ph.D. student, Department of Political Science, University of Michigan (E-mail: kkalinin@umich.edu).

Introduction

Growing authoritarian tendencies in Russian politics pose the problem of widespread electoral fraud designed to boost electoral support for Kremlin presidential candidates and parties, and to suppress political competitors. Our previous research (Mebane and Kalinin 2009a,b) and work by others (Myagkov and Ordeshook 2008; Myagkov, Ordeshook, and Shaikin 2008, 2009) focuses on fraudulently inflated turnout. Our current research, again using polling station level data from the Russian Duma elections of 2007 and presidential election of 2008, examines the methods used to distort vote counts and examine whether votes reported at different times during the day are differently distorted. To accomplish our research objective we apply methods studied in Mebane (2010) that examine the pattern of digits in vote counts.

Mebane (2010) uses a Monte Carlo simulation study to show that tests based on the second significant digits of precinct-level vote counts can distinguish votes that were cast normally from votes that were subject to coercion. Votes being normal refers to both votes that directly reflect preferences and votes that are changed by voters voting strategically according to "wasted vote logic": voters vote not for their most preferred choice but instead for a lower ranked alternative in order to try to defeat an even lower ranked alternative that they believe is attracting more votes than their first choice is attracting (Cox 1994). Votes being coerced means votes are cast regardless of preferences. Mebane's simulation study applies to a simple plurality election. In Mebane (2010) the simulation results are supported by data from several American elections, elections in Mexico and an election in Iran.

The presidential election in Russia in 2008 is an example of a simple plurality election, so the results claimed in Mebane (2010) should apply directly. The 2007 Duma election is different, however, using a proportional representation (PR) election system instead of a plurality rule. Here we assume Mebane's simulation results are relevant to PR election systems, pending a direct demonstration. For both kinds of Russian elections we also

extend the concept of coercion to include ballot box stuffing: adding entirely phony votes to a candidate's total. The rationale for this is that each such vote is not motivated independently by a set of preferences, only by the preferences of the malefactor; so it seems reasonable to say they are cast regardless of preferences, in the same sense as the coerced votes in Mebane (2010).

Exploring Turnout by Time

Previously we studied the relationship between electoral frauds and turnout figures, using precinct-level data (Mebane and Kalinin 2009a,b). We have undertaken a complex methodological approach to diagnostics of electoral falsifications in the federal elections of 2003-2004, 2007-2008 in Russia. The methods of diagnostics of electoral falsifications involved in our research have revealed abnormal zones of the Russian elections with reference to turnout and, partly, voting. Kernel density plots of turnout have shown excess occurrence of 100% turnout for republics and the abnormal localized irregularity testifying that turnout indicators have been provided by Kremlin to regional authorities (Mebane and Kalinin 2009a,b, Figures 1 and 2). The analysis of last significant figures in numbers of the voted voters has revealed presence of a considerable quantity of zeros and fives and lack of nines (Mebane and Kalinin 2009a,b, Table 1). This tendency worsens across elections from 2003 to 2008. Construction of nonparametric regression of turnout shares and a share of obtained votes has revealed strong relationships between turnout and the level of support for each party, which is positive for United Russia and negative for the Communist Party of the Russian Federation and all other parties (Mebane and Kalinin 2009a,b, Figures 3–6). These relationships cause suspicions about falsifications in turnout and voting. Last, as a result of the analysis of nonparametric regression of the second significant digit and turnout share, the intervals of turnout were constructed which suggest that "vote switching" most likely took place (Mebane and Kalinin 2009a,b, Figures 7–10). It has been revealed that similar "vote switching" was carried out not for high levels of

turnout, but at average levels of turnout.

The general conclusion of the research is that a combination of various methods of electoral diagnostics is the important way of revealing falsifications of turnout and voting anomalies. In this paper we further develop our argument by exploring the patterns of turnout distribution across time for the federal elections of 2007 and 2008. Unlike the previous paper, which focuses on the diagnostics of electoral frauds related to turnout, in this paper we emphasize the mechanism by which the anomalies in turnout have been produced. In other words, we will be addressing the question whether there are any observed irregularities in turnout which will help us to explain "how" the observed levels of fraudulent turnout have been reached throughout the day in around 95,000 precincts across the country during 2007 and 2008 elections.

Unfortunately, there is a lack of relevant literature discussing the distribution of by-hour turnout during the Russian elections. In her work Arbatskaya, by analyzing Russian elections 1996–2000 argues that the models of electoral activity of the regional electorate, on the one hand, are determined by political and administrative factors, such as the type of elections (regional or federal) and administrative interferences in the electoral process, on the other hand, by the type of the regions—urban/rural, type of industrial structure, seasonal effects—contributing to the changes in turnout rates during the day (Arbatskaya 2004). She makes a strong assumption that the course of voting—i.e. turnout by time—should follow particular distributions. As a result of her analysis, Arbatskaya groups regions into two broad categories of turnout activity: passive, predominantly, Russian regions and rural territories; and active regions, Republics and rural territories.

In this paper we suggest that the observed anomalies in the distribution of turnout throughout the day in the federal elections of 2007 and 2008 can be attributed to the active interference of administrative elites with the electoral process.

Let's first consider specifics of federal elections of 2007 and 2008.

Both elections were vital for the future of the authoritarian regime established under

Vladimir Putin's presidency. The 2007 parliamentary elections, labeled as a referendum for the all-national Leader, were aimed to provide sustainability of the regime by relegitimating Vladimir Putin, i.e. providing him the level of electoral support comparable with 2004 elections (2004, 71.31%, and 2007, 64.30%) and thus securing his position for at least another 4 years. The 2008 presidential elections had to insure the consistency of the established regime, serving as another referendum, this time through support for Putin's crony, today's Russia's president Dmitry Medvedev. Most experts agree that Medvedev's support in 2008 had to be almost similar to Putin's, but a bit less—70.28% was his result. Similarly, turnout levels for Putin in 2007 had to be relatively similar to turnout level for Putin in 2004, respectively 63.66% and 64.3% (compared to 55.75% in 2003), and for Medvedev in 2008, 69.7%.

The significance of these both elections for the present Russian political regime made both the level of turnout and level of electoral support important indicators of the regime's sustainability and consistency. In reality, given the fact that the Parliament was always considered as weak and ineffective by the average Russian voter (as Boris Gryzlov, a leader of UR memorably said: "Parliament isn't a place for political discussions") and presidential elections were characterized by low competition and the lack of any intrigue—both elections could have provided low turnout and hence an inferior political outcome to Kremlin (Buzin and Lubarev 2008, 83–84).

Therefore the wide range of methods to boost turnout figures were introduced, which included various propaganda methods, increased levels of "controlled" voting (outdoor voting, voting at home, rising number of absentee certificates), wide scale organization of precincts at the railway stations/hospitals etc., as well as, open falsifications designed not solely to shift votes from one candidate to another, but rather to simultaneously increase the number of votes and the number of voters, implemented by "stuffing" the ballot boxes (*vbros*) or "adding figures to protocols" (*pripiska*) (Buzin and Lubarev 2008, 184). Buzin and Lubarev (2008) present electoral data, observer reports and multiple stories from

observers and ordinary voters that illustrate the growth of crude falsifications and their widespread character, a pattern they refer to as "mass administrational electoral technology."

The administrative implementation of the Kremlin's strategy of winning/frauding votes was assigned to the governors. With the abolition of regional elections the governors lost their independent political base: the political survival of the governor was put entirely under the Center's judgment, which has led to local "political machines", which were quite independent during Yeltsin's rule, being co-opted into a nation-wide political "convoy" (Gel'man 2009). As a result, electoral frauds started to serve as a basic "signaling" mechanism through which favorable electoral outcomes were aimed to display regional elites' loyalty to the Center.

Regional clientelistic networks can serve as vehicles to win national elections both under decentralized competitive political regime—when patron-clientelistic networks work autonomously—and under centralized authoritarian political regime—when patron-clientelistic networks are built into the vertical power structure. Since there was no perfect coordination in the economy, enterprises took on roles of providers of many social services. The first secretaries of the regional organizations of the Communist Party of the Soviet Union tended to play a central role in insuring the regional economy. They organized informal, off-plan exchanges among enterprises within their regions, and the regional party bosses had considerable formal and informal control over the personnel in regional enterprises (Hale 2003). Interestingly, to meet the figures in the plan and not to be punished the regional bosses also often applied "false accounting" (*pripiski*), affecting the measures of the level of regional output (Harrison 2009). No wonder that after the collapse of the Soviet Union and installation of the market, many such clientelistic ties between the regional governments and enterprises persisted, though it became harder for regional bosses to manipulate the enterprises.

By definition, turnout is a ratio between the number of participated voters and the

number of registered voters in the denominator. Clearly, the increase in turnout rate leads to the increase in numerator or decrease in denominator. Given this information, we also need to consider the way strategies of the elites towards the increase of turnout occur in different types of elections, i.e. parliamentary elections with PR electoral formula and presidential elections with built in majoritarian formula. Here we argue that despite the fact that in both elections the goals of increased turnout by the regional elites were similar, electoral systems will differently affect the strategies of the regional governors. The majoritarian electoral system which is based on a "winner take all" principle is in contrast to PR, designed to split ballots proportionately between the parties.

If we consider 2007 parliamentary elections, not only the threat of sanctioning of the governors, but also the distribution of mandates (seats) between regional groups tied the level of turnout to the number of mandates, and subsequently motivated the regional governors to fight for the increase in the level of turnout as far as the number of voters is concerned in order to provide themselves with the greater number of mandates. Given the fact that according to PR electoral formula, the regional governors are interested in increasing the number of voters during the day of elections by using the range of methods to boost the number of participated voters. Moreover, with the cancellation of the threshold of turnout for elections to be successful (20%) the governors lost their incentives to decrease the number of registered voters. These incentives might have eclipsed the electoral goal of 2007 to provide Putin with equivalent "percentages."

If we consider presidential elections and its "winner take all setting," what matters most is the level of turnout (understood as the percentage), which means that elites will consider manipulation with a ratio between the number of participated voters and the number of registered voters. For instance, to meet specific "turnout" percentage the fraud is more likely to take place before the elections (reduce the lists of participants to secure higher level of turnout before the election day) or by the end of the day to adjust both components in such a way as to provide a required percentage of voters. For instance, the

tremendous decrease in the number of registered voters in 2008 compared to 2007 discussed by many experts was most likely caused by above-mentioned political reasoning, i.e. the incentives of the governors to provide the higher level of turnout at the presidential elections by reducing the denominator (i.e. the number of registered voters), compared to Duma elections, where the governors were more eager to increase the numerator due to the fact that it's linked to the number of mandates distributed (Kornya 2008).

As a result, we expect to see that turnout was manipulated in parliamentary elections by increasing the number of voters during the day of elections, while for the presidential election of 2008 the turnout figures were adjusted closer to the end of the day.

Second-digit Benford's Law (2BL) Testing

In general the digits in vote counts do not follow Benford's Law, but several examinations have found Benford's Law often approximately describes vote counts' second digits (e.g. Mebane 2006, 2010). Under Benford's Law, the relative frequency of each second significant digit $j = 0, 1, 2, \ldots, 9$ in a set of numbers is given by $r_j = \sum_{k=1}^{9} \log_{10}(1 + (10k + j)^{-1})$. If vote counts' second-digits follow Benford's Law, then the value expected for the second-digit mean is $\bar{j} = \sum_{j=0}^{9} j r_j = 4.187$. We use $\hat{j}$ to denote the estimated second-digit mean.

The simulation and data in Mebane (2010) suggest that $\hat{j}$ can support the following interpretations of what happened in a plurality election that produces a collection of vote counts. $\hat{j} \approx \bar{j}$ occurs when there is neither strategic voting nor fraud and no other candidates similar to the candidate are on the ballot. $\hat{j} > \bar{j}$, significantly, suggests that the candidate gained votes that were switched to the candidate by voters who abandoned their favorite candidate in order to avoid wasting their votes. In particular, in this case, the simulation suggests we should see a value $\hat{j} = 4.35$. A candidate who lost votes through such strategic vote switching is expected to have a relatively small vote count and $\hat{j}$ much smaller than $\bar{j}$. These patterns count as normal politics. In the case of coercion, the

candidate who receives the coerced votes should have relatively high vote counts and $\hat{j}$ much less than $\bar{j}$.

Because these interpretations turn largely on how $\hat{j}$ stands relative to $\bar{j}$, we focus on differences $\hat{j} - \bar{j}$. When $\hat{j} - \bar{j} \approx 0$ or $\hat{j} - \bar{j} \approx 0.163$, we diagnose normal politics. When $\hat{j} - \bar{j}$ is significantly less than zero for candidates who receive relatively many votes, then we diagnose fraud by coercion, by which we mean to cover the possibility of ballot-box stuffing. When $\hat{j} - \bar{j}$ is significantly less than zero for candidates who receive relatively few votes, then we diagnose strategic vote switching if there is another candidate for whom $\hat{j} - \bar{j} \approx 0.163$. In this case the suggestion is that votes were switched from the candidates with $\hat{j} - \bar{j} < 0$ to the candidate with $\hat{j} - \bar{j} > 0$.

A complication in these interpretations is that the simulation of Mebane (2010) is based on a plurality election, while the Duma election is based on PR. We find a conceptual basis for the simulation result to be relevant in the Duma threshold of 5 percent for a party to gain seats in the legislature. We suppose that voters who fear the party they most support will finish below the threshold will strategically switch their votes to another party that they expect will finish above the threshold. A constraint on this rule, of course, following the wasted vote logic, is that no voter votes for the candidate he ranks last in his preferences. Any voter who does that is coerced.

Data from 2007 and 2008

We use data from polling stations (UIKs)[1] from the Russian Duma elections of 2007 and the presidential election of 2008. Data were downloaded from the website of the Central Election Commission of the Russian Federation, `http://www.vybory.izbirkom.ru/`.

Table 1 shows the national total votes for each party in our data. *Edinaya Rossiya* or United Russia (UR) apparently did very well in both elections, gaining 64.9% of the vote in 2007 and 71.2% in 2008. The *Kommunisticheskaya partiya Rossijskoj Federacii* or

[1]UIK, also described by us as a precinct, is *uchastkovaya izbiratelnaya komissiya*.

Communist party (KPRF) came in a distant second, with 11.7% and 18.0% of the votes respectively in the two elections, and the third-place finisher in both elections was *Liberal'no-demokraticheskaya partiya Rossii* (LDPR) with 8.2% and 9.5%, respectively. In 2007 a fourth party alliance, *Spravedlivaya Rossiya: Rodina/Pensionery/Zhizn'* (Just Russia) did only slightly worse than LDPR, gaining 7.8% of the votes nationally. Other parties did much worse, none others exceeding the 5 percent threshold in 2007.

*** Table 1 about here ***

Even so, LDPR and Just Russia just barely cleared the threshold, so to see signs that some voters had strategically abandoned them to vote for another party would not be a great surprise. Given the substantive politics of Russia at the time, we might expect UR to be the beneficiary of these vote switches.

We separate precincts in republics from precincts in oblasts, and within each class we separate precincts into three categories: cities; towns; and rural.[2] Cities are the most urban areas, such as Moscow and St. Petersburg, while towns are smaller, somewhat urban locations.

We also separate precincts based on information about the level of turnout reported at four time points during election day. For 2007 and 2008, turnout percentages are reported at `http://www.vybory.izbirkom.ru/` for each precinct at 10, 14, 17 and 19 hours.[3] The polls open at 10 and close at 19 hours. Because we consider that the level of turnout in 2004 (64.3%) was a goal for the regime in 2007 and 2008, we separate those precincts that had turnout greater than or equal to 65% from precincts that did not. Our suspicion, naturally, is that the higher turnout values are fraudulent. Precincts that exceeded 65% turnout in each time period are considered separately. We also highlight precincts where turnout was reported as 100% or greater at 10 hours.

[2]The basis for the classification is the name of the territory commission for the precinct. Cities match the regular expression `/Gorod |g\.|,/`, towns match `/ gorod/` and rural territories match neither pattern. An example of a territory commission that we classified as a city is *Ulan-Ud'e, ZHeleznodorozhnaya* in *Respublika Buryatiya*. An example of a territory commission that we classified as a town is *Majkopskaya gorodskaya* in *Respublika Adygeya*.

[3]Times are on a 24-hour clock.

We estimate $\hat{j}$ in each category and use the standard error of the mean to help assess whether $\hat{j}$ differs significantly from $\bar{j}$. We use $z = (\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$ to measure the difference, where $\hat{\sigma}_{\hat{j}}$ denotes the standard error of the mean. We consider that a value of z greater than 2.0 in absolute magnitude represents a significant difference. We report results for a category only if it contains more than 10 precincts.

Table 2 reports results for precincts in republics in 2007. There are separate results for cities, towns and rural areas, and within each class results reported separately for precincts that hit the 65% turnout level at different times. The values N show the number of precincts that have a vote count greater than 9 for the respective party (so there is a second digit to analyze). The four columns for times 10h, 14h, 17h and 19h are not cumulative, so a precinct that exceeded 65% turnout at 10h is not included in the columns for subsequent times. The next to last column shows precincts that had turnout less than 65% at the end of the day. The last column shows precincts that had turnout at least 100% when the polls opened at 10h; any such precinct results are also included in the column for precincts with turnout greater than or equal to 65% at 10h. In addition to N, two kinds of statistics are reported for each category of precincts, namely $\hat{j} - \bar{j}$ and z.

*** Table 2 about here ***

There is evidence of strategic voting according to the modified kind of wasted vote logic in relation to the threshold of 5 percent required to gain seats in the Duma. Often z is significantly negative for both Just Russia and LDPR, while z is often significantly positive or not significantly different from zero for UR. $\hat{j} - \bar{j}$ is not all that different from 0.163 for precincts that had turnout less than 65% at 19h. This pattern also holds in Table 3, below, for oblasts. The interpretation is that in 2007 many voters strategically abandoned Just Russia or LDPR in order to vote for UR.

There is also some evidence of coercion. Cities with turnout greater than 65% at 19h and towns with such turnout at 17h have z significantly negative for UR. Also negative, but not significant, are the z values for towns at 19h and rural places at 17h and 19h. Evidently

in these places there was substantial ballot box stuffing near then end of election day.

Except in rural areas in the middle of the day, the z statistics are not significant for KPRF, which suggests that in cities and towns in republics in 2007 that party for the most part neither gained nor lost votes through strategic switching nor was subject to votes being added through coercion. In rural areas the story is a bit different. Perhaps the significant z values for precincts that reached 65% turnout during the day indicates places where votes were stolen from KPRF.

Table 3 shows similar patterns for precincts in oblasts in 2007. The pattern of strategic vote switching away from Just Russia and LDPR and to UR is apparent, as are the signs of coercion in favor of UR late in the day, especially in cities and towns. A difference from republics is that KPRF seems to have benefitted from strategically switched votes in cities where turnout was less than 65%, but they seem to have lost votes to UR in towns and maybe rural areas.

For oblasts there are enough precincts with at least 100% turnout at 10h to compute z, and the pattern that appears in those precincts is clearly one of coercion in favor of UR. z is significantly negative for UR in towns and rural areas and negative in cities.

*** Table 3 about here ***

Table 4 shows results for UR and KPRF in 2008 in republics. In cities the pattern differs substantially from 2007. Now there is strong evidence of coercion in precincts where turnout was less than 65% ($z = -5.0$). Coercion in favor of UR is also apparent in the z statistics for cities in precincts with turnout of at least 65% at 17h and 19h. In towns and rural areas there is a hint of strategic voting in favor of UR in places than had turnout less than 65%, but coercion is evident in towns that had high turnout during the day. The value of $\hat{j} - \bar{j}$ for KPRF in towns with turnout less than 65% is considerably higher than that seen in the simulation of Mebane (2010) or in any other data and hence must be deemed suspicious.

*** Table 4 about here ***

Table 5 shows similar patterns for 2008 for precincts in oblasts. There is clear evidence of extensive coercion for UR in cities and towns. Now KPRF seems to have benefitted from strategically switched votes in both cities and towns, although $\hat{j} - \bar{j}$ in cities with less than 65% turnout and in towns with at least 65% turnout at 19h is slightly too high to match the simulation of Mebane (2010). In rural areas there is some evidence of coercion in favor of UR during the middle of the day. Precincts with at least 100% turnout now do not consistently show signs of coercion having affected the vote counts.

*** Table 5 about here ***

Conclusion

Overall the 2BL tests indicate substantial changes in at least the location of fraud in Russian elections. In 2008, fraud moved into cities in ways it had not been present in 2007. This finding expands our previous findings (Mebane and Kalinin 2009a,b) that distortions in turnout were more apparent in 2008 and in 2007, and also reinforces our claim that in 2008 fraudulent manipulation was not confined to areas with excessively high turnout.

But we also find signs of "normal politics" at work, meaning that besides the extensive evidence of widespread fraud there is also evidence of people having switched their votes in order to avoid wasting them on hopeless candidates. The pattern in rural areas could be due to patron-client relationships (Hale 2003, 245). Whether all the candidates in the election were credible in other senses is a topic beyond our scope here (Gel'man 2006). There is evidence of more "normal politics" in 2007 than in 2008, although again our conclusions about this depend on our having applied plurality system simulation results to a PR system.

Notwithstanding the different context, we see the analysis here as further reinforcing the finding by Mebane (2010) that "given an appropriate covariate, tests based on vote counts' digits can do a lot to give strong suggestions about what happened" in an election. Here the conditioning on type of place and turnout level at different times of day supplies

the covariate.

References

Arbatskaya, Marina. 2004. *How Many Voters Are there in Russia? (Political-geographical analysis of a General Number of the Russian Voters and Level of their Activity. 1990-2004) (In Russian: Skol'ko zhe izbiratelei v Rossii? (Politiko-geograficheskii analiz obschego chisla rossiiskih izbiratelei i urovnya ih aktivnosti. 1990-2004)).* Irkutsk: Institute of Geography SB RAS.

Buzin, Andrei and Arkadii Lubarev. 2008. *Crime without Punishment: Administrative Technologies of Federal Elections of 2007-2008 (In Russian: Prestupleniye bez nakazaniya. Administrativniye tekhnologii federal'nih viborov 2007-2008 godov).* Moscow: Nikkolo M.

Cox, Gary W. 1994. "Strategic Voting Equilibria Under the Single Nontransferable Vote." *American Political Science Review* 88 (Sep.): 608–621.

Gel'man, Vladimir. 2006. "From 'Feckless Pluralism' to 'Dominant Power Politics': The Transformation of Russia's Party System." Paper presented at the 2006 Annual Meeting of the American Political Science Association, Philadelphia, Aug 31, 2006.

Gel'man, Vladimir. 2009. "The Dynamics of Sub-National Authoritarianism: Russia in Comparative Perspective." Paper presented at the 2009 Annual Meeting of the American Political Science Association, Toronto, Canada, Sept 3–6, 2009.

Hale, Henry E. 2003. "Explaining Machine Politics in Russia's Regions: Economy, Ethnicity, and Legacy." *Post-Soviet Affairs* 19 (3): 228–263.

Harrison, Mark. 2009. "Forging Success: Soviet Managers and False Accounting, 1943–1962." Working paper, October 26,2009.

Kornya, A. 2008. "Propavshie dushi (Lost souls)." *Vedomosti* 06.03.2008, No41 (2063). Comment on the change in the number of voters during the federal elections 2007-2008. (Kommentarii obizmenenii chislennosti izbiratelei v hode federal'nih viborov 2007-2008 godov).

Mebane, Walter R., Jr. 2006. "Election Forensics: Vote Counts and Benford's Law." Paper prepared for the 2006 Summer Meeting of the Political Methodology Society, UC-Davis,

July 20–22.

Mebane, Walter R., Jr. 2010. "Election Fraud or Strategic Voting?" Paper presented at the 2010 Annual Meeting of the Midwest Political Science Association, Chicago, IL, April 22–25.

Mebane, Walter R., Jr. and Kirill Kalinin. 2009a. "Comparative Election Fraud Detection." Paper presented at the 2009 Annual Meeting of the American Political Science Association, Toronto, Canada, Sept 3–6, 2009.

Mebane, Walter R., Jr. and Kirill Kalinin. 2009b. "Electoral Falsification in Russia: Complex Diagnostics Selections 2003-2004, 2007-2008 (in Russian)." *Electoral Policy* REO 2/09: 57–70.

Myagkov, Mikhail, Peter C. Ordeshook, and Dimitry Shaikin. 2009. *The Forensics of Election Fraud: With Applications to Russia and Ukraine*. New York: Cambridge University Press.

Myagkov, Misha and Peter C. Ordeshook. 2008. "Russian Elections: An Oxymoron of Democracy." Caltech/MIT Voting Technology Project, VTP Working Paper #63, Mar 2008.

Myagkov, Misha, Peter C. Ordeshook, and Dimitry Shaikin. 2008. "Estimating the Trail of Votes in Russia's Elections and the Likelihood of Fraud." In R. Michael Alvarez, Thad E. Hall, and Susan D. Hyde, editors, *The Art and Science of Studying Election Fraud: Detection, Prevention, and Consequences*, .Washington, DC: Brookings Institution.

Table 1: Russia, national vote totals by party, 2007 and 2008

Year	Party	Total	Percentage
2007	Edinaya Rossiya (UR)	44,460,295	64.9
	Spravedlivaya Rossiya: Rodina/Pensionery/Zhizn' (Just Russia)	5,372,269	7.8
	Patrioty Rossii	613,324	.9
	Soyuz Pravyh Sil	663,689	1.0
	Grazhdanskaya Sila	730,783	1.1
	Agrarnaya partiya Rossii	1,598,092	2.3
	Rossijskaya obedinennaya demokraticheskaya partiya Yabloko	1,100,456	1.6
	Partiya social'noj spravedlivosti	153,563	2.2
	Kommunisticheskaya partiya Rossijskoj Federacii (KPRF)	8,026,122	11.7
	Liberal'no-demokraticheskaya partiya Rossii (LDPR)	5,646,622	8.2
	Demokraticheskaya partiya Rossii	89,402	1.3
2008	Medvedev (UR)	52,238,287	71.2
	Zyuganov (KPRF)	13,217,489	18.0
	Bogdanov (DPR)	964,489	1.3
	ZHirinovskij (LDPR)	6,972,745	9.5

Note: vote counts based on UIK-level data downloaded from `http://www.vybory.izbirkom.ru/`.

Table 2: Russia, republics: 2BL mean deviations for UIK vote counts, 2007

cities			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	2,034	52	161	403	448	933	—
	KPRF	1,890	35	99	348	442	928	—
	Just Russia	1,744	11	61	320	437	912	—
	LDPR	1,725	—	52	325	432	909	—
$\hat{j} - \bar{j}$	UR	−.069	.293	.098	−.046	−.598	.106	—
	KPRF	−.111	−.159	.338	−.164	−.267	−.070	—
	Just Russia	−.078	−.551	−.056	.091	−.446	.052	—
	LDPR	−.392	—	−1.053	−.563	−.692	−.141	—
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−1.1	.8	.5	−.3	−5.0	1.1	—
	KPRF	−1.7	−.4	1.2	−1.1	−1.9	−.8	—
	Just Russia	−1.1	−.7	−.2	.5	−3.4	.5	—
	LDPR	−5.8	—	−2.9	−3.5	−5.1	−1.5	—
towns			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	2,394	—	248	749	406	992	—
	KPRF	2,235	—	198	681	387	976	—
	Just Russia	1,995	—	164	518	352	968	—
	LDPR	1,942	—	135	489	347	979	—
$\hat{j} - \bar{j}$	UR	−.147	—	−.296	−.545	−.202	.223	—
	KPRF	−.089	—	−.001	.033	−.131	−.167	—
	Just Russia	−.211	—	−.236	−.172	−.324	−.192	—
	LDPR	−.391	—	−.595	−.361	−.228	−.448	—
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−2.5	—	−1.7	−5.6	−1.4	2.4	—
	KPRF	−1.5	—	.0	.3	−.9	−1.8	—
	Just Russia	−3.3	—	−1.0	−1.3	−2.1	−2.1	—
	LDPR	−6.2	—	−2.7	−2.8	−1.5	−5.0	—
rural			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	13,357	85	5,141	4,232	1,667	2,244	—
	KPRF	7,592	12	1,615	2,748	1,276	1,948	—
	Just Russia	5,151	12	852	1,689	865	1,741	—
	LDPR	4,552	—	619	1,424	830	1,680	—
$\hat{j} - \bar{j}$	UR	−.020	.048	−.016	−.055	−.115	.110	—
	KPRF	−.190	−.854	−.424	−.223	−.051	−.042	—
	Just Russia	−.214	−.187	−.504	−.203	−.301	−.042	—
	LDPR	−.257	—	−.672	−.234	−.022	−.242	—
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−.8	.2	−.4	−1.2	−1.6	1.8	—
	KPRF	−5.8	−1.2	−5.9	−4.1	−.6	−.6	—
	Just Russia	−5.4	−.2	−5.2	−3.0	−3.1	−.6	—
	LDPR	−6.0	—	−6.0	−3.1	−.2	−3.5	—

Note: N, number of UIKs with count > 9; $\hat{j}$, mean second digit; $\bar{j}$, mean expected under 2BL; $\hat{\sigma}_{\hat{j}}$, standard error of $\hat{j}$; t, turnout percentage; —, fewer than 10 UIKs.

Table 3: Russia, oblasts: 2BL mean deviations for UIK vote counts, 2007

cities			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	18,116	252	590	688	1,110	15,472	172
	KPRF	17,731	77	456	658	1,096	15,449	33
	Just Russia	17,563	64	396	633	1,070	15,408	29
	LDPR	17,683	91	450	639	1,080	15,429	50
$\hat{j} - \bar{j}$	UR	.122	−.255	.111	−.362	−.482	.196	−.304
	KPRF	.072	.033	−.203	−.116	−.129	.104	.176
	Just Russia	−.472	−.437	−.117	−.221	−.256	−.506	−.532
	LDPR	−.416	−.385	.126	−.103	−.011	−.473	−.327
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	5.6	−1.4	1.0	−3.3	−5.5	8.4	−1.4
	KPRF	3.4	.1	−1.5	−1.0	−1.5	4.6	.3
	Just Russia	−22.2	−1.2	−.8	−1.9	−3.0	−22.4	−1.0
	LDPR	−19.6	−1.3	.9	−.9	−.1	−20.8	−.8

towns			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	9,197	166	309	780	854	7,092	120
	KPRF	8,855	36	225	743	831	7,025	11
	Just Russia	8,689	29	179	685	817	6,982	—
	LDPR	8,881	42	225	743	837	7,038	24
$\hat{j} - \bar{j}$	UR	−.006	−.483	−.074	−.332	−.306	.080	−.554
	KPRF	−.121	.313	−.121	−.342	−.101	−.102	.540
	Just Russia	−.333	−.980	−.210	.026	−.216	−.382	—
	LDPR	−.276	−.449	.021	−.232	−.012	−.320	−.604
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−.2	−2.1	−.4	−3.3	−3.1	2.3	−2.1
	KPRF	−4.0	.7	−.6	−3.3	−1.0	−3.0	.6
	Just Russia	−10.9	−2.1	−1.0	.2	−2.2	−11.3	—
	LDPR	−9.1	−1.1	.1	−2.2	−.1	−9.4	−1.1

rural			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	50,156	438	7,035	11,881	7,804	22,957	260
	KPRF	41,394	84	3,938	9,218	6,717	21,399	29
	Just Russia	35,018	43	2,258	6,889	5,599	20,221	14
	LDPR	40,095	119	3,606	8,718	6,463	21,171	56
$\hat{j} - \bar{j}$	UR	.047	−.276	−.051	−.038	.020	.136	−.395
	KPRF	−.143	−.664	−.323	−.117	−.098	−.134	−1.153
	Just Russia	−.232	−.676	−.717	−.300	−.165	−.168	−.902
	LDPR	−.156	−.154	−.296	−.125	−.122	−.155	−.348
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	3.7	−2.0	−1.5	−1.5	.6	7.2	−2.3
	KPRF	−10.2	−2.2	−7.2	−3.9	−2.8	−6.9	−2.5
	Just Russia	−15.2	−1.5	−12.3	−8.8	−4.5	−8.3	−1.1
	LDPR	−10.9	−.6	−6.3	−4.1	−3.4	−7.8	−.9

Note: N, number of UIKs with count > 9; $\hat{j}$, mean second digit; $\bar{j}$, mean expected under 2BL; $\hat{\sigma}_{\hat{j}}$, standard error of $\hat{j}$; t, turnout percentage; —, fewer than 10 UIKs.

Table 4: Russia, republics: 2BL mean deviations for UIK vote counts, 2008

cities			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	1,396	12	100	342	336	608	—
	KPRF	1,359	—	84	331	333	608	—
$\hat{j} - \bar{j}$	UR	−.707	−.937	.333	−.760	−1.181	−.589	—
	KPRF	.128	—	.027	.106	.236	.110	—
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−9.6	−1.1	1.2	−5.5	−8.5	−5.0	—
	KPRF	1.6	—	.1	.6	1.5	.9	—
towns			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	1,693	—	130	743	254	557	—
	KPRF	1,656	—	118	729	250	555	—
$\hat{j} - \bar{j}$	UR	−.137	—	−.464	−.276	−.164	.182	—
	KPRF	.121	—	−.018	−.056	.301	.321	—
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−2.0	—	−2.0	−2.7	−.9	1.5	—
	KPRF	1.7	—	−.1	−.5	1.6	2.7	—
rural			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	10,089	102	3,222	3,727	1,431	1,538	—
	KPRF	7,446	34	1,551	3,106	1,257	1,476	—
$\hat{j} - \bar{j}$	UR	.013	−.246	.083	−.053	.004	.051	—
	KPRF	−.113	−.834	−.294	−.053	−.119	−.019	—
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	.5	−.9	1.6	−1.1	.1	.7	—
	KPRF	−3.4	−1.7	−4.1	−1.0	−1.5	−.3	—

Note: N, number of UIKs with count > 9; $\hat{j}$, mean second digit; $\bar{j}$, mean expected under 2BL; $\hat{\sigma}_{\hat{j}}$, standard error of $\hat{j}$; t, turnout percentage; —, fewer than 10 UIKs.

Table 5: Russia, oblasts: 2BL mean deviations for UIK vote counts, 2008

cities			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	17,291	314	740	1,820	2,324	12,056	234
	KPRF	16,939	88	667	1,810	2,319	12,051	34
$\hat{j} - \bar{j}$	UR	−.229	−.156	−.131	−.421	−.665	−.123	−.243
	KPRF	.198	.347	−.025	.022	.179	.241	.254
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−10.4	−.9	−1.3	−6.7	−12.0	−4.5	−1.3
	KPRF	9.0	1.2	−.2	.3	3.0	9.3	.6
towns			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	8,526	53	535	1,245	1,150	5,548	13
	KPRF	8,420	38	465	1,230	1,145	5,537	—
$\hat{j} - \bar{j}$	UR	−.186	.341	−.279	−.348	−.579	−.065	2.043
	KPRF	.137	.128	.067	−.064	.301	.154	—
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−5.8	.8	−2.2	−4.3	−6.8	−1.6	4.4
	KPRF	4.4	.3	.5	−.8	3.5	4.0	—
rural			$t \geq 65\%$				$t < 65\%$	$t \geq 100\%$
		all	10h	14h	17h	19h	19h	10h
N	UR	49,028	481	11,235	14,883	7,664	14,776	296
	KPRF	45,524	126	9,304	14,086	7,429	14,589	51
$\hat{j} - \bar{j}$	UR	−.019	.016	−.049	−.050	−.016	.032	.029
	KPRF	−.009	−.489	−.049	−.006	−.029	.029	−1.089
$(\hat{j} - \bar{j})/\hat{\sigma}_{\hat{j}}$	UR	−1.4	.1	−1.8	−2.1	−.5	1.3	.2
	KPRF	−.7	−1.9	−1.6	−.2	−.9	1.2	−2.9

Note: N, number of UIKs with count > 9; $\hat{j}$, mean second digit; $\bar{j}$, mean expected under 2BL; $\hat{\sigma}_{\hat{j}}$, standard error of $\hat{j}$; t, turnout percentage; —, fewer than 10 UIKs.